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Interested committees:

Title: Draft BS EN 62196-3 Ed. 3.0. Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles

Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



23H/535/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:

IEC 62196-3 ED3

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2023-06-23

CLOSING DATE FOR COMMENTS:

2023-09-15

SUPERSEDES DOCUMENTS:

23H/531/RR

IEC SC 23H : PLUGS, SOCKET-OUTLETS AND COUPLERS FOR INDUSTRIAL AND SIMILAR APPLICATIONS, AND FOR ELECTRIC VEHICLES

SECRETARIAT:

France

SECRETARY:

Mrs Anne Le Guennec

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 69

PROPOSED HORIZONTAL STANDARD:

☐

Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☒ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PLUGS, SOCKET-OUTLETS, VEHICLE CONNECTORS AND VEHICLE
INLETS – CONDUCTIVE CHARGING OF ELECTRIC VEHICLES –****Part 3: Dimensional compatibility requirements
for DC and AC/DC pin and contact-tube vehicle couplers**

FOREWORD

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IEC 62196-3 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 an International Standard.

This third edition cancels and replaces the second edition published in 2022. This edition constitutes a technical revision.

[Sec note: The following list of changes will be subject to change](#)

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

- a) The content of IEC TS 62196-3-1 has been integrated into this document as normative Annex A. As far as applicable, the clause numbers are identical with the main part. Added

subclauses, tables and figures start with the number 100 to avoid confusion with the main part.

b) interchangeability requirements have been removed from the title of Part 3;

c) increased ratings for all configurations;

d) reference to new tests in IEC 62196-1 (Clauses 34, 35, 36 and 37).

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

Draft	Report on voting
23H/500/FDIS	23H/504/RVD

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 International Standard 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/standardsdev/publications.

A list of all the parts in the IEC 62196 series, published 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 document is to be read in conjunction with IEC 62196-1:2022. The clauses of the particular requirements in this document supplement or modify the corresponding clauses in IEC 62196-1:2022. Where the text indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of IEC 62196-1:2022, these changes are made to the relevant text of IEC 62196-1:2022, which then becomes part of this document. Where no change is necessary, the words "Clause X of IEC 62196-1:2022 is applicable" are used.

Subclauses, figures, tables, or notes which are additional to those in IEC 62196-1:2022 are numbered starting from 301.

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 61851 (all parts) specifies requirements for electric vehicle (EV) conductive supply equipment.

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).

Charging using off-board DC charging equipment can be achieved by the direct connection of an electric vehicle to DC EV supply equipment incorporating control and communication circuits.

To support the connection of DC power for such vehicles, this document provides the standard interface configurations of DC vehicle couplers and accessories to be used in conductive charging of electric vehicles, taking the most frequent charging situations into consideration.

IEC 62196 is divided into several parts as follows:

- Part 1: General requirements, comprising clauses of a general character.
- Part 2: Dimensional compatibility requirements for AC pin and contact-tube accessories.
- Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers.
- Part 3-1: Vehicle connector, vehicle inlet and cable assembly intended to be used with a thermal management system for DC charging.
- Part 4: Dimensional compatibility requirements for DC pin and contact-tube accessories for Class II or Class III applications.
- Part 6: Dimensional compatibility requirements for DC pin and contact-tube couplers for applications using a system of protective electrical separation.

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

Part 3: Dimensional compatibility requirements for DC and AC/DC pin and contact-tube vehicle couplers

1 Scope

This part of IEC 62196 is applicable to vehicle couplers with pins and contact tubes of standardized configuration, herein also referred to as "accessories", intended for use in electric vehicle conductive charging systems which incorporate control means, with rated operating voltage and current in accordance with IEC 62196-1:2022.

This document applies to high power DC interfaces and combined AC/DC interfaces of vehicle couplers that are intended for use in conductive charging systems for circuits specified in IEC 61851-1:2017 and IEC 61851-23:—¹.

This document applies to accessories and cable assemblies that employ

- thermal sensing, or
- thermal transport and thermal sensing

with the system architecture described in CCC.4.100 of Annex CCC.

The DC vehicle connectors and inlets covered by this document are used only in charging mode 4, according to IEC 61851-1:2017, 6.2.4, and case C, as shown in IEC 61851-1:2017, Figure 3.

These vehicle couplers are intended to be used for circuits specified in IEC 61851-23:— which operate at different voltages, and which can include ELV and communication signals.

This document applies to the vehicle couplers to be used in an ambient temperature between –30 °C and +40 °C.

NOTE 1 In some countries, other requirements may apply.

NOTE 2 In the following country, –35 °C applies: SE.

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

These accessories are intended to be connected to cables according to the IEC 62893 series for DC cables.

2 Normative references

Clause 2 of IEC 62196-1:2022 applies, except as follows.

Additional normative references:

¹ Second edition under preparation. Stage at the time of publication: IEC PRVC 61851-23:2022

205 IEC 60364-5-54:2011, *Low-voltage electrical installations – Part 5-54: Selection and erection*
206 *of electrical equipment – Earthing arrangements and protective conductors*

207 IEC 60811-501, *Electric and optical fibre cables – Test methods for non-metallic materials –*
208 *Part 501: Mechanical tests – Tests for determining the mechanical properties of insulating and*
209 *sheathing compounds*

210 IEC 62196-1:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive*
211 *charging of electric vehicles – Part 1: General requirements*

212 IEC 62196-2:2022, *Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive*
213 *charging of electric vehicles – Part 2: Dimensional compatibility requirements for AC pin and*
214 *contact-tube accessories*

215 IEC 62893-4-1:—², *Charging cables for electric vehicles of rated voltages up to and including*
216 *0,6/1 kV – Part 4-1: Cables for DC charging according to mode 4 of IEC 61851-1 – DC charging*
217 *without use of a thermal management system*

218 ISO 2719:2016, *Determination of flash point – Pensky-Martens closed cup method*

219 ISO 17409:2020, *Electrically propelled road vehicles – Conductive power transfer – Safety*
220 *requirements*

221 ISO 25178-1:2016, *Geometrical product specifications (GPS) – Surface texture: Areal – Part 1:*
222 *Indication of surface texture*

223 *Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Eighth revised*
224 *edition, United Nations, 2019*

225 *OECD Guidelines for the Testing of Chemicals, Section 3, Test No. 301: Ready*
226 *Biodegradability, 17 Jul 1992*

227 **3 Terms and definitions**

228 Clause 3 of IEC 62196-1:2022 applies.

229 **4 General**

230 Clause 4 of IEC 62196-1:2022 applies except as follows:

231 *Addition:*

232 *Add the following after the 2nd paragraph of 4.1 of IEC 62196-1:20XX:*

233 Accessories of the combined interface for AC/DC type intended for use with AC shall comply
234 with the ratings and requirements of IEC 62196-2:2022.

235 **5 Ratings**

236 Clause 5 of IEC 62196-1:202X applies, except as follows:

² Under preparation. Stage at the time of publication: IEC FDIS 62893-4-1:2020.

237 *Addition:*

238 **5.2.2 Rated current for signal or control purposes**

239 *Add the following text at the end of Subclause 5.2.2:*

240 For configuration AA, control pilot contacts are rated 30 V, 10 A. The auxiliary power supply
241 may consist of a safety extra-low voltage system circuit.

242 Clause 5.2.4 is not applicable.

243 *Add the following new subclause:*

244 **5.301 Rated current for auxiliary power supply contacts**

245 For configuration BB, auxiliary power supply contacts are rated 30 V, 20 A. The auxiliary power
246 supply may consist of a safety extra-low voltage system circuit.

