

INTERNATIONAL STANDARD



Switches for appliances –

Part 2-6: Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SWITCHES FOR APPLIANCES –

**Part 2-6: Particular requirements for switches used
in electric motor-operated hand-held tools, transportable
tools and lawn and garden machinery**

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61058-2-6 has been prepared by subcommittee 23J: Switches for appliances, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2016. It constitutes a technical revision.

This edition includes the following significant change with respect to the previous edition:

Overall format to support IEC 61058-1, IEC 61058-1-1 and IEC 61058-1-2.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3J/450/FDIS	23J/452/RVD

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

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

This document is to be used in conjunction with IEC 61058-1:2016.

This document supplements or modifies the corresponding clauses in IEC 61058-1, so as to convert that publication into the IEC standard: *Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery.*

When a particular subclause of IEC 61058-1 is not mentioned in this document, that subclause applies as far as reasonable. Where this document states "addition", "modification" or "replacement", the relevant text of IEC 61058-1 is to be adapted accordingly.

In this standard:

- 1) the following print types are used:
 - requirements proper: in roman type;
 - test specifications: *in italic type*;
 - notes/explanatory matter: in small roman type.
- 2) subclauses, notes, figures and tables which are additional to those in IEC 61058-1 are numbered starting from 101.

A list of all the parts in the IEC 61058 series, under the general title *Switches for appliances*, can be found on the IEC website.

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

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

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SWITCHES FOR APPLIANCES –

Part 2-6: Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery

1 Scope

Clause 1 of IEC 61058-1:2016 is applicable except as follows.

~~1.1~~ Addition:

This part of IEC 61058 is a subset based on IEC 61058-1. The clauses outlined below are intended to address the specific requirements for switches incorporated into or integrated with electric motor-operated hand-held tools, transportable tools and lawn and garden machinery.

This document is intended for switches with an ambient temperature up to and including 55 °C. Switches tested according to IEC 61058-1 are considered to comply with this document and additional testing is not required provided ratings, loads, and endurance are correct.

NOTE This document takes into account the fact that tests are conducted as part of the end-product evaluation (e.g. products tested according to the IEC 60745 and IEC 62841 series, and lawn and gardening equipment tested according to the IEC 60335 series), and ~~need not be~~ that tests are not conducted on the component switch.

2 Normative references

Clause 2 of IEC 61058-1:2016 is applicable ~~except as follows~~.

Addition:

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

3 Terms and definitions

Clause 3 of IEC 61058-1:2016 is applicable.

4 General requirements

Clause 4 of IEC 61058-1:2016 is applicable.

5 General ~~notes~~ information on tests

Clause 5 of IEC 61058-1:2016 is applicable.

6 Rating

Clause 6 of IEC 61058-1:2016 is applicable.

7 Classification

Clause 7 of IEC 61058-1:2016 is applicable except as follows.

7.4.3.2 IEC 61058-1:2016, 7.3.2 is not applicable.

7.4.3.3 IEC 61058-1:2016, 7.3.3 is not applicable.

7.1.5.3.1 7.7.1 IEC 61058-1:2016, 7.7.1 is not applicable.

7.1.5.3.2 7.7.2 IEC 61058-1:2016, 7.7.2 is not applicable.

8 Marking and documentation

Clause 8 of IEC 61058-1:2016 is applicable except as follows.

8.1.1 General

Addition:

Switches declared for use in appliances such as power tools are considered unique type (U-T) when referencing Table 3.

8.1.3 By documentation

Replacement of Table 3:

Table 3 – Switch information

Characteristic	Means of information
SWITCH IDENTIFICATION –	UNIQUE TYPE REFERENCE U-T- (7.10.1)
Manufacturer's name or trade mark	Marking (Ma)
Type reference (model or catalogue number)	Marking (Ma)
Identification that the switch is in compliance with this document (8.101)	Marking (Ma)
Type of appliance for which a switch shall be used (hand-held tools, transportable tools, or lawn and garden machinery)	Documentation (Do)
Number of operating cycles (7.4.4)	Documentation (Do)
Degree of protection against electric shock, from outside an appliance (7.1.5.3 7.7)	Documentation
Number of contact only cycles (TC 7 for electronic switches) (17.2.4.7) Number of cycles with switching device only (TC 7) (17.5.7)	Documentation (Do)
All terminals shall be suitably identified, or their purpose self-evident, or the switch circuitry visually apparent. For terminals intended for the connection of supply conductors, the identification may take the form of a letter L, a number or an arrow	Marking
The rated current and electrical load type	Documentation (Do)
Ambient temperature limits if different from 0 °C to 55 °C	Documentation (Do)
Duty type and relevant information (e.g. ON/OFF time) (7.18)	Documentation (Do)
For electronic switches, the duty-type S1 (7.1.16)	Documentation (Do)

8.3 Load rating

IEC 61058-1:2016, 8.3 is applicable except as follows.

8.3.2 Substantially restive load

IEC 61058-1:2016, 8.3.2 is not applicable.

8.3.4 Resistive load and capacitive load

IEC 61058-1:2016, 8.3.4 is not applicable.

8.3.5 Resistive load and tungsten filament lamp load

IEC 61058-1:2016, 8.3.5 is not applicable.

8.3.6 Declared specific load

IEC 61058-1:2016, 8.3.6 is not applicable.

8.3.8 General purpose loads

IEC 61058-1:2016, 8.3.8 is not applicable.

Addition:

8.101 Switch compliance with IEC 61058-2-6

The marking to indicate compliance with IEC 61058-2-6 shall be "PT".

Compliance is checked by inspection.

9 Protection against electric shock

Clause 9 of IEC 61058-1:2016 is applicable except as follows.

9.1 IEC 61058-1:2016, 9.1 is not applicable.

NOTE The requirements of this subclause ~~is~~ are covered in the end-product standard.

~~**9.2** This subclause is not applicable.~~

~~NOTE This subclause is covered in the end-~~

10 Provision for earthing

Clause 10 of IEC 61058-1:2016 is not applicable.

11 Terminals and terminations

Clause 11 of IEC 61058-1:2016 is applicable, ~~except as follows:~~

~~**11.1.1.2** This subclause is not applicable.~~

~~NOTE This subclause is covered in the end-product standard.~~

~~11.1.1.3 This subclause is not applicable except Table 4.~~

~~NOTE This subclause is covered in the end product standard.~~

~~11.1.1.4 This subclause is not applicable.~~

~~NOTE This subclause is covered in the end product standard.~~

~~11.1.1.5 This subclause is not applicable.~~

~~11.1.1.6 Replacement:~~

~~Terminals shall be designed so that the end of a conductor introduced into the hole is visible or that the insertion of the conductor is prevented by a stop if further insertion may reduce creepage distances and/or clearances or influence the mechanism of the switch.~~

~~Compliance is checked by inspection.~~

~~11.1.2 Screw-type terminals for unprepared conductors~~

~~Addition:~~

~~Screw type terminals for unprepared conductors are permitted but tested as part of the end product evaluation.~~

~~11.1.2.1 This subclause is not applicable.~~

~~11.1.2.2 This subclause is not applicable.~~

~~11.1.2.3 This subclause is not applicable.~~

~~11.1.3.1 Replacement:~~

~~Screwless terminals shall allow, according to their classification, the proper connection of conductors having cross-sectional areas as declared.~~

~~The intended disconnection of a conductor shall require an operation other than a pull at the conductor, such that it can be effected manually with or without the help of a tool in normal use.~~

~~11.1.3.2 Replacement:~~

~~Screwless terminals shall withstand the mechanical stress occurring in normal use. The conductor shall be clamped reliably and between metal surfaces, except that, for screwless terminals intended to be used in circuits carrying a current not exceeding 0,2 A, one of the surfaces may be non-metallic.~~

~~Compliance is checked by the following test, which is carried out with uninsulated copper conductors, first having the largest declared cross-sectional area, and then having the smallest declared cross-sectional area:~~

- ~~a) either rigid: five insertions and disconnections for solid conductors and one insertion and disconnection for stranded conductors; or~~
- ~~b) flexible: five insertions and disconnections; or~~
- ~~c) rigid and flexible: if the terminal can accept both types of conductors, the tests are carried out with rigid and flexible conductors for the number of times indicated above.~~

~~The conductors are inserted and disconnected for the number of times indicated above using new conductors each time, except for the last time, when the conductors used for the last but one insertion are clamped at the same place.~~

~~For each insertion, the conductors shall be either pushed as far as possible into the terminal or shall be inserted to ensure that the connection is adequate. After each insertion, the conductor is twisted through 90° in an axial direction and then subjected to a pull force of 35 N; the pull force is applied without jerks, for 1 min, in the direction of the axis of the conductor space.~~

~~If the terminal is declared as suitable for two or more conductors, the appropriate pull force is applied consecutively to each conductor. During the application of the pull force, the conductor shall not come out of the terminal. After these tests, neither the screwless terminals nor the clamping means shall have become loose.~~

