

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Low-voltage switchgear and controlgear –
Part 5-2: Control circuit devices and switching elements – Proximity switches**

**Appareillage à basse tension –
Partie 5-2: Appareils et éléments de commutation pour circuits de commande –
DéTECTEURS DE PROXIMITÉ**



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FOREWORD

This amendment has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

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

CDV	Report on voting
17B/1733/CDV	17B/1774/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 stability 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- withdrawn,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.

1.2 Normative references

Replace the existing references to the following publications as follows:

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14:2009, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
Amendment 1:2010

IEC 61000-3-2:2005, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
Amendment 1:2008
Amendment 2:2009

IEC 61000-3-3:2008, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

Amendment 1:2007

Amendment 2:2010

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low-frequency immunity tests*
Amendment 1:2009

CISPR 11:2009, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
Amendment 1:2010

Replace the existing reference IEC 60446:2007 by the following:

IEC 60445:2010, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

Replace the reference to ISO 630:1995 by the following:

ISO 630 (all parts), *Structural steels*

Add the following new references:

IEC 61076-2 (all parts), *Connectors for electronic equipment – Product requirements – Part 2: Circular connectors*

5.3 Instruction for installation, operation and maintenance

Replace the title and the existing text by the following:

5.3 Instructions for installation, operation and maintenance

The manufacturer shall specify the conditions for installation, operation and maintenance of the proximity switch.

He shall also specify the recommended extent and frequency of maintenance, if any.

7.1.7.3 Connection means

Replace the existing subclause by the following:

Subclause 7.1.8.3 of IEC 60947-1 applies with the following additions:

Proximity switches may have integral connecting leads; in this case the outer sheath of the connecting leads should be $2_0^{+0,1}$ m long unless otherwise agreed between manufacturer and customer. Information provided by the manufacturer may constitute such an agreement.

NOTE National US Electrical Code states that:

- 1) the free length of a field wiring lead is not less than 152 mm long or 100 mm when intended for installation in an outlet box;
- 2) a lead that is intended to be spliced in the field to a circuit conductor is not smaller than 0,2 mm² (24 AWG) and the insulation, when rubber or thermoplastic, is not less than 0,8 mm thick.

Table 3 – Connection and wiring identification

Add, to the existing table, a new table Footnote h and a new row for “12 poles M12 connector d.c. polarized” as follows:

Table 3 – Connection and wiring identification

Type	Function	Wire	Wire colour	Terminal number ^{b, c, d}
2 terminals a.c. and 2 terminals d.c. unpolarized	NO (make)		Any colour ^a except: Yellow, Green or Green and yellow	3
				4
	NC (break)			1
				2
	NO/NC programmable			1
				4
2 terminals d.c. polarized	NO (make)	+ –	Brown Blue	1 4
	NC (break)	+ –	Brown Blue	1 2 ^h
3 terminals d.c. polarized	NO (make)	+ – Output	Brown Blue Black	1 3 4
	NC (break)	+ – Output	Brown Blue Black	1 3 2 ^h
3 terminals a.c. and 3 terminals a.c./ d.c. polarized	NO (make)	L Output	Brown Blue Black	1 3 4
	NC (break)	L Output	Brown Blue Black	1 3 2
4 terminals d.c. polarized	Change over (make/break)	+	Brown	1
		–	Blue	3
		NO output	Black	4
		NC output	White	2
8 poles M12 connector d.c. polarized ^g	NO, NC and other not defined functions	+	Brown	1
		–	Blue	3
		NO output	Black	4
		NC output	White	2
		Not defined	Grey	5
		Not defined	Pink	6
		Not defined	Violet	7
		GND	Orange ^e	8
Screen	Screen ^f	8		

Table 3 (continued)

Type	Function	Wire	Wire colour	Terminal number ^{b, c, d}
12 poles M12 connector d.c. polarized ^g	NO, NC and other not defined functions	+	Brown	1
		–	Blue	3
		NO output	Black	4
		NC output	White	2
		Not defined	Grey	5
		Not defined	Pink	6
		Not defined	Violet	7
		GND	Orange ^e	8
		Screen	Screen ^f	8
		Not defined	Grey/Pink	9
		Not defined	White/Blue	10
		Not defined	White/Grey	11
Not defined	Grey/Brown	12		

^a It is recommended that both wires are of the same colour.