247 **6 Connection between the power supply and the electric vehicle**

248 Clause 6 of IEC 62196-1:202X applies, except as follows:

249 **6.2 Basic interface**

250 *Not applicable.*

251 **6.3 DC interface**

252 *Replacement:*

253 *Replace the existing text of IEC 62196-1:202X, 6.3 with the following:*

254 The DC interface may contain up to 12 power or signal contacts, with only one physical
255 configuration of contact positions. The electrical ratings and contact functions are described in
256 Table 301.

257 **Table 301 – Overview of the DC vehicle interface**

Position number ^a	Configuration							
	AA		BB		GG			
	$U_{\max}$	$I_{\max}$	$U_{\max}$	$I_{\max}$	$U_{\max}$	$I_{\max}$	Symbol	Function
	V	A	V	A				
1	1 000	400	950	250	1 500	600	DC +	DC +
2	1 000	400	950	250	1 500	600	DC –	DC –
3	30	10	30	2	30	2	CP	Control Pilot 1
4	30	10	30	2	30	2	CP2	Control Pilot 2
5	30	10	-	-	-	-	CP3	Control Pilot 3
6	30	2	30	2	30	2	COM1	Communication 1 (+)
7	30	2	30	2	30	2	COM2	Communication 1 (–)
8	30	2	-	-	-	-	IM	Isolation Monitor
9	-	-	-	-	-	b	PE	Protective earth

10	30	2	-	-	-	-	PP or CS	Proximity detection or connection switch
11	30 ^c	10 ^c	30	20	-	-	AUX1	Auxiliary Power Supply 1 (+)
12	-	-	30	20	-	-	AUX2	Auxiliary Power Supply 1 (-)
^a Position number does not refer to the location and/or identification of the contact in the accessory. ^b Conductor size dependent upon system requirements ^c For system AA, position 11 is optional.								

258

259 DC vehicle interfaces shall be used in a system according to IEC 61851-23:—, Annex AA "DC
 260 EV supply equipment of System A" or Annex BB "DC EV supply equipment of System B",
 261 respectively. See the corresponding standard sheets for additional interface details.

262 For use with non-isolated DC EV supply equipment, the interface shall be provided with a
 263 contact for protective earthing conductors.

264 For use with isolated DC EV supply equipment, the interface may be provided with a contact
 265 for protective earthing conductors.

266 6.4 Combined interface

267 *Replacement:*

268 *Replace the existing text of IEC 62196-1:202X, 6.4 with the following:*

269 A combined interface extends the use of a basic interface for AC and DC charging.

270 The combined interface permits AC or DC energy through separate power contacts. The
 271 electrical ratings and their function are described in Table 302.

272 **Table 302 – Overview of the combined AC/DC vehicle interface**

Position number ^a	Configuration EE				Configuration FF			
	$U_{\max}$	$I_{\max}$	Symbol	Function	$U_{\max}$	$I_{\max}$	Symbol	Function
	V	A			V	A		
1	250 ^b	32 ^b	L1	L1	480 ^c	63 ^{c,e}	L1	L1
2	250 ^b	32 ^b	L2	L2/N	480 ^c	63 ^c	L2	L2
3	—	—	—	—	480 ^c	63 ^c	L3	L3
4	—	—	—	—	480 ^c	63 ^{c,e}	N	Neutral
5	—	— ^f	PE	Protective earth	—	— ^f	PE	Protective earth
6	30 ^d	2 ^d	CP	Control pilot	30 ^d	2 ^d	CP	Control pilot
7	30 ^d	2 ^d	PP or CS	Proximity detection or connection switch	30 ^d	2 ^d	PP or CS	Proximity detection or connection switch
8	1 000	400	DC+	DC+	1 000	400	DC+	DC+
9	1 000	400	DC-	DC-	1 000	400	DC-	DC-

- a Position number does not refer to the location and/or identification of the contact in the accessory.
- b These contacts are only available in Configuration EE single-phase vehicle inlet. They may be used as portion of basic interface, see IEC 62196-2:2022, Standard Sheets 2-I.
- c These contacts are optional in Configuration FF. They may be used as a portion of basic interface, see IEC 62196-2:2022, Standard Sheets 2-II.
- d These contacts may be used as basic interface. For requirements for basic interface see IEC 62196-2:2022, Standard Sheets 2-I and 2-II.
- e Contacts 1 and 4 for single phase rated $I_{\max} = 70 \text{ A}$.
- f Conductor size dependent upon system requirements.

273

274 The basic portion of the combined vehicle inlet can be used with a basic connector for either
275 AC charging or with a combined vehicle connector for DC charging.

276 Combined couplers shall only be used for DC charging with the "DC EV supply equipment of
277 System C" described in IEC 61851-23:—, Annex CC.

278 NOTE 1 Implementation of all aspects (i.e., topology and communication) according to IEC 61851-23:—, Annex CC
279 ensures that:

280 This system allows DC charging but prevents AC and DC charging at the same time.

281 – AC chargeable EVs with a basic vehicle inlet do not need any means to protect themselves against DC voltage
282 at the inlet. This protection is provided by the DC charging system.

283 – Vehicle protection against mischarging in case of fault is provided in accordance with ISO 17409:2020.

284 NOTE 2 If the AC or DC ratings of a mating connector and inlet differ, the coupler (mating pair) is used at the lower
285 rating of either the vehicle connector or vehicle inlet of the mating accessory.

286 NOTE 3 ISO 17409 will be revised to ISO 5474 series (under development).

287 **7 Classification of accessories**

288 Clause 7 of IEC 62196-1:202X applies, except as follows:

289 **7.1 According to purpose**

290 *Replacement:*

291 *Replace the existing text of IEC 62196-1:202X, 7.1 with the following:*

292 – vehicle connectors;

293 – vehicle inlets.

294 **7.5 According to interface**

295 *Replacement:*

296 *Replace the existing text of IEC 62196-1:202X, 7.5 with the following:*

297 As specified in Clause 6 of this document and in IEC 61851-1:2017:

298 – combined interface;

299 – DC interface.

300 *Addition:*

301 *Additional subclause:*

7.301 According to the standard sheets used

- Configuration AA;
- Configuration BB;
- Configuration EE and AC corresponding to Type 1 in IEC 62196-2:2022;
- Configuration FF and AC corresponding to Type 2 in IEC 62196-2:2022;
- Configuration GG.

8 Marking

Clause 8 of IEC 62196-1:202X applies.

9 Dimensions

Clause 9 of IEC 62196-1:202X applies, except as follows:

Addition:

Add the following text at the end of Clause 9 of IEC 62196-1:202X.

The vehicle connector and vehicle inlet shall comply with the relevant configuration shown in Table 303.

Table 303 – Interface overview

Configuration	Dimensions described in:	Max. rated voltage V DC	Max. rated current A DC	Shall only be used with DC charging station according to the following annexes in IEC 61851-23:—
AA	Standard Sheets 3-I	1 000	400	Annex AA
BB	Standard Sheets 3-II	950	250	Annex BB
EE ^a	Standard Sheets 3-III	1 000	400	Annex CC
FF ^b	Standard Sheets 3-IV	1 000	400	Annex CC
GG	Standard Sheets 3-V	1 500	600	Annex DD ^c
^a AC ratings are in accordance with IEC 62196-2:2022, 6.2, type 1. ^b AC ratings are in accordance with IEC 62196-2:2022, 6.2, type 2. ^c To be proposed in the next edition of IEC 61851-23.				

