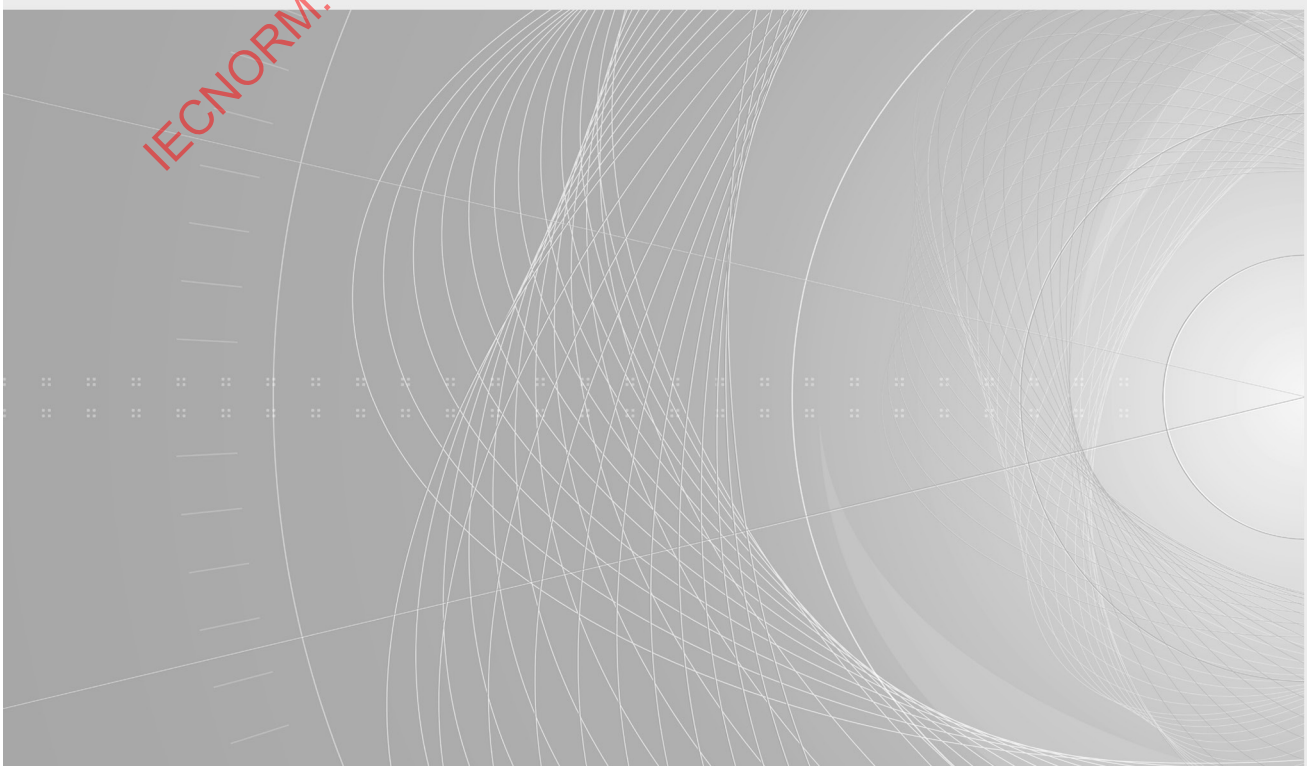
IEC TS 62196-4

Edition 1.0 2022-10

TECHNICAL SPECIFICATION

Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles –
Part 4: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for Class II or Class III applications



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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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CONTENTS

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PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 4: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for Class II or Class III applications

FOREWORD

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IEC TS 62196-4 has been prepared by subcommittee 23H: Plugs, socket-outlets and couplers for industrial and similar applications, and for electric vehicles, of IEC technical committee 23: Electrical accessories. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
23H/382/DTS	23H/385B/RVDTS 23H/385A/RVDTS 23H/385/RVDTS

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

The language used for the development of this Technical Specification is English.

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

A list of all the parts in the IEC 62196 series, under the general title *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles*, can be found on the IEC website.

This part of IEC 62196 is to be read in conjunction with IEC 62196-1:2014. The clauses of the particular requirements in Part 4 supplement or modify the corresponding clauses in Part 1. Where the text indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of the standard.

Subclauses, figures, tables or notes which are additional to those in IEC 62196-1 are numbered starting from 401.

In this document, the following print types are used:

– requirements proper: in roman type;

– *test specifications: in italic type;*

– notes: in smaller roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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.

INTRODUCTION

IEC 62196 (all parts) specifies the requirements for plugs, socket-outlets, vehicle connectors, vehicle inlets and cable assemblies as described in IEC 61851 (all parts).

Some conductive transfer of electric power can be achieved by direct connection from an electric vehicle to common mains socket-outlets.

IEC 62196-4 covers the mechanical, electrical and performance requirements for dedicated accessories for conductive transfer of electric power between the supply network and a light electric road vehicle according to IEC TS 61851-3 (all parts).

IEC 62196 is divided into several parts:

- Part 1: General requirements, comprising clauses of a general character;
- Part 2: Dimensional compatibility and interchangeability requirements for AC pin and contact-tube accessories;
- Part 3: Dimensional compatibility and interchangeability requirements for DC and AC/DC pin and contact-tube vehicle couplers;
- Part 4: Dimensional compatibility and interchangeability requirements for dedicated DC pin and contact-tube accessories for Class II or Class III applications.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent no. EP1537632 B1 concerning Standard sheets 4-I.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

Rosenberger Hochfrequenztechnik GmbH & Co. KG

Hauptstraße 1, 83413 Fridolfing, Germany

PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –

Part 4: Dimensional compatibility and interchangeability requirements for DC pin and contact-tube accessories for Class II or Class III applications

1 Scope

This part of IEC 62196 is applicable to plugs, socket-outlets, vehicle connectors and vehicle inlets, herein referred to as “accessories”, of standardized configuration for DC power supply of electric road vehicles, where the protection against electric shocks relies on double or reinforced insulation between all AC and DC inputs and outputs of the EV supply equipment, intended for use in conductive power supply systems which can incorporate control means, with a maximum operating voltage up to 120 V DC, not exceeding 60 A.

These accessories are intended to be used for circuits specified in IEC 61851-3 (all parts).

The accessories covered by this part of IEC 62196 are intended to be used only with electric vehicles that provide a vehicle power supply circuit with double or reinforced insulation or battery systems covered by IEC 61851-3 (all parts).

These accessories and cable assemblies are intended to be used in an ambient temperature of between −30 °C and +50 °C.

These accessories are intended to be connected only to cables with copper or copper-alloy conductors.

2 Normative references

Clause 2 of IEC 62196-1:2014 applies except as follows:

Addition:

NOTE All EMC related standard references are given in IEC 61851-21-1 and IEC 61851-21-2.

IEC TS 61851-3-1:–[1], *Electric vehicle conductive charging system – Part 3-1: DC EV supply equipment where protection relies on double or reinforced insulation – General rules and requirements for stationary equipment*

IEC TS 61851-3-2:–[2], *Electric vehicle conductive charging system – Part 3-2: DC EV supply equipment where protection relies on double or reinforced insulation – Particular requirements for portable and mobile equipment*

IEC TS 61851-3-4:–[3], *Electric vehicle conductive charging system – Part 3-4: DC EV supply equipment where protection relies on double or reinforced insulation – General definitions and requirements for CANopen communication*

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1 Under preparation. Stage at the time of publication: IEC DTS 61851-3-1:2022.

2 Under preparation. Stage at the time of publication: IEC DTS 61851-3-2:2022.

3 Under preparation. Stage at the time of publication: IEC TS 61851-3-4:2022.

IEC 61851-21-1, *Electric vehicle conductive charging system – Part 21-1 Electric vehicle on-board charger EMC requirements for conductive connection to AC/DC supply*

ISO 17409, *Electrically propelled road vehicles – Connection to an external electric power supply – Safety requirements*

3 Terms and definitions

Clause 3 of IEC 62196-1:2014 applies except as follows:

Addition:

3.401
communication contact
auxiliary electric contact for use in a communication and its power supply, if any

4 General

Clause 4 of IEC 62196-1:2014 applies except as follows:

4.1 General requirements

Replacement:

The accessories covered by this document shall only be used with electric vehicles that provide a vehicle power supply circuit with double or reinforced insulation or battery systems that comply with the requirements of IEC 61851-3 (all parts).

Accessories shall be so designed and constructed that in normal use their performance is reliable and minimises the risk of danger to the user or surroundings.

Compliance is checked by meeting all of the relevant requirements and tests specified.

Accessories shall be so designed and constructed that it is not possible to make a cord extension set. The plug and the vehicle connector shall not be compatible.

Compliance is checked by a manual test.

5 Ratings

Clause 5 of IEC 62196-1:2014 is not applicable.

Replacement:

For voltage and corresponding rated currents, see Table 401.

Voltage classes shall be according to ISO 17409.

Table 401 – Overview of the rated voltages and currents

Rated volt V	Rated current A	DC	ISO voltage-class	Sheet
60	5	X	A	4-I
60	60	X	A	4-IIa/4-IIc
120	60	X	B	4-IIa/4-IIb
60/120	60	X	A/B	4-IIa (only socket-outlet)
60	60	X	A	4-III
120	60	X	B	4-IV
NOTE 1 Communication contacts (if any) are rated for 15 V and 2 A DC. NOTE 2 Nominal system output voltages, see IEC TS 61851-3-1.				

An accessory rated above 60 V DC and above 5 A shall be classified as not suitable for making and breaking an electrical circuit under load.

NOTE In Canada, "not suitable for making and breaking an electric circuit under load" is considered "disconnect use only".

6 Connection between the power supply and the electric vehicle

Clause 6 of IEC 62196-1:2014 is not applicable.

Replacement:

6.401 General

Clause 6 provides a description of the different types of accessories.

Table 402 gives an overview of the types of accessories.

Table 402 – Overview of the DC vehicle coupler

Pos no.	4-I	4-IIa [c] 4-IIc [d]	4-IIa [c] 4-IIb [d]	4-IIa [e]	4-III	4-IV	Functions
	60 V	60 V	120 V	60/120 V	60 V	120 V	
1	5 A	60 A	--	60 A	60 A	--	DC +60 V
2	--	--	60 A	60 A	--	60 A	DC −120 V
3	5 A	60 A	60 A	60 A	60 A	60 A	DC 0 V
4	2 A[a]	NA[b]	NA[b]	NA[b]	2 A[a]	2 A[a]	CAN Hi
5	2 A[a]	NA[b]	NA[b]	NA[b]	2 A[a]	2 A[a]	CAN Lo
6	2 A[a]	NA[b]	NA[b]	NA[b]	2 A[a]	2 A[a]	AUX +12 V
7	2 A[a]	NA[b]	NA[b]	NA[b]	2 A[a]	2 A[a]	AUX 0 V

[a] For contacts 4 to 7, 15 V DC.

[b] Communication contacts provided by near field communication (NFC).

[c] Socket-outlets/vehicle inlets.

[d] Plug/vehicle connectors.

[e] Only used for socket-outlets.

6.402 Types of vehicle inlets

There are different types of vehicle inlets:

– 5 A and 60 V DC;
– 60 A and 60 V DC;
– 60 A and 120 V DC.

6.403 Types of vehicle connectors

There are different types of vehicle connectors:

– 5 A and 60 V DC;
– 60 A and 60 V DC;
– 60 A and 120 V DC.

6.404 Types of socket-outlets

There are different types of socket-outlets:

– 5 A and 60 V DC;
– 60 A and 60 V DC;
– 60 A and 120 V DC.

6.405 Types of plugs

There are different types of plugs:

– 5 A and 60 V DC;
– 60 A and 60 V DC;
– 60 A and 120 V DC.

6.406 Contact sequencing

The contact sequence during the connection process shall be:

– power contacts: “DC 0 V”, “DC +60 V”, “DC −120 V” (if provided);
– communication contacts (if provided);
– proximity detection (if provided).

During disconnection, the order shall be reversed.

7 Classification of accessories

Clause 7 of IEC 62196-1:2014 applies except as follows:

7.5 *Not applicable*.

8 Marking

Clause 8 of IEC 62196-1:2014 applies except as follows:

8.5 *Replacement:*

For rewireable accessories, the contacts shall be indicated by the following symbols:

– DC +60 V or +, DC −120 V or −, DC 0 V or 0 V for DC, if any;
– CAN Hi or 4;
– CAN Lo or 5;
– AUX +12 V or 6;
– AUX 0 V or 7.

These symbols shall be placed close to the relevant terminals; they shall not be placed on screws, removable washers or other removable parts.

If numbers are used, a pin description shall be stated in the documentation.

Compliance is checked by inspection.

9 Dimensions

Clause 9 of IEC 62196-1:2014 applies.

10 Protection against electric shock

Clause 10 of IEC 62196-1:2014 applies except as follows:

10.1 *Replacement:*

Accessories shall be so designed that hazardous live parts of accessories, when they are wired as in normal use, are not accessible.

In addition, it shall not be possible to make contact between a live part of a plug or vehicle connector and a live part of a socket-outlet or vehicle inlet while any live part is accessible.

NOTE DC 0 V contacts of vehicle connectors and plugs are deemed to be live parts; communication contacts are not considered to be live parts.

This does not apply to contacts and conductors used for signal, data, communications and control circuits.

Compliance is checked by inspection and, if necessary, by a test on the sample wired as in normal use.

The standard test finger shown in Figure 3 of IEC 62196-1:2014 is applied in every possible position, an electrical indicator, with a voltage not less than 40 V, being used to show contact with the relevant part.

10.3 *Replacement:*

Accessories shall be so designed that:

a) when inserting the plug or the vehicle connector,
   1) communication connection, if any, is made after the DC +60 V, DC −120 V, DC 0 V connections, if any, are made;
   2) the proximity contact or the connection switch contact, if any, is made after or at the same time as the communication connections if any are made.
b) when withdrawing the plug or the vehicle connector,
   1) communication connection if any, is broken before the DC +60 V, DC −120 V, DC 0 V connections, if any, are broken;
   2) the proximity contact or connection switch contact, if any, is broken before or at the same time as the communication connections are broken.