^b Terminal numbers (except for a.c. proximity switches, proximity switches using 5 mm and 8 mm connector) shall be the same as integral connector pin numbers.

^c For proximity switches with four or eight terminals d.c. having special functions, terminals 2 or 4 may be used for functions other than outputs. In this case, the manufacturer shall give a clear indication of the wire colour and functionality.

^d For proximity switches with four terminals d.c., terminals 2 or 4 may be used for output combinations other than those shown in this table. In this case, the manufacturer shall give a clear indication of the function of each terminal.

^e For connectors without screen connection.

^f For connectors with screen connection.

^g Recommended colour coding. The manufacturer shall state the actual wire colours used in the information for use.

^h For proximity switches with 3 poles M5/M8 connector the NC output is connected to terminal 4.

Table 7 – Acceptance criteria

Add a reference to new Footnote b in the cell on the line "Overall performance" and column "Acceptance criterion B" as follows:

... one half cycle of supply frequency for a.c. devices^b

Add the following new Footnote b:

^b For a.c. devices with power consumption of more than 750 mW, the recovery time of the switching element may be longer than one half cycle but shall be less than the specified maximum startup-time t_v (time delay before ability) according to 7.2.1.7. The maximum recovery time shall be stated by the manufacturer in his literature.

8.3.4.2 Results to be obtained

Add the following text at the end of the existing sentence:

and shall pass a dielectric test performed in accordance with 8.3.3.4.

Annex C (normative) – Additional requirements for proximity switches with integrally connected cables

C.8.1.1 Pull test

Replace the second paragraph of C.8.1.1 by the following:

Subclause 8.2.4.4 of IEC 60947-1 applies.

Annex D (normative) – Integral connectors for plug-in proximity switches

Replace the first paragraph by the following two new paragraphs:

M12, M8 or M5 integral connectors used for plug-in proximity switches shall be in accordance with relevant parts of the IEC 61076-2 series. They shall provide a minimum protection rating of IP65 when correctly coupled with their mating connector.

Figure D.1, Figure D.2, Figure D.3, Figure D.4, Figure D.5, Figure D.6, Figure D.7 and Figure D.8 show examples of these connectors.

Replace in the titles of Figure D.1, Figure D.2, Figure D.3, Figure D.4, Figure D.5, Figure D.6 and Figure D.7, the symbol \emptyset by the word "thread".

Add the new following Figure D.8:

<https://standards.iteh.ai/catalog/standards/sist/14e2ab7f-fc5e-4c6b-ac03-7da420d24398/iec-60947-5-2-2007-amd1-2012>