10 Protection against electric shock

Clause 10 of IEC 62196-1:202X applies, except as follows:

10.3 Contact sequencing and order of contact insertion and withdrawal

Replacement:

Replace the existing text of IEC 62196-1:202X, 10.3 with the following:

For all DC interfaces, the contact sequence during the connection process shall be:

- protective earth (if any),

- 325 – DC power contacts,
326 – isolation monitor contacts,
327 – control pilot contact.

328 The isolation monitor contacts and the control pilot contacts shall mate in the sequence shown
329 or can mate simultaneously.

330 The proximity contact or the connection switch contact, if any, shall mate after the protective
331 earth contact and before or simultaneously with the control pilot contact.

332 During disconnection the order shall be reversed.

333 Accessories shall be so designed that:

334 a) when inserting the vehicle connector:

- 335 1) the protective earth connection is made before the DC power contacts, if any, are
336 made;
337 2) the control pilot connection, if any, is made after the DC power contacts are made;
338 3) the proximity contact or connection switch contact, if any, is made after the protective
339 earth contact and before or simultaneously as the control pilot is made.

340 b) when withdrawing the vehicle connector:

- 341 1) the DC power contacts are broken before the protective earth connection is broken;
342 2) the control pilot connection, if any, is broken before the DC power contacts are broken;
343 3) the proximity contact or connection switch contact, if any, is broken before the
344 protective earth contact and after or simultaneously as the control pilot is opened.

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

346 **11 Size and colour of protective earthing and neutral conductors**

347 Clause 11 of IEC 62196-1:202X applies for the AC portion.

348 *Additional subclauses:*

349 **11.301** For the DC portion, the following applies.

350 The protective earthing conductor or protective conductor shall comply with the requirements
351 of 8.105.11 of IEC 61851-23:202X, or shall be of sufficient cross-sectional area calculated by
352 the I^2t -methodology according to the formula in 543.1.2 of IEC 60364-5-54:2011 by using I^2t_{SUM} .

353 The I^2t_{EVSE} -values for the respective EVSE, used in the calculation, shall be according to IEC
354 61851-23:202X.

355 The I^2t_{EV} -values for the vehicle inlet for the respective EV, used in the calculation, shall be
356 determined according to ISO 5474-3:202X (under development).

357 The summarized I^2t value shall be determined by the equation:

358
$$I^2t_{SUM} = (\sqrt{I^2t_{EVSE}} + \sqrt{I^2t_{EV}})^2$$

359 NOTE 1 In the following country, the size and rating of the protective conductor is specified in national codes and
360 regulations: CA.

The conductor connected to the protective earthing terminal shall be identified by the colour combination green-and-yellow.

NOTE 2 In the following countries, the colour green may be used to identify the earthing conductor: JP, US, CA.

Compliance is checked by inspection and measurement.

12 Provisions for earthing

Clause 12 of IEC 62196-1:202X applies, except as follows:

12.1 This subclause is not applicable for configuration AA.

12.2 This subclause is not applicable for configuration AA.

12.3 This subclause is not applicable for configuration AA.

12.4 This subclause is not applicable for configuration AA.

13 Terminals

Clause 13 of IEC 62196-1:202X applies.

14 Interlocks

Clause 14 of IEC 62196-1:202X applies, except as follows:

14.1.8 This subclause is applicable for configuration EE: Standard Sheets 3-III

14.1.9 This subclause is applicable for configuration EE: Standard Sheets 3-III

14.1.10 This subclause is applicable for configuration EE: Standard Sheets 3-III

14.1.11 This subclause is applicable for configuration EE: Standard Sheets 3-III

Additional subclause:

14.301 Latching function

Accessories shall be provided with a latching device to prevent the connection from being separated unintentionally or by unauthorized persons.

The interlock function shall be performed by the proper functioning of the latching device.

A means shall be provided to indicate that the interlock is properly engaged.

Compliance is checked by inspection and manual test.

14.302 Achieve and release the latching device (configuration FF)

Sec note: To MT8 regarding this proposal in 14.201. Please take the following input from the submitter into account when commenting: "shall" changed to "should"; test optional for inlet/socket-outlet but mandatory for connector/plug; should this be moved to an informative annex?

14.302.1 General

Accessories should be so constructed that the latching device can be properly latched and unlatched with an appropriate accessory, while an external mechanical load is being applied to the vehicle connector during normal operation.

NOTE 1 In comparison, the tests of 14.1.5 and 14.1.6 of IEC 62196-1:20XX contain already a latched position.

NOTE 2 Latching device means e.g., an electromechanical latching actuator pin.

Compliance is checked by the test of 14.302.3.

14.302.2 Samples

For the vehicle inlet manufacturer, each accessory shall be tested on three samples with the test gauge according to Figure 307.

For the vehicle connector manufacturer, each accessory shall be tested on three samples with the test gauge according to Figure 307.

14.302.3 Test sequence

Part 1 – Achieve latching

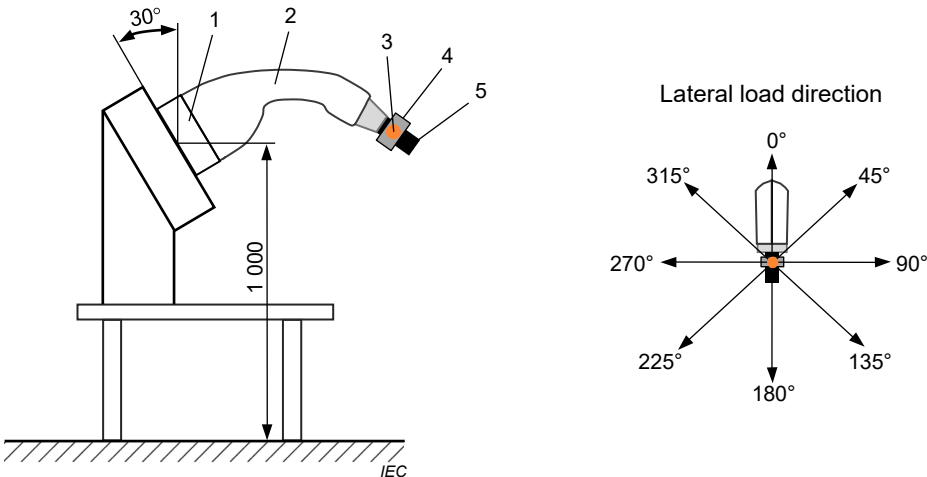
- 1) *Fully insert the vehicle connector into the vehicle inlet until mated position.*
- 2) *In mated position, using a force gauge apply, either manually or automatically, the minimum load according to Table 301 as illustrated in Figure 306 in the defined direction.*
- 3) *Electrically activate latching device.*
- 4) *Check PASS CRITERIA by visual inspection. The latching device shall indicate that the latch is in correct latched position.*
- 5) *Repeat steps 1 through 4 according to Table 301.*

Part 2 – Release the latch

- 1) *Fully insert the vehicle connector into the vehicle inlet until mated position and ensure that the vehicle connector is in latched position.*
- 2) *In latched position, using a force gauge apply, either manually or automatically, the minimum load according to Table 301 as illustrated in Figure 306 in the defined direction until step 4.*
- 3) *Electrically activate the latching device to unlatch the vehicle connector.*
- 4) *Check PASS CRITERIA by visual inspection. The latching device shall indicate that the latch is in correct unlatched position.*
- 5) *Repeat steps 1 through 4 according to that Table 301.*

Table 301 – Definition of interlock test numbers for checking latched position and unlatched position

Test number No	Load direction °	Minimum external load N
1	0°	65
2	45°	65
3	90°	65
4	135°	65
5	180°	65
6	225°	65
7	270°	65
8	315°	65