Compliance is checked by inspection and manual test, if required.

10.4 *Replacement:*

It shall not be possible to inadvertently assemble:

- either the part that carries the contacts of a socket-outlet or of a vehicle inlet into the enclosure of a plug or of a vehicle connector,
- or the part that carries the contacts of a plug or of a vehicle connector into the enclosure of a socket-outlet or of a vehicle inlet.

Compliance is checked by inspection and manual test, if required.

11 Size and colour of protective earthing conductors

Clause 11 of IEC 62196-1:2014 is not applicable.

12 Provisions for protective earthing

Clause 12 of IEC 62196-1:2014 is not applicable.

13 Terminals

Clause 13 of IEC 62196-1:2014 applies except as follows:

13.1.2 *Addition:*

Add the following lines to Table 7:

5	1	16	N.A.	1	16	N.A.
60	6 to 16	10 to 6	N.A.	6 to 25	10 to 4	N.A.

14 Interlocks

Clause 14 of IEC 62196-1:2014 applies.

15 Resistance to ageing of rubber and thermoplastic material

Clause 15 of IEC 62196-1:2014 applies.

16 General construction

Clause 16 of IEC 62196-1:2014 applies except as follows:

16.8 *Replacement:*

With the retaining means in place, the mating accessory shall be pulled with a force equal to the weight of the accessory and a cable of 1,5 m in length with the maximum size conductors as specified in Table 7 of IEC 62196-1:2014. The retaining means shall not release.

17 Construction of socket-outlets

Clause 17 of IEC 62196-1:2014 applies except as follows:

17.2 Contact tubes

17.2.1 *Addition:*

Add the following line to Table 12:

4	3,85	2,5

17.2.2 *Addition:*

Add the following line to Table 13:

4	4,00

Add the following lines to Table 14:

up to and including 5	100
from 6 up to and including 60	275

18 Construction of plugs and of vehicle connectors

Clause 18 of IEC 62196-1:2014 applies.

19 Construction of vehicle inlets

Clause 19 of IEC 62196-1:2014 applies except as follows:

19.2 *Not applicable.*

20 Degrees of protection

Clause 20 of IEC 62196-1:2014 applies except as follows:

20.1 *Replacement of the first paragraph:*

Accessories shall have the minimum degrees of protection as required in IEC TS 61851-3-1.

21 Insulation resistance and dielectric strength

Clause 21 of IEC 62196-1:2014 applies except as follows:

21.1 *Replacement*:

Replace the NOTE with the following NOTE:

NOTE For the purpose of these tests, the communications contacts, if any, are connected together and deemed as one pole.

21.3 *Replacement of the second and third paragraphs:*

For the parts indicated in 21.2 a) (first dashed item) and 21.2 b) (first dashed item) of IEC 62196-1:2014, which are used in non-power circuits for energy management system (EMS) communication according to IEC TS 61851-3-4, each circuit may be tested separately, using a test voltage based on the highest voltage in the circuit.

For the parts indicated in 21.2 a) (second dashed item) and 21.2 b) (second dashed item) of IEC 62196-1:2014, which are used in non-power circuits for energy management system (EMS) communication according to IEC TS 61851-3-4, the test voltage between these circuits and the power circuits shall be based on the voltage of the power circuit.

22 Breaking capacity

Clause 22 of IEC 62196-1:2014 applies except as follows:

22.2 *Addition:*

Add the following lines to Table 16:

5 (DC)	8	1,1 × maximum rated	–	50
60 (DC)	96	1,1 × maximum rated	–	50

23 Normal operation

Clause 23 of IEC 62196-1:2014 applies except as follows:

23.3 *Addition:*

Add the following lines to Table 17:

5 (DC)	–	5 000 [a]	5 000
60 (DC)	–	–	10 000

24 Temperature rise

Clause 24 of IEC 62196-1:2014 applies except as follows:

24.1 *Addition:*

Add the following lines to Table 18:

5	6,5	1	–	1	–
60	75	16	25	6	4

25 Flexible cables and their connection

Clause 25 of IEC 62196-1:2014 applies except as follows:

25.3 *Addition:*

Add the following lines to Table 19:

5	160	0,6	2
60	240	1,2	2

26 Mechanical strength

Clause 26 of IEC 62196-1:2014 applies.

27 Screws, current-carrying parts and connections

Clause 27 of IEC 62196-1:2014 applies.

28 Creepage distances, clearances and distances

Clause 28 of IEC 62196-1:2014 applies.

29 Resistance to heat, to fire and to tracking

Clause 29 of IEC 62196-1:2014 applies.

30 Corrosion and resistance to rusting

Clause 30 of IEC 62196-1:2014 applies.

31 Conditional short-circuit current withstand test

Clause 31 of IEC 62196-1:2014 applies.

32 Electromagnetic compatibility

Clause 32 of IEC 62196-1:2014 applies except as follows:

32.1 *Addition:*

If the interface of the accessories contains electronics, it shall be tested in accordance with IEC 61851-21-1.

32.2 *Addition:*

If the interface of the accessories contains electronics, it shall be tested in accordance with IEC 61851-21-1.

33 Vehicle driveover

Clause 33 of IEC 62196-1:2014 applies.

STANDARD SHEETS

STANDARD SHEETS 4-I

VEHICLE COUPLER 5 A 60 V DC

Overview

The standard sheets 4-I apply to vehicle couplers for maximum voltages 60 V DC and operating currents up to 5 A according to Table 2 of IEC TS 61851-3-1:–.

Vehicle couplers according to standard sheet 4-I shall be used for EV supply system configuration type "B" and type "D" according to IEC TS 61851-3-1 only. For these vehicle couplers, the circuit diagrams according to Clauses AA.2 and AA.4 of IEC TS 61851-3-2:–, using communication contacts, apply. Only energy management system (EMS) communication according to IEC TS 61851-3-4 shall be used.

These accessories shall be classified as making or breaking under load.

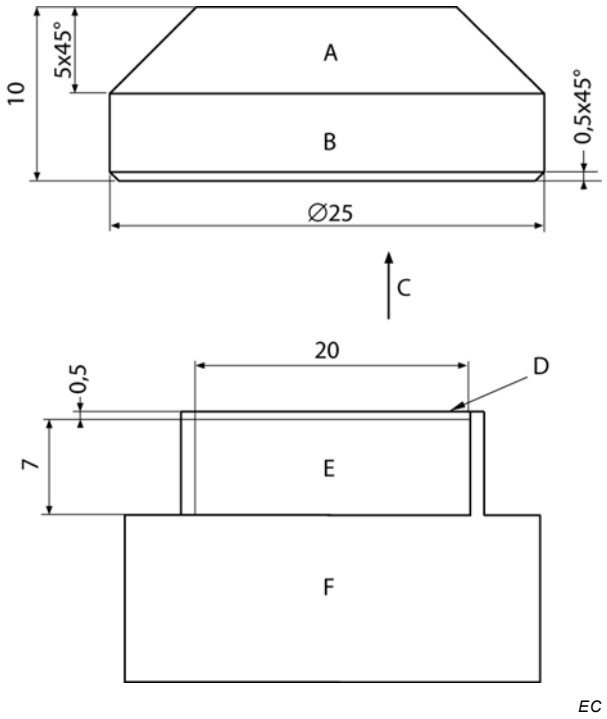
A cap may be used to protect the contacts of the vehicle inlet. The construction of the cap is given by the drawing of the vehicle connector.

The magnetic force of each magnet shall be tested by the apparatus according to Figure 8 of IEC 62196-1:2014.

The probe shall be fixed on the non-magnetic test weight, for example brass; the counterpart is steel S235JR.

The magnets of the vehicle inlet and the vehicle connector shall withstand a minimum pulling force of 8 N.

The magnets of the vehicle inlet and the vehicle connector shall release at a maximum pulling force of 20 N. The magnet shall hold a force no greater than 20 N



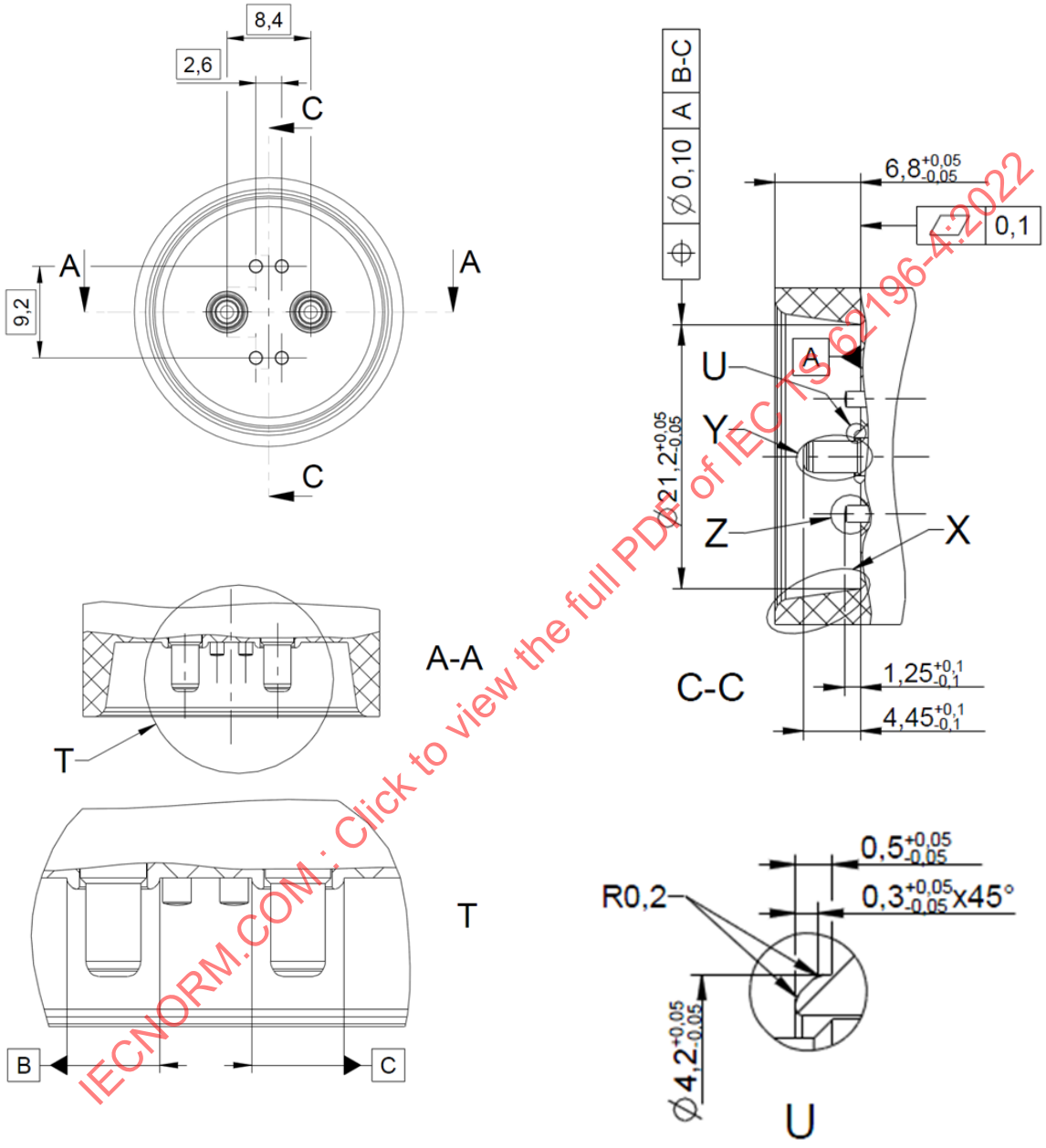
Key

A	Reference standard
B	Material: S235JR
C	Direction of testing
D	Material: POM
E	Magnet
F	Test equipment

STANDARD SHEET 4-Ia

Sheet 1

VEHICLE INLET 5 A 60 V DC



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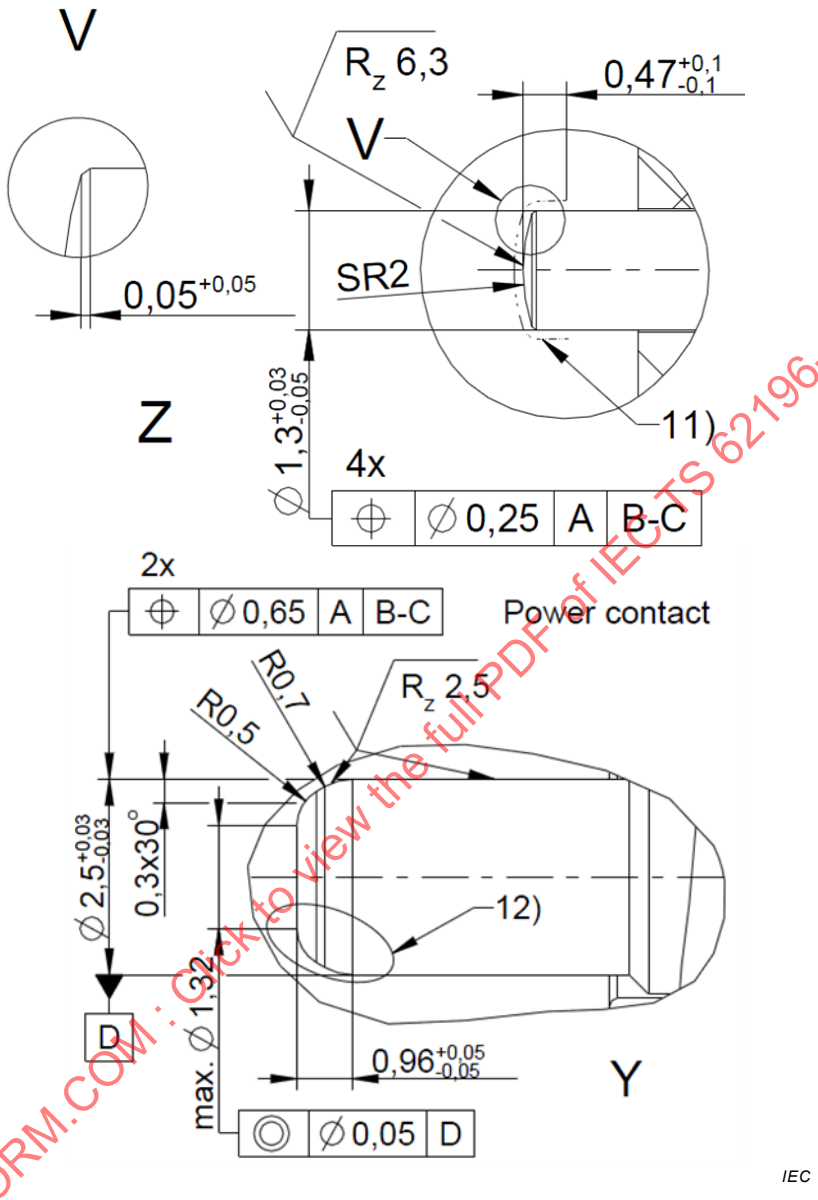
Drawings show the direction of mounting of the vehicle inlet.