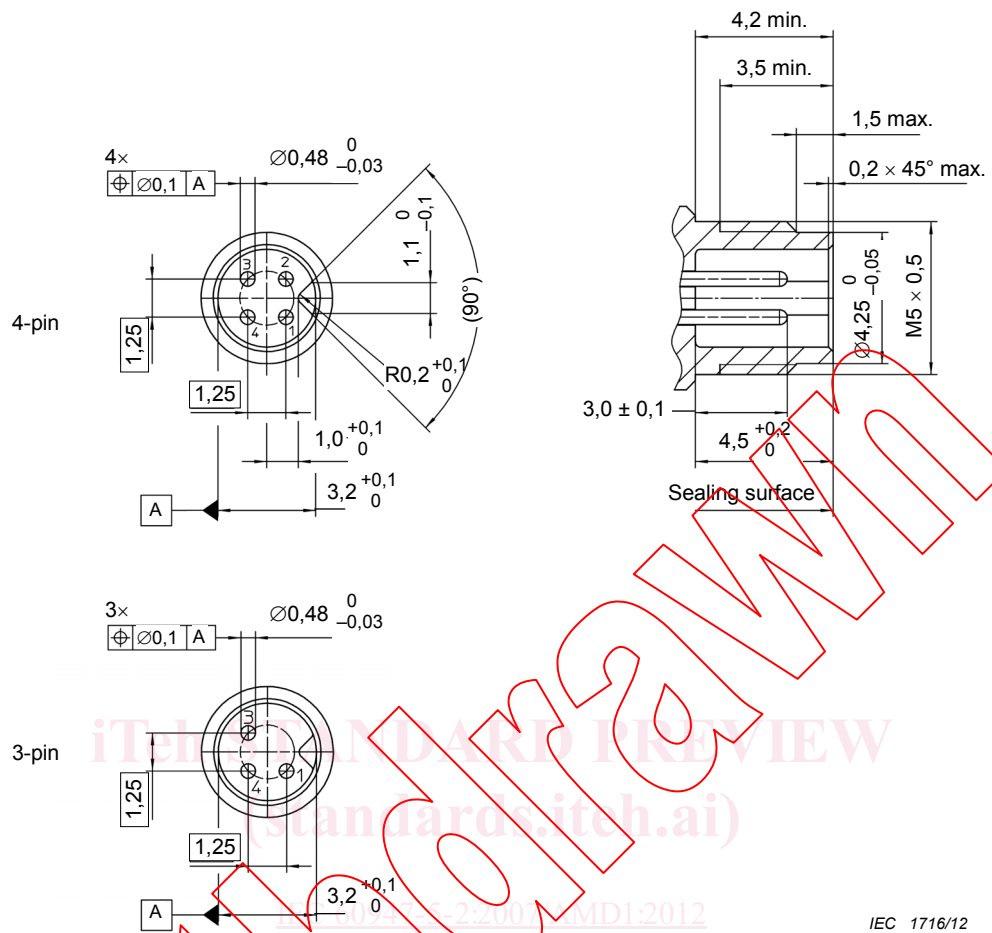


Figure D.8 – M5 thread 4-pin/3-pin integral connector for d.c. proximity switches

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 (standards.iteh.ai)
 https://standards.iteh.ai/catalog/standards/sist/17e2ab7f-fc5e-4c6b-ac03-7da420d24398/iec-60947-5-2-2007-amd1-2012

IEC 1716/12

AVANT-PROPOS

Le présent amendement a été établi par le sous-comité 17B: Appareillage à basse tension, du comité d'études 17 de la CEI: Appareillage.

Le texte de cet amendement est issu des documents suivants:

CDV	Rapport de vote
17B/1733/CDV	17B/1774/RVC

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

Le comité a décidé que le contenu de cet amendement et de la publication de base ne sera pas modifié avant la date de stabilité indiquée sur le site web de la CEI sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

1.2 Références normatives

Remplacer les références existantes aux publications suivantes comme suit:

CEI 60068-2-6:2007, *Essais d'environnement – Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)*

CEI 60068-2-14:2009, *Essais d'environnement – Partie 2-14: Essais – Essai N: Variation de température*

CEI 60068-2-27:2008, *Essais d'environnement – Partie 2-27: Essais – Essai Ea et guide: Chocs*

CEI 60947-1:2007, *Appareillage à basse tension – Partie 1: Règles générales*
Amendement 1:2010

CEI 61000-3-2:2005, *Compatibilité électromagnétique (CEM) – Partie 3-2: Limites – Limites pour les émissions de courant harmonique (courant appelé par les appareils ≤ 16 A par phase)*
Amendement 1:2008
Amendement 2:2009

CEI 61000-3-3:2008, *Compatibilité électromagnétique (CEM) – Partie 3-3: Limites – Limitation des variations de tension, des fluctuations de tension et du papillotement dans les réseaux publics d'alimentation basse tension, pour les matériels ayant un courant assigné ≤ 16 A par phase et non soumis à un raccordement conditionnel*