IEC 62841-3-14

Edition 1.1 2024-10
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

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Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 3-14: Particular requirements for transportable drain cleaners

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FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62841-3-14 edition 1.1 contains the first edition (2017-10) [documents 116/340/FDIS and 116/349/RVD] and its amendment 1 (2024-10) [documents 116/807/FDIS and 116/833/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62841-3-14 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

This Part 3-14 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 3-14 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC standard: Particular requirements for transportable drain cleaners.

Where a particular subclause of Part 1 is not mentioned in this Part 3-14, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– notes: in small roman type;
– **terms defined in Clause 3: bold typeface.**

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the 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- withdrawn, or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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 3-14: Particular requirements for transportable drain cleaners

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to transportable **drain cleaners**.

NOTE 101 **Drain cleaners** are also known as pipe cleaners.

This standard does not apply to hand-held **drain cleaners**.

NOTE 102 Hand-held drain cleaners are covered by IEC 62841-2-21.

This standard does not apply to high pressure cleaners to clean drains.

NOTE 103 High pressure cleaners are covered by IEC 60335-2-79.

This standard does not apply to machines that use a solid rod to clean drains.

2 Normative references

~~This clause of Part 1 is applicable.~~

This clause of IEC 62841-1:2014 is applicable, except as follows:

Addition:

IEC 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Additional definitions:

3.101
cutter
accessory that is attached to the end of the **drain cleaner cable** or is a specially formed section of the **drain cleaner cable**

3.102
drain cleaner
tool designed to clean out drains and pipes using a **drain cleaner cable** and that rests on the ground, floor or a counter top during operation

3.103
drain cleaner cable
rotating flexible **accessory** of a **drain cleaner** that is inserted into the pipe or drain

3.104
drum
cylindrical container that rotates and houses the **drain cleaner cable**

3.105
drum machine
drain cleaner that uses a **drain cleaner cable** contained in a rotating **drum**

Note 1 to entry: See Figure 101.

3.106
guide tube
rotating tube that guides the **drain cleaner cable** from the **drum** to the front exit of a **drum machine**

3.107
rear guide hose
device connected to the rear of a **sectional machine** and which encloses a portion of the **drain cleaner cable** that extends out of the rear of the tool

3.108
sectional machine
drain cleaner that uses individual sections of the **drain cleaner cable** which are connected together to extend the overall length of the **drain cleaner cable**

Note 1 to entry: See Figure 102.

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 *Addition:*

A **drain cleaner cable** is considered to be an **accessory** and is not included in the mass of the tool.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.14.1 *Addition:*

For **drain cleaners**, the additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.1 *Addition:*

Item 2) b) is not applicable.

8.14.1.101 Safety instructions for drain cleaners

NOTE 1 In the below instructions, on discretion of the manufacturer the term "drain" is replaced with the term "pipe".

a) **Before using the tool, test the residual current device (RCD) provided with the supply cord to insure it is operating correctly.** *A properly operating RCD reduces the risk of electrical shock.*

NOTE 2 It is possible to replace the term "residual current device (RCD)" with the term "ground fault circuit interrupter (GFCI)" or "earth leakage circuit breaker (ELCB)".

b) **Only use extension cords that are protected by an RCD.** *The RCD on the machine power cord will not prevent electrical shock from the extension cords.*

NOTE 3 It is possible to replace the term "residual current device (RCD)" with the term "ground fault circuit interrupter (GFCI)" or "earth leakage circuit breaker (ELCB)".

c) **Only grasp the rotating cable with gloves recommended by the manufacturer.** *Latex or loose fitting gloves or rags can become wrapped around the cable and may result in serious personal injury.*

d) **Do not allow the cutter to stop turning while the cable is turning.** *This can overstress the cable and may cause twisting, kinking or breaking of the cable and may result in serious personal injury.*

e) **One person must control both the cable and the switch.** *If the cutter stops rotating, the operator must be able to turn the tool off to prevent the cable from twisting, kinking and breaking.*

f) **Use latex or rubber gloves inside the gloves recommended by the manufacturer, goggles, face shields, protective clothing, and respirator when chemicals, bacteria or other toxic or infectious substances are suspected to be in a drain line.** *Drains may contain chemicals, bacteria and other substances that may cause burns, be toxic or infectious or may result in other serious personal injury.*

g) **Practice good hygiene. Do not eat or smoke while handling or operating the tool. After handling or operating drain cleaning equipment, use hot, soapy water to wash hands and other body parts exposed to drain contents.** *This will help reduce the risk of health hazards due to exposure to toxic or infectious material.*

h) **Only use the drain cleaner for the recommended drain sizes.** *Using the wrong size drain cleaner can lead to twisting, kinking or breaking of the cable and may result in personal injury.*

i) **Always use the rear guide hose while operating the tool and ensure the cable does not extend beyond the rear guide hose.** *This prevents the cable from whipping which may result in entanglement and personal injury.*

NOTE 4 The above warning only applies for **sectional machines**.

8.14.2 a) *Additional items:*

101) Information on the permitted length(s) and diameter(s) of the **drain cleaner cable** or **drain cleaner cable** sections;

102) Instruction on how to install the **drain cleaner cable**;

103) For **sectional machines**: instruction on how to install the **rear guide hose**;

104) Information on recommended **drain cleaner cable** diameters for different pipe diameters.

8.14.2 b) *Additional items:*

101) Information on the correct gloves to wear during operation;

102) Information on the distance the **drain cleaner** is to be placed from the drain or pipe opening.

103) Instruction on **drain cleaner cable** feed and rotation.

8.14.2 c) *Additional items:*

101) Instruction on how to inspect and maintain the **drain cleaner cable**.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable, except as follows:

14.5 *Replacement:*

A **residual current device** used to provide protection from shock in the case of moisture shall comply with IEC 61540:1999 and shall meet the following requirements a) to c):

1) The **RCD** shall disconnect both mains conductors, but not the earth conductor if provided, when the leakage exceeds 10 mA and with a maximum response of 300 ms.