Dimensions in millimetres

GENERAL TOLERANCE			
10 MAX	50 MAX	100 MAX	ANGLE
±0,15	±0,2	±0,3	±30'

STANDARD SHEET 4-Ia

Sheet 2 (continuation of Sheet 1)



Key

11) Au-plating

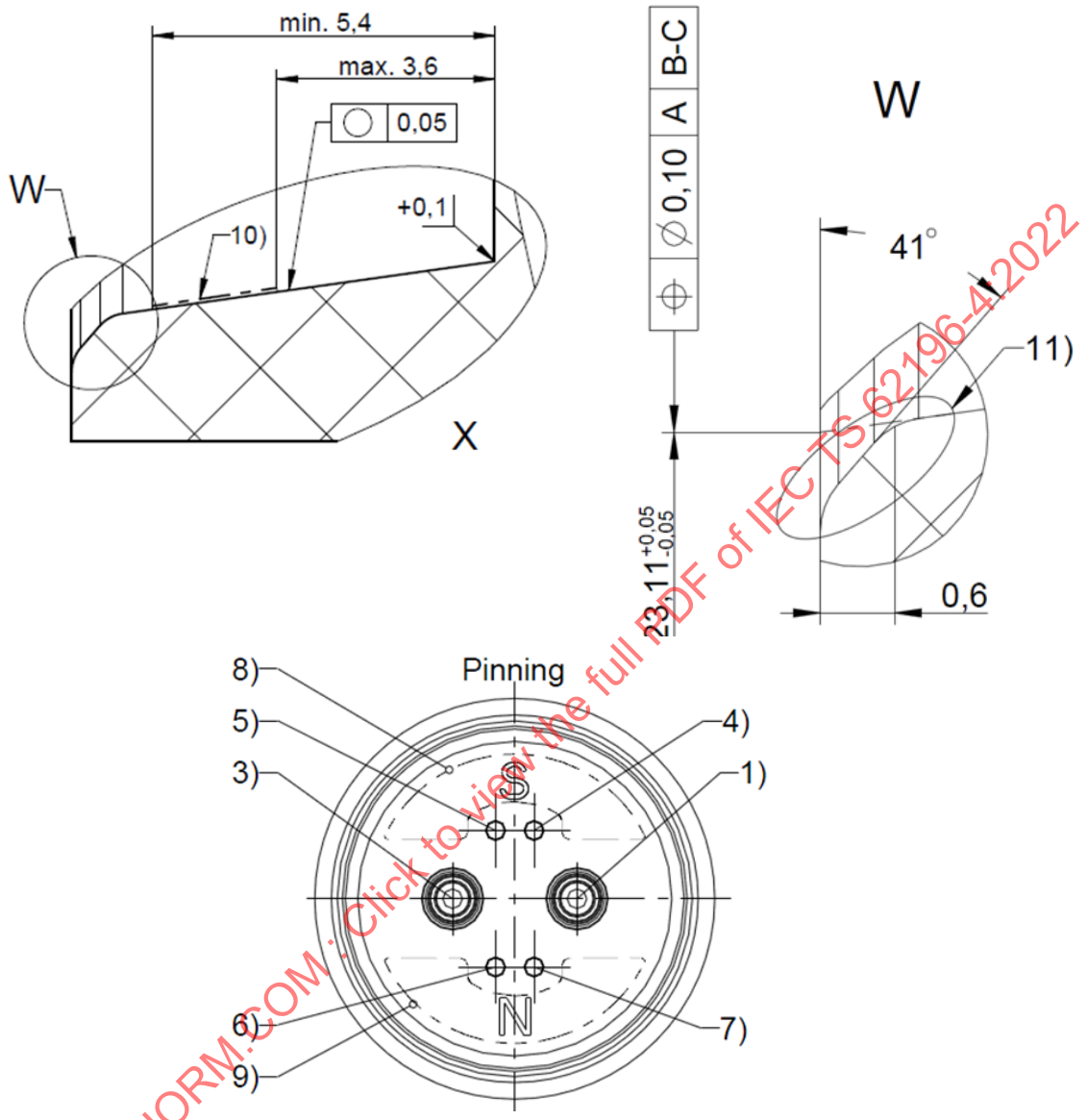
12) No burr and sharp edges permitted

Dimensions in millimetres

GENERAL TOLERANCE			
10 MAX	50 MAX	100 MAX	ANGLE
±0,15	±0,2	±0,3	±30'

STANDARD SHEET 4-Ia

Sheet 3 (continuation of Sheet 2)



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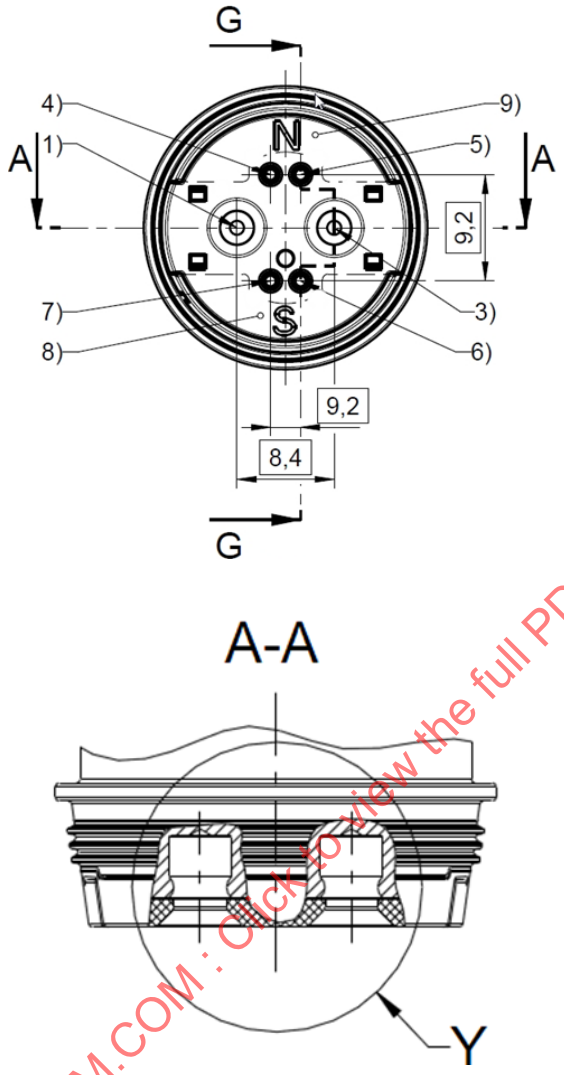
Key

1) DC +60 V
3) DC 0 V
4) CAN Hi
5) CAN Lo
6) AUX +12 V
7) AUX 0 V
8) South pole of magnet, pull force: min. 8 N / max. 20 N
9) North pole of magnet, pull force: min. 8 N / max. 20 N
10) Sealing surface free of flaws

STANDARD SHEET 4-Ib

Sheet 1

VEHICLE CONNECTOR 5 A 60 V DC



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Key

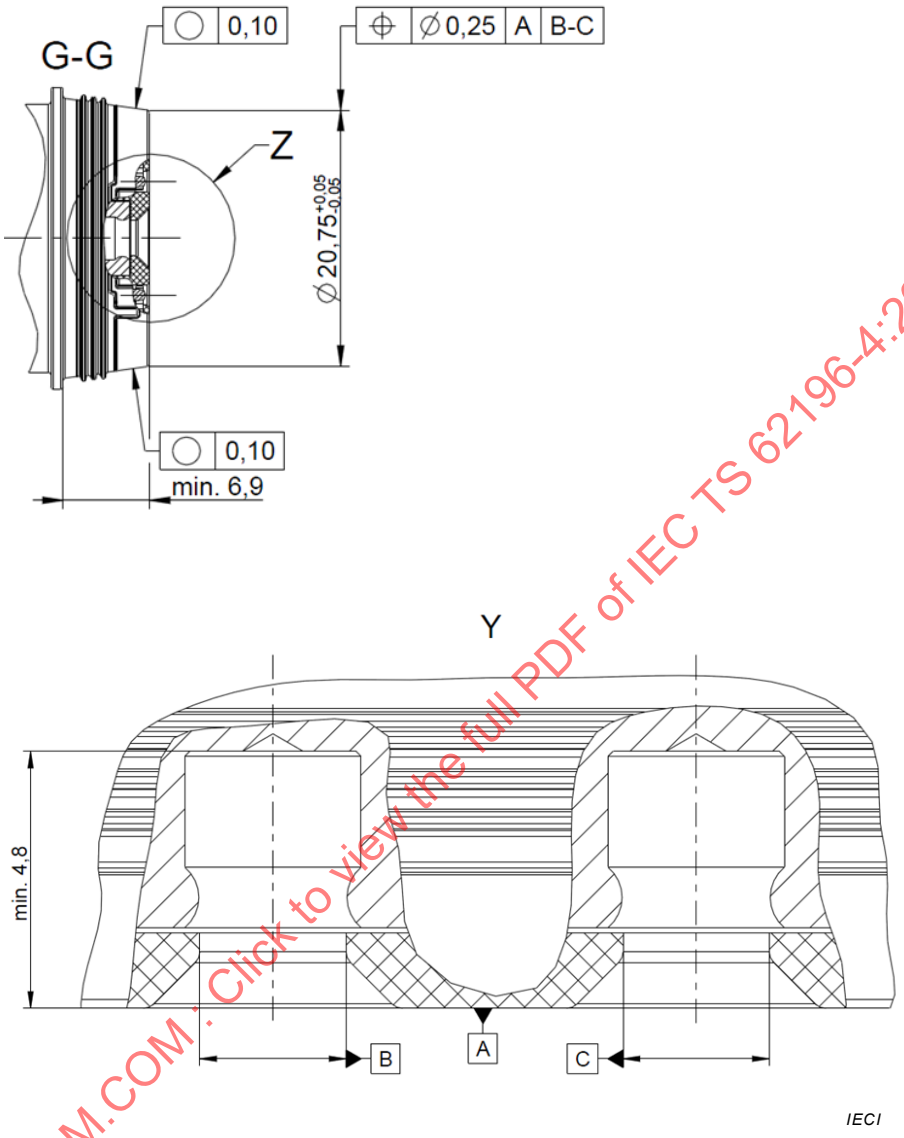
1) DC +60 V
3) DC 0 V
4) CAN Hi
5) CAN Lo
6) AUX +12 V
7) AUX 0 V
8) South pole of magnet, pull force: min. 8 N / max. 20 N
9) North pole of magnet, pull force: min. 8 N / max. 20 N

Dimensions in millimetres

GENERAL TOLERANCE			
10 MAX	50 MAX	100 MAX	ANGLE
±0,15	±0,2	±0,3	±30'

STANDARD SHEET 4-Ib

Sheet 2 (continuation of Sheet 1)

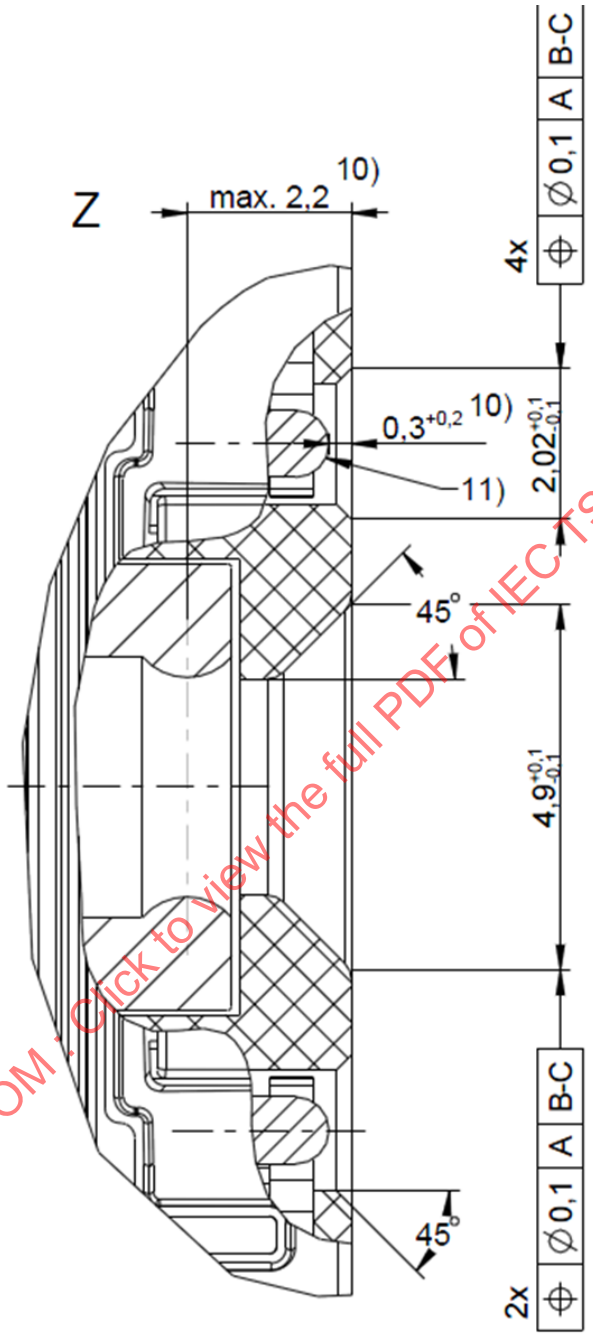


Dimensions in millimetres

GENERAL TOLERANCE			
10 MAX	50 MAX	100 MAX	ANGLE
±0,15	±0,2	±0,3	±30'

STANDARD SHEET 4-Ib

Sheet 3 (continuation of Sheet 2)



IEC

Key

10) Contact point

11) Minimum stroke 1,2mm

Dimensions in millimetres

GENERAL TOLERANCE			
10 MAX	50 MAX	100 MAX	ANGLE
±0,15	±0,2	±0,3	±30'

STANDARD SHEETS 4-II

ACCESSORIES 60 A 60/120 V DC

Overview

The standard sheets 4-II apply to accessories for maximum voltages 60/120 V DC and operating currents up to 60 A DC according to Table 401.