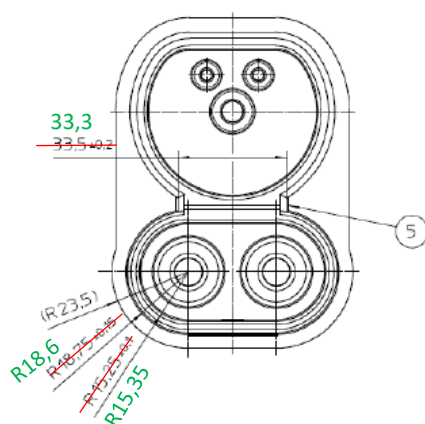
- | Key | Description |
|-----|---|
| 1 | Support with vehicle inlet |
| 2 | Vehicle connector |
| 3 | Load application: As close as possible to the connector body end |
| 4 | Suitable cable clamp fixed on cable, adjustable for each test number (if any) |
| 5 | Cable length cut off below the cable clamp |
- NOTE 1: Other testing equipment are permitted.
- NOTE 2: Alternatively, the test may also be carried out with a “dummy vehicle connector”. In this case a load of 40 N shall be applied in the 6:00 h direction for each test to take into account the net weight of the connector.

Figure 306 – Example of interlock test setup for checking latched and unlatched position

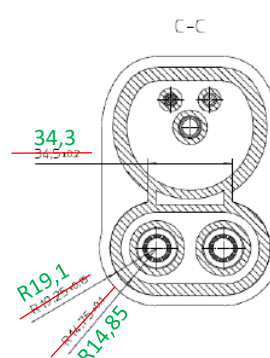
For the vehicle inlet manufacturer of configuration FF, the tests shall be carried out for all latching device positions offered by the vehicle inlet manufacturer with the test gauge according to Figure 307 or with a vehicle connector of IEC 62196-3. The test gauge of the AC portion, or a AC vehicle connector is described in IEC 62196-2.

Dimensions in millimetres

Sheet 3 (continuation of Sheet 2)



Sheet 4 (continuation of Sheet 3)



NOTE The test gauge should have the dimensions as highlighted to represent the “smallest” vehicle connector contour. The other vehicle connector dimensions, see Standard Sheets 3-IVc of IEC 62196-3.

Figure 307 – Test gauge of vehicle connector (configuration FF) for checking latched position and unlatched position

Sec note: The relevant dimensions for the test gauge in Figure 307 are under consideration. The image will be improved at the next phase.

15 Resistance to ageing of rubber and thermoplastic material

Clause 15 of IEC 62196-1:202X applies.

16 General construction

Clause 16 of IEC 62196-1:202X applies, except as follows.

16.16 Replacement

Replace the first paragraph of the existing text of IEC 62196-1:202X, 16.16 with the following:

The force to insert and withdraw a vehicle connector shall be less than 100 N. Means to facilitate the insertion and withdrawal of the vehicle connector from the vehicle inlet may be provided. If a vehicle coupler is equipped with an assist device to reduce this force (e.g. mechanical assist device), the operating force of the assist device shall be less than 100 N.

17 Construction of EV socket-outlets – General

Clause 17 of IEC 62196-1:202X does not apply.

18 Construction of EV plugs and vehicle connectors

Clause 18 of IEC 62196-1:202X applies, except as follows:

Additional subclause:

18.301 A thermal sensing device is required on each DC+ and DC– contact in the vehicle connector for DC charging.

19 Construction of vehicle inlets

Clause 19 of IEC 62196-1:202X applies, except as follows:

Additional subclause:

19.301 A thermal sensing device is required on each DC+ and DC– contact in the vehicle inlet for DC charging.

20 Degrees of protection

Clause 20 of IEC 62196-1:202X applies.

21 Insulation resistance and dielectric strength

Clause 21 of IEC 62196-1:202X applies.

22 Breaking capacity

Clause 22 of IEC 62196-1:202X is not applicable.

23 Normal operation

Clause 23 of IEC 62196-1:202X applies, except as follows:

Replacement of Table 9 with Table and note:

Table 9 – Normal operation

Rated current A	Cycles of operation	
	Load	No-load
DC (all ratings)	–	10 000

NOTE Use cases can require a higher number of operations and/or regular maintenance.

23.2 Load endurance test

Not applicable.

24 Temperature rise

Clause 24 of IEC 62196-1:202X applies, except as follows:

24.1 *Addition:*

Add the following after the first paragraph of the existing text of IEC 62196-1:202X, 24.1:

506 For the purposes of the temperature rise test, any thermal monitoring or thermal cut-out device
507 shall be short circuited (i.e. the test results shall be acceptable without relying on the thermal
508 monitoring or thermal cut-out).

509 *Replacement:*

510 *Replace the eighth paragraph of the existing text of IEC 62196-1:202X, 24.1, i.e. "The test*
511 *current is shown in Table 10.", with the following:*

512 *The test current is a direct or alternating current of the value shown in Table 22 of*
513 *IEC 62196-1:202X.*

514 **25 Flexible cables and their connection**

515 Clause 25 of IEC 62196-1:202X applies except as follows:

516 *Additional subclause:*

517 **25.301 Additional test for strain relief**

518 Accessories shall be submitted to the additional following test:

519 *Non-rewirable accessories are tested as delivered.*

520 *Rewirable accessories are tested with the maximum and minimum size cables recommended*
521 *by the manufacturer.*

522 *Conductors of the cable of rewirable accessories are introduced into the terminals, the terminal*
523 *screws being tightened just sufficiently to prevent the conductors from easily changing their*
524 *position.*

525 *The cable anchorage is used in the normal way, clamping screws being tightened with a torque*
526 *equal to two-thirds of that specified in IEC 62196-1:202X, 27.1. After reassembly of the sample,*
527 *with cable glands, if any, in position, the component parts shall fit snugly, and it shall not be*
528 *possible to push the cable into the sample to any appreciable extent.*

529 *The sample is fixed in the test apparatus so that the axis of the cable is vertical where it enters*
530 *the sample.*

531 *The cable is then subjected once to a pull of 750 N. The pull is applied without jerks for a*
532 *duration of 1 min.*

533 *Immediately afterwards, the cable is subjected to a torque, of the value specified in*
534 *IEC 62196-1:202X, Table 24, for 1 min.*

535 *During the tests, the cable shall not be damaged.*

536 *After the tests, the cable shall not have been displaced by more than the values indicated in*
537 *IEC 62196-1:202X, Table 24. For rewirable accessories, the ends of the conductors shall not*
538 *have moved noticeably in the terminals; for non-rewirable accessories, there shall be no break*
539 *in the electrical connections.*

540 *For the measurement of the longitudinal displacement, a mark is made on the cable at a*
541 *distance of approximately 2 cm from the end of the sample or the cable anchorage before*
542 *starting the tests. If, for non-rewirable accessories, there is no definite end to the sample, an*
543 *additional mark is made on the body of the sample.*

544 *After the tests, the displacement of the mark on the cable in relation to the sample or the cable*
545 *anchorage is measured.*