~~11.1.3.4 This subclause of Part 1 is not applicable.~~

~~11.2 Terminals for prepared copper conductors and/or terminals requiring the use of a special purpose tool~~

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

~~11.2.1 Common requirements~~

~~This subclause is not applicable.~~

~~11.2.3.2 This subclause is not applicable.~~

~~11.2.4 Non-disconnectable screwless terminations~~

~~Addition:~~

~~Non-disconnectable screwless terminations are permitted but tested as part of the end product evaluation.~~

~~11.2.4.1 This subclause is not applicable.~~

~~11.2.4.2 This subclause is not applicable.~~

~~11.2.4.3 This subclause is not applicable.~~

~~11.2.5.1 This subclause is not applicable.~~

~~11.2.5.2 This subclause is not applicable.~~

~~11.2.5.3 Replacement:~~

~~Tabs shall allow the application and withdrawal of female connectors without damage to the switch so as not to impair compliance with this standard.~~

~~Compliance is checked by applying a 10 N axial pull force without jerks. No damage or disengagement shall occur.~~

~~11.2.5.4 This subclause is not applicable.~~

~~11.2.7 Solder terminations~~

Addition:

~~Solder terminations are permitted but tested as part of the end-product evaluation.~~

~~11.2.7.1 This subclause is not applicable.~~

~~11.2.7.2 This subclause is not applicable.~~

~~11.2.7.3 This subclause is not applicable.~~

12 Construction

Clause 12 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause ~~is~~ are covered in the end-product standard.

13 Mechanism

Clause 13 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause ~~is~~ are covered in the end-product standard.

14 Protection against ingress of solid foreign objects, ingress of water and humid conditions

Clause 14 of IEC 61058-1:2016 is applicable except as follows.

14.3 Protection against humid conditions

Replacement of the second paragraph:

Compliance is checked by the humidity treatment described in IEC 61058-1:2016, 14.3, followed by the test of 15.1. Cable inlet openings, if any, and drain-holes are left open. If a drain-hole is provided for a water-tight switch, it is opened.

15 Insulation resistance and dielectric strength

Clause 15 of IEC 61058-1:2016 is applicable except as follows.

15.1 General requirements

Replacement:

The dielectric strength of switches shall be adequate.

Compliance is checked by the test of 15.3, the test being made immediately after the test of 14.3.

The test voltage according to Table ~~12~~ 8 is applied in the case of:

- *functional insulation: between the different poles of a switch. For the purpose of the test, all the parts of each pole are connected together;*

- *basic insulation: between all live parts connected together and a metal foil covering the outer accessible surface of the basic insulation and accessible metal parts in contact with the basic insulation;*
- *double insulation: between all live parts connected together and a metal foil covering the outer, normally not accessible, surface of basic insulation and non-accessible metal parts; then: between two metal foils covering separately the inner, normally not accessible, surface of supplementary insulation and connected to non-accessible metal parts, and the outer accessible surface of supplementary insulation and connected to accessible metal parts;*
- *reinforced insulation: between all live parts connected together and a metal foil covering the outer accessible surface of reinforced insulation and accessible metal parts;*
- *contacts: between the open contacts of each pole of a switch at the test voltages for "across electronic disconnection".*

The foils are not pressed into openings but are pushed into corners and the like by means of the standard test finger.

In cases where basic insulation and supplementary insulation cannot be tested separately, the insulation provided is subjected to the test voltages specified for reinforced insulation.

For electronic switches, the test is carried out at the test voltages for "across full disconnection" and "across micro-disconnection" only on electronic switches with mechanical switching devices connected in series with the semiconductor switching device. ~~For electronic switches,~~ The tests are not carried out across protective impedances and poles interconnected by components.

15.2 Measurement of insulation resistance

IEC 61058-1:2016, 15.2 is not applicable.

16 Heating

Clause 16 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause ~~is~~ are covered in the end-product standard.

17 Endurance – Mechanical switches

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

~~17.1.2 Replacement:~~

~~The sequence of tests for all switches except electronic switches is as follows:~~

- ~~when declared for locked rotor, a test at accelerated speed as specified in 17.2.4.9 (TC9);~~
- ~~a test at accelerated speed as specified in 17.2.4.4 (TC4);~~
- ~~a functional compliance test in accordance with 17.2.5.1 (TE1);~~
- ~~a dielectric strength test in accordance with 17.2.5.3 (TE3).~~

~~17.1.3 Replacement:~~

~~For electronic switches (complete switch) the sequence of tests is as follows:~~

- ~~a test at accelerated speed as specified in 17.2.4.4 (TC4);~~
- ~~when declared for locked rotor, a test at accelerated speed as specified in 17.2.4.9 (TC9);~~

- ~~a functional compliance test in accordance with 17.2.5.1 (TE1);~~
- ~~a dielectric strength test in accordance with 17.2.5.3 (TE3).~~

~~Additionally 3 new specimens shall be prepared and tested as follows:~~

- ~~the SSD (solid state switching device and assembly) in series with contact(s) is short circuited and/or the SSD in parallel with contact(s) is disconnected;~~
- ~~a test at accelerated speed as specified in 17.2.4.7 (TC7).~~

~~The number of operating cycles is 1 000 or the declared number (if different).~~

~~17.1.4 Replacement:~~

~~After all the tests specified, the specimens shall meet the requirements of 17.2.5.1 (TE1) and 17.2.5.3 (TE3).~~

~~17.2.1.2 This subclause is applicable, except as follows:~~

~~Replacement of Table 17 and Table 18:~~

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Table 17 – Test loads for electrical endurance tests for a.c. circuits

Type of circuit as classified in 7.1.2	Operation of contacts	Test voltage	Test current r.m.s. ¹⁾	Power factor ³⁾
Motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-M$	0,60 (+0,05)
			or $I-R$	or $\geq 0,9$
	Breaking	Rated voltage	$I-R$	$\geq 0,9$
			or $I-M$	or $\geq 0,9^{4)}$
Magnetically driven tools and magnetically driven lawn and garden machinery; also acceptable for motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-I$	0,60 (+0,05)
	Breaking	Rated voltage	$I-I$	0,60 (+0,05)
Declared specific load (classified in 7.1.2.5)	Making and breaking	As determined by load		
NOTE $I-I$: — inductive load current $I-M$: — motor load current $I-R$: — resistive load current				
¹⁾— Whichever is arithmetically greater or the most unfavourable value in case of equal values. ²⁾— The specified making conditions are maintained for a period between 50 ms and 100 ms, and are then reduced by an auxiliary switch to the specified breaking conditions. — For all switches except electronic switches the test current may be reduced to $I-R$ by introducing a resistor in the circuit. Short interruptions of the test current during the reduction to $I-R$ not exceeding a period of 50 ms to 100 ms are permitted. — For electronic switches, the reduction to the break current should be achieved without any open-circuiting of the simulated inductive loads circuit, to ensure that no abnormal voltage transients are generated. — A typical method of achieving this is shown in Figure 19. ³⁾— Resistors and inductors are not connected in parallel except that if any air-core inductor is used, a resistor taking approximately 1 % of the current through the inductor is connected in parallel with it. Iron-core inductors may be used provided that the current has a substantial sine-wave form. For three-phase tests, three-core inductors are used. ⁴⁾— The test circuit condition for testing electronic switches, according to Figure 18, shall be substantially resistive.				

Table 18 – Test loads for electrical endurance tests for d.c. circuits

Type of circuit as classified in 7.1.2	Operation of contacts	Test voltage	Test current	Time constant
Declared specific load (classified in 7.1.2.5)	Making and breaking	Rated voltage	As determined by load	

17.2.2 Thermal conditions

This subclause is not applicable.

17.2.3.1 Replacement:

The switches are operated by means of their actuating member either manually or by an appropriate apparatus which is arranged to simulate normal actuation.

~~The operating speed for the operating cycles shall be as follows:~~

- ~~• for linear actions, the switch actuation speed shall be approximately 80 mm/s (mechanical) and 25 mm/s (electronic);~~
- ~~• for rotary actions, the switch actuation speed shall be approximately 90°/s (mechanical) and 45°/s (electronic).~~

~~17.2.3.3 This subclause is not applicable.~~

~~17.2.4.1 Increased voltage test at accelerated speed (TC1)~~

~~This subclause is not applicable.~~

~~17.2.4.2 Test at slow speed (TC2)~~

~~This subclause is not applicable.~~

~~17.2.4.3 Test at high speed (TC3)~~

~~This subclause is not applicable.~~

~~17.2.4.4 Test at accelerated speed (TC4)~~

~~Replacement:~~

~~The electrical conditions are those specified in 17.2.1.~~

~~The thermal conditions are as follows: Tests are carried out at $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$.~~

~~The total number of operations shall be declared by the manufacturer.~~

~~NOTE Typically the total number of operations is 50 000 for hand-held tools, 10 000 for transportable tools and 10 000 for lawn and garden machinery.~~

~~The method of operation is that specified for accelerated speed in 17.2.3.~~

~~17.2.4.5 Manual functional test (TC5)~~

~~This subclause is not applicable.~~

~~17.2.4.6 Functional test at minimum load (TC6)~~

~~This subclause is not applicable.~~

~~17.2.4.7 Test with limited number of operations (TC7)~~

~~Replacement:~~

~~The electrical conditions are those specified in 17.2.1.~~

~~The thermal conditions are $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$.~~

~~The number of operating cycles is 1 000 or greater as declared by the manufacturer.~~

~~The method of operation is that specified in 17.2.3 for accelerated speed.~~

~~17.2.4.8 Endurance test (TC8)~~

~~This subclause is not applicable.~~

~~17.2.4.10 Test at very slow speed (TC10)~~

~~This subclause is not applicable.~~

~~17.2.5 Evaluation of compliance~~

~~This subclause is applicable, except as follows:~~

~~17.2.5.2 Thermal compliance (TE2)~~

~~This subclause is not applicable.~~

Clause 17 of IEC 61058-1:2016 is replaced by the following.

