

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

iTeh STANDARD

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 3-6: Particular requirements for transportable diamond drills with liquid system

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 3-6: Exigences particulières pour les forets diamantés transportables avec système liquide





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 3-6: Particular requirements for transportable diamond drills with liquid system

AMENDMENT 1

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Amendment 1 to IEC 62841-3-6:2014 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

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

Draft	Report on voting
116/575/FDIS	116/583/RVD

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

The language used for the development of this Amendment is English.

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

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iTeh STANDARD
PREVIEW
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1 Scope

Replace the existing text with the following new text:

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

Replacement of the third paragraph:

The **rated voltage** is not more than 250 V for single-phase AC or DC tools, and 480 V for three-phase AC tools.

Addition:

This document applies to transportable **diamond drills**, intended to be connected to a **liquid system**. **Liquid system** can include liquid from a pipe or container.

2 Normative references

Replace the existing text with the following new text:

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

Replacement:

IEC 61540:1997¹, *Electrical accessories – Portable residual current devices without integral overcurrent protection for household and similar use (PRCDs)*
IEC 61540:1997/AMD1:1998

¹ There exists a consolidated edition 1.1:1999 which includes IEC 61540:1997 and its Amendment 1:1998.

Addition:

IEC 61008-1:2010², *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules*
IEC 61008-1:2010/AMD1:2012
IEC 61008-1:2010/AMD2:2013

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

8 Marking and instructions

Delete the existing addition to 8.1.

Add the following new subclause:

8.3 Replacement of the sixth dash:

– ">25 kg" on each separable unit with a mass above 25 kg, in accordance with 8.14.2 a) 102).

Replace the existing text of 8.14.2 a), item 102), with the following new text:

102) Instruction to and information about how to mount the **drill unit** to the **drill stand**, if separable;

Add the following new subclause:

8.14.3 Replacement:

If information about the mass or weight of the tool is provided, it shall either be the mass specified in 5.17, or it shall be clear which part of the tool the mass refers to.

Compliance is checked by inspection.

14 Moisture resistance

Replace the existing text with the following new text:

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

14.3 Replacement:

Liquid systems or spillage of liquid shall not subject the user to an increased risk of electrical shock.

If the tool is rated at least IPX4 in accordance with 14.2, this requirement is deemed to be fulfilled.

² There exists a consolidated edition 3.2:2013 which includes IEC 61008-1:2010 and its Amendment 1:2012 and Amendment 2:2013.

Compliance is checked by the following test:

The **residual current device**, if any, shall be disabled during the test. Electrical components, covers and other parts which can be removed without the aid of a tool are removed, except those fulfilling the test of 21.22.

The tool is prepared with approximately 1,0 % NaCl solution in the following modes if applicable:

- as described in 8.14.2;
- the liquid container of the tool is completely filled, and a further quantity, equal to 15 % of the capacity of the container, or 0,25 l, whichever is the greater, is poured in steadily over a period of 60_{-10}^{+0} s, while the tool is resting in its filling position in accordance with 8.14.2 d);
- a detachable liquid container is filled completely and mounted and dismantled 10 times on the tool.

In each applicable preparation, the tool is operated at **rated voltage** in each position consistent with the instructions according to 8.14.2 b) for 1 min while monitoring the leakage current as in Clause C.3.

For 3-phase **diamond drills** with a **rated input** exceeding 3 700 W, during the test the leakage current shall not exceed:

- 5 mA for a, b and c in Figure C.2 in the closed position;
- 10 mA for the test repeated with each of the switches a, b, c in Figure C.2 open in turn, the other two switches being closed.

For all other **diamond drills**, during the test the leakage current shall not exceed:

- 2 mA for a **class II tool**;
- 5 mA for a **class I tool**.

Following this test, the tool shall meet the electric strength test of Clause D.2 between **live parts** and **accessible parts** after being allowed to dry for 24 h at ambient temperature.

14.3.101 Diamond drills which are intended to be used for drilling overhead in accordance with 8.14.2 a) 104) and using a **liquid collection device** shall prevent electric shock due to excessive liquid spillage.

Compliance is checked by the following test.

The **drill unit** runs vertically upwards at **rated voltage** under no-load condition with the **liquid collection device** installed. If the **liquid collection device** is designed to be connected to a liquid vacuum device, then such a device shall be attached. The test is conducted twice, the drill being fitted once with the minimum and once with the maximum diameter of the diamond core bit as specified for the **liquid collection device** in accordance with 8.14.2 a) 106).

The test arrangement is shown in Figure 102.

The liquid flow of approximately 1,0 % NaCl solution shall be in the range of 1 l/min to 1,5 l/min. The running time shall be 15 min. The measuring time starts when the core bit is filled with liquid.

During the test, the leakage current as in Clause C.3 is monitored.

For 3-phase **diamond drills** with a **rated input** exceeding 3 700 W, during the test the leakage current shall not exceed:

- 5 mA for a, b and c in Figure C.2 in the closed position;
- 10 mA for the test repeated with each of the switches a, b, c in Figure C.2 open in turn, the other two switches being closed.

For all other **diamond drills**, during the test the leakage current shall not exceed:

- 2 mA for a **class II tool**;
- 5 mA for a **class I tool**.

Following this test, the tool shall meet the electric strength test of Clause D.2 between **live parts** and **accessible parts** after being allowed to dry for 24 h at ambient temperature.