546 **26 Mechanical strength**

547 Clause 26 of IEC 62196-1:202X applies.

548 **27 Screws, current-carrying parts and connections**

549 Clause 27 of IEC 62196-1:202X applies.

550 **28 Creepage distances, clearances and distances through sealing compound**

551 Clause 28 of IEC 62196-1:202X applies.

552 **29 Resistance to heat and to fire**

553 Clause 29 of IEC 62196-1:202X applies.

554 **30 Corrosion and resistance to rusting**

555 Clause 30 of IEC 62196-1:202X applies.

556 **31 Conditional short-circuit current**

557 Clause 31 of IEC 62196-1:202X does not apply.

558 **32 Electromagnetic compatibility**

559 Clause 32 of IEC 62196-1:202X applies.

560 **33 Vehicle drive over**

561 Clause 33 of IEC 62196-1:202X applies, except as follows:

562 **33.3** *Not applicable.*

563 **33.4** *Not applicable.*

564 **34 Thermal cycling**

565 Clause 34 of IEC 62196-1:202X applies.

566 **35 Humidity exposure**

567 Clause 35 of IEC 62196-1:202X applies.

568 **36 Misalignment**

569 Clause 36 of IEC 62196-1:202X applies.

570 **37 Contact endurance test**

571 Clause 37 of IEC 62196-1:202X applies.

572

573

STANDARD SHEETS CONFIGURATION AA

VEHICLE COUPLER RATED 1 000 V DC AND UP TO 400 A

STANDARD SHEET 3-1a

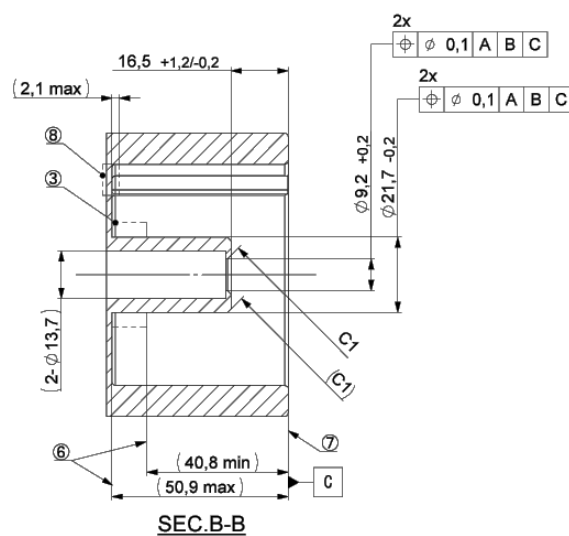
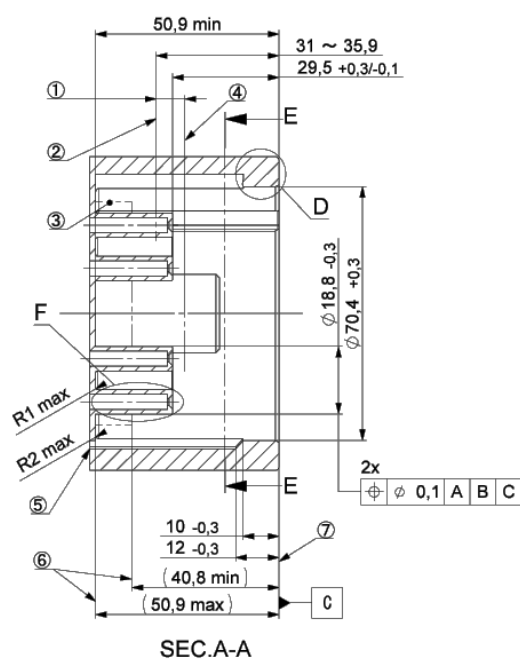
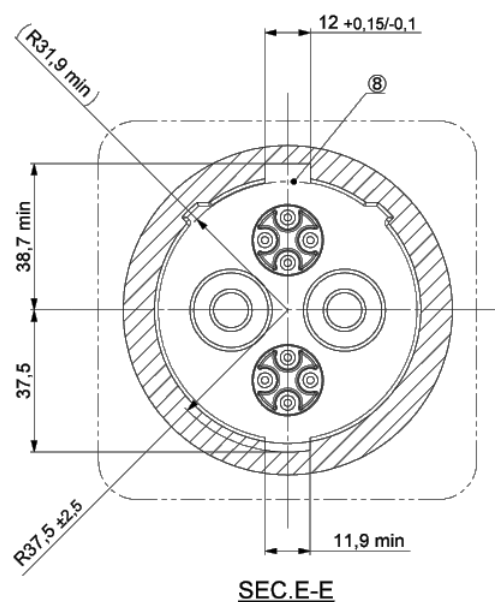
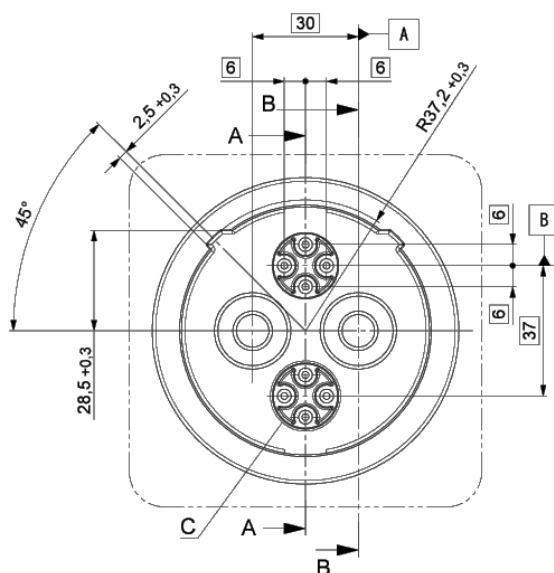
VEHICLE INLET

Sheet 1

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

Dimensions in parentheses for reference

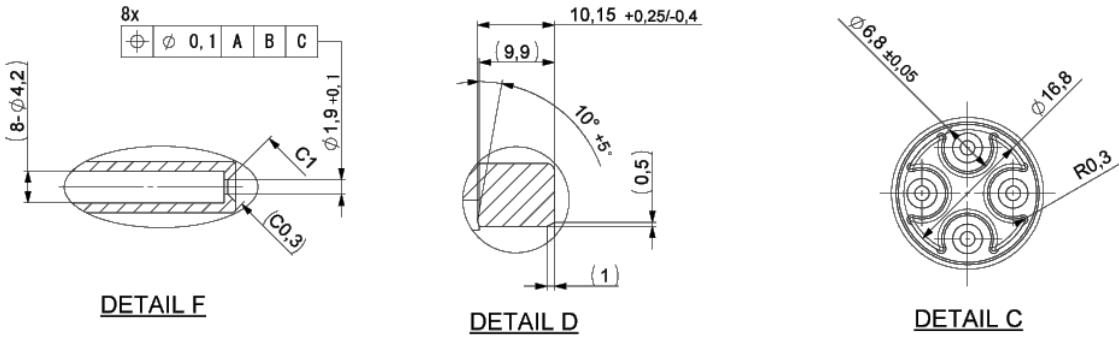


CONFIGURATION AA

STANDARD SHEET 3-la
VEHICLE INLET

Sheet 2 (continuation of Sheet 1)

Sec note: Drawings in Standard Sheet to be improved at the next stage



General tolerance			
10 max.	50 max.	100 max.	Angle
±0,15	±0,2	±0,3	±30°

Key (STANDARD SHEET 3-la)

- ① 8 min difference between power and signal terminal contact point at worst case
- ② Signal terminal contact point
- ③ Packing (if necessary); a sealing method for IP44 when coupled with vehicle connector
- ④ Power terminal contact point
- ⑤ Drain hole
- ⑥ Sealing area
- ⑦ Standard datum plane
- ⑧ Grommet (if necessary)

