

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Safety requirements for electrical equipment for measurement, control and laboratory use –
Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test**

**Règles de sécurité pour appareils électriques de mesure, de régulation et de laboratoire –
Partie 031: Prescriptions de sécurité pour sondes équipées tenues à la main pour mesurage et essais électriques**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2008 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: csc@iec.ch

Tel.: +41 22 919 02 11

Fax: +41 22 919 03 00

A propos de la CEI

La Commission Electrotechnique internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: www.iec.ch/searchpub/cur_fut-f.htm

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,...). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: www.iec.ch/online_news/justpub

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: www.iec.ch/webstore/custserv/custserv_entry-f.htm

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:

Email: csc@iec.ch

Tél.: +41 22 919 02 11

Fax: +41 22 919 03 00

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Safety requirements for electrical equipment for measurement, control and laboratory use –
Part 031: Safety requirements for hand-held probe assemblies for electrical measurement and test**

**Règles de sécurité pour appareils électriques de mesurage, de régulation et de laboratoire –
Partie 031: Prescriptions de sécurité pour sondes équipées tenues à la main pour mesurage et essais électriques**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

N

FOREWORD

This amendment has been prepared by IEC technical committee 66: Safety of measuring, control and laboratory equipment.

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

CDV	Report on voting
66/383/CDV	66/394/RVC

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

Page 3

CONTENTS

Replace the titles of 6.6 and 6.7, as follows: 2002/AMD1:2008

- 6.6 Voltage tests
- 6.7 Constructional requirements

Add, on page 5, the titles of new Clause 13 and Subclauses 13.1 and 13.2, new Figures 10, 11, and 12, and of new Table 9:

- 13 Prevention of HAZARD from arc flash and short-circuits
 - 13.1 General
 - 13.2 Exposed conductive parts

Figure 10 – Examples of type D PROBE ASSEMBLIES

Figure 11 – Treatment of the insulation of probe cable

Figure 12 – Pulley for the treatment of Figure 11

Table 9 – Forces for flexing/pull test for single core probe cable

Page 11

1.1 Scope

Add a new item d):

- d) Low-voltage attenuating and non-attenuating PROBE ASSEMBLIES (type D), that are RATED for direct connection only to voltages not exceeding 33 V r.m.s., or 46,7 V peak, or 70 V d.c., and are suitable for currents exceeding 8 A.

Amend the text of the first dashed item of the note as follows:

- are not within the definitions of types A, B, C, or D, or,

1.2 Object

1.2.1 Aspects included in scope

Add a new item e):

- e) arc flash (see Clause 13).

Page 15

3 Definitions

3.1.4

PROBE ASSEMBLY

Replace the existing note with the following:

NOTE See Figures 1, 2, and 10 for examples of PROBE ASSEMBLIES and an explanation of the function of their parts.

Page 21

3.5.6

POLLUTION degree

Replace the title and text with the following:

POLLUTION DEGREE

a numeral indicating the level of POLLUTION that may be present in the environment

3.5.6.1
POLLUTION degree 1

Replace the title with the following:

POLLUTION DEGREE 1

3.5.6.2
POLLUTION degree 2

Replace the title with the following:

POLLUTION DEGREE 2

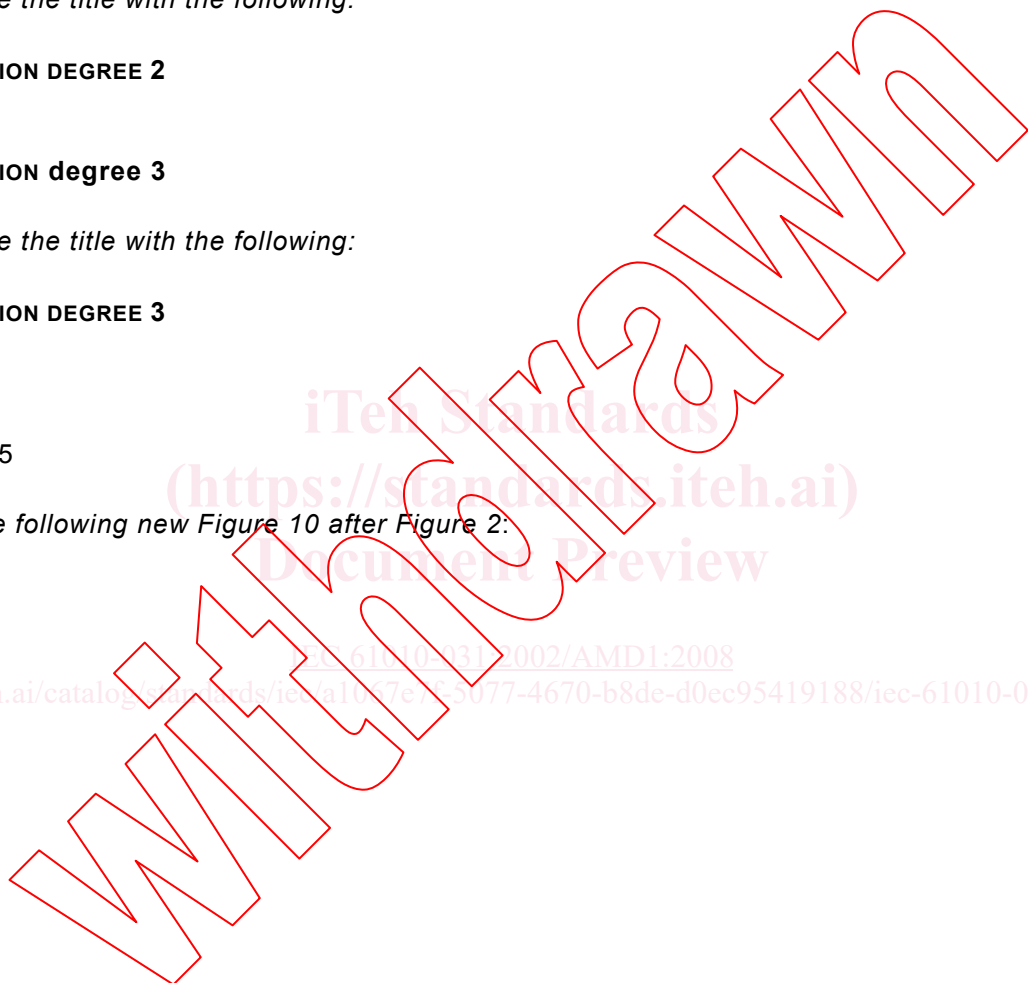
3.5.6.3
POLLUTION degree 3

Replace the title with the following:

POLLUTION DEGREE 3

Page 25

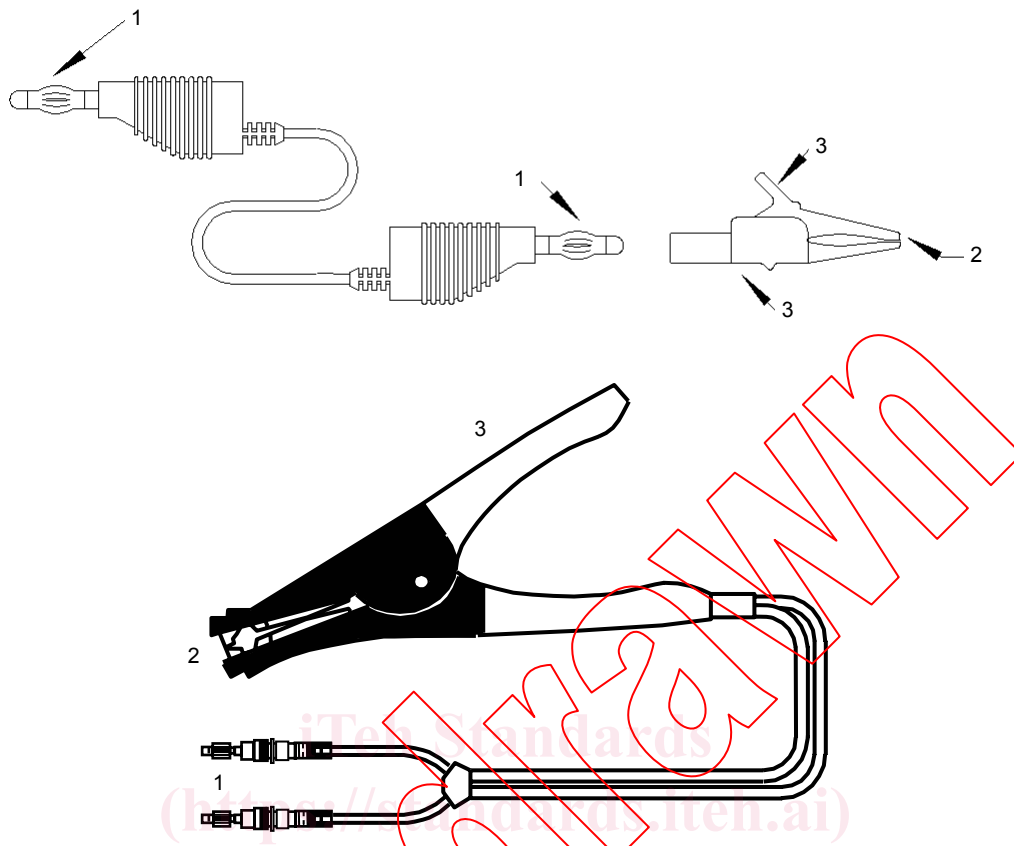
Add the following new Figure 10 after Figure 2:



iTech Standards
(<https://standards.iteh.ai>)
Document Preview

IEC 61010-031:2002/AMD1:2008

<https://standards.iteh.ai/catalog/standards/iec/a1687e7c-5077-4670-b8de-d0ec95419188/iec-61010-031-2002-amd1-2008>



IEC 076/08

Key

- 1 connector
- 2 jaw
- 3 hand-held area of crocodile clip or clamp

Figure 10 – Examples of type D PROBE ASSEMBLIES

Page 31

4.4.3 Duration of tests

Replace the last sentence of the second paragraph with the following sentence:

If the minimum operating current of the fuse is not reached in the test, the PROBE ASSEMBLY shall be operated for a period corresponding to the maximum fusing time or continuously for 1 h or 4 h, as specified above.

Page 35

5.1.2 Identification

In Table 1, replace row 7 with the following text:

Number	Symbol	Reference	Description
7	----	----	Not used

Page 37

5.1.5 Parts protected by DOUBLE INSULATION or REINFORCED INSULATION

Replace the existing title and text of the subclause with the following:

5.1.5 Not used.

5.1.6 RATING

Replace the first sentence of the third paragraph with:

For type A and type D PROBE ASSEMBLIES only, the maximum RATED current of the PROBE ASSEMBLY shall be marked together with the maximum RATED voltage-to-earth.

5.2 Warning markings

In the fourth paragraph of 5.2, on page 39, replace the reference to “9.2” by “9.1”.

Page 41

5.4.3 Operation

Add an item i), as follows:

- i) a warning that the measurement category of a combination of a PROBE ASSEMBLY and an accessory is the lower of the measurement categories of the PROBE ASSEMBLY and of the accessory.

Page 43

6.2 Determination of ACCESSIBLE parts

Delete the reference “(see 6.4, note 1)”, at the end of the first paragraph.

Page 49

6.3.1.3 Capacitance

Add a new last paragraph, as follows:

See Figure 5.

Page 51

6.3.2.3 Capacitance

Replace the title of Figure 5 by the following:

**Figure 5 – Charged capacitance level in NORMAL CONDITION and SINGLE-FAULT CONDITION
(see 6.3.1.3 and 6.3.2.3)**

Page 57

6.4.3 Cables

Add a new item d), as follows:

d) for type D PROBE ASSEMBLIES, 125 V.

Replace the existing conformity statement with the following new conformity statement:

Conformity is checked by inspection, and by the voltage tests of 6.6 (without humidity preconditioning), using metal foil tightly wrapped around a 150 mm ± 20 mm length of cable. Test voltage values are based on the CLEARANCES of the probe listed in Table 3 for measurement categories II, III or IV, and on the calculation of 6.5.2.2 for measurement category I or if no category is specified.