Accessories 4-II shall be used for EV supply system configuration type "B" to "F" according to IEC TS 61851-3-1. For these accessories, the circuit diagrams according to of IEC TS 61851-3-2:–, Clauses AA.1 and AA.3, using near field communication (NFC) apply. Accessories according to standard sheet 4-II are considered to be passive devices according to IEC TS 61851-3-4 and shall use energy management system (EMS) communication and identification according to IEC TS 61851-3-4 only.

Interlocking of the accessories shall be provided by use of the latching device.

The vehicle inlet according to standard sheets 4-IIa is used also in the same configuration as the socket-outlet.

Vehicle connectors according to standard sheets 4-IIb to 4-IIc are used also in the same configuration as the plug.

NFC shall be implemented according to Annex F of IEC TS 61851-3-4:–.

The standard sheets 4-IIa (Sheet 3) define the latching device.

Latching of the accessories is mandatory to prevent their unintentional separation and breaking under load. The latching shall insure that the power transfer is stopped before separation. According to 7.1 of IEC TS 61851-3-1:–, the latching device has to be closed before starting the power transfer and cannot be opened until 100 ms after power transfer has stopped.

Standard sheets 4-IIa (Sheet 4) show the position of the connection switch to provide proximity function according to 7.2.1 of IEC TS 61851-3-1:–. Other solutions are not excluded, as long as the following functionalities are ensured:

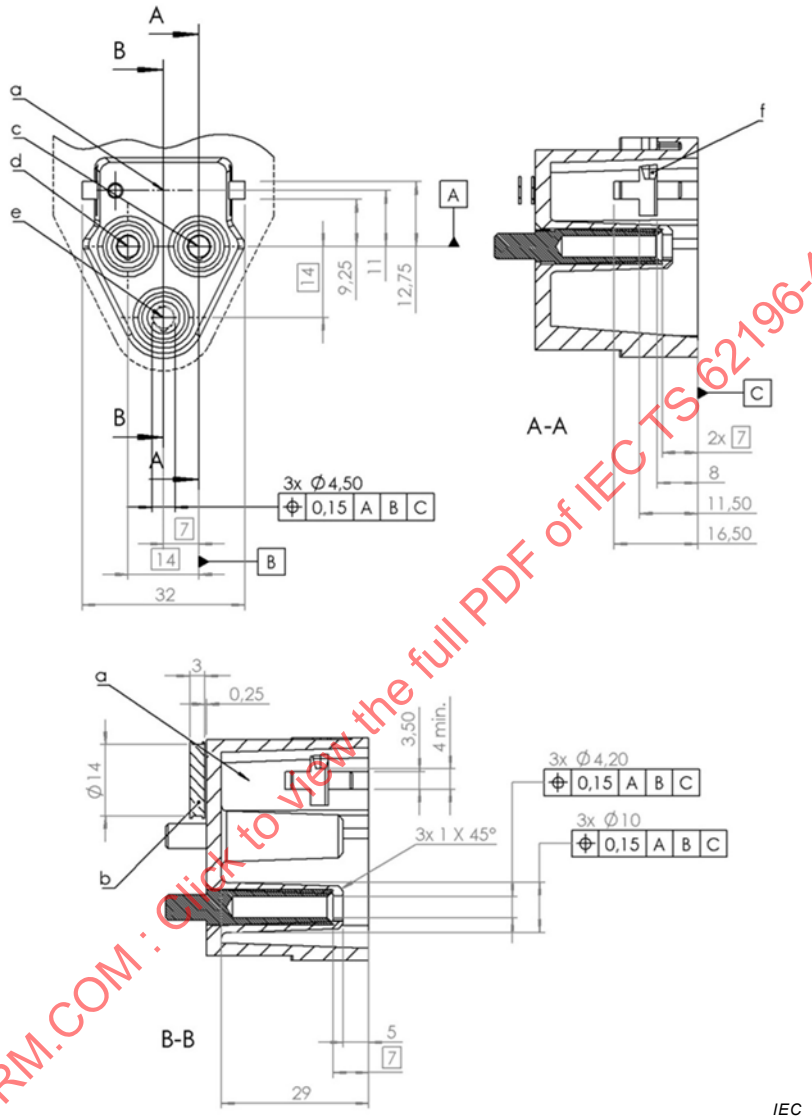
- proximity function; and
- contact sequence according to Clause 6.

If proximity contact or connection switch is not made, NFC shall not be active.

STANDARD SHEET 4-IIa

Sheet 1

VEHICLE INLET/ SOCKET-OUTLET 60 A 60/120 V DC



Dimensions in millimetres

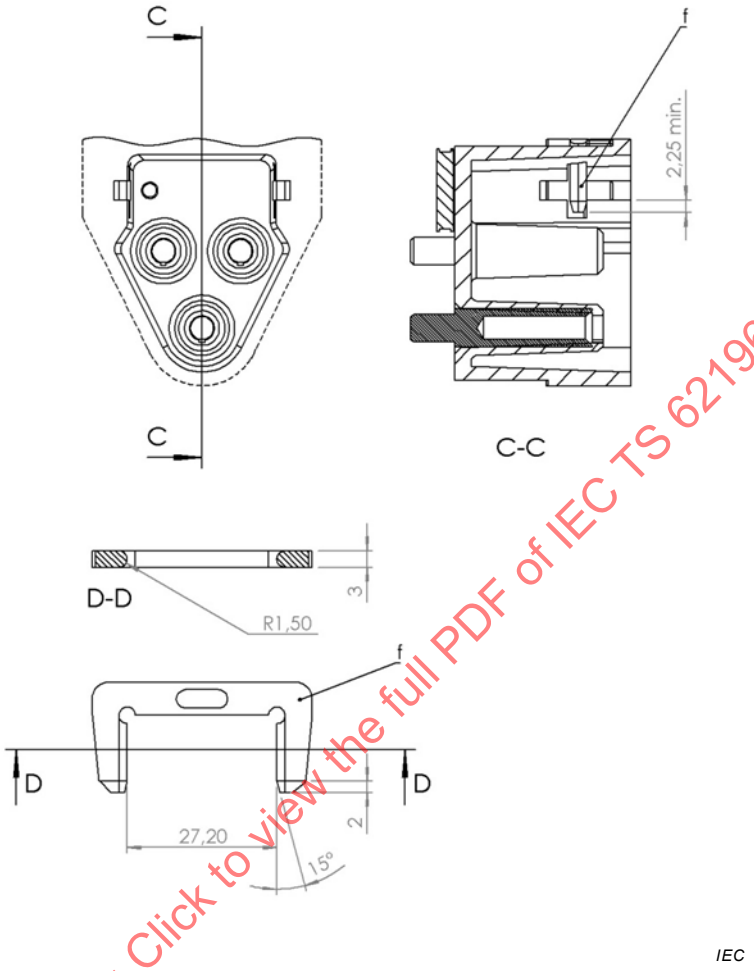
Key

a	Axis of NFC coil
b	NFC coil
c	DC +60 V
d	DC 0 V
e	DC -120 V
f	Latching device

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIa

Sheet 2 (continuation of Sheet 1)



IEC

Key

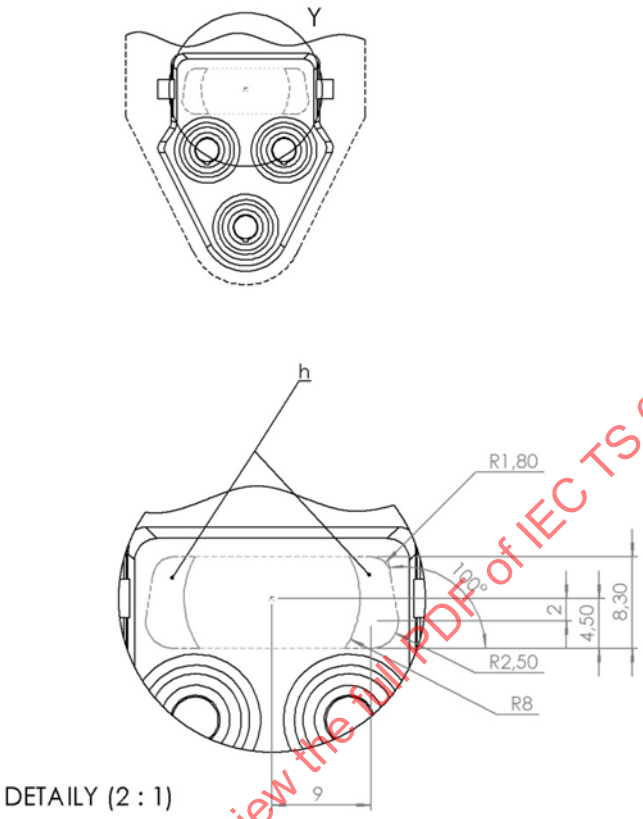
f Latching device

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIa

Sheet 3 (continuation of Sheet 2)



IEC

Key

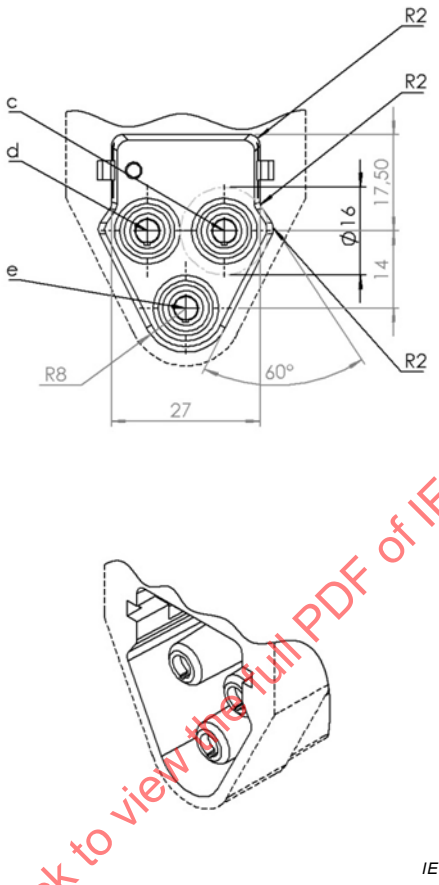
h Area for mechanical means for proximity function

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIa

Sheet 4 (continuation of Sheet 3)



IEC

Key

c DC +60 V *

d DC 0 V

e DC −120 V *

* One of the two is optional for the socket outlet and only one of the two shall be provided for the vehicle inlet

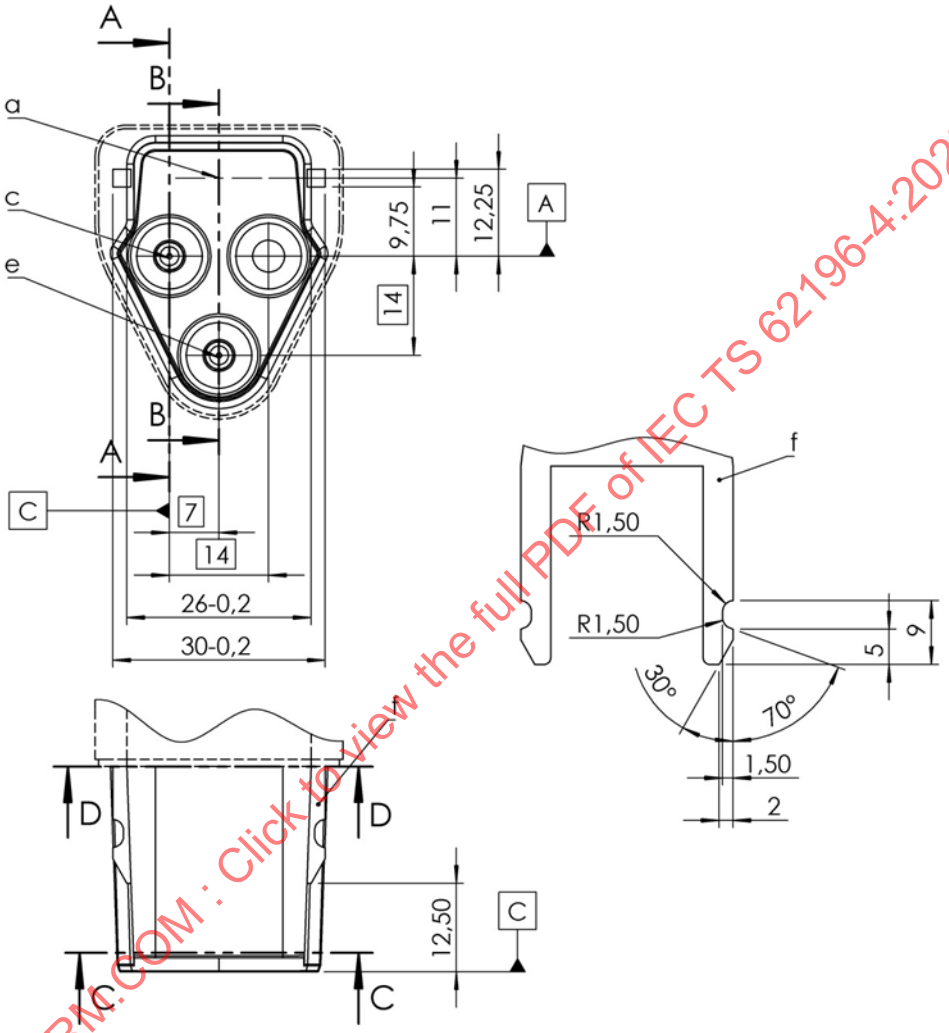
Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIb

Sheet 1

PLUG / VEHICLE CONNECTOR 60 A 120 V DC



IEC

Key

a Axis of NFC coil

c DC +60V

e DC -120V

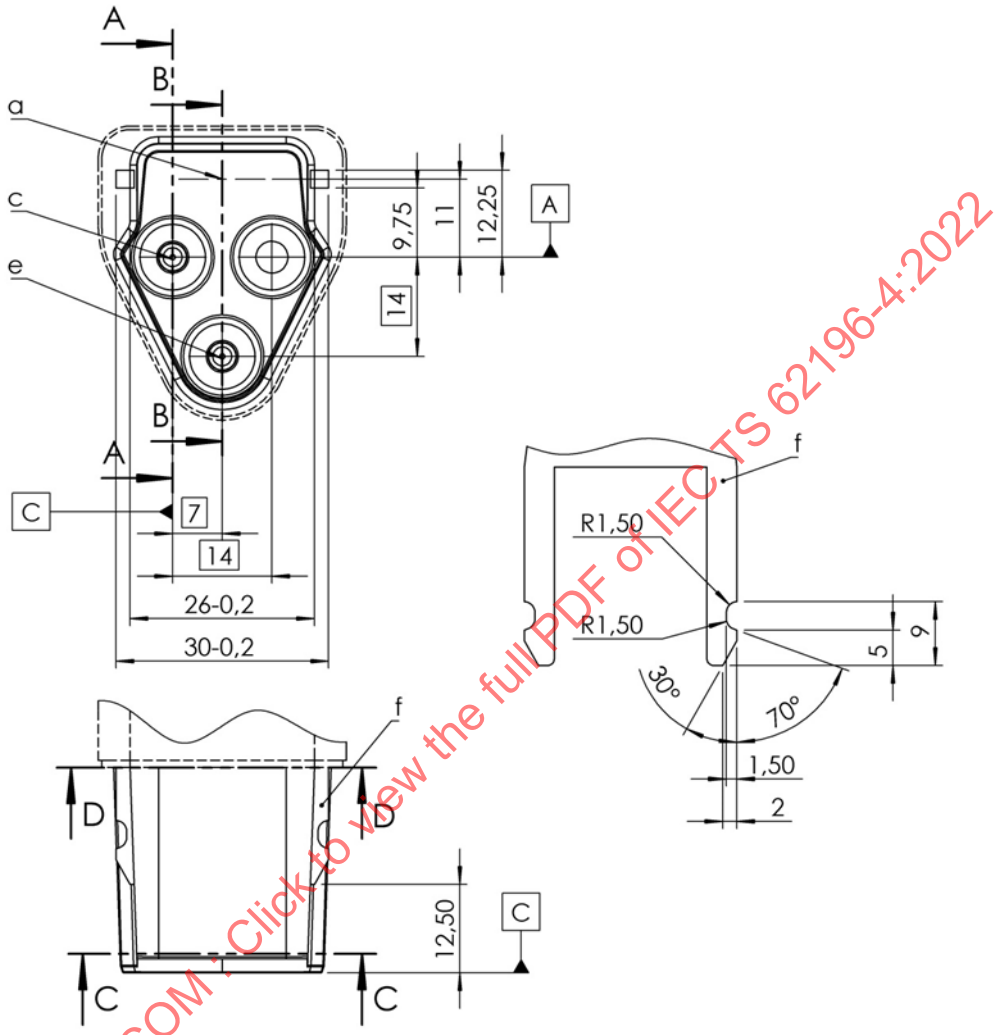
f Latching device

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIb

Sheet 2 (continuation of Sheet 1)



IEC

Key

a Axis of NFC coil

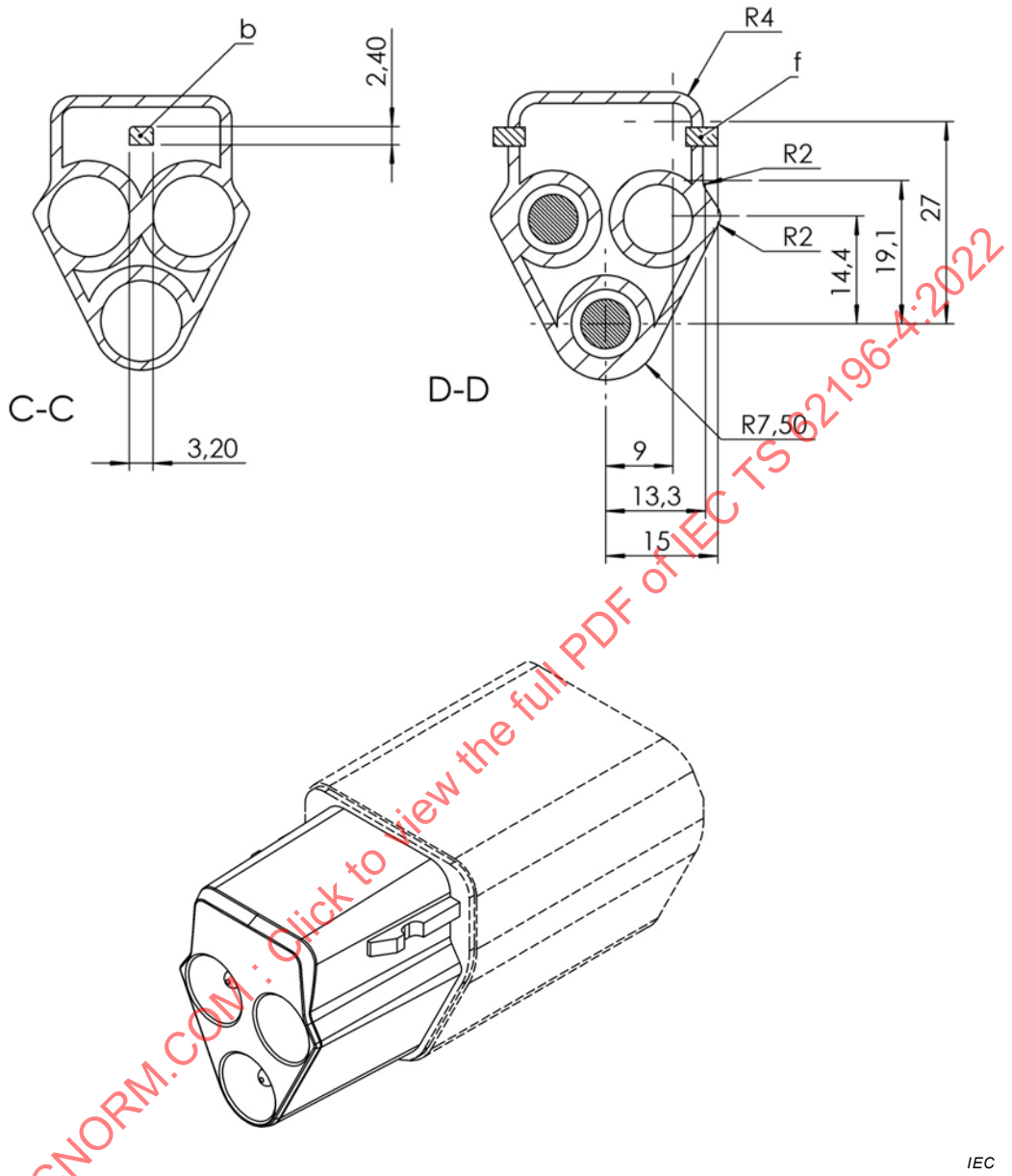
b NFC coil

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIb

Sheet 3 (continuation of Sheet 2)



Key

b NFC coil

f Latching device

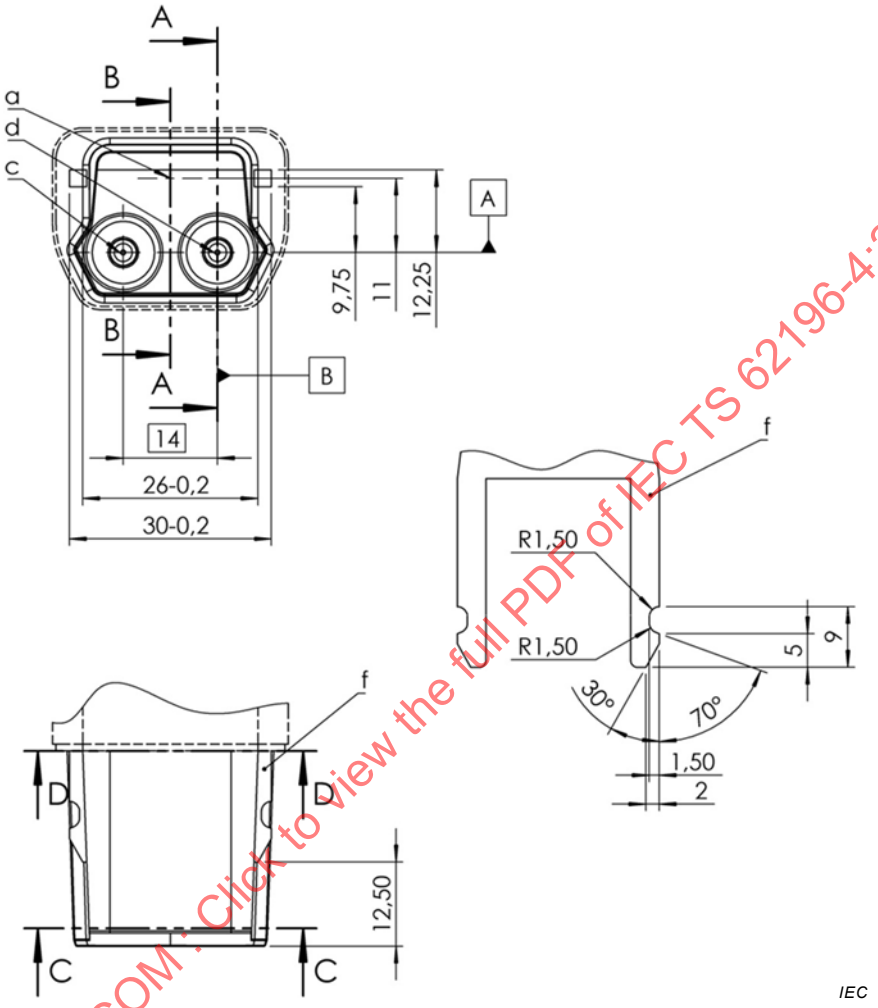
Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIc

Sheet 1

PLUG / VEHICLE CONNECTOR 60 A 60 V DC



Key

a Axis of NFC coil

c DC +60V

d DC 0V

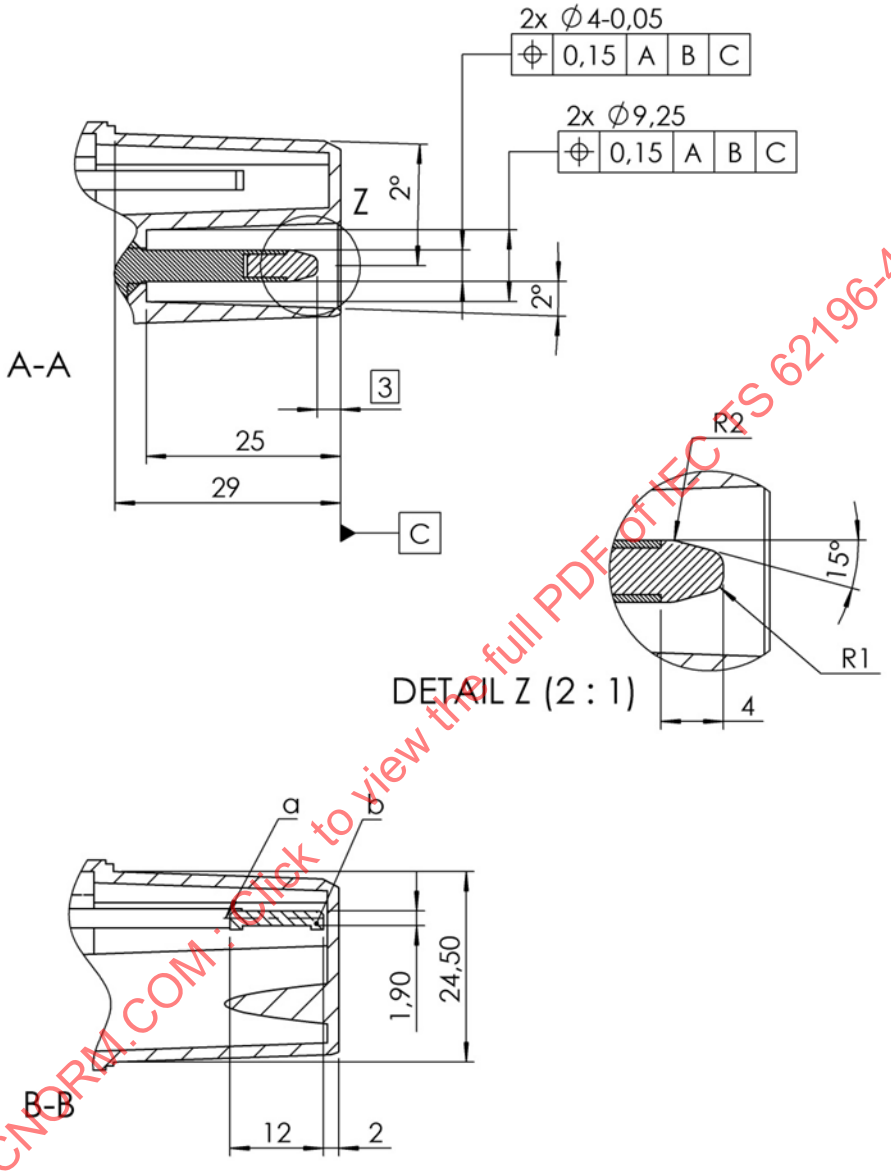
f Latching device

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIc

Sheet 2 (continuation of Sheet 1)