   Compliance is checked by inspection and the test of 9.9.2 of IEC 61540:1999. In addition, during the test, the earthing conductor shall not become disconnected.

2) The **RCD** shall be reliable for its intended use.

   *Compliance is checked at **rated voltage** by operating the **residual current device** under conditions of simulated leakage as in a) above during conditions of locked rotor of the tool for 50 cycles. The **residual current device** shall operate correctly for all cycles.*

3) The **RCD** shall be installed such that it is unlikely to be removed during use or normal maintenance.

   This requirement is considered fulfilled if the **residual current device** is fixed to the tool or the **supply cord** connected to the tool.

Where fitted in the **supply cord**, the **residual current device** shall be provided with **type Y attachment** or **type Z attachment** for connection with the **supply cord** and **interconnection cord**.

Compliance is checked by inspection.

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

~~This clause of Part 1 is applicable, except as follows:~~

~~**17.101** The device for **sectional machines** as required in 21.18.2.1 shall have sufficient endurance for safe operation.~~

~~*Compliance is checked by the following test.*~~

~~*The **sectional machine** is fitted with the longest **drain cleaner cable** section of the largest diameter permitted in accordance with 8.14.2 a) 101). The tool is switched on.*~~

~~*For the endurance test, the device is actuated with the minimum required force to rotate the **drain cleaner cable** section and then released until the **drain cleaner cable** section rotation has completely stopped. This actuation and release is repeated for 10 000 cycles or until the device fails to rotate the **drain cleaner cable** section, whichever occurs first. During the test, any **user maintenance** to ensure the correct operation of the device is allowed.*~~

~~*During the test, the **drain cleaner cable** section shall always stop rotating when the device is released.*~~

IEC 62841-1:2014, Clause 17 is applicable.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.8 *Replacement of Table 4*:

Table 4 – Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on for **drain cleaners** with a clutch that disengages the output from the motor	Not an **SCF**
Power switch – prevent unwanted switch-on for other **drain cleaners**	a
Power switch – provide desired switch-off	a
Provide desired direction of rotation	Not an **SCF**

Any electronic control to pass the test of 18.3	a
Any speed limiting device	Not an **SCF**
Prevent exceeding thermal limits as in Clause 18	a

19 Mechanical hazards

This clause of Part 1 is applicable, except as follows:

19.1 *Replacement of the first paragraph*:

Moving and dangerous parts other than the **drain cleaner cable**, the **drum**, the **guide tube** and the drive belt, as applicable, which are covered by 19.101 and 19.102, shall be so positioned or enclosed to provide adequate protection against personal injury.

The **drain cleaner cable** shall be smooth and free from sharp edges except for the **cutter**.

19.6 This subclause is not applicable.

19.8 This subclause is applicable for **drain cleaners** with wheels.

19.101 Additional requirements for drum machines

19.101.1 The drive belt shall be guarded to provide adequate protection against personal injury.

Compliance is checked by inspection and by manual test. Using test probe 'a' of Figure 104, it shall not be possible to touch the inner surface of the drive belt, see Figure 103.

19.101.2 Any part of a **guide tube** or a **guide tube** assembly, if any, that is outside of the **drum** shall be smooth, free of burrs and shall not have any openings larger than 12,5 mm.

*Compliance is checked by inspection and by manual test using the test probe 2 of IEC 61032:1997 (12,5 mm sphere). The test probe shall not pass through any opening in the **guide tube** or **guide tube** assembly that is outside of the **drum** or **guard**.*

19.101.3 Either the **drum** shall not be accessible or all of the following conditions shall be met, see Figure 105:

– the outer circumference of the **drum** has a smooth continuous surface without any openings; however openings in the front of the **drum** are allowed;
– there is at least a 12,5 mm radial distance between the **drum** and any stationary member of the tool other than the **guard** per 19.101.1;
– if the rear plane of the **drum** is accessible, the rear of the **drum** or any component protruding from the rear of the **drum** is at least 12,5 mm away from any stationary member of the tool;
– any protrusions from or indentations in the front or rear plane of the **drum** are smooth and free of burrs;
– any protrusions from or indentations in the front or rear plane of the **drum** do not have an acute angle in the forward direction of rotation in accordance with 8.14.2.b) 103).

*Compliance is checked by inspection, by measurement and by manual test. Accessibility is checked by using the test probe 'a' of Figure 104. The 12,5 mm distance is checked by using the test probe 2 of IEC 61032:1997 which shall pass freely between the **drum** and any stationary member.*

19.102 Additional requirements for sectional machines

19.102.1 A **sectional machine** shall be provided with a **rear guide hose**. The removal of the **rear guide hose** without the aid of a tool is permitted.

Compliance is checked by inspection.

19.102.2 The **rear guide hose** shall be long enough to protect the entire portion of the **drain cleaner cable** that extends past the rear of the tool.

Compliance is checked by the following test.

*With the longest single section of the **drain cleaner cable** in accordance with 8.14.2 a) 101) extending out the front of the tool equal to the recommended distance from the drain or pipe opening according to 8.14.2 b) 102), the end of the **drain cleaner cable** section shall not extend past the end of the **rear guide hose**.*

19.102.3 The device for **sectional machines** as required in 21.18.2.1 shall have sufficient endurance for safe operation.

Compliance is checked by the following test.