Clause 17 of IEC 61058-1-1 is applicable, except as follows.

NOTE The requirements for mechanical switches (IEC 61058-1-1) are followed by the requirements specific to electronic switches (IEC 61058-1-2). As a result, some subclause numbers are repeated.

17.1.2 Replacement:

The sequence of tests to be completed on the same 3 samples is as follows:

- *a test at accelerated speed as specified in 17.5.4 (TC4);*
- *a functional compliance test in accordance with 17.6.1 (TE1);*
- *a dielectric strength test in accordance with 17.6.3 (TE3).*

17.1.3 IEC 61058-1-1:2016, 17.1.3 is not applicable.

17.2 Electrical endurance tests

Replacement:

The switch shall be loaded as specified in Table 201 and/or Table 202 and connected in accordance with the circuit as given in IEC 61058-1:2016, Table 2.

- Where, in IEC 61058-1:2016, Table 2, an auxiliary switch (A) is symbolized in the test circuit, the tests for the two ON-positions of the specimen (S) are performed on two separate sets of test samples. The connection to the test load to be performed for the two tests is symbolized in IEC 61058-1:2016, Table 2 by an auxiliary switch A.*
- Multiway switches are loaded according to IEC 61058-1:2016, Table 1. The load for the other switch positions is that resulting from the loads necessary to achieve the conditions specified above.*
- No electrical load is applied during the endurance tests for switches classified according to 7.2.6 with a rating of 20 mA or less.*

Replacement:

Table 102 (IEC 61058-1-1:2016) with Table 201 (IEC 61058-2-6:2018)

Table 103 (IEC 61058-1-1:2016) with Table 202 (IEC 61058-2-6:2018)

17.3 Thermal conditions

IEC 61058-1-1:2016, 17.3 is not applicable.

17.4 Actuating conditions

IEC 61058-1-1:2016, 17.4 is applicable except as follows.

17.4.1 Replacement:

The switches are operated by means of their actuating member either manually or by an appropriate apparatus which is arranged to simulate normal actuation.

The operating speed for the operating cycles shall be as follows:

- *for linear actions, the switch actuation speed shall be approximately 80 mm/s (mechanical);*
- *for rotary actions, the switch actuation speed shall be approximately 90°/s (mechanical).*

17.4.3 IEC 61058-1-1:2016, 17.4.3 is not applicable.

17.5 Type of test condition (TC)

IEC 61058-1-1:2016, 17.5 is applicable except as follows.

17.5.1 Increased-voltage test at accelerated speed (TC1)

IEC 61058-1-1:2016, 17.5.1 is not applicable.

17.5.2 Test at slow speed (TC2)

IEC 61058-1-1:2016, 17.5.2 is not applicable.

17.5.3 Test at high speed (TC3)

IEC 61058-1-1:2016, 17.5.3 is not applicable.

17.5.4 Test at accelerated speed (TC4)

Replacement:

The electrical conditions are those specified in 17.2.

The thermal conditions are as follows: Tests are carried out at 25 °C ± 10 °C. The total number of operations shall be declared by the manufacturer.

NOTE Typically the total number of operations is 50 000 for hand-held tools, 10 000 for transportable tools and 10 000 for lawn and garden machinery.

The method of operation is that specified for accelerated speed in 17.4.

17.5.5 Locked-rotor test (TC9)

IEC 61058-1-1:2016, 17.5.5 is not applicable.

17.5.6 Test at very slow speed (TC10)

IEC 61058-1-1:2016, 17.5.6 is not applicable.

17.6 Evaluation of compliance

IEC 61058-1-1:2016, 17.6 is applicable, except as follows.

17.6.2 Thermal compliance (TE2)

IEC 61058-1-1:2016, 17.6.2 is not applicable.

17 Endurance – Electronic switches

Clause 17 of IEC 61058-1-2:2016 is applicable, except as follows.

17.1.2 Replacement:

For electronic switches (complete switch) the sequence of tests to be completed on the same 3 samples is as follows:

- a test at accelerated speed as specified in 17.5.4 (TC4);
- when declared for locked rotor, a test at accelerated speed as specified in 17.5.9 (TC9);
- a functional compliance test in accordance with 17.6.1 (TE1);
- a dielectric strength test in accordance with 17.6.3 (TE3).

Additionally 3 new specimens shall be prepared and tested as follows:

- the SD (semiconductor device and assembly) in series with contact(s) is short circuited and/or the SD in parallel with contact(s) is disconnected;
- a test at accelerated speed as specified in 17.5.7 (TC7).

The number of operating cycles is 1 000 or the declared number (if different).

17.2 Electrical conditions

Replacement:

The switch shall be loaded and tested as specified in Table 201 and/or Table 202, and connected in accordance with the circuit in IEC 61058-1:2016, Table 2.

- d) Where, in IEC 61058-1:2016, Table 2, an auxiliary switch (A) is symbolized in the test circuit, the tests for the two ON-positions of the specimen (S) are performed on two separate sets of test samples. The connection to the test load to be performed for the two tests is symbolized in IEC 61058-1:2016, Table 2 by an auxiliary switch A.
- e) Multiway switches are loaded according to IEC 61058-1:2016, Table 1. The load for the other switch positions is that resulting from the loads necessary to achieve the conditions specified above.
- f) No electrical load is applied during the endurance tests for switches classified according to 7.2.6 with a rating of 20 mA or less.
- g) For electronic switches, the test circuit shall be as shown in IEC 61058-1:2016, Figure 16. The declared load shall be set at rated voltage before the electronic switch is inserted into the circuit (the load is not readjusted).

Replacement:

Table 104 (IEC 61058-1-2) with Table 201 (IEC 61058-2-6:2018)

Table 105 (IEC 61058-1-2) with Table 202 (IEC 61058-2-6:2018)

Table 201 – Test loads for electrical endurance tests for AC circuits

Type of circuit as classified in 7.2	Operation of contacts	Test voltage	Test current RMS ¹⁾	Power factor ³⁾
Motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-M$	0,60 (+0,05)
			or $I-R$	or $\geq 0,9$
	Breaking	Rated voltage	$I-R$	$\geq 0,9$
			or $I-M$	or $\geq 0,9^{4)}$
Magnetically driven tools and magnetically driven lawn and garden machinery; also acceptable for motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-I$	0,60 (+0,05)
	Breaking	Rated voltage	$I-I$	0,60 (+0,05)
Declared specific load (classified in 7.2.5)	Making and breaking	As determined by load		
NOTE				
$I-I$: inductive-load current				
$I-M$: motor-load current				
$I-R$: resistive-load current				
1) Whichever is arithmetically greater or the most unfavourable value in case of equal values. 2) The specified making conditions are maintained for a period between 50 ms and 100 ms, and are then reduced by an auxiliary switch to the specified breaking conditions. For all switches except electronic switches the test current may be reduced to $I-R$ by introducing a resistor in the circuit. Short interruptions of the test current during the reduction to $I-R$ not exceeding a period of 50 ms to 100 ms are permitted. For electronic switches, the reduction to the break current should be achieved without any open circuiting of the simulated inductive loads circuit, to ensure that no abnormal voltage transients are generated. A typical method of achieving this is shown in Figure 16. 3) Resistors and inductors are not connected in parallel except that if any air-core inductor is used, a resistor taking approximately 1 % of the current through the inductor is connected in parallel with it. Iron-core inductors may be used provided that the current has a substantial sine-wave form. For three-phase tests, three-core inductors are used. 4) The test circuit condition for testing electronic switches, according to Figure 16, shall be substantially resistive.				

Table 202 – Test loads for electrical endurance tests for DC circuits

Type of circuit as classified in 7.2	Operation of contacts	Test voltage	Test current	Time constant
Declared specific load (classified in 7.2.5)	Making and breaking	Rated voltage	As determined by load	

17.3 Thermal conditions

IEC 61058-1-2:2016, 17.3 is not applicable.

17.4 Actuating conditions

IEC 61058-1-2:2016, 17.4 applies with the following exceptions.

17.4.1 Replacement:

The switches are operated by means of their actuating member either manually or by an appropriate apparatus which is arranged to simulate normal actuation.