CONFIGURATION AA

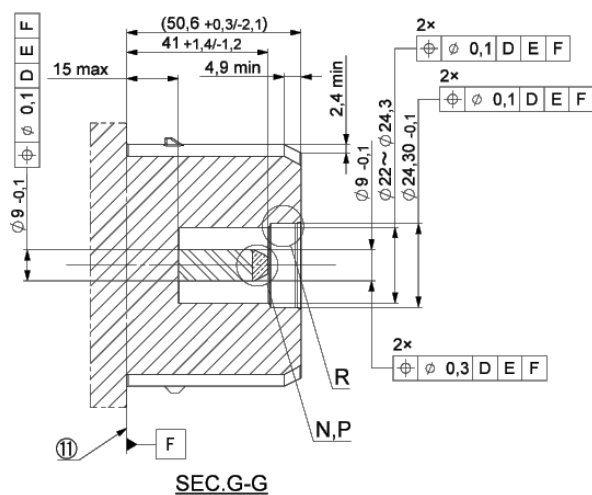
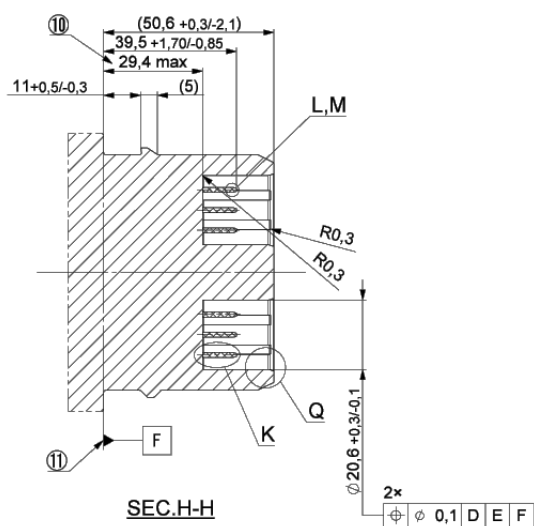
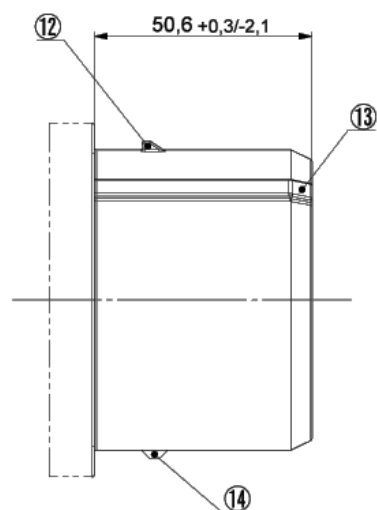
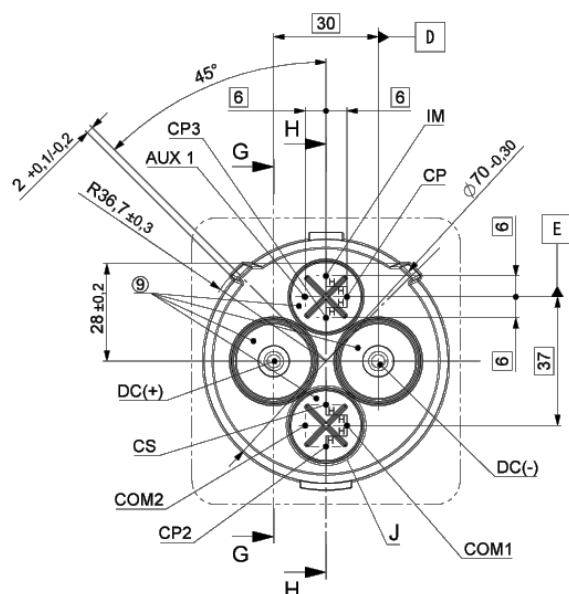
STANDARD SHEET 3-lb
VEHICLE CONNECTOR

Sheet 1

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

Dimensions in parentheses for reference



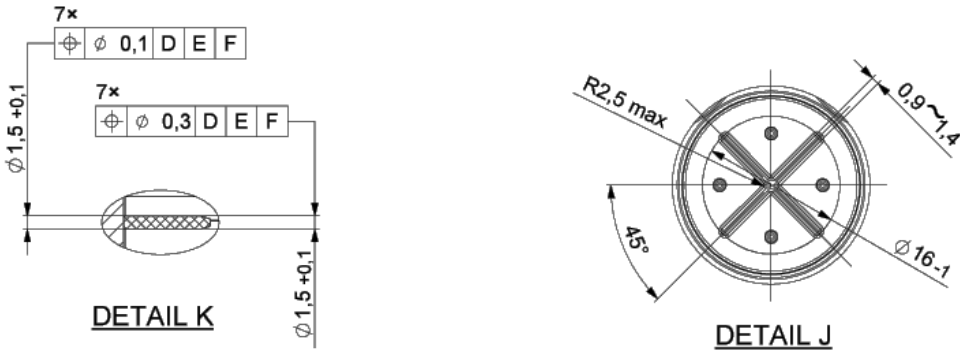
CONFIGURATION AA

STANDARD SHEET 3-lb
VEHICLE CONNECTOR

Sheet 2 (continuation of sheet 1)

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres



General tolerance			
10 max.	50 max.	100 max.	Angle
±0,15	±0,2	±0,3	±30°

- ⑨ Drain hole (if necessary)
- ⑩ For optional latch outline: 29,5 maximum
- ⑪ Standard datum plane
- ⑫ Latch
- ⑬ Any dimension for guide rib
- ⑭ Lever stopper (if necessary) (This portion is movable)

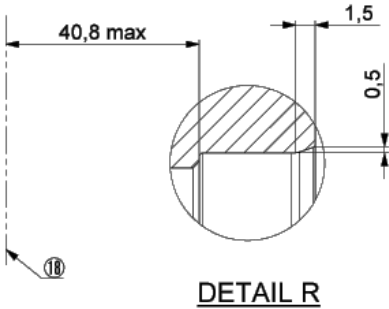
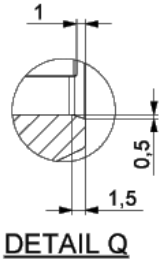
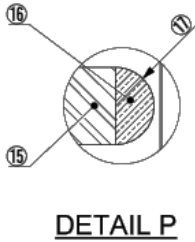
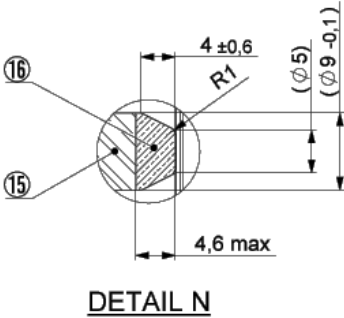
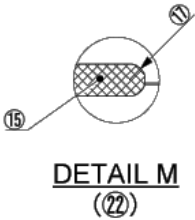
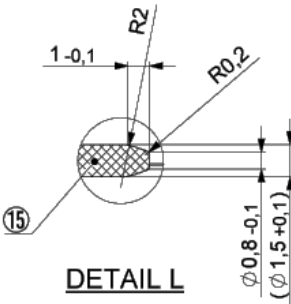
CONFIGURATION AA

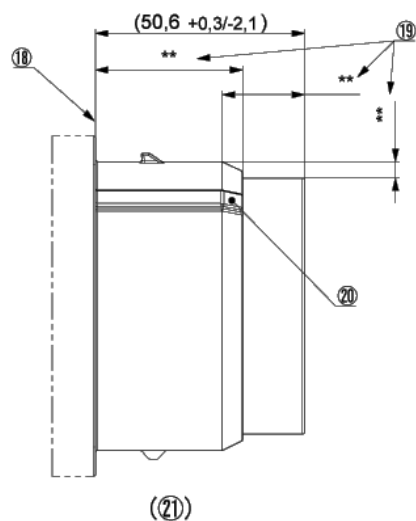
STANDARD SHEET 3-lb
VEHICLE CONNECTOR

Sheet 3 (continuation of Sheet 2)