6.4.4 PROBE TIPS

Replace the existing text of 6.4.4 with the following text, but retain Figure 6:

PROBE TIPS that may be HAZARDOUS LIVE during NORMAL USE shall meet the following requirements (see 6.1.1).

If a conductive part of a PROBE TIP can become HAZARDOUS LIVE, a BARRIER shall be fitted to reduce the danger of touching an exposed conductive part of the PROBE TIP, and to provide an indication of the limit beyond which it may be hazardous to touch the probe body during use.

CLEARANCES and CREEPAGE DISTANCES between the HAZARDOUS LIVE part of the PROBE TIP and the hand-held side of the BARRIER shall be those specified for REINFORCED INSULATION.

Figure 6a gives an example of PROBE ASSEMBLIES with BARRIERS and indicates applicable CLEARANCES and CREEPAGE DISTANCES.

Spring-loaded squeeze PROBE ASSEMBLIES RATED for WORKING VOLTAGES up to 1 kV (see Figure 6b) are acceptable without a BARRIER provided that:

- a) actuation of the spring-loaded mechanism prevents the OPERATOR touching a HAZARDOUS LIVE part; and
- b) the CLEARANCE and CREEPAGE DISTANCE between the PROBE TIP and the nearest surface which the OPERATOR needs to touch to actuate the mechanism is increased by an additional protective distance of 45 mm.

Insulated crocodile and similar clips (see Figure 6c) RATED for measurement category I or II which require finger pressure at about 90° to the axis of the clip are acceptable without a BARRIER, provided that there is a tactile indicator to indicate the limit of safe access for the OPERATOR.

NOTE See Clause 13 for additional requirements for the exposed conductive parts of PROBE TIPS.

Conformity is checked by inspection and measurement.

Page 61

6.5 CLEARANCES and CREEPAGE DISTANCES

Replace, in the first line of the first paragraph, the reference to “6.5.4” by “6.5.3”.

6.5.1.1 CLEARANCES

Replace, on page 63, in the second line of the fifth paragraph, the words “dielectric strength test” with the words “voltage test”.

Page 67

6.5.2.2 CLEARANCE values for measurement category I

Replace the note with the following note:

NOTE The following is an example:

CLEARANCE for REINFORCED INSULATION for a peak WORKING VOLTAGE of 3 500 V and a maximum transient overvoltage of 4 500 V.

$$U_M = U_W + U_t = (3\,500 + 4\,500) \text{ V} = 8\,000 \text{ V}$$

$$F = (1,25 U_W / U_M) - 0,25 = (1,25 \times 3\,500 / 8\,000) - 0,25 = 0,297$$

$$D_1 = 16,7 \text{ mm}; D_2 = 29,5 \text{ mm (values for } 8\,000 \times 1,6 = 12\,800 \text{ V)}$$

$$\text{CLEARANCE} = D_1 + F(D_2 - D_1) = 16,7 + 0,297(29,5 - 16,7) = 16,7 + 3,8 = 20,5 \text{ mm}$$

Page 73

6.6 Dielectric strength tests*Replace the existing title with:***6.6 Voltage tests**

Page 75

6.6.4 Voltage tests*Replace the existing title with:***6.6.4 Test voltages***In the fourth paragraph, replace “10 μs” with “10 ms”.*

Page 79

6.7 Constructional requirements for protection against electric shock*Replace the existing title with:***6.7 Constructional requirements**

Page 83

Table 8 – Pull force for cable attachment*Replace Table 8 with the following table:*

Cross section of the conductor (a) mm ²	Pull force N
$a \leq 2,5$	36
$2,5 < a \leq 4$	50
$4 < a \leq 6$	60
$6 < a \leq 10$	80
$10 < a \leq 16$	90

NOTE For cables with multiple conductors, the cross-sectional area (a) is calculated as the sum of the cross-sectional areas of the individual conductors.

6.7.4.2 Flexing/pull test*Replace the existing text of 6.7.4.2 with the following text, but retain the existing Figure 7:*

The test is shown in Figure 7. With the probe body or equipment or connector clamped so that it cannot move and any soldered connection severed, attach a mass that provides a force