The operating speed for the operating cycles shall be as follows:

- *for linear actions, the switch actuation speed shall be approximately 25 mm/s (electronic);*
- *for rotary actions, the switch actuation speed shall be approximately 45°/s (electronic).*

17.4.3 IEC 61058-1-2:2016, 17.4.3 is not applicable.

17.5 Type of test condition (TC)

IEC 61058-1-2:2016, 17.5 applies with the following exceptions.

17.5.1 Increased-voltage test at accelerated speed (TC1)

IEC 61058-1-2:2016, 17.5.1 is not applicable.

17.5.2 Test at slow speed (TC2)

IEC 61058-1-2:2016, 17.5.2 is not applicable.

17.5.3 Test at high speed (TC3)

IEC 61058-1-2:2016, 17.5.3 is not applicable.

17.5.4 Test at accelerated speed (TC4)

Replacement:

The electrical conditions are those specified in 17.2.

The thermal conditions are as follows: Tests are carried out at 25 °C ± 10 °C. The total number of operations shall be declared by the manufacturer.

NOTE Typically the total number of operations is 50 000 for hand-held tools, 10 000 for transportable tools and 10 000 for lawn and garden machinery.

The method of operation is that specified for accelerated speed in 17.4.

17.5.5 Manual functional test (TC5)

IEC 61058-1-2:2016, 17.5.5 is not applicable.

17.5.6 Functional test at minimum load (TC6)

IEC 61058-1-2:2016, 17.5.6 is not applicable.

17.5.7 Test with limited number of operations (TC7)

Replacement:

The electrical conditions are those specified in 17.2. The thermal conditions are 25 °C ± 10 °C.

The number of operating cycles is 1 000 or greater as declared by the manufacturer.

The method of operation is that specified in 17.4.1 for accelerated speed.

17.5.8 Endurance complete switch (TC8)

IEC 61058-1-2:2016, 17.5.8 is not applicable.

17.5.10 Test at very slow speed (TC10)

IEC 61058-1-2:2016, 17.5.10 is not applicable.

17.6 Evaluation of compliance

IEC 61058-1-2:2016, 17.6 is applicable, except as follows.

17.6.2 Thermal compliance (TE2)

IEC 61058-1-2:2016, 17.6.2 is not applicable.

18 Mechanical strength

Clause 18 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause ~~is~~ are covered in the end-product standard.

19 Screws, current-carrying parts and connections

Clause 19 of IEC 61058-1:2016 is applicable.

20 Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies

Clause 20 of IEC 61058-1:2016 is applicable.

21 Fire hazard

Clause 21 of IEC 61058-1:2016 is applicable except as follows.

21.1 Resistance to heat

Replacement: (replacing 21.1.1, 21.1.2, 21.1.3 and 21.1.4)

Parts of non-metallic material shall be resistant to heat.

This requirement does not apply to small parts, to decorative trims, actuators which are not integral with the actuating means, ~~and~~ or to other parts for which no tests are required.

NOTE The definition for small parts is given in 3.15 of IEC 60695-2-11:2014.

Compliance is checked with new samples using the ball pressure test according to IEC 60695-10-2 at the following temperatures:

a) at $75\text{ °C} \pm 2\text{ °C}$:

for parts which are accessible when the switch is mounted as declared, and the deterioration of which may result in the switch becoming unsafe (e.g. reduction in the declared degree of protection, or reduction of creepage and clearances below those values required according to Clause 20);

b) at $125\text{ °C} \pm 2\text{ °C}$:

- for parts which are in contact with, maintain or retain in position electrical connections including those parts which maintain an electrical connection under spring force, for example a connection within the switch maintained in position by a spring in association with a non-metallic part, the deterioration of which could cause overheating;
- for parts which are in contact with or support heat-sources (for example, heat sinks).

21.2 Resistance to abnormal heat

Replacement:

Parts of non-metallic material shall be resistant to abnormal heat.

For decorative trims, actuating members which are not integral with the actuating means, and parts which are unlikely to be ignited or to propagate flames, no test is required.

In cases where it is neither practical nor possible to carry out the tests on a complete switch, for example, when the switch is either too small or of an inconvenient shape, then the test is carried out using a specimen of the material from which the relevant part is manufactured. The size of the specimen shall be greater than 60 mm × 60 mm and with a thickness equal to the minimum thickness as measured for the relevant part.

NOTE A switch is considered to be practical for testing if a 15 mm diameter circle can be inscribed within the surface to be tested.

Compliance is checked with one new sample using the glow wire test of IEC 60695-2-11 at the glow wire temperature of minimum 650 °C.

The test specimen is considered to have passed the glow-wire test if flames or the glowing of the test specimen extinguish within 30 s after removal of the glow wire and there is no ignition of the layer of wrapping tissue.

If there is no flame or ignition, this shall be reported.

22 Resistance to rusting

Clause 22 of IEC 61058-1:2016 is applicable.

23 Abnormal operation and fault conditions for ~~electronic~~ switches

~~Replacement.~~

~~Not applicable, except as follows.~~

~~Switches shall be constructed so that the risk of electric shock as a result of abnormal condition is prevented.~~

~~Compliance is checked by carrying out the tests described in 23.1.1.1 and 23.1.1.2 for circuits where circuit analysis shows an electric shock hazard to exist.~~

~~When tested, the switch shall be installed in a test circuit as shown in Figure 18.~~

~~The load conditions are as follows:~~

- ~~• for electronic switches for which no thermal current is declared, the tests are carried out with rated current and duty type;~~
- ~~• for electronic switches for which a thermal current is declared, the tests are carried out with the specified thermal current and duty type;~~
- ~~• for electronic switches for a specific end application, the tests are carried out in or together with the appliance.~~

NOTE 1 ~~Circuits below 15 W are generally considered not to represent a risk of electric shock.~~

NOTE 2 ~~These load conditions are a subset of the requirements from 16.3.3.~~

Clause 23 of IEC 61058-1:2016 is applicable.

24 Components for ~~electronic~~ switches

Clause 24 of IEC 61058-1:2016 is not applicable.

NOTE Specific requirements for components are covered by the end-product standard.

25 EMC requirements

Clause 25 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause ~~is~~ are covered in the end-product standard.

Annexes

The annexes of IEC 61058-1:2016 are applicable, except as follows.

~~Annex F~~ **D** (informative)

Switch application guide

Annex D of IEC 61058-1:2016 is not applicable.

~~Annex H~~ (informative)

~~Flat quick-connect terminations, method for selection of female connectors~~

~~This annex of Part 1 is not applicable.~~

~~Annex N~~ **H** (normative)

Altitude correction factors

Annex H of IEC 61058-1:2016 is not applicable.

~~Annex U~~ **N** (informative)

Dimensions of tabs forming part of a switch

Annex N of IEC 61058-1:2016 is not applicable.

~~Annex V~~ (informative)

~~Requirements and tests for resistance to abnormal heat for unattended appliances~~

~~This annex of Part 1 is not applicable.~~

Bibliography

The Bibliography of IEC 61058-1:2016 is applicable, except as follows.

Addition:

IEC 60745-1, *Hand-held motor-operated electric tools – Safety – Part 1: General requirements*

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

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Switches for appliances –

Part 2-6: Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery

Interrupteurs pour appareils –

Partie 2-6: Exigences particulières pour les interrupteurs utilisés sur les outils électroportatifs à moteur, les outils portables et les machines pour jardins et pelouses

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SWITCHES FOR APPLIANCES –

**Part 2-6: Particular requirements for switches used
in electric motor-operated hand-held tools, transportable
tools and lawn and garden machinery**

FOREWORD

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International Standard IEC 61058-2-6 has been prepared by subcommittee 23J: Switches for appliances, of IEC technical committee 23: Electrical accessories.

This second edition cancels and replaces the first edition published in 2016. It constitutes a technical revision.

This edition includes the following significant change with respect to the previous edition:

Overall format to support IEC 61058-1, IEC 61058-1-1 and IEC 61058-1-2.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3J/450/FDIS	23J/452/RVD

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

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

This document is to be used in conjunction with IEC 61058-1:2016.

This document supplements or modifies the corresponding clauses in IEC 61058-1, so as to convert that publication into the IEC standard: *Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery*.

When a particular subclause of IEC 61058-1 is not mentioned in this document, that subclause applies as far as reasonable. Where this document states "addition", "modification" or "replacement", the relevant text of IEC 61058-1 is to be adapted accordingly.

In this standard:

- 1) the following print types are used:
 - requirements proper: in roman type;
 - test specifications: *in italic type*;
 - notes/explanatory matter: in small roman type.
- 2) subclauses, notes, figures and tables which are additional to those in IEC 61058-1 are numbered starting from 101.

A list of all the parts in the IEC 61058 series, under the general title *Switches for appliances*, can be found on the IEC website.

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

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

SWITCHES FOR APPLIANCES –

Part 2-6: Particular requirements for switches used in electric motor-operated hand-held tools, transportable tools and lawn and garden machinery

1 Scope

Clause 1 of IEC 61058-1:2016 is applicable except as follows.