*The **sectional machine** is fitted with the longest **drain cleaner cable** section of the largest diameter permitted in accordance with 8.14.2 a) 101). The tool is switched on.*

*For the endurance test, the device is actuated with the minimum required force to rotate the **drain cleaner cable** section and then released until the **drain cleaner cable** section rotation has completely stopped. This actuation and release is repeated for 10 000 cycles or until the device fails to rotate the **drain cleaner cable** section, whichever occurs first. During the test, any **user maintenance** to ensure the correct operation of the device is allowed.*

*During the test, the **drain cleaner cable** section shall always stop rotating when the device is released.*

20 Mechanical strength

This clause of Part 1 is applicable, except as follows:

20.5 This subclause is not applicable.

21 Construction

This clause of Part 1 is applicable, except as follows:

21.15 *Replacement:*

Drain cleaners shall protect the user against the increased risk of shock due to the presence of moisture.

Drain cleaners shall be either:

– of **class III construction**; or

– of **class I construction** or **class II construction** and be provided with a **residual current device** and comply with 14.5; or

– of **class I construction** or **class II construction** and be designed for use in combination with an isolating transformer.

Compliance is checked by inspection.

21.17 *Replacement:*

Drain cleaners shall be fitted with a **power switch** which is not a **momentary power switch**. The actuating member of this switch shall be easily accessible. A **power switch** that controls rotation of the **drain cleaner cable** in the reverse direction in accordance with 8.14.2 b) 103) may be a **momentary power switch.**

Compliance is checked by inspection.

21.18.2.1 *Replacement:*

In addition to the **power switch** required in 21.17, **drum machines** shall be fitted with a foot switch which is a **momentary power switch** without a lock-on device. It shall be necessary that both the **power switch** and the foot switch are in the "on" position in order to operate the machine.

In addition to the **power switch** required in 21.17, **sectional machines** shall be provided with a device that requires constant actuation applied by the operator to rotate the **drain cleaner cable**.

NOTE 101 The endurance requirements of the device are covered in ~~17.101~~ 19.102.3.

Compliance is checked by inspection.

21.18.2.3 *Replacement:*

A **drain cleaner** shall be designed so that unintentional movement of the **drain cleaner cable** is unlikely.

It shall not be possible to simultaneously actuate the foot switch/mechanical device required by 21.18.2.1 and the **power switch** required by 21.17 with a single grasping or a straight line motion.

Compliance is checked by inspection and by manual test.

21.30 This subclause is not applicable.

21.35 This subclause of IEC 62841-1:2014 is not applicable.

21.101 A **drain cleaner cable** locking mechanism that rotates with the cable shall be smooth and free from burrs. To prevent entanglement, protrusions shall

– not exceed 12 mm radially; and

– not have an acute angle in the forward direction of rotation.

*Compliance is checked by inspection and by measurement with the locking mechanism fully tightened with the largest **drain cleaner cable** installed in accordance with 8.14.2 b) 102). See Figure 106.*

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

~~This clause of Part 1 is applicable.~~

This clause of IEC 62841-1:2014 is applicable, except as follows:

23.3 This subclause of IEC 62841-1:2014 is not applicable.

24 Supply connection and external flexible cords

This clause of Part 1 is applicable.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

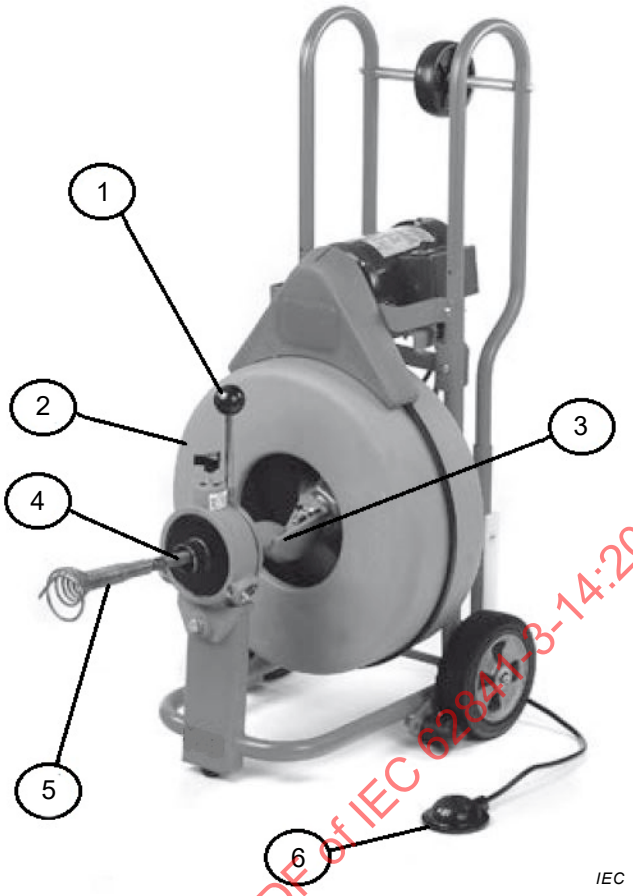
This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.

28 Creepage distances, clearances and distances through insulation

This clause of Part 1 is applicable.



Key

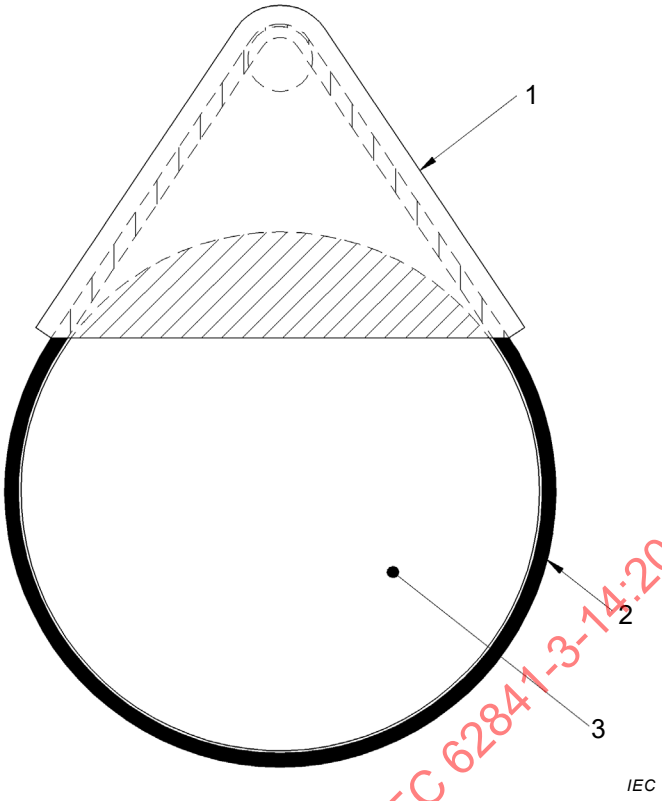
1 cable feed handle
2 **drum**
3 **guide tube**
4 **drain cleaner cable**
5 cutter
6 foot switch