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres
Dimensions in parentheses for reference



**Key**

- 15 Terminal
- 16 Insulated end cap
- 17 Full R
- 18 Standard datum plane
- 19 Any dimension
- 20 Any dimension for guide rib
- 21 Optional for movable terminal design
- 22 Optional shape

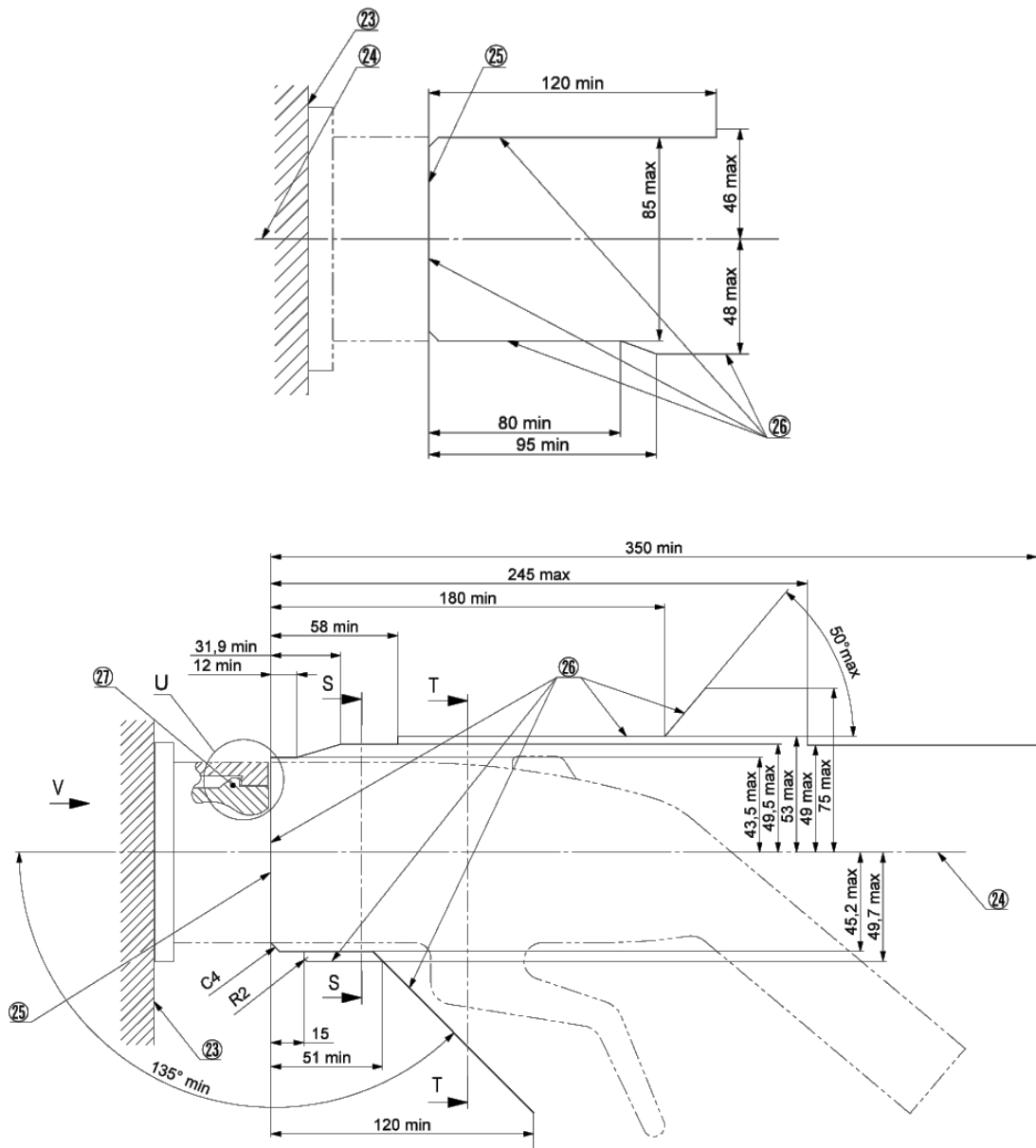
636

CONFIGURATION AA

STANDARD SHEET 3-lc
MAXIMUM DIMENSIONS OF VEHICLE CONNECTOR BODY OUTLINE

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres



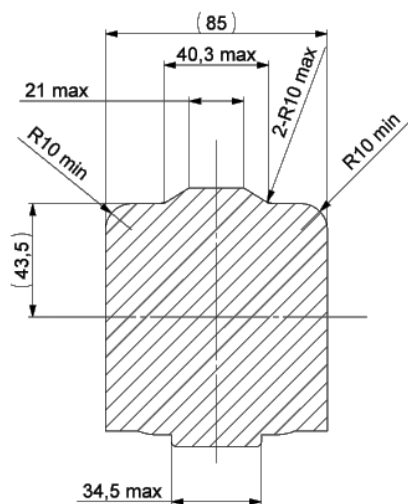
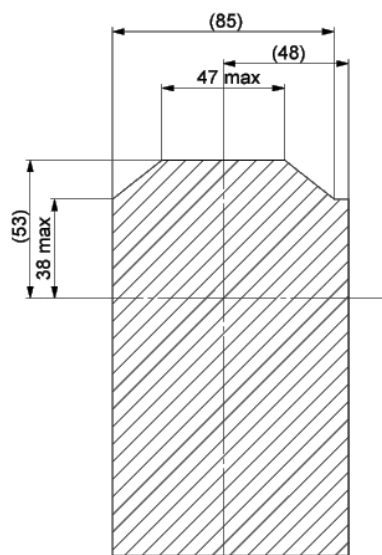
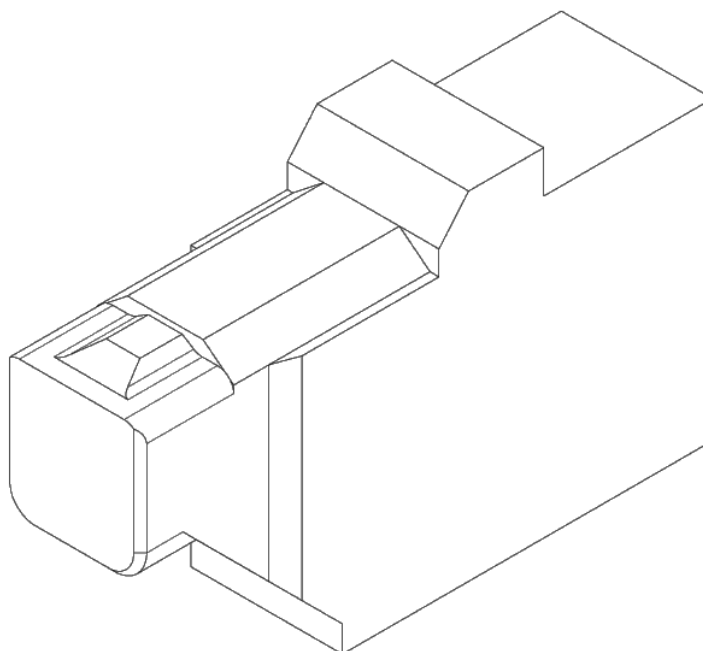
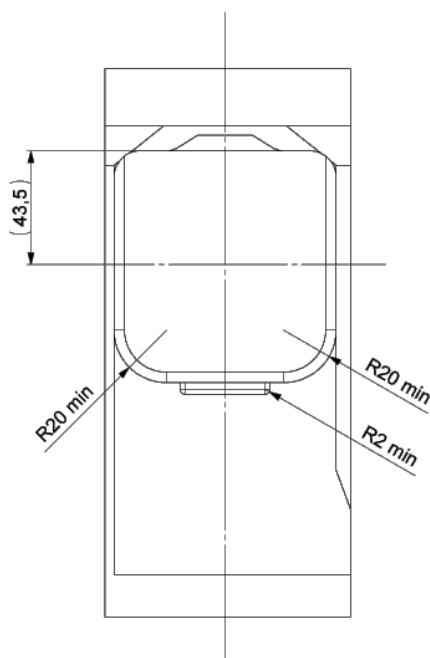
- Key**
- 23 Vehicle surface
 - 24 Centre line of vehicle connector
 - 25 Standard datum plane
 - 26 Vehicle connector body shape shall be within these solid lines (the sketches are not intended to restrict design of vehicle connector)
 - 27 Latch