Addition:

This part of IEC 61058 is a subset based on IEC 61058-1. The clauses outlined below are intended to address the specific requirements for switches incorporated into or integrated with electric motor-operated hand-held tools, transportable tools and lawn and garden machinery.

This document is intended for switches with an ambient temperature up to and including 55 °C. Switches tested according to IEC 61058-1 are considered to comply with this document and additional testing is not required provided ratings, loads, and endurance are correct.

NOTE This document takes into account the fact that tests are conducted as part of the end-product evaluation (e.g. products tested according to the IEC 60745 and IEC 62841 series, and lawn and gardening equipment tested according to the IEC 60335 series), and that tests are not conducted on the component switch.

2 Normative references

Clause 2 of IEC 61058-1:2016 is applicable except as follows.

Addition:

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

3 Terms and definitions

Clause 3 of IEC 61058-1:2016 is applicable.

4 General requirements

Clause 4 of IEC 61058-1:2016 is applicable.

5 General information on tests

Clause 5 of IEC 61058-1:2016 is applicable.

6 Rating

Clause 6 of IEC 61058-1:2016 is applicable.

7 Classification

Clause 7 of IEC 61058-1:2016 is applicable except as follows.

7.3.2 IEC 61058-1:2016, 7.3.2 is not applicable.

7.3.3 IEC 61058-1:2016, 7.3.3 is not applicable.

7.7.1 IEC 61058-1:2016, 7.7.1 is not applicable.

7.7.2 IEC 61058-1:2016, 7.7.2 is not applicable.

8 Marking and documentation

Clause 8 of IEC 61058-1:2016 is applicable except as follows.

8.1.1 General

Addition:

Switches declared for use in appliances such as power tools are considered unique type (UT) when referencing Table 3.

8.1.3 By documentation

Replacement of Table 3:

Table 3 – Switch information

Characteristic	Means of information
SWITCH IDENTIFICATION –	UNIQUE TYPE REFERENCE UT (7.10.1)
Manufacturer's name or trade mark	Marking
Type reference (model or catalogue number)	Marking
Identification that the switch is in compliance with this document (8.101)	Marking
Type of appliance for which a switch shall be used (hand-held tools, transportable tools, or lawn and garden machinery)	Documentation
Number of operating cycles (7.4)	Documentation
Degree of protection against electric shock, from outside an appliance (7.7)	Documentation
Number of cycles with switching device only (TC 7) (17.5.7)	Documentation
All terminals shall be suitably identified, or their purpose self-evident, or the switch circuitry visually apparent. For terminals intended for the connection of supply conductors, the identification may take the form of a letter L, a number or an arrow	Marking
The rated current and electrical load type	Documentation
Ambient temperature limits if different from 0 °C to 55 °C	Documentation
Duty-type and relevant information (e.g. ON/OFF-time) (7.18)	Documentation

8.3 Load rating

IEC 61058-1:2016, 8.3 is applicable except as follows.

8.3.2 Substantially restive load

IEC 61058-1:2016, 8.3.2 is not applicable.

8.3.4 Resistive load and capacitive load

IEC 61058-1:2016, 8.3.4 is not applicable.

8.3.5 Resistive load and tungsten filament lamp load

IEC 61058-1:2016, 8.3.5 is not applicable.

8.3.6 Declared specific load

IEC 61058-1:2016, 8.3.6 is not applicable.

8.3.8 General purpose loads

IEC 61058-1:2016, 8.3.8 is not applicable.

Addition:

8.101 Switch compliance with IEC 61058-2-6

The marking to indicate compliance with IEC 61058-2-6 shall be "PT".

Compliance is checked by inspection.

9 Protection against electric shock

Clause 9 of IEC 61058-1:2016 is applicable except as follows.

9.1 IEC 61058-1:2016, 9.1 is not applicable.

NOTE The requirements of this subclause are covered in the end-product standard.

10 Provision for earthing

Clause 10 of IEC 61058-1:2016 is not applicable.

11 Terminals and terminations

Clause 11 of IEC 61058-1:2016 is applicable.

12 Construction

Clause 12 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause are covered in the end-product standard.

13 Mechanism

Clause 13 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause are covered in the end-product standard.

14 Protection against ingress of solid foreign objects, ingress of water and humid conditions

Clause 14 of IEC 61058-1:2016 is applicable except as follows.

14.3 Protection against humid conditions

Replacement of the second paragraph:

Compliance is checked by the humidity treatment described in IEC 61058-1:2016, 14.3, followed by the test of 15.1. Cable inlet openings, if any, and drain-holes are left open. If a drain-hole is provided for a water-tight switch, it is opened.

15 Insulation resistance and dielectric strength

Clause 15 of IEC 61058-1:2016 is applicable except as follows.

15.1 General requirements

Replacement:

The dielectric strength of switches shall be adequate.

Compliance is checked by the test of 15.3, the test being made immediately after the test of 14.3.

The test voltage according to Table 8 is applied in the case of:

- *functional insulation: between the different poles of a switch. For the purpose of the test, all the parts of each pole are connected together;*
- *basic insulation: between all live parts connected together and a metal foil covering the outer accessible surface of the basic insulation and accessible metal parts in contact with the basic insulation;*
- *double insulation: between all live parts connected together and a metal foil covering the outer, normally not accessible, surface of basic insulation and non-accessible metal parts; then: between two metal foils covering separately the inner, normally not accessible, surface of supplementary insulation and connected to non-accessible metal parts, and the outer accessible surface of supplementary insulation and connected to accessible metal parts;*
- *reinforced insulation: between all live parts connected together and a metal foil covering the outer accessible surface of reinforced insulation and accessible metal parts;*
- *contacts: between the open contacts of each pole of a switch at the test voltages for "across electronic disconnection".*

The foils are not pressed into openings but are pushed into corners and the like by means of the standard test finger.

In cases where basic insulation and supplementary insulation cannot be tested separately, the insulation provided is subjected to the test voltages specified for reinforced insulation.

For electronic switches, the test is carried out at the test voltages for "across full disconnection" and "across micro-disconnection" only on electronic switches with mechanical switching devices connected in series with the semiconductor switching device. The tests are not carried out across protective impedances and poles interconnected by components.

15.2 Measurement of insulation resistance

IEC 61058-1:2016, 15.2 is not applicable.

16 Heating

Clause 16 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause are covered in the end-product standard.

17 Endurance – Mechanical switches

Clause 17 of IEC 61058-1:2016 is replaced by the following.

Clause 17 of IEC 61058-1-1 is applicable, except as follows.

NOTE The requirements for mechanical switches (IEC 61058-1-1) are followed by the requirements specific to electronic switches (IEC 61058-1-2). As a result, some subclause numbers are repeated.

17.1.2 Replacement:

The sequence of tests to be completed on the same 3 samples is as follows:

- *a test at accelerated speed as specified in 17.5.4 (TC4);*
- *a functional compliance test in accordance with 17.6.1 (TE1);*
- *a dielectric strength test in accordance with 17.6.3 (TE3).*

17.1.3 IEC 61058-1-1:2016, 17.1.3 is not applicable.

17.2 Electrical endurance tests

Replacement:

The switch shall be loaded as specified in Table 201 and/or Table 202 and connected in accordance with the circuit as given in IEC 61058-1:2016, Table 2.

- a) *Where, in IEC 61058-1:2016, Table 2, an auxiliary switch (A) is symbolized in the test circuit, the tests for the two ON-positions of the specimen (S) are performed on two separate sets of test samples. The connection to the test load to be performed for the two tests is symbolized in IEC 61058-1:2016, Table 2 by an auxiliary switch A.*
- b) *Multiway switches are loaded according to IEC 61058-1:2016, Table 1. The load for the other switch positions is that resulting from the loads necessary to achieve the conditions specified above.*
- c) *No electrical load is applied during the endurance tests for switches classified according to 7.2.6 with a rating of 20 mA or less.*

Replacement:

Table 102 (IEC 61058-1-1:2016) with Table 201 (IEC 61058-2-6:2018)

Table 103 (IEC 61058-1-1:2016) with Table 202 (IEC 61058-2-6:2018)

17.3 Thermal conditions

IEC 61058-1-1:2016, 17.3 is not applicable.

17.4 Actuating conditions

IEC 61058-1-1:2016, 17.4 is applicable except as follows.

17.4.1 Replacement:

The switches are operated by means of their actuating member either manually or by an appropriate apparatus which is arranged to simulate normal actuation.

The operating speed for the operating cycles shall be as follows:

- *for linear actions, the switch actuation speed shall be approximately 80 mm/s (mechanical);*
- *for rotary actions, the switch actuation speed shall be approximately 90°/s (mechanical).*

17.4.3 IEC 61058-1-1:2016, 17.4.3 is not applicable.

17.5 Type of test condition (TC)

IEC 61058-1-1:2016, 17.5 is applicable except as follows.

17.5.1 Increased-voltage test at accelerated speed (TC1)

IEC 61058-1-1:2016, 17.5.1 is not applicable.