Figure 101 – Drum machine

Key

1 **drain cleaner cable**
2 clutch handle
3 **rear guide hose**
4 cutter
5 switch

Figure 102 – Sectional machine

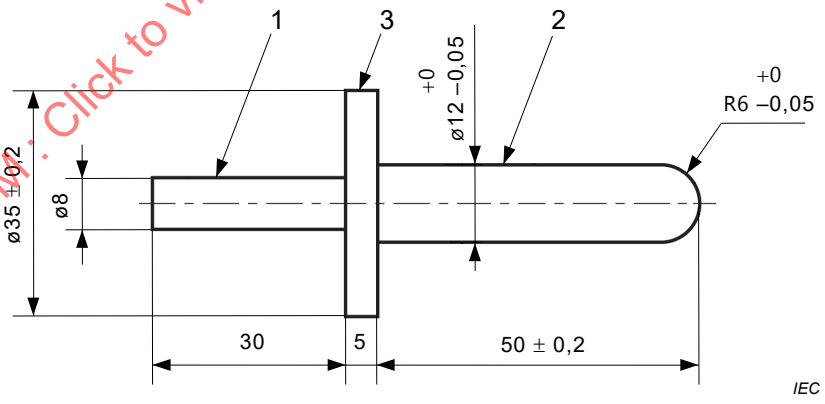


Key

1 guard
2 drive belt
3 drum

Figure 103 – Guarding of drum machines

Dimensions in millimetres

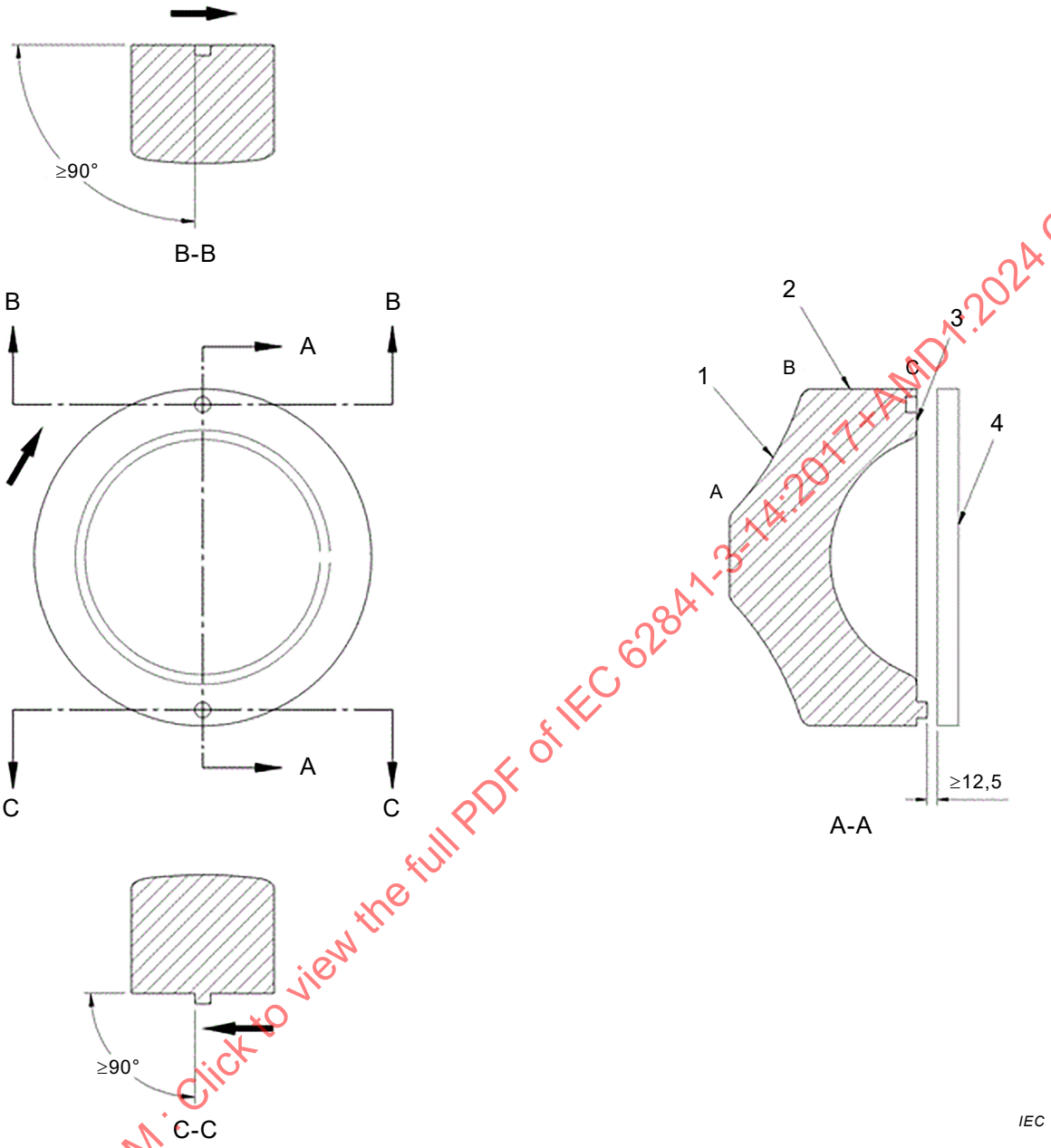


Key

1 handle section
2 test section
3 probe's flange

Figure 104 – Test probe 'a'