Key

a Axis of NFC coil

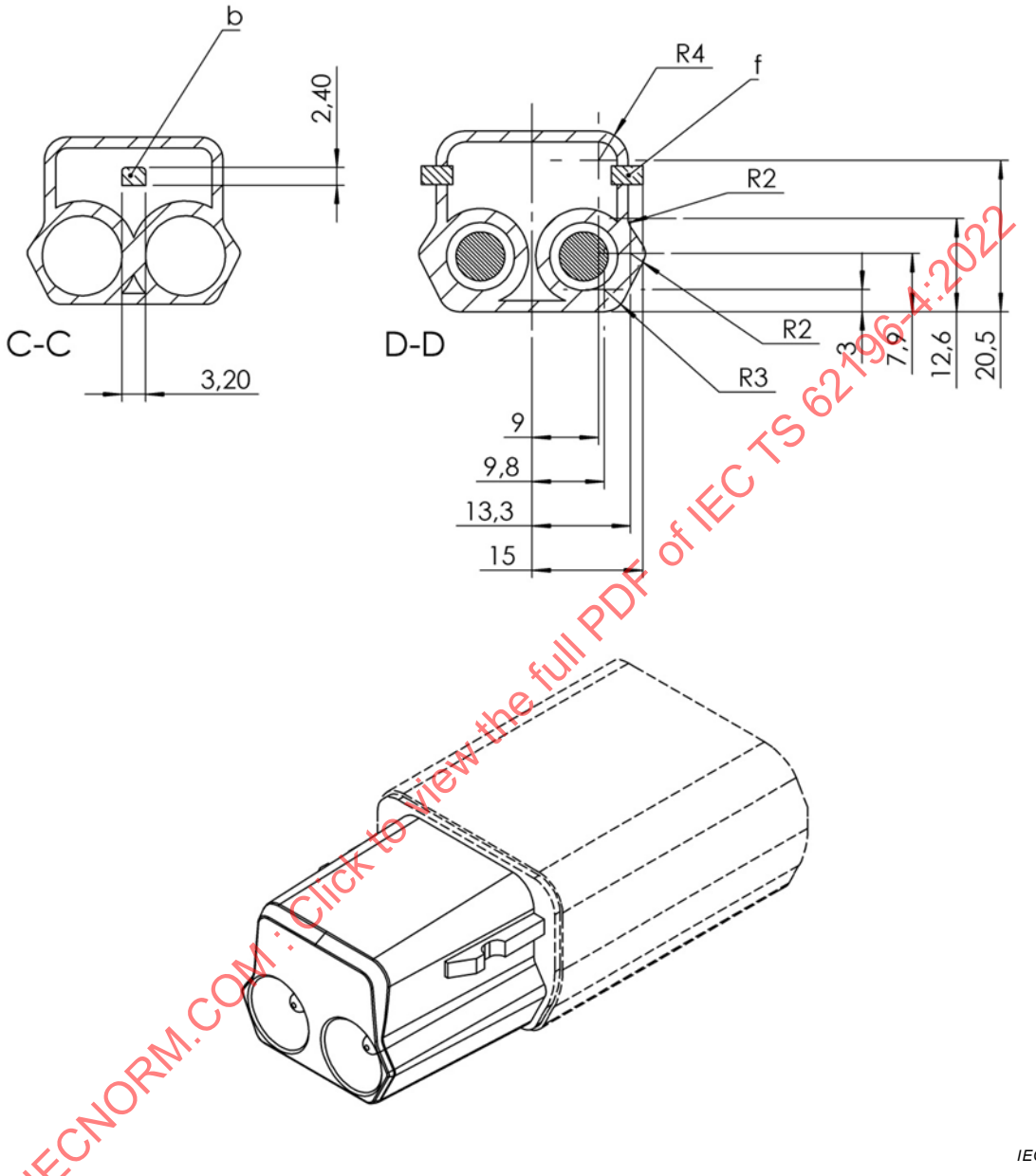
b NFC coil

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IIc

Sheet 3 (continuation of Sheet 2)



Key

b NFC coil

f Latching device

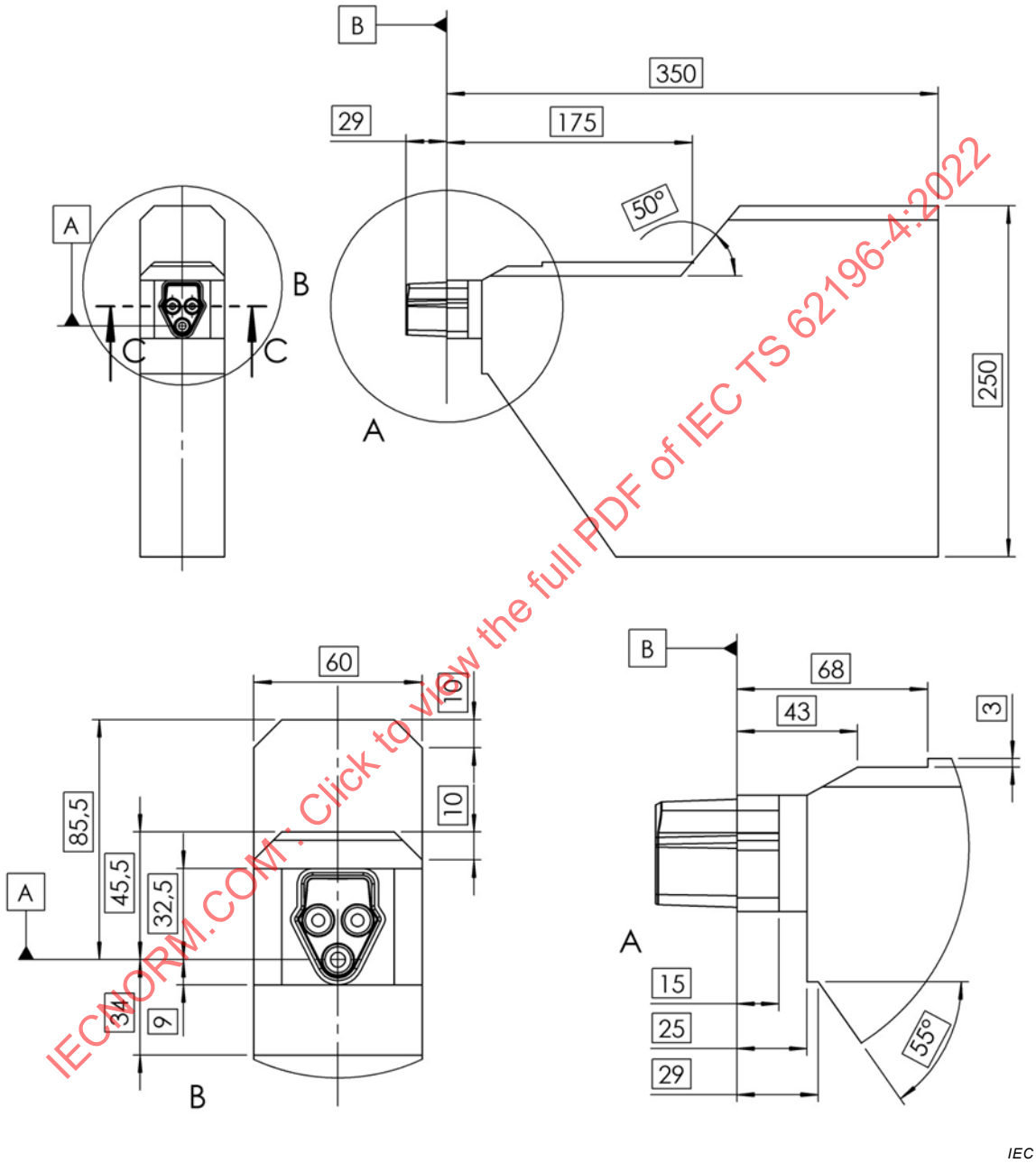
Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEET 4-IId

Sheet 1

PACKING ROOM FOR PLUG



IEC

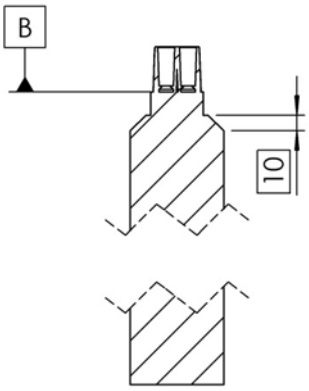
Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

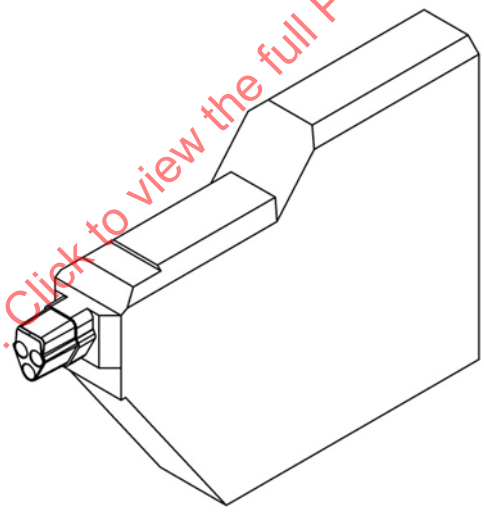
STANDARD SHEET 4-IId

Sheet 2 (continuation of Sheet 1)

PACKING ROOM FOR PLUG



C-C



IEC

Dimensions in millimetres

GENERAL TOLERANCE			
6 MAX	30 MAX	120 MAX	ANGLE
±0,05	±0,1	±0,15	±30'

STANDARD SHEETS 4-III

VEHICLE COUPLER 60 A 60 V DC

Overview

The standard sheets 4-III apply to: 60 A, 60 V DC vehicle couplers.

Couplers 4-III are considered to be used for EV supply system configuration type "B" and "C" according to IEC TS 61851-3-1. For these couplers the circuit diagrams according to IEC TS 61851-3-2:–, Clauses AA.2 and AA.4, using communication contacts apply.

Vehicle inlets according to sheets 4-IIIa can be used also in the same configuration as socket-outlets in cases A and B.

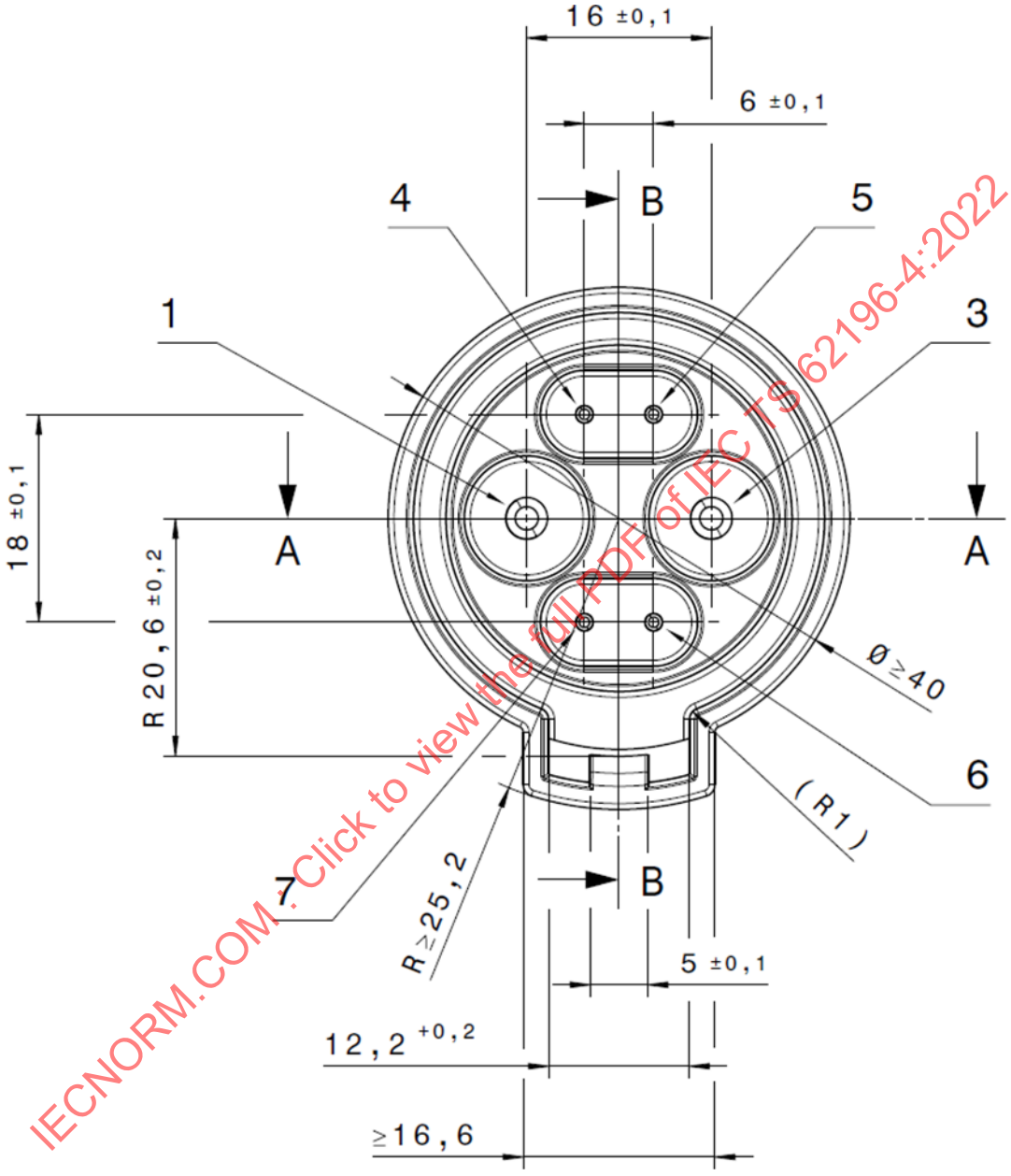
Vehicle connectors according to standard sheets 4-IIIb can be used also in the same configuration as plug in cases A and B.