17.5.2 Test at slow speed (TC2)

IEC 61058-1-1:2016, 17.5.2 is not applicable.

17.5.3 Test at high speed (TC3)

IEC 61058-1-1:2016, 17.5.3 is not applicable.

17.5.4 Test at accelerated speed (TC4)

Replacement:

The electrical conditions are those specified in 17.2.

The thermal conditions are as follows: Tests are carried out at 25 °C ± 10 °C. The total number of operations shall be declared by the manufacturer.

NOTE Typically the total number of operations is 50 000 for hand-held tools, 10 000 for transportable tools and 10 000 for lawn and garden machinery.

The method of operation is that specified for accelerated speed in 17.4.

17.5.5 Locked-rotor test (TC9)

IEC 61058-1-1:2016, 17.5.5 is not applicable.

17.5.6 Test at very slow speed (TC10)

IEC 61058-1-1:2016, 17.5.6 is not applicable.

17.6 Evaluation of compliance

IEC 61058-1-1:2016, 17.6 is applicable, except as follows.

17.6.2 Thermal compliance (TE2)

IEC 61058-1-1:2016, 17.6.2 is not applicable.

17 Endurance – Electronic switches

Clause 17 of IEC 61058-1-2:2016 is applicable, except as follows.

17.1.2 Replacement:

For electronic switches (complete switch) the sequence of tests to be completed on the same 3 samples is as follows:

- a test at accelerated speed as specified in 17.5.4 (TC4);
- when declared for locked rotor, a test at accelerated speed as specified in 17.5.9 (TC9);
- a functional compliance test in accordance with 17.6.1 (TE1);
- a dielectric strength test in accordance with 17.6.3 (TE3).

Additionally 3 new specimens shall be prepared and tested as follows:

- the SD (semiconductor device and assembly) in series with contact(s) is short circuited and/or the SD in parallel with contact(s) is disconnected;
- a test at accelerated speed as specified in 17.5.7 (TC7).

The number of operating cycles is 1 000 or the declared number (if different).

17.2 Electrical conditions

Replacement:

The switch shall be loaded and tested as specified in Table 201 and/or Table 202, and connected in accordance with the circuit in IEC 61058-1:2016, Table 2.

- Where, in IEC 61058-1:2016, Table 2, an auxiliary switch (A) is symbolized in the test circuit, the tests for the two ON-positions of the specimen (S) are performed on two separate sets of test samples. The connection to the test load to be performed for the two tests is symbolized in IEC 61058-1:2016, Table 2 by an auxiliary switch A.
- Multiway switches are loaded according to IEC 61058-1:2016, Table 1. The load for the other switch positions is that resulting from the loads necessary to achieve the conditions specified above.
- No electrical load is applied during the endurance tests for switches classified according to 7.2.6 with a rating of 20 mA or less.
- For electronic switches, the test circuit shall be as shown in IEC 61058-1:2016, Figure 16. The declared load shall be set at rated voltage before the electronic switch is inserted into the circuit (the load is not readjusted).

Replacement:

Table 104 (IEC 61058-1-2) with Table 201 (IEC 61058-2-6:2018)

Table 105 (IEC 61058-1-2) with Table 202 (IEC 61058-2-6:2018)

Table 201 – Test loads for electrical endurance tests for AC circuits

Type of circuit as classified in 7.2	Operation of contacts	Test voltage	Test current RMS ¹⁾	Power factor ³⁾
Motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-M$	0,60 (+0,05)
			or $I-R$	or $\geq 0,9$
	Breaking	Rated voltage	$I-R$	$\geq 0,9$
			or $I-M$	or $\geq 0,9^{4)}$
Magnetically driven tools and magnetically driven lawn and garden machinery; also acceptable for motor-operated tools and motor-operated lawn and garden machinery	Making ²⁾	Rated voltage	$6 \times I-I$	0,60 (+0,05)
	Breaking	Rated voltage	$I-I$	0,60 (+0,05)
Declared specific load (classified in 7.2.5)	Making and breaking	As determined by load		
NOTE				
$I-I$: inductive-load current				
$I-M$: motor-load current				
$I-R$: resistive-load current				
1) Whichever is arithmetically greater or the most unfavourable value in case of equal values. 2) The specified making conditions are maintained for a period between 50 ms and 100 ms, and are then reduced by an auxiliary switch to the specified breaking conditions. For all switches except electronic switches the test current may be reduced to $I-R$ by introducing a resistor in the circuit. Short interruptions of the test current during the reduction to $I-R$ not exceeding a period of 50 ms to 100 ms are permitted. For electronic switches, the reduction to the break current should be achieved without any open circuiting of the simulated inductive loads circuit, to ensure that no abnormal voltage transients are generated. A typical method of achieving this is shown in Figure 16. 3) Resistors and inductors are not connected in parallel except that if any air-core inductor is used, a resistor taking approximately 1 % of the current through the inductor is connected in parallel with it. Iron-core inductors may be used provided that the current has a substantial sine-wave form. For three-phase tests, three-core inductors are used. 4) The test circuit condition for testing electronic switches, according to Figure 16, shall be substantially resistive.				

Table 202 – Test loads for electrical endurance tests for DC circuits

Type of circuit as classified in 7.2	Operation of contacts	Test voltage	Test current	Time constant
Declared specific load (classified in 7.2.5)	Making and breaking	Rated voltage	As determined by load	

17.3 Thermal conditions

IEC 61058-1-2:2016, 17.3 is not applicable.

17.4 Actuating conditions

IEC 61058-1-2:2016, 17.4 applies with the following exceptions.

17.4.1 Replacement:

The switches are operated by means of their actuating member either manually or by an appropriate apparatus which is arranged to simulate normal actuation.

The operating speed for the operating cycles shall be as follows:

- *for linear actions, the switch actuation speed shall be approximately 25 mm/s (electronic);*
- *for rotary actions, the switch actuation speed shall be approximately 45°/s (electronic).*

17.4.3 IEC 61058-1-2:2016, 17.4.3 is not applicable.

17.5 Type of test condition (TC)

IEC 61058-1-2:2016, 17.5 applies with the following exceptions.

17.5.1 Increased-voltage test at accelerated speed (TC1)

IEC 61058-1-2:2016, 17.5.1 is not applicable.

17.5.2 Test at slow speed (TC2)

IEC 61058-1-2:2016, 17.5.2 is not applicable.

17.5.3 Test at high speed (TC3)

IEC 61058-1-2:2016, 17.5.3 is not applicable.

17.5.4 Test at accelerated speed (TC4)

Replacement:

The electrical conditions are those specified in 17.2.

The thermal conditions are as follows: Tests are carried out at 25 °C ± 10 °C. The total number of operations shall be declared by the manufacturer.

NOTE Typically the total number of operations is 50 000 for hand-held tools, 10 000 for transportable tools and 10 000 for lawn and garden machinery.

The method of operation is that specified for accelerated speed in 17.4.

17.5.5 Manual functional test (TC5)

IEC 61058-1-2:2016, 17.5.5 is not applicable.

17.5.6 Functional test at minimum load (TC6)

IEC 61058-1-2:2016, 17.5.6 is not applicable.

17.5.7 Test with limited number of operations (TC7)

Replacement:

The electrical conditions are those specified in 17.2. The thermal conditions are 25 °C ± 10 °C.

The number of operating cycles is 1 000 or greater as declared by the manufacturer.

The method of operation is that specified in 17.4.1 for accelerated speed.

17.5.8 Endurance complete switch (TC8)

IEC 61058-1-2:2016, 17.5.8 is not applicable.

17.5.10 Test at very slow speed (TC10)

IEC 61058-1-2:2016, 17.5.10 is not applicable.

17.6 Evaluation of compliance

IEC 61058-1-2:2016, 17.6 is applicable, except as follows.

17.6.2 Thermal compliance (TE2)

IEC 61058-1-2:2016, 17.6.2 is not applicable.

18 Mechanical strength

Clause 18 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause are covered in the end-product standard.

19 Screws, current-carrying parts and connections

Clause 19 of IEC 61058-1:2016 is applicable.

20 Clearances, creepage distances, solid insulation and coatings of rigid printed board assemblies

Clause 20 of IEC 61058-1:2016 is applicable.

21 Fire hazard

Clause 21 of IEC 61058-1:2016 is applicable except as follows.

21.1 Resistance to heat

Replacement: (replacing 21.1.1, 21.1.2, 21.1.3 and 21.1.4)

Parts of non-metallic material shall be resistant to heat.

This requirement does not apply to small parts, to decorative trims, actuators which are not integral with the actuating means, or to other parts for which no tests are required.

NOTE The definition for small parts is given in 3.15 of IEC 60695-2-11:2014.