Dimensions in millimetres



Key

1 front of **drum** (point A to point B)

2 outer circumference of **drum** (point B to point C)

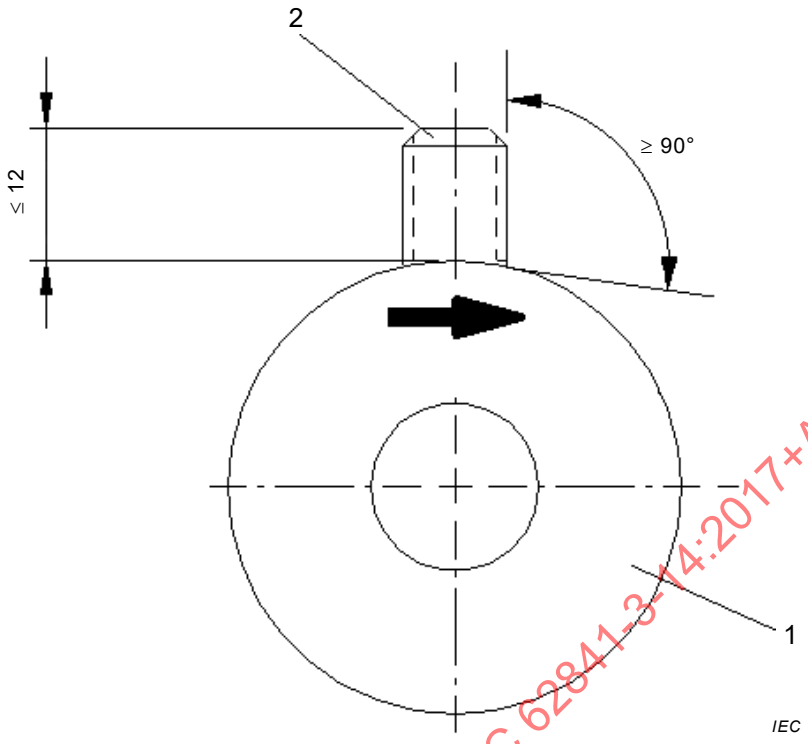
3 rear of **drum**

4 stationary member

➔ forward direction of rotation

Figure 105 – Construction of drum machines (example)

Dimensions in millimetres



Key

1 locking collar

2 cable locking mechanism

➔ direction of rotation

Figure 106 – Locking mechanism for drain cleaner cable (example)

Annexes

The annexes of Part 1 are applicable except as follows:

Annex I
(informative)

Measurement of noise and vibration emissions

NOTE 101 In Europe (EN 62841-3-14), Annex I is normative.

I.2 Noise test code (grade 2)

This clause of Part 1 is applicable except as follows:

I.2.3.2 Transportable tools

Replacement:

The microphone shall be located at a reference point that is 1 m from the point and the direction where the **drain cleaner cable** exits the tool. The microphone shall be located directly above the reference point at a height in the range of (0,8 ± 0,075) m.

I.2.4 Installation and mounting conditions of the power tools during noise tests

Addition:

Drain cleaners are tested without a **drain cleaner cable** installed.

I.2.5 Operating conditions

Addition:

Drain cleaners are tested at no-load with no operator present. Speed settings are set to the highest speed.

The temperature requirements of 5.6 are not applicable.

I.3 Vibration

This clause of Part 1 is not applicable.

Annex K
(normative)

Battery tools and battery packs

K.1 *Addition:*

All clauses of this Part 3-14 apply unless otherwise specified in this annex.

K.8.14.1.101 Items a) and b) are not applicable.

K.14.5 This subclause is not applicable.

K.21.15 This subclause is not applicable.

NOTE 101 In Europe (EN 62841-3-14), the following additional subclause applies:

K.21.18.Z101 Isolation and disabling device

Tools with an **integral battery** shall either be equipped

– with an isolation device to prevent the risk of injury from mechanical hazards during servicing or **user maintenance**; or

– with a disabling device that prevents unintentional starting of the tool.

An isolation device shall

– provide disconnection of all poles of the **battery** from the serviceable region of the tool;

– be equipped with an unambiguous indication of the state of the disconnection device which corresponds to each position of its manual control (actuator);

– be provided with protection against accidental reconnection.

NOTE 1 Examples of methods to achieve this disconnection include removable jumpers, **integral batteries** that can be disconnected for servicing or **user maintenance**, or an electromechanical **power switch** with a direct mechanical link between the actuator and the contact.

NOTE 2 The risk of accidental reconnection for a **power switch** is addressed by the requirement of 21.18.1.2. The other examples in NOTE 1 achieve this by the necessary actions for reconnection.

A disabling device may be achieved by any of the following:

– a self-restoring or non-self-restoring lock-off device where two separate and dissimilar actions are necessary before the motor is switched on (e.g. a **power switch** which has to be pushed in before it can be moved laterally to close the contacts to start the motor). It shall not be possible to achieve these two actions with a single grasping motion or a straight line motion;

– a removable disabling device provided with the tool where it shall not be possible for the tool to be operated when either applied or removed.

Compliance is checked by inspection and by manual test.

Annex L
(normative)

Battery tools and battery packs provided with mains connection or non-isolated sources

L.1 *Addition:*

All clauses of this Part 3-14 apply unless otherwise specified in this annex.