Interlocking of the accessories shall be provided by use of the latching device.

STANDARD SHEET 4-IIIa

Sheet 1

VEHICLE INLET 60 A 60 V DC



Key

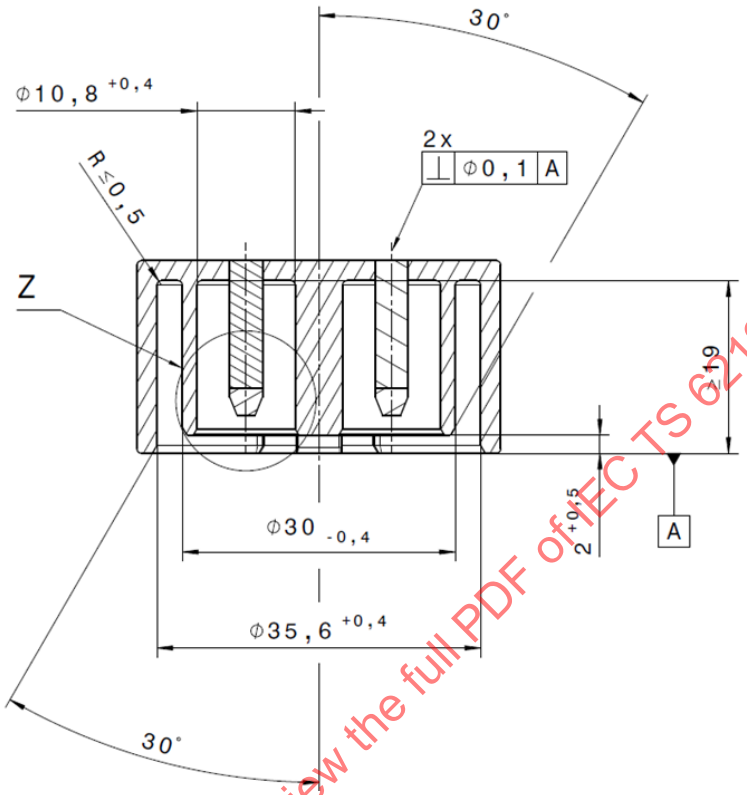
1	DC +60 V
3	DC 0 V
4	CAN Hi
5	CAN Lo
6	AUX +12 V
7	AUX 0 V

Dimensions in millimetres

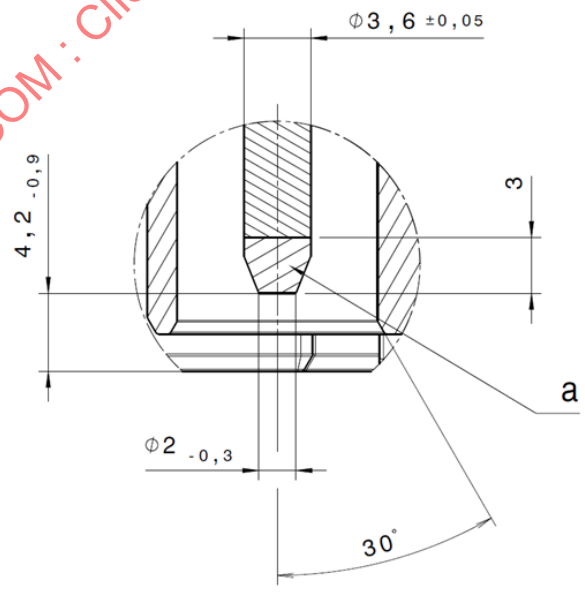
STANDARD SHEET 4-IIIa

Sheet 2 (continuation of Sheet 1)

Section A – A



Detail Z



IEC

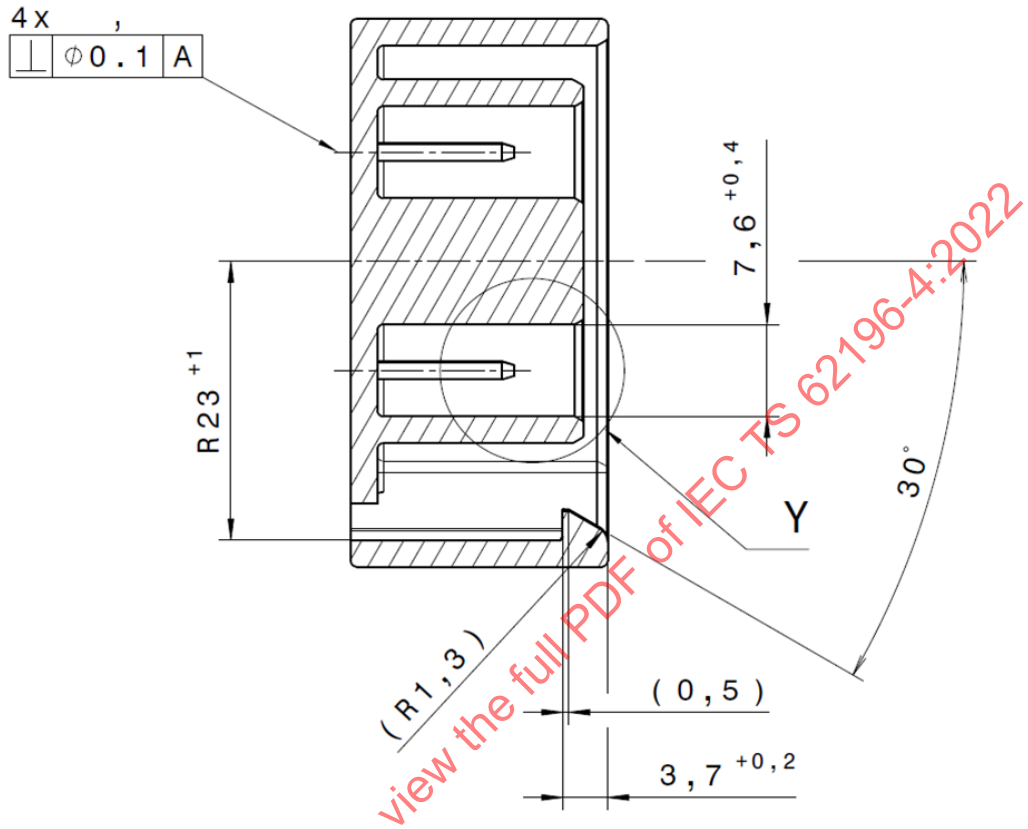
IEC

Dimensions in millimetres

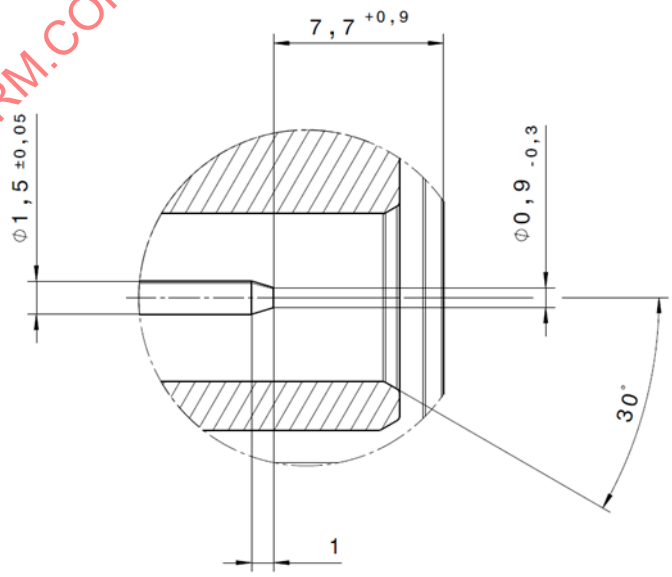
STANDARD SHEET 4-IIIa

Sheet 3 (continuation of Sheet 2)

Section B – B



Detail Y



IEC

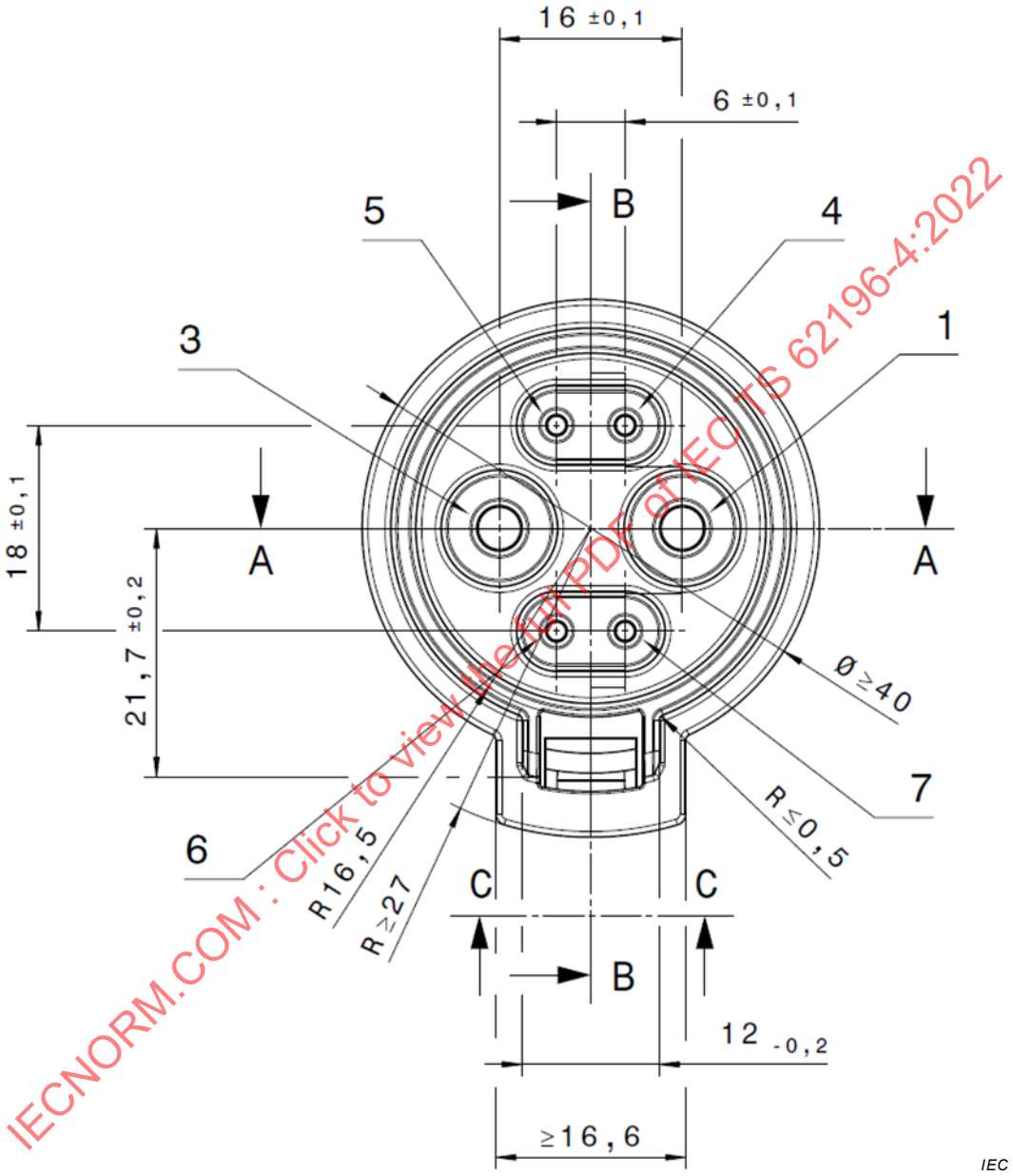
Dimensions in millimetres

Value in parenthesis is for reference

STANDARD SHEET 4-IIIb

Sheet 1

VEHICLE CONNECTOR 60 A 60 V DC



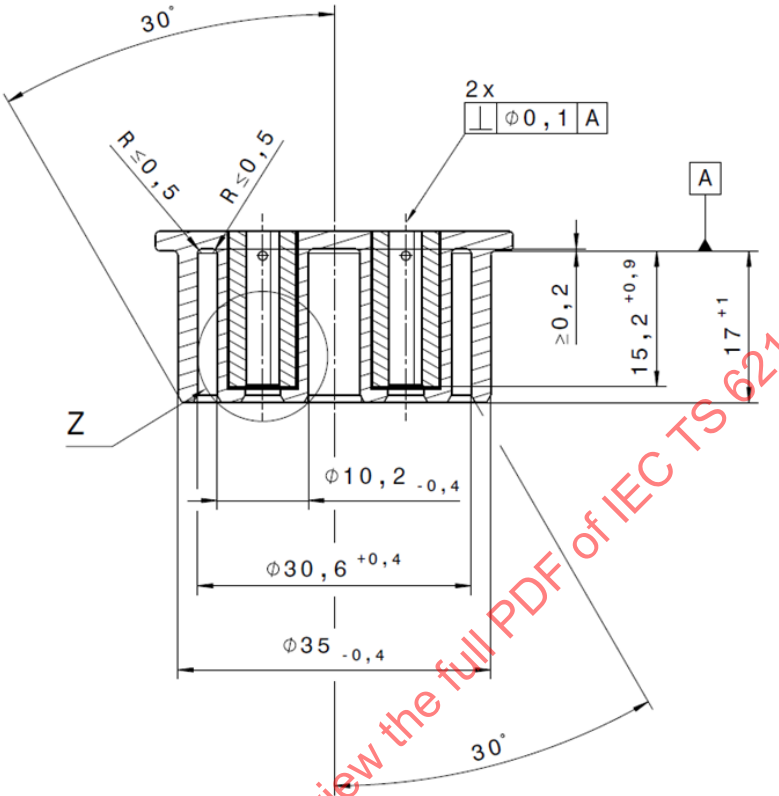
Key

1	DC +60 V	Dimensions in millimetres
3	DC 0 V	
4	CAN Hi	
5	CAN Lo	
6	AUX +12 V	
7	AUX 0 V	

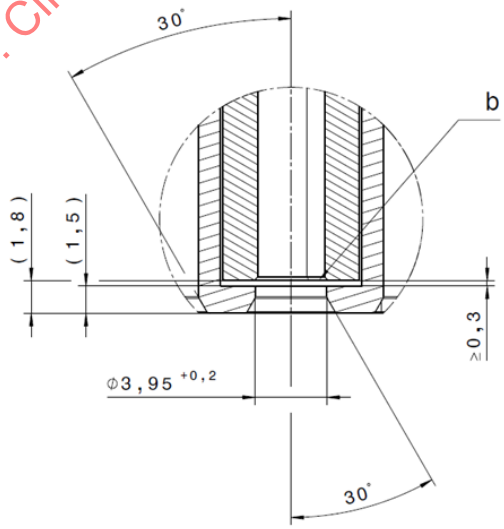
STANDARD SHEET 4-IIIb

Sheet 2 (continuation of Sheet 1)