14.4 Replacement:

Liquid systems shall not subject the user to an increased risk of electrical shock by components not capable of withstanding the pressure during operation.

Compliance is checked by the following test.

The **residual current device**, if any, shall be disabled during the test.

The **liquid system** is closed and an approximately 1,0 % NaCl solution at a hydrostatic pressure equal to twice the pressure stated in 8.14.2 d) 1) is applied for 1 h.

The tool is then placed for 1 min in all positions consistent with the instructions in accordance with 8.14.2 b) while monitoring the leakage current as in Clause C.2.

For 3-phase **diamond drills** with a **rated input** exceeding 3 700 W, during the test the leakage current shall not exceed:

- 5 mA for a, b and c in Figure C.2 in the closed position;
- 10 mA for the test repeated with each of the switches a, b, c in Figure C.2 open in turn, the other two switches being closed.

For all other **diamond drills**, during the test the leakage current shall not exceed:

- 2 mA for a **class II tool**;
- 5 mA for a **class I tool**.

Following this test, the tool shall meet the electric strength test of Clause D.2 between **live parts** and **accessible parts** after being allowed to dry for 24 h at ambient temperature.

14.5 Replacement:

Residual current devices used to provide protection from shock in the case of failure of the **liquid system** shall comply with

- IEC 61540:1997; or
- alternatively for 3-phase tools, IEC 61008-1:2010

and shall meet the following requirements a) to c):

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

- alternatively for 3-phase tools, 30 mA with a maximum response time of 300 ms.

NOTE 1 For 3-phase tools, the values are based on specified levels in IEC 61008-1:2010.

Compliance is checked by inspection and by the test of

- IEC 61540:1997, 9.9.2 for single phase tools; or
- alternatively, IEC 61008-1:2010, 9.9.2 and IEC 61008-1/AMD2:2013, 9.9.2 for 3-phase tools.

In addition, during the test, the earthing conductor shall not become disconnected.

b) 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.*

c) 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.

NOTE 2 In Canada, the following conditions apply:

Replacement of the first paragraph:

Residual current devices used to provide protection from shock in the case of failure of the **liquid system** shall comply with

- IEC 61540:1997; or
 - alternatively for 3-phase tools, IEC 61008-1:2010 up to 440 V; or
 - alternatively for 3-phase tools, CSA C22.2 No. 144 above 440 V;
- and shall meet the following requirements a) to c).

NOTE 3 In the United States of America, the following conditions apply:

Replacement of the first paragraph:

Residual current devices used to provide protection from shock in the case of failure of the **liquid system** shall comply with

- IEC 61540:1997; or
- alternatively for 3-phase tools, IEC 61008-1:2010 up to 440 V; or
- alternatively for 3-phase tools, UL 1053 above 440 V;

and shall meet the following requirements a) to c).

18 Abnormal operation

Replace the existing text with the following new text:

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	a
Power switch – provide desired switch-off	b
Provide desired direction of rotation	Not an SCF
Any electronic control to pass the test of 18.3	a
Prevent exceeding thermal limits as in 18.4 and 18.5.3	a
Limiting device to comply with 19.103	c

19 Mechanical hazards

Add the following new subclause:

19.6 This subclause of Part 1 is not applicable.

21 Construction

Add the following new subclauses:

21.15 Replacement:

Tools employing **liquid systems** shall be either:

- of **class III construction**, or
- of **class I** or **class II construction** and be provided with a **residual current device** and comply with 14.3, 14.4 and 14.5; or
- of **class I** or **class II construction** and be designed for use in combination with an isolating transformer and comply with 14.3 and 14.4; or
- a **class I tool** that fulfils the requirements of at least IPX3 in accordance with IEC 60529:1989, IEC 60529, AMD1:1999, IEC 60529, AMD2:2013 when it is operating and fulfils the requirements of at least IPX5 in accordance with IEC 60529:1989, IEC 60529, AMD1:1999, IEC 60529, AMD2:2013 when it is not operating. The enclosure shall not be required to be opened during operation or **user maintenance** in accordance with 8.14.2.

Compliance is checked by inspection.

21.35 This subclause of Part 1 is not applicable.

23 Components

Replace the existing text with the following new text:

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

23.3 This subclause of Part 1 is not applicable.

24 Supply connection and external flexible cords

Add the following new subclause:

24.5 Replacement of Table 8:

Table 8 – Minimum cross-sectional area and AWG sizes of supply cords

Rated current of the tool A	Nominal cross-sectional area mm ²	AWG size ^a
Up to and including 6	0,75	18
Over 6 up to and including 10	1	
Over 10 up to and including 12	1,5	17
Over 12 up to and including 13		16
Over 13 up to and including 16		14
Over 16 up to and including 18	2,5	12
Over 18 up to and including 25		10
Over 25 up to and including 32	4	8
Over 32 up to and including 40	6	4
Over 40 up to and including 63	10	

^a AWG stands for American Wire Gauge as defined in ASTM B 258-02.

28 Creepage distances, clearances and distances through insulation

Replace the existing text with the following new text:

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

28.1 Replacement of the first paragraph:

Creepage distances and **clearances** shall not be less than the values in millimetres shown in Table 12. The values specified in the table do not apply to cross-over points of motor windings. For **working voltages** greater than 480 V, the requirements of IEC 60664-1 are applicable.