NOTE 101 In Europe (EN 62841-3-14), the following additional subclause applies:

L.21.18.Z101 Isolation and disabling device

Tools with an **integral battery** shall either be equipped

– with an isolation device to prevent the risk of injury from mechanical hazards during servicing or **user maintenance**; or

– with a disabling device that prevents unintentional starting of the tool.

An isolation device shall

– provide disconnection of all poles of the **battery** from the serviceable region of the tool;

– be equipped with an unambiguous indication of the state of the disconnection device which corresponds to each position of its manual control (actuator);

– be provided with protection against accidental reconnection.

NOTE 1 Examples of methods to achieve this disconnection include removable jumpers, **integral batteries** that can be disconnected for servicing or **user maintenance**, or an electromechanical **power switch** with a direct mechanical link between the actuator and the contact.

NOTE 2 The risk of accidental reconnection for a **power switch** is addressed by the requirement of 21.18.1.2. The other examples in NOTE 1 achieve this by the necessary actions for reconnection.

A disabling device may be achieved by any of the following:

– a self-restoring or non-self-restoring lock-off device where two separate and dissimilar actions are necessary before the motor is switched on (e.g. a **power switch** which has to be pushed in before it can be moved laterally to close the contacts to start the motor). It shall not be possible to achieve these two actions with a single grasping motion or a straight line motion;

– a removable disabling device provided with the tool where it shall not be possible for the tool to be operated when either applied or removed.

Compliance is checked by inspection and by manual test.

Bibliography

The bibliography of Part 1 is applicable, except as follows:

Addition:

IEC 62841-2-21, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 2-21: Particular requirements for hand-held drain cleaners*

IEC 60335-2-79, *Household and similar electrical appliances – Safety – Part 2-79: Particular requirements for high pressure cleaners and steam cleaners*

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 3-14: Particular requirements for transportable drain cleaners

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62841-3-14 edition 1.1 contains the first edition (2017-10) [documents 116/340/FDIS and 116/349/RVD] and its amendment 1 (2024-10) [documents 116/807/FDIS and 116/833/RVD].

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

International Standard IEC 62841-3-14 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

This Part 3-14 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 3-14 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC standard: Particular requirements for transportable drain cleaners.

Where a particular subclause of Part 1 is not mentioned in this Part 3-14, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– notes: in small roman type;
– **terms defined in Clause 3: bold typeface.**

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document and its amendment will remain unchanged until the 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 3-14: Particular requirements for transportable drain cleaners

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This part of IEC 62841 applies to transportable **drain cleaners**.

NOTE 101 **Drain cleaners** are also known as pipe cleaners.

This standard does not apply to hand-held **drain cleaners**.

NOTE 102 Hand-held drain cleaners are covered by IEC 62841-2-21.

This standard does not apply to high pressure cleaners to clean drains.

NOTE 103 High pressure cleaners are covered by IEC 60335-2-79.

This standard does not apply to machines that use a solid rod to clean drains.

2 Normative references

This clause of IEC 62841-1:2014 is applicable, except as follows:

Addition:

IEC 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

Additional definitions:

3.101
cutter
accessory that is attached to the end of the **drain cleaner cable** or is a specially formed section of the **drain cleaner cable**

3.102
drain cleaner
tool designed to clean out drains and pipes using a **drain cleaner cable** and that rests on the ground, floor or a counter top during operation

3.103
drain cleaner cable
rotating flexible **accessory** of a **drain cleaner** that is inserted into the pipe or drain

3.104
drum
cylindrical container that rotates and houses the **drain cleaner cable**

3.105
drum machine
drain cleaner that uses a **drain cleaner cable** contained in a rotating **drum**

Note 1 to entry: See Figure 101.

3.106
guide tube
rotating tube that guides the **drain cleaner cable** from the **drum** to the front exit of a **drum machine**

3.107
rear guide hose
device connected to the rear of a **sectional machine** and which encloses a portion of the **drain cleaner cable** that extends out of the rear of the tool

3.108
sectional machine
drain cleaner that uses individual sections of the **drain cleaner cable** which are connected together to extend the overall length of the **drain cleaner cable**

Note 1 to entry: See Figure 102.

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.17 *Addition:*

A **drain cleaner cable** is considered to be an **accessory** and is not included in the mass of the tool.

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.14.1 *Addition:*

For **drain cleaners**, the additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.1 *Addition:*

Item 2) b) is not applicable.

8.14.1.101 Safety instructions for drain cleaners

NOTE 1 In the below instructions, on discretion of the manufacturer the term "drain" is replaced with the term "pipe".

a) **Before using the tool, test the residual current device (RCD) provided with the supply cord to insure it is operating correctly.** *A properly operating RCD reduces the risk of electrical shock.*

NOTE 2 It is possible to replace the term "residual current device (RCD)" with the term "ground fault circuit interrupter (GFCI)" or "earth leakage circuit breaker (ELCB)".

b) **Only use extension cords that are protected by an RCD.** *The RCD on the machine power cord will not prevent electrical shock from the extension cords.*

NOTE 3 It is possible to replace the term "residual current device (RCD)" with the term "ground fault circuit interrupter (GFCI)" or "earth leakage circuit breaker (ELCB)".