Compliance is checked with new samples using the ball pressure test according to IEC 60695-10-2 at the following temperatures:

a) at $75\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$:

for parts which are accessible when the switch is mounted as declared, and the deterioration of which may result in the switch becoming unsafe (e.g. reduction in the declared degree of protection, or reduction of creepage and clearances below those values required according to Clause 20);

b) at $125\text{ °C} \pm 2\text{ °C}$:

- *for parts which are in contact with, maintain or retain in position electrical connections including those parts which maintain an electrical connection under spring force, for example a connection within the switch maintained in position by a spring in association with a non-metallic part, the deterioration of which could cause overheating;*
- *for parts which are in contact with or support heat-sources (for example, heat sinks).*

21.2 Resistance to abnormal heat

Replacement:

Parts of non-metallic material shall be resistant to abnormal heat.

For decorative trims, actuating members which are not integral with the actuating means, and parts which are unlikely to be ignited or to propagate flames, no test is required.

In cases where it is neither practical nor possible to carry out the tests on a complete switch, for example, when the switch is either too small or of an inconvenient shape, then the test is carried out using a specimen of the material from which the relevant part is manufactured. The size of the specimen shall be greater than 60 mm × 60 mm and with a thickness equal to the minimum thickness as measured for the relevant part.

NOTE A switch is considered to be practical for testing if a 15 mm diameter circle can be inscribed within the surface to be tested.

Compliance is checked with one new sample using the glow wire test of IEC 60695-2-11 at the glow wire temperature of minimum 650 °C.

The test specimen is considered to have passed the glow-wire test if flames or the glowing of the test specimen extinguish within 30 s after removal of the glow wire and there is no ignition of the layer of wrapping tissue.

If there is no flame or ignition, this shall be reported.

22 Resistance to rusting

Clause 22 of IEC 61058-1:2016 is applicable.

23 Abnormal operation and fault conditions for switches

Clause 23 of IEC 61058-1:2016 is applicable.

24 Components for switches

Clause 24 of IEC 61058-1:2016 is not applicable.

NOTE Specific requirements for components are covered by the end-product standard.

25 EMC requirements

Clause 25 of IEC 61058-1:2016 is not applicable.

NOTE The requirements of this clause are covered in the end-product standard.

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Annexes

The annexes of IEC 61058-1:2016 are applicable, except as follows.

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Annex D
(informative)

Switch application guide

Annex D of IEC 61058-1:2016 is not applicable.

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Annex H
(normative)

Altitude correction factors

Annex H of IEC 61058-1:2016 is not applicable.

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Annex N
(informative)

Dimensions of tabs forming part of a switch

Annex N of IEC 61058-1:2016 is not applicable.

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Bibliography

The Bibliography of IEC 61058-1:2016 is applicable, except as follows.

Addition:

IEC 60745-1, *Hand-held motor-operated electric tools – Safety – Part 1: General requirements*

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

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

INTERRUPTEURS POUR APPAREILS –

Partie 2-6: Exigences particulières pour les interrupteurs utilisés sur les outils électroportatifs à moteur, les outils portables et les machines pour jardins et pelouses

AVANT-PROPOS

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La Norme internationale IEC 61058-2-6 a été établie par le sous-comité 23J: Interrupteurs pour appareils, du comité d'études 23 de l'IEC: Petit appareillage.

Cette deuxième édition annule et remplace la première édition parue en 2016, dont elle constitue une révision technique.

Cette édition inclut la modification majeure suivante par rapport à l'édition précédente:

Le format global a été modifié pour être compatible avec la structure révisée de l'IEC 61058-1, de l'IEC 61058-1-1 et de l'IEC 61058-1-2.

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
3J/450/FDIS	23J/452/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Le présent document doit être utilisé conjointement avec l'IEC 61058-1:2016.

Le présent document complète ou modifie les articles correspondants de l'IEC 61058-1, de façon à transformer cette publication en Norme IEC: *Exigences particulières pour les interrupteurs utilisés sur les outils électroportatifs à moteur, les outils portables et les machines pour jardins et pelouses.*

Lorsqu'un paragraphe particulier de l'IEC 61058-1 n'est pas mentionné dans le présent document, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque le présent document spécifie "addition", "modification" ou "remplacement", le texte correspondant de la l'IEC 61058-1 doit être adapté en conséquence.

Dans la présente norme:

- 1) les caractères d'imprimerie suivants sont utilisés:
 - exigences proprement dites: caractères romains;
 - *modalités d'essais: caractères italiques;*
 - notes/commentaires: petits caractères romains.
- 2) les paragraphes, notes, figures et tableaux qui sont ajoutés à ceux de l'IEC 61058-1 sont numérotés à partir de 101.

Une liste de toutes les parties de la série IEC 61058, publiées sous le titre général *Interrupteurs pour appareils*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

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INTERRUPTEURS POUR APPAREILS –

Partie 2-6: Exigences particulières pour les interrupteurs utilisés sur les outils électroportatifs à moteur, les outils portables et les machines pour jardins et pelouses

1 Domaine d'application

L'Article 1 de l'IEC 61058-1:2016 s'applique avec l'exception suivante.

Addition:

Le présent document est un sous-ensemble basé sur l'IEC 61058-1. Les articles ci-après visent à répondre aux exigences spécifiques aux interrupteurs incorporés ou intégrés aux outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses.

Le présent document s'applique aux interrupteurs destinés à être utilisés à une température ambiante inférieure ou égale à 55 °C. Les interrupteurs satisfaisant aux essais de l'IEC 61058-1 sont considérés conformes au présent document, et aucun essai supplémentaire n'est exigé si les caractéristiques assignées, les charges et l'endurance sont correctes.

NOTE Le présent document considère que les essais sont réalisés dans le cadre de l'évaluation du produit final (par exemple, les produits soumis aux essais selon les séries IEC 60745 et IEC 62841 et les équipements pour jardins et pelouses soumis aux essais selon la série IEC 60335) et qu'ils ne sont pas effectués indépendamment sur l'interrupteur en tant que composant unitaire.

2 Références normatives

L'Article 2 de l'IEC 61058-1:2016 s'applique avec l'exception suivante.

Addition:

IEC 61058-1:2016, *Interrupteurs pour appareils – Partie 1: Exigences générales*.

3 Termes et définitions

L'Article 3 de l'IEC 61058-1:2016 s'applique.

4 Exigences générales

L'Article 4 de l'IEC 61058-1:2016 s'applique.

5 Informations générales sur les essais

L'Article 5 de l'IEC 61058-1:2016 s'applique.

6 Caractéristiques assignées

L'Article 6 de l'IEC 61058-1:2016 s'applique.

7 Classification

L'Article 7 de l'IEC 61058-1:2016 s'applique avec les exceptions suivantes.

7.3.2 L'IEC 61058-1:2016, 7.3.2 ne s'applique pas.

7.3.3 L'IEC 61058-1:2016, 7.3.3 ne s'applique pas.

7.7.1 L'IEC 61058-1:2016, 7.7.1 ne s'applique pas.

7.7.2 L'IEC 61058-1:2016, 7.7.2 ne s'applique pas.

8 Marquage et documentation

L'Article 8 de l'IEC 61058-1:2016 s'applique avec les exceptions suivantes.

8.1.1 Généralités

Addition:

Les interrupteurs déclarés pour une utilisation dans des appareils tels que des outils électriques sont considérés comme des références uniques de type (UT) selon le Tableau 3.

8.1.3 Documentation

Remplacement du Tableau 3:

Tableau 3 – Informations relatives aux interrupteurs

Caractéristique	Moyen d'information
IDENTIFICATION DE L'INTERRUPTEUR –	REFERENCE UNIQUE DE TYPE UT (7.10.1)
Nom ou marque commerciale du fabricant	Marquage
Référence de type (modèle ou référence catalogue)	Marquage
Identification de la conformité de l'interrupteur au présent document (8.101)	Marquage
Type d'appareil sur lequel l'interrupteur doit être utilisé (outils portatifs, outils portables ou machines pour jardins et pelouses)	Documentation
Nombre de cycles de manœuvres (7.4)	Documentation
Degré de protection contre les chocs électriques de l'extérieur d'un appareil (7.7)	Documentation
Nombre de cycles avec un dispositif de coupure uniquement (TC 7) (17.5.7)	Documentation
Toutes les bornes doivent être clairement identifiées, ou leur usage doit être évident, ou les circuits de l'interrupteur doivent être visibles. Pour les bornes destinées à la connexion de conducteurs d'alimentation, l'identification peut s'effectuer sous la forme d'une lettre L, d'un nombre ou d'une flèche.	Marquage
Courant assigné et type de charge électrique	Documentation
Limites de température ambiante si différentes de 0 °C à 55 °C	Documentation
Service type et informations applicables (par exemple, temps à l'état OUVERT/FERMÉ) (7.18)	Documentation

8.3 Charges assignées

L'IEC 61058-1:2016, 8.3 s'applique avec l'exception suivante.

8.3.2 Charge pratiquement résistive

L'IEC 61058-1:2016, 8.3.2 ne s'applique pas.

8.3.4 Charge résistive et charge capacitive

L'IEC 61058-1:2016, 8.3.4 ne s'applique pas.

8.3.5 Charge résistive et charge de lampe à filament de tungstène

L'IEC 61058-1:2016, 8.3.5 ne s'applique pas.