CONFIGURATION AASTANDARD SHEET 3-Id
MAXIMUM DIMENSIONS OF VEHICLE CONNECTOR BODY OUTLINE

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

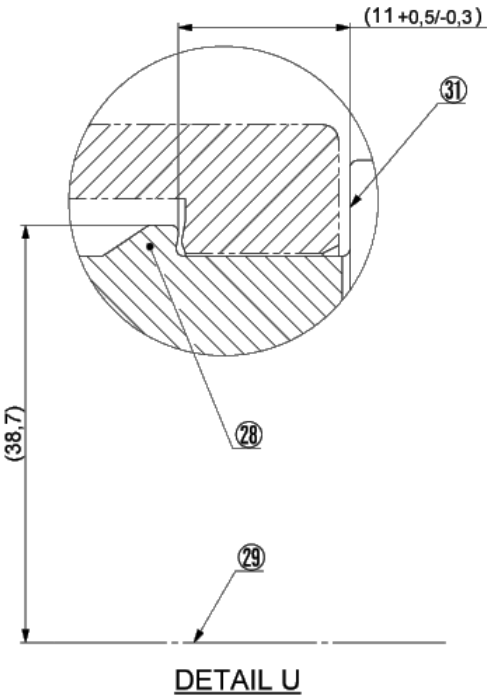
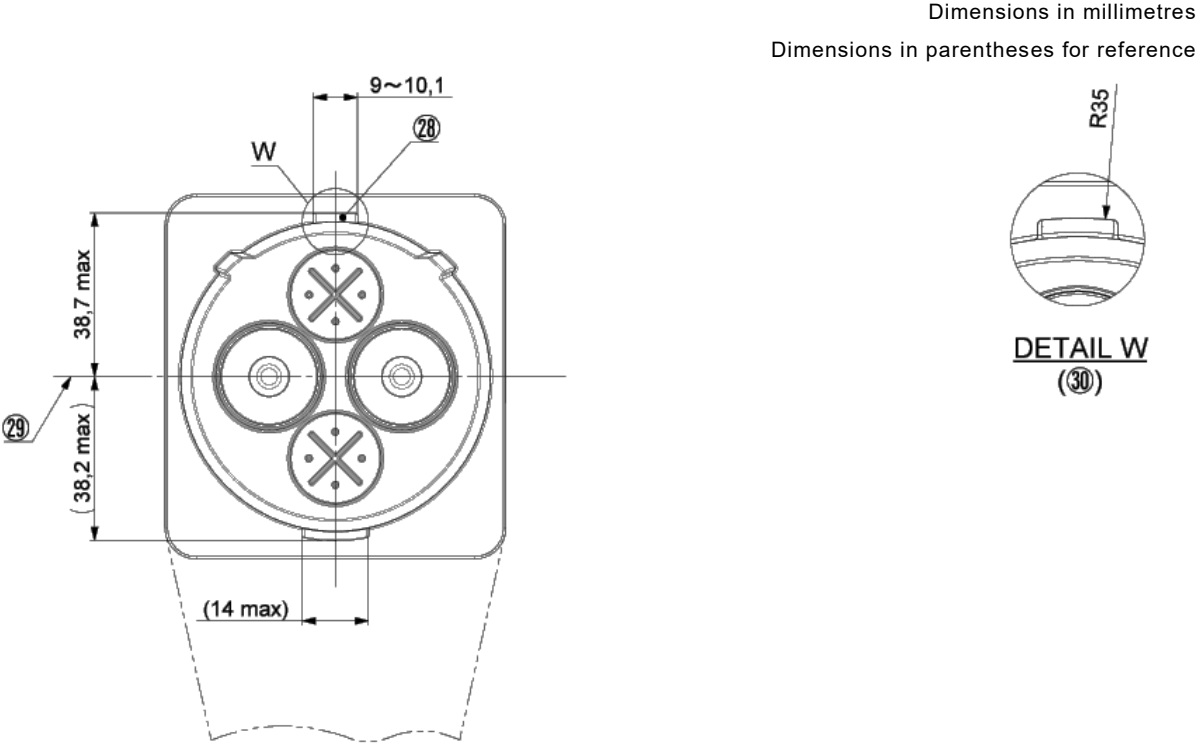
Dimensions in parentheses for reference

SEC.S-SSEC.T-T3D VIEW

CONFIGURATION AA

STANDARD SHEET 3-le
MAXIMUM OUTLINE OF LATCH

Sec note: Drawings in Standard Sheet to be improved at the next stage



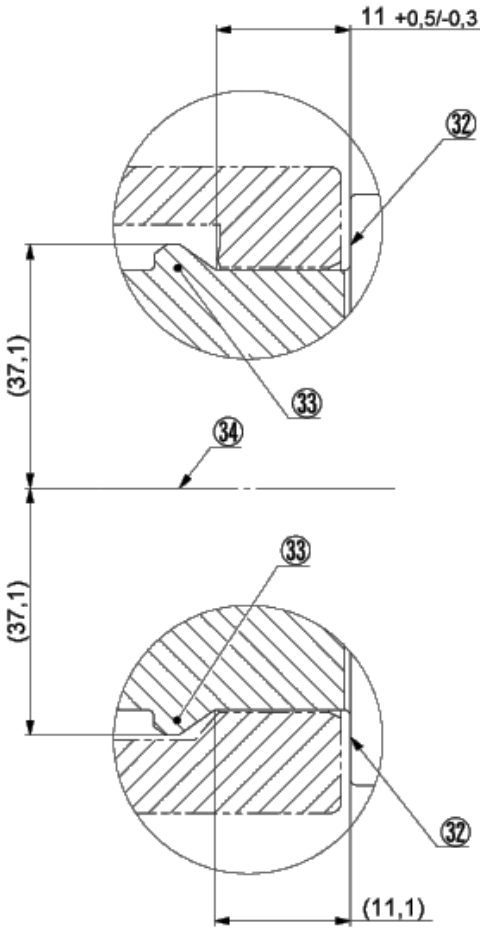
- Key**
- 28 Latch (the sketches are not intended to restrict design of latch shape)
 - 29 Centre line of vehicle connector
 - 30 Optional shape
 - 31 Standard datum plane of vehicle

CONFIGURATION AA

STANDARD SHEET 3-If
OPTIONAL OUTLINE OF LATCH

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres
Dimensions in parentheses for reference



DETAIL X