c) **Only grasp the rotating cable with gloves recommended by the manufacturer.** *Latex or loose fitting gloves or rags can become wrapped around the cable and may result in serious personal injury.*

d) **Do not allow the cutter to stop turning while the cable is turning.** *This can overstress the cable and may cause twisting, kinking or breaking of the cable and may result in serious personal injury.*

e) **One person must control both the cable and the switch.** *If the cutter stops rotating, the operator must be able to turn the tool off to prevent the cable from twisting, kinking and breaking.*

f) **Use latex or rubber gloves inside the gloves recommended by the manufacturer, goggles, face shields, protective clothing, and respirator when chemicals, bacteria or other toxic or infectious substances are suspected to be in a drain line.** *Drains may contain chemicals, bacteria and other substances that may cause burns, be toxic or infectious or may result in other serious personal injury.*

g) **Practice good hygiene. Do not eat or smoke while handling or operating the tool. After handling or operating drain cleaning equipment, use hot, soapy water to wash hands and other body parts exposed to drain contents.** *This will help reduce the risk of health hazards due to exposure to toxic or infectious material.*

h) **Only use the drain cleaner for the recommended drain sizes.** *Using the wrong size drain cleaner can lead to twisting, kinking or breaking of the cable and may result in personal injury.*

i) **Always use the rear guide hose while operating the tool and ensure the cable does not extend beyond the rear guide hose.** *This prevents the cable from whipping which may result in entanglement and personal injury.*

NOTE 4 The above warning only applies for **sectional machines**.

8.14.2 a) *Additional items:*

101) Information on the permitted length(s) and diameter(s) of the **drain cleaner cable** or **drain cleaner cable** sections;

102) Instruction on how to install the **drain cleaner cable**;

103) For **sectional machines**: instruction on how to install the **rear guide hose**;

104) Information on recommended **drain cleaner cable** diameters for different pipe diameters.

8.14.2 b) *Additional items:*

101) Information on the correct gloves to wear during operation;

102) Information on the distance the **drain cleaner** is to be placed from the drain or pipe opening.

103) Instruction on **drain cleaner cable** feed and rotation.

8.14.2 c) *Additional items:*

101) Instruction on how to inspect and maintain the **drain cleaner cable**.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable, except as follows:

14.5 *Replacement:*

A **residual current device** used to provide protection from shock in the case of moisture shall comply with IEC 61540:1999 and shall meet the following requirements a) to c):

1) The **RCD** shall disconnect both mains conductors, but not the earth conductor if provided, when the leakage exceeds 10 mA and with a maximum response of 300 ms.

   Compliance is checked by inspection and the test of 9.9.2 of IEC 61540:1999. In addition, during the test, the earthing conductor shall not become disconnected.

2) The **RCD** shall be reliable for its intended use.

   *Compliance is checked at **rated voltage** by operating the **residual current device** under conditions of simulated leakage as in a) above during conditions of locked rotor of the tool for 50 cycles. The **residual current device** shall operate correctly for all cycles.*

3) The **RCD** shall be installed such that it is unlikely to be removed during use or normal maintenance.

   This requirement is considered fulfilled if the **residual current device** is fixed to the tool or the **supply cord** connected to the tool.

Where fitted in the **supply cord**, the **residual current device** shall be provided with **type Y attachment** or **type Z attachment** for connection with the **supply cord** and **interconnection cord**.

Compliance is checked by inspection.

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

IEC 62841-1:2014, Clause 17 is applicable.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.8 *Replacement of Table 4*:

Table 4 – Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on for **drain cleaners** with a clutch that disengages the output from the motor	Not an **SCF**
Power switch – prevent unwanted switch-on for other **drain cleaners**	a
Power switch – provide desired switch-off	a
Provide desired direction of rotation	Not an **SCF**
Any electronic control to pass the test of 18.3	a
Any speed limiting device	Not an **SCF**
Prevent exceeding thermal limits as in Clause 18	a

19 Mechanical hazards

This clause of Part 1 is applicable, except as follows:

19.1 *Replacement of the first paragraph*:

Moving and dangerous parts other than the **drain cleaner cable**, the **drum**, the **guide tube** and the drive belt, as applicable, which are covered by 19.101 and 19.102, shall be so positioned or enclosed to provide adequate protection against personal injury.

The **drain cleaner cable** shall be smooth and free from sharp edges except for the **cutter**.

19.6 This subclause is not applicable.

19.8 This subclause is applicable for **drain cleaners** with wheels.

19.101 Additional requirements for drum machines

19.101.1 The drive belt shall be guarded to provide adequate protection against personal injury.

Compliance is checked by inspection and by manual test. Using test probe 'a' of Figure 104, it shall not be possible to touch the inner surface of the drive belt, see Figure 103.

19.101.2 Any part of a **guide tube** or a **guide tube** assembly, if any, that is outside of the **drum** shall be smooth, free of burrs and shall not have any openings larger than 12,5 mm.

*Compliance is checked by inspection and by manual test using the test probe 2 of IEC 61032:1997 (12,5 mm sphere). The test probe shall not pass through any opening in the **guide tube** or **guide tube** assembly that is outside of the **drum** or **guard**.*

19.101.3 Either the **drum** shall not be accessible or all of the following conditions shall be met, see Figure 105:

– the outer circumference of the **drum** has a smooth continuous surface without any openings; however openings in the front of the **drum** are allowed;
– there is at least a 12,5 mm radial distance between the **drum** and any stationary member of the tool other than the **guard** per 19.101.1;
– if the rear plane of the **drum** is accessible, the rear of the **drum** or any component protruding from the rear of the **drum** is at least 12,5 mm away from any stationary member of the tool;
– any protrusions from or indentations in the front or rear plane of the **drum** are smooth and free of burrs;
– any protrusions from or indentations in the front or rear plane of the **drum** do not have an acute angle in the forward direction of rotation in accordance with 8.14.2.b) 103).

*Compliance is checked by inspection, by measurement and by manual test. Accessibility is checked by using the test probe 'a' of Figure 104. The 12,5 mm distance is checked by using the test probe 2 of IEC 61032:1997 which shall pass freely between the **drum** and any stationary member.*

19.102 Additional requirements for sectional machines

19.102.1 A **sectional machine** shall be provided with a **rear guide hose**. The removal of the **rear guide hose** without the aid of a tool is permitted.

Compliance is checked by inspection.