8.3.6 Charge spécifique déclarée

L'IEC 61058-1:2016, 8.3.6 ne s'applique pas.

8.3.8 Charges d'usage général

L'IEC 61058-1:2016, 8.3.8 ne s'applique pas.

Addition:

8.101 Conformité de l'interrupteur à l'IEC 61058-2-6

Le marquage indiquant la conformité à l'IEC 61058-2-6 doit être "PT".

La conformité est vérifiée par examen.

9 Protection contre les chocs électriques

L'Article 9 de l'IEC 61058-1:2016 s'applique avec l'exception suivante.

9.1 L'IEC 61058-1:2016, 9.1 ne s'applique pas.

NOTE Les exigences de ce paragraphe sont traitées dans la norme du produit final.

10 Dispositions en vue de la mise à la terre

L'Article 10 de l'IEC 61058-1:2016 ne s'applique pas.

11 Bornes et terminaisons

L'Article 11 de l'IEC 61058-1:2016 s'applique.

12 Construction

L'Article 12 de l'IEC 61058-1:2016 ne s'applique pas.

NOTE Les exigences de cet article sont traitées dans la norme du produit final.

13 Mécanisme

L'Article 13 de l'IEC 61058-1:2016 ne s'applique pas.

NOTE Les exigences de cet article sont traitées dans la norme du produit final.

14 Protection contre la pénétration de corps solides étrangers, la pénétration de l'eau et les conditions d'humidité

L'Article 14 de l'IEC 61058-1:2016 s'applique avec l'exception suivante.

14.3 Protection contre l'humidité

Remplacement du deuxième alinéa:

La conformité est vérifiée par le traitement hygroscopique décrit au 14.3 de l'IEC 61058-1:2016, suivi par l'essai du 15.1. Les (éventuels) orifices d'entrée de câbles et les trous d'écoulement sont laissés ouverts. Si un trou d'écoulement est prévu pour un interrupteur étanche à l'eau, il est ouvert.

15 Résistance d'isolement et rigidité diélectrique

L'Article 15 de l'IEC 61058-1:2016 s'applique avec les exceptions suivantes.

15.1 Exigences générales

Remplacement:

La rigidité diélectrique des interrupteurs doit être appropriée.

La conformité est vérifiée par l'essai de 15.3, effectué immédiatement après l'essai de 14.3.

La tension d'essai selon le Tableau 8 est appliquée dans les cas suivants:

- *isolation fonctionnelle: entre les différents pôles d'un interrupteur. Pour les besoins de l'essai, toutes les parties de chaque pôle sont raccordées ensemble;*
- *isolation principale: entre toutes les parties actives raccordées ensemble et une feuille métallique recouvrant la surface externe accessible de l'isolation principale et les parties métalliques accessibles en contact avec l'isolation principale;*
- *double isolation: entre toutes les parties actives raccordées ensemble et une feuille métallique recouvrant la surface externe normalement non accessible de l'isolation principale et les parties métalliques non accessibles; puis entre deux feuilles métalliques, l'une recouvrant la surface interne normalement non accessible de l'isolation supplémentaire et raccordée aux parties métalliques non accessibles et l'autre recouvrant la surface externe accessible de l'isolation supplémentaire et raccordée aux parties métalliques accessibles;*
- *isolation renforcée: entre toutes les parties actives raccordées ensemble et une feuille métallique recouvrant la surface externe accessible de l'isolation renforcée et les parties métalliques accessibles;*
- *contacts: entre les contacts ouverts de chaque pôle de l'interrupteur, aux tensions d'essai correspondant aux valeurs "à travers une coupure électronique".*

Les feuilles ne sont pas pressées dans les ouvertures, mais sont poussées dans les coins et endroits analogues au moyen du doigt d'épreuve normalisé.

Dans les cas où l'isolation principale et l'isolation supplémentaire ne peuvent pas être soumises à l'essai séparément, le système d'isolation fourni est soumis aux tensions d'essai spécifiées pour l'isolation renforcée.

Pour les interrupteurs électroniques, l'essai est effectué aux tensions d'essai correspondant aux valeurs "à travers une coupure totale" et "à travers une microcoupure" uniquement pour les interrupteurs électroniques équipés de dispositifs de coupure mécaniques montés en série avec le dispositif de coupure à semiconducteurs. Les essais ne sont pas effectués à travers des impédances de protection et des pôles raccordés par des composants.

15.2 Mesure de la résistance d'isolement

L'IEC 61058-1:2016, 15.2 ne s'applique pas.

16 Echauffements

L'Article 16 de l'IEC 61058-1:2016 ne s'applique pas.

NOTE Les exigences de cet article sont traitées dans la norme du produit final.

17 Endurance – Interrupteurs mécaniques

L'Article 17 de l'IEC 61058-1:2016 est remplacé par ce qui suit.

L'Article 17 de l'IEC 61058-1-1:2016 s'applique avec les exceptions suivantes.

NOTE Les exigences relatives aux interrupteurs mécaniques (l'IEC 61058-1-1) sont complétées par les exigences spécifiques aux interrupteurs électroniques (l'IEC 61058-1-2). C'est pourquoi certains numéros de paragraphes sont répétés.

17.1.2 Remplacement:

La séquence d'essai à réaliser sur les 3 échantillons identiques est la suivante:

- *un essai à vitesse accélérée conformément à 17.5.4 (TC4);*
- *un essai de conformité fonctionnelle conformément à 17.6.1 (TE1);*
- *un essai de rigidité diélectrique conformément à 17.6.3 (TE3).*

17.1.3 L'IEC 61058-1-1:2016, 17.1.3 ne s'applique pas.

17.2 Essais d'endurance électrique

Remplacement:

L'interrupteur doit être chargé comme spécifié au Tableau 201 et/ou au Tableau 202, puis connecté conformément au circuit de l'IEC 61058-1:2016, Tableau 2.

- a) *Lorsque, dans l'IEC 61058-1:2016, Tableau 2, un interrupteur auxiliaire (A) est symbolisé dans le circuit d'essai, les essais pour les deux positions FERMEES du spécimen (S) sont réalisés sur deux ensembles distincts d'échantillons d'essai. Le raccordement de la charge d'essai à réaliser pour les deux essais est symbolisé dans l'IEC 61058-1:2016, Tableau 2, par l'interrupteur auxiliaire A.*
- b) *Les interrupteurs à directions multiples sont chargés selon l'IEC 61058-1:2016, Tableau 1. La charge pour les autres positions de l'interrupteur résulte des charges nécessaires pour accomplir les conditions spécifiées ci-dessus.*
- c) *Aucune charge électrique n'est appliquée pendant les essais d'endurance pour les interrupteurs classés selon 7.2.6 avec une valeur assignée inférieure ou égale à 20 mA.*

Remplacement:

Tableau 102 (IEC 61058-1-1:2016) par Tableau 201 (IEC 61058-2-6:2018)

Tableau 103 (IEC 61058-1-1:2016) par Tableau 202 (IEC 61058-2-6:2018)

17.3 Conditions thermiques

L'IEC 61058-1-1:2016, 17.3 ne s'applique pas.

17.4 Conditions de manœuvre

L'IEC 61058-1-1:2016, 17.4 s'applique avec les exceptions suivantes.

17.4.1 Remplacement:

Les interrupteurs sont mis en fonctionnement par l'intermédiaire de leur organe de manœuvre, soit manuellement, soit au moyen d'un appareil approprié visant à simuler une manœuvre normale.

La vitesse de manœuvre des cycles de manœuvres doit être comme suit:

- *pour les manœuvres linéaires, la vitesse de manœuvre de l'interrupteur doit être d'environ 80 mm/s (interrupteur mécanique);*
- *pour les manœuvres rotatives, la vitesse de manœuvre de l'interrupteur doit être d'environ 90°/s (interrupteur mécanique).*

17.4.3 L'IEC 61058-1-1:2016, 17.4.3 ne s'applique pas.

17.5 Type de condition d'essai (TC)

L'IEC 61058-1-1:2016, 17.5 s'applique avec les exceptions suivantes.

17.5.1 Essai à vitesse accélérée avec augmentation de tension (TC1)

L'IEC 61058-1-1:2016, 17.5.1 ne s'applique pas.

17.5.2 Essai à vitesse lente (TC2)

L'IEC 61058-1-1:2016, 17.5.2 ne s'applique pas.

17.5.3 Essai à vitesse élevée (TC3)

L'IEC 61058-1-1:2016, 17.5.3 ne s'applique pas.

17.5.4 Essai à vitesse accélérée (TC4)

Remplacement:

Les conditions électriques sont celles spécifiées en 17.2.

Les conditions thermiques sont les suivantes: Les essais sont réalisés à 25 °C ± 10 °C. Le nombre total de manœuvres doit être déclaré par le fabricant.

NOTE Typiquement, le nombre total de manœuvres est de 50 000 pour les outils portatifs, de 10 000 pour les outils portables et de 10 000 pour les machines pour jardins et pelouses.

La méthode de fonctionnement est celle spécifiée en 17.4 pour la vitesse accélérée.