Section A – A



Detail Z



IEC

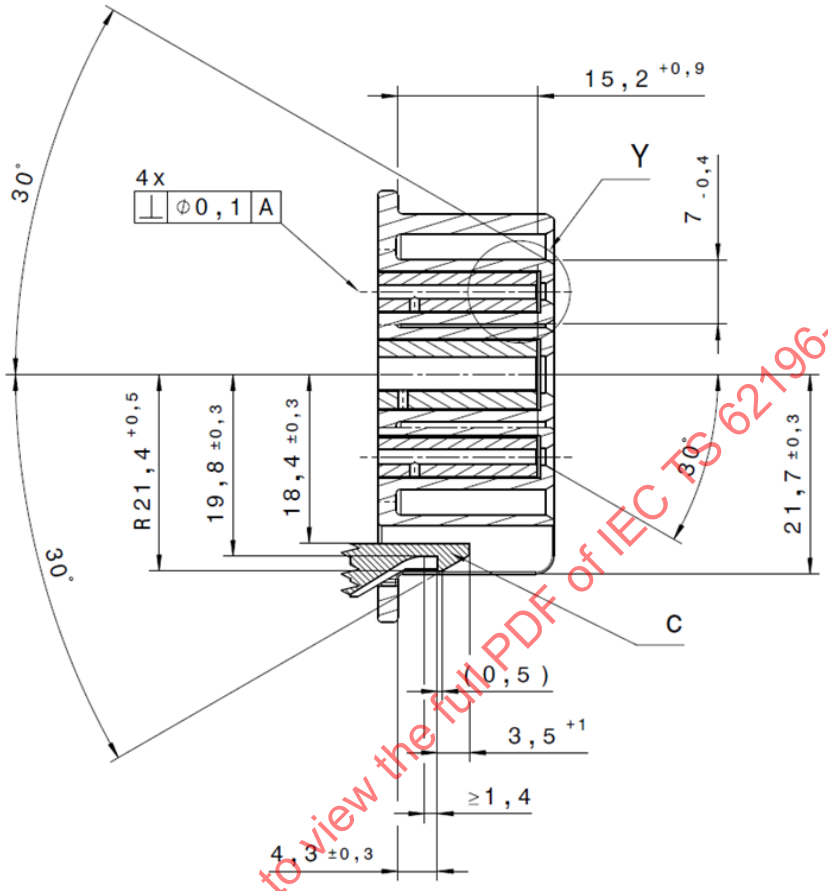
Dimensions in millimetres

Value in parenthesis is for reference

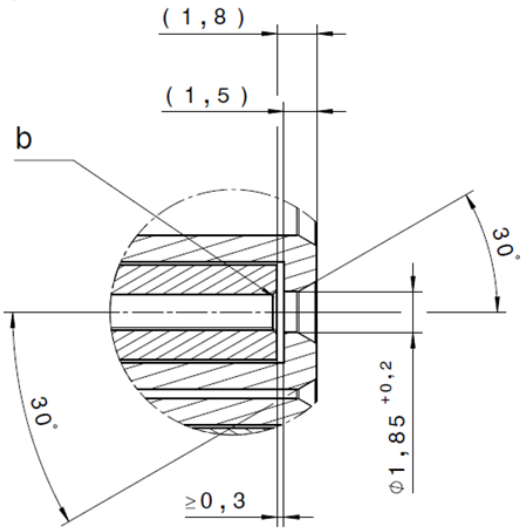
STANDARD SHEET 4-IIIb

Sheet 3 (continuation of Sheet 2)

Section B – B



Detail Y



IEC

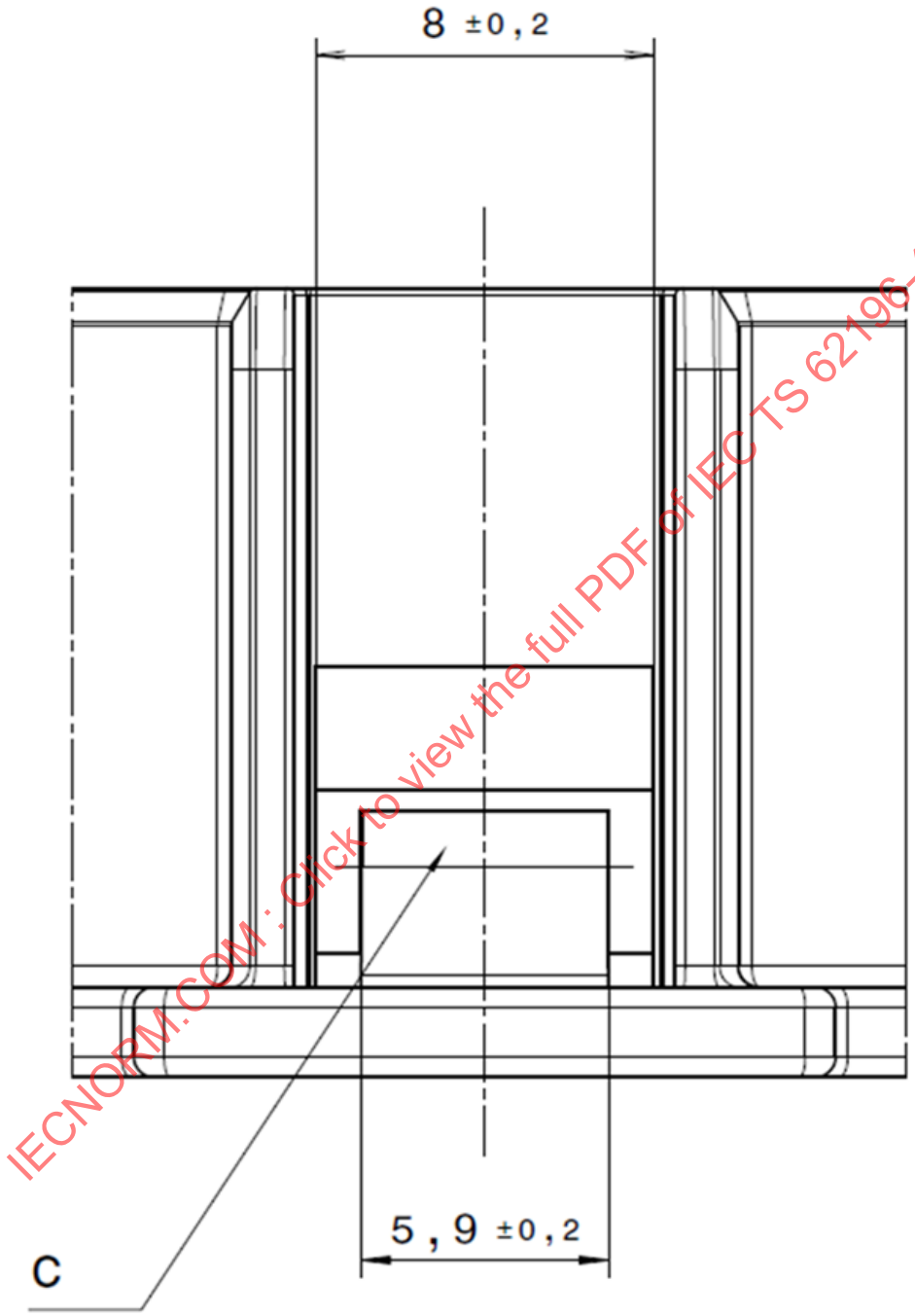
Dimensions in millimetres

Value in parenthesis is for reference

STANDARD SHEET 4-IIIb

Sheet 4 (continuation of Sheet 3)

Section C – C



Key

a Isolated cap (if necessary)

b Chamfered for easy insertion (45°)

c Latch (movable part)

Dimensions in millimetres

STANDARD SHEETS 4-IV

COUPLER 60 A 120 V DC

Overview

The standard sheets 4-IV apply to 60 A, 120 V DC couplers.

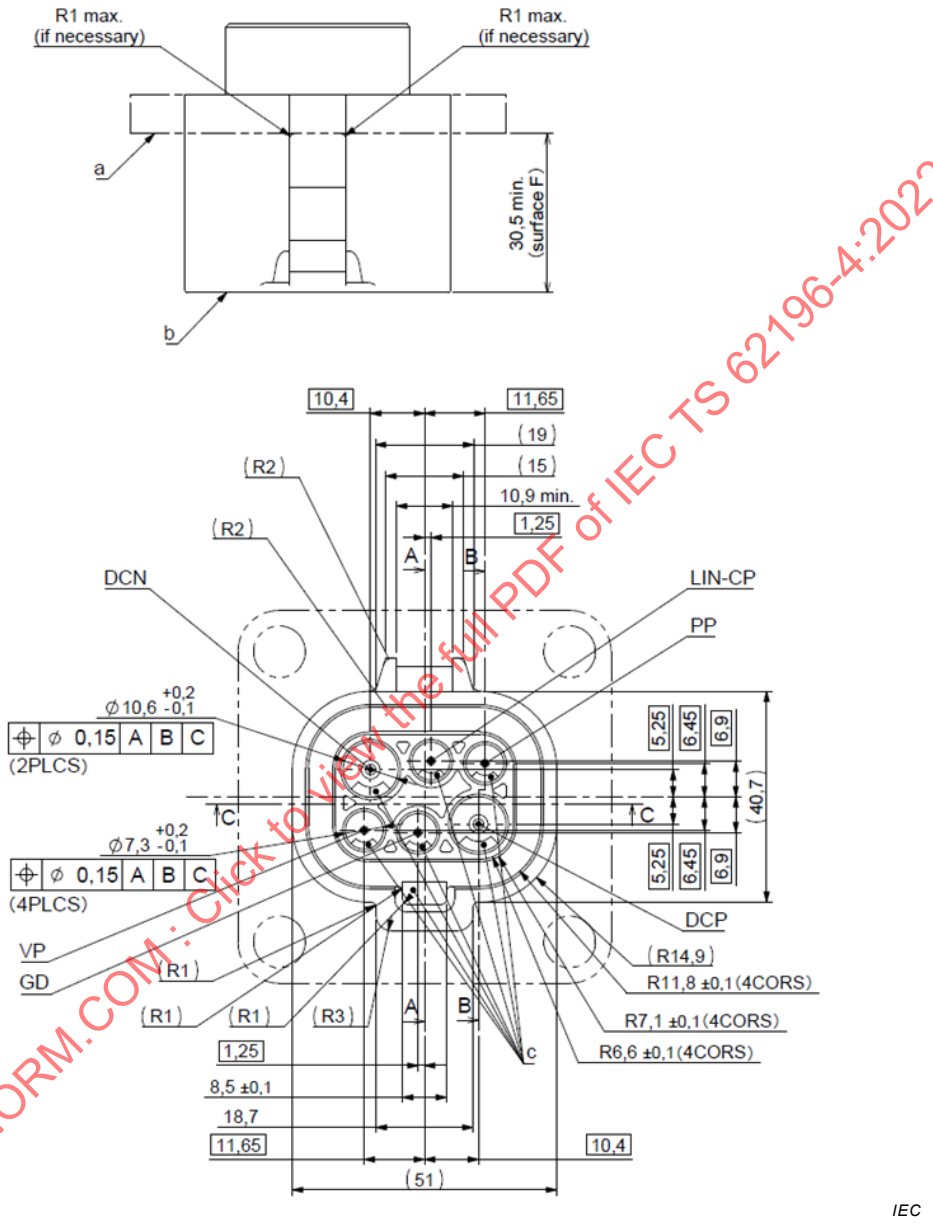
The standard sheets 4-IVd define the latching device. The latching device is mandatory to prevent the vehicle coupler from unintentional separation and breaking under load.

Interlocking with latching device is mandatory.

STANDARD SHEET 4-IVa

Sheet 1

VEHICLE INLET 60 A 120 V DC



Key

a Surface F (if any)

b Standard datum plane

c Egress of fluids

	GENERAL TOLERANCE			
Dimensions in millimetres	10 MAX	50 MAX	100 MAX	ANGLE
Value in parenthesis is for reference	±0,15	±0,2	±0,3	±30'