19.102.2 The **rear guide hose** shall be long enough to protect the entire portion of the **drain cleaner cable** that extends past the rear of the tool.

Compliance is checked by the following test.

*With the longest single section of the **drain cleaner cable** in accordance with 8.14.2 a) 101) extending out the front of the tool equal to the recommended distance from the drain or pipe opening according to 8.14.2 b) 102), the end of the **drain cleaner cable** section shall not extend past the end of the **rear guide hose**.*

19.102.3 The device for **sectional machines** as required in 21.18.2.1 shall have sufficient endurance for safe operation.

Compliance is checked by the following test.

*The **sectional machine** is fitted with the longest **drain cleaner cable** section of the largest diameter permitted in accordance with 8.14.2 a) 101). The tool is switched on.*

*For the endurance test, the device is actuated with the minimum required force to rotate the **drain cleaner cable** section and then released until the **drain cleaner cable** section rotation has completely stopped. This actuation and release is repeated for 10 000 cycles or until the device fails to rotate the **drain cleaner cable** section, whichever occurs first. During the test, any **user maintenance** to ensure the correct operation of the device is allowed.*

*During the test, the **drain cleaner cable** section shall always stop rotating when the device is released.*

20 Mechanical strength

This clause of Part 1 is applicable, except as follows:

20.5 This subclause is not applicable.

21 Construction

This clause of Part 1 is applicable, except as follows:

21.15 *Replacement:*

Drain cleaners shall protect the user against the increased risk of shock due to the presence of moisture.

Drain cleaners shall be either:

– of **class III construction**; or
– of **class I construction** or **class II construction** and be provided with a **residual current device** and comply with 14.5; or
– of **class I construction** or **class II construction** and be designed for use in combination with an isolating transformer.

Compliance is checked by inspection.

21.17 *Replacement:*

Drain cleaners shall be fitted with a **power switch** which is not a **momentary power switch**. The actuating member of this switch shall be easily accessible. A **power switch** that controls rotation of the **drain cleaner cable** in the reverse direction in accordance with 8.14.2 b) 103) may be a **momentary power switch.**

Compliance is checked by inspection.

21.18.2.1 *Replacement:*

In addition to the **power switch** required in 21.17, **drum machines** shall be fitted with a foot switch which is a **momentary power switch** without a lock-on device. It shall be necessary that both the **power switch** and the foot switch are in the “on” position in order to operate the machine.

In addition to the **power switch** required in 21.17, **sectional machines** shall be provided with a device that requires constant actuation applied by the operator to rotate the **drain cleaner cable**.

NOTE 101 The endurance requirements of the device are covered in 19.102.3.

Compliance is checked by inspection.

21.18.2.3 *Replacement:*

A **drain cleaner** shall be designed so that unintentional movement of the **drain cleaner cable** is unlikely.

It shall not be possible to simultaneously actuate the foot switch/mechanical device required by 21.18.2.1 and the **power switch** required by 21.17 with a single grasping or a straight line motion.

Compliance is checked by inspection and by manual test.

21.30 This subclause is not applicable.

21.35 This subclause of IEC 62841-1:2014 is not applicable.

21.101 A **drain cleaner cable** locking mechanism that rotates with the cable shall be smooth and free from burrs. To prevent entanglement, protrusions shall

– not exceed 12 mm radially; and
– not have an acute angle in the forward direction of rotation.

*Compliance is checked by inspection and by measurement with the locking mechanism fully tightened with the largest **drain cleaner cable** installed in accordance with 8.14.2 b) 102). See Figure 106.*

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

This clause of IEC 62841-1:2014 is applicable, except as follows:

23.3 This subclause of IEC 62841-1:2014 is not applicable.

24 Supply connection and external flexible cords

This clause of Part 1 is applicable.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

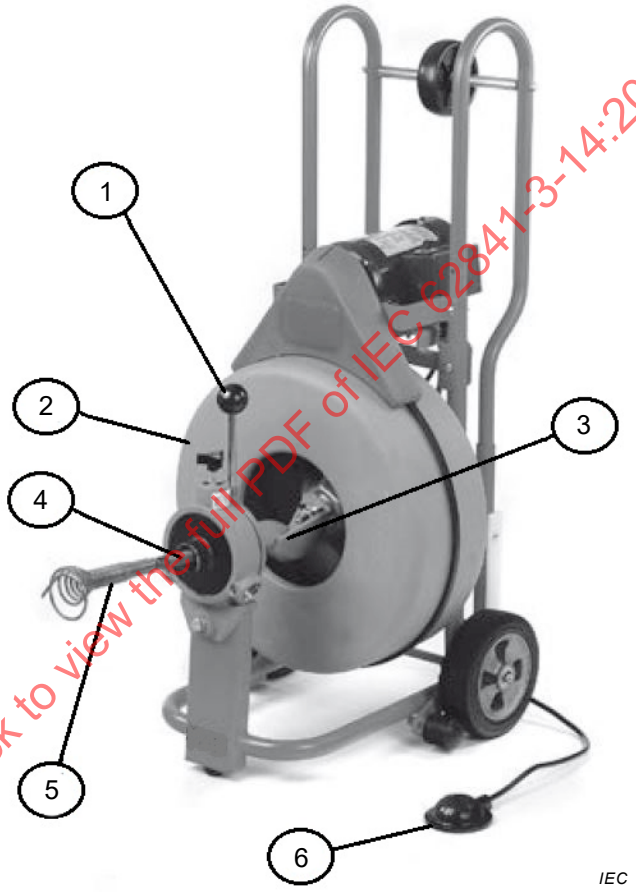
This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.

28 Creepage distances, clearances and distances through insulation

This clause of Part 1 is applicable.



Key

1 cable feed handle
2 **drum**
3 **guide tube**
4 **drain cleaner cable**
5 cutter
6 foot switch

Figure 101 – Drum machine