

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Live working – Insulating aerial devices for mounting on a chassis

Travaux sous tension – Dispositifs élévateurs isolants pour montage sur un châssis

[IEC 61057:2017](#)

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INTERNATIONAL STANDARD

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LIVE WORKING –
INSULATING AERIAL DEVICES
FOR MOUNTING ON A CHASSIS****FOREWORD**

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International Standard IEC 61057 has been prepared by IEC technical committee 78: Live working.

This second edition cancels and replaces the first edition published in 1991 and IEC TS 61813:2000. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) general review of the requirements and test provisions;
- b) preparation of the elements of evaluation of defects, and general application of IEC 61318:2007;
- c) distinguishes between tests for hollow booms and those for foam filled booms;
- d) references ISO 16368 for particular mechanical tests;

- e) further information on vacuum protection and leakage current monitoring and a mandatory requirement that aerial devices for bare hand work be fitted with a permanently installed lower test electrode system;
- f) *controls* of high electrical resistance;
- g) reference to SAE for insulating hydraulic hoses;
- h) inclusion of IEC TS 61813 for care, maintenance and in-service testing of aerial devices with insulating booms.

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

FDIS	Report on voting
78/1182/FDIS	78/1183/RVD

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

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

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- amended.

INTRODUCTION

This document covers *insulating aerial devices* for use at temperatures between -25 °C and $+55\text{ °C}$. Where aerial devices are for use in unusual atmospheric conditions (for example, higher or lower temperatures), other considerations may be appropriate and will be identified by the *manufacturer* both in the markings and instructions for use.

The products covered by this document are primarily intended to be used for live working or for work within the live working zone. It recognizes that a user may specify a product, or products complying with this document where there is a risk of accidental contact with live (energized) part(s). In such circumstances users are reminded that national or local regulations regarding maintaining of Minimum Approach Distances to live parts, or those obtained from IEC 61472 are to be applied. Annex A of this document gives advice and information.

The product covered by this document may have an impact on the environment during some or all stages of its life cycle. These impacts can range from slight to significant, be short-term or long-term, and occur at the global, regional or local level.

Except for a disposal statement in the Instructions for use, this document does not include requirements and test provisions for the *manufacturers* of the product, or recommendations to the users of the product for environmental improvement. However, all parties intervening in its design, manufacture, packaging, distribution, use, maintenance, repair, reuse, recovery and disposal are invited to take account of environmental considerations.

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LIVE WORKING – INSULATING AERIAL DEVICES FOR MOUNTING ON A CHASSIS

1 Scope

This document is applicable to *insulating aerial devices* for mounting on a *chassis*, to be used for live working on electrical installations at nominal voltages above 1 000V r.m.s. AC in the range 45 Hz to 65 Hz and 1 500V DC.

The primary purpose of an aerial device is for work positioning of personnel. Other devices, such as jibs, may be fitted in order to assist the *operator* in performing the work.

This document also includes requirements and tests for the parts of the *chassis* influencing the performance of the *insulating aerial devices* to be used for live working.

When mounted on a *chassis*, the *insulating aerial device* becomes a component of a mobile elevating work *platform* (MEWP). Complementary requirements for the resulting MEWP are included in ISO 16368.

NOTE 1 In Europe, EN 280 instead of ISO 16368 is often used as reference for complementary requirements.

The products designed and manufactured according to this document contribute to the safety of users, provided they are used by skilled persons, in accordance with safe methods of work and the instructions for use.

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NOTE 2 Any requirements that are in conflict with or are meant to be complementary to ISO 16368 are delineated herein.

Radial boom (digger) derricks are not covered by this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60060-2, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60212:2010, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60417, *Graphical symbols for use on equipment* (available at <http://www.graphical-symbols.info/equipment>)

IEC 61318, *Live working – Conformity assessment applicable to tools, devices and equipment*

IEC 62237:2003, *Live working – Insulating hoses with fittings for use with hydraulic tools and equipment*

ISO 16368:2010, *Mobile elevating work platforms – Design, calculations, safety requirements and test methods*

ISO 13850, *Safety of machinery – Emergency stop function – Principles for design*

SAE J343, *Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies*

SAE J517, *Hydraulic hose*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61318, ISO 16368 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

aerial device

insulating aerial device

any device, extensible, articulating or both, incorporating insulating components and which is primarily designed and used to position personnel at or near an electric potential different from that of earth

Note 1 to entry: An *insulating aerial device* may also be used to handle material if designed and equipped for that purpose.

Note 2 to entry: An *insulating aerial device* does not include a *chassis*. When an aerial device is mounted on a mobile *chassis* it becomes a component of a mobile elevating work *platform* (MEWP).

3.2

aerial device centre of gravity – horizontal

horizontal component of the distance from the axis of rotation to the centre of gravity of the aerial device in the *stowed position*

SEE: Figure 1

3.3

aerial device centre of gravity – vertical

vertical component of the distance above the mounting surface of the aerial device to the centre of gravity of the aerial device in the *stowed position*

SEE: Figure 1

3.4

aerial device mass

mass of the standard aerial device, less optional counterweights, accessories and auxiliary equipment

3.5

bare hand working

live working carried out in accordance with a method where the worker is electrically bonded to the energized parts on which live working is to be performed whilst being suitably isolated from surrounding parts which are at different potentials

[SOURCE: IEC 60050-651:2014, 651-21-07, modified – The definition has been modified for clarity.]

3.6

basket

bucket

totally enclosed type of *platform* which does not need guardrails or toe-guard

3.7

boom tip

furthest extremity of the *upper boom* from the *turntable* and the end of the *upper boom* to which the *platform* is attached

SEE: Figure 2

3.8

brittle material

fibreglass-reinforced plastic material or material that does not meet the requirements for *ductile material*

3.9

cab-axle dimension

distance between the back of the cab and the *rear axle centreline* of the *chassis* recommended for mounting the aerial device

SEE: Figure 1

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3.10

centre of rotation location

distance from the centreline of the rear axle to the axis of rotation of the *turntable*

SEE: Figure 1

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3.11

chassis

base on which the aerial device is mounted

3.12

chassis frame height

height from ground level to the top of the *chassis* frame rail

SEE: Figure 1

3.13

chassis insulating system

all dielectric components installed between the *chassis* and the upper insulating boom and designed to insulate the *chassis* should the portion of the aerial device between the upper insulating boom and this system contact a live part

SEE: Figure 2

Note 1 to entry: A *lower boom insulating insert* is a type of *chassis insulating system*.

3.14

conductive shield

guard ring

device used to shield the *lower test electrode system* from capacitive coupling

3.15

control

means by which operation of a function is effected

3.16

disruptive discharge

sparkover

flashover

passage of an arc following dielectric breakdown

Note 1 to entry: The term “sparkover” (in French “amorçage”) is used when a disruptive discharge occurs in a gaseous or liquid dielectric.

Note 2 to entry: The term “flashover” (in French “contournement”) is used when a disruptive discharge occurs over the surface of a solid dielectric surrounded by a gaseous or liquid medium.

Note 3 to entry: The term “puncture” (in French “perforation”) is used when a disruptive discharge occurs through a solid dielectric.

[SOURCE: IEC 60050-604:1987, 604-03-38]

3.17

ductile material

material that has a minimum elongation at failure of 10 % in a gauge length of 51 mm of a standardized test specimen

3.18

elbow

structure connecting the *upper boom* to the *lower boom*, about which one articulates relative to the other

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SEE: Figure 2

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3.19

elbow pin

horizontal pin about which the *upper boom* rotates relative to the *lower boom*

SEE: Figure 2

3.20

extensible boom aerial device

aerial device on which the length of the *upper boom* can be varied within pre-determined limits

EXAMPLE telescoping boom

3.21

fixed handling tool

tool that is mechanically mounted at the *boom tip* or *platform*

EXAMPLE *jib*, phase lifter

3.22

formally trained and qualified person

competent person possessing the appropriate practical and theoretical knowledge and having adequate skill and experience to enable them to perform the required duty, interpret the resultant information and from that information determine that the equipment is safe to use, and report the importance of any defect found or suspected in relation to the safety and continued use of the equipment

3.23**front overhang**

maximum distance of any part of the *aerial device* forward of the front bumper

SEE: Figure 1

3.24**front projection**

maximum distance of any part of the *aerial device* forward of the front axle centreline when stowed for travel

SEE: Figure 1

3.25**gradient control device**

corona ring

device at the upper end of an *insulating boom* that reduces electrical stress level(s) below that considered to be disruptive

3.26**guardrail system**

guard rail system

system of barriers intended to protect personnel from falling to lower levels

3.27**hot stick working**

live working carried out in accordance with a method where the worker remains at a specified distance from the energized parts and carries out the work by means of insulating sticks

[SOURCE: IEC 60050-651:2014, 651-21-05]
IEC 61057:2017
<https://standards.iteh.ai/catalog/standards/sist/5ba776b-ccee-45b3-9c8b-78632917d884/iec-61057-2017>

3.28**horizontal reach**

maximum distance reached from the centreline of the rotating *turntable* to the outer edge of the *platform*

SEE: Figure 1

3.29**instability**

condition of a MEWP in which the sum of the moments tending to overturn the MEWP is equal to or exceeds the sum of the moments tending to resist overturning

3.30**insulating boom**

insulating component of the extending structure denominated the *upper boom* and, where provided, the *lower boom insert*.

Note 1 to entry: ISO 16368 defines *extending structure*.

3.31**insulating glove working**

live working carried out in accordance with a method where the worker is in direct contact with an energized part and is electrically protected by electrical insulating gloves

[SOURCE: IEC 60050-651:2014, 651-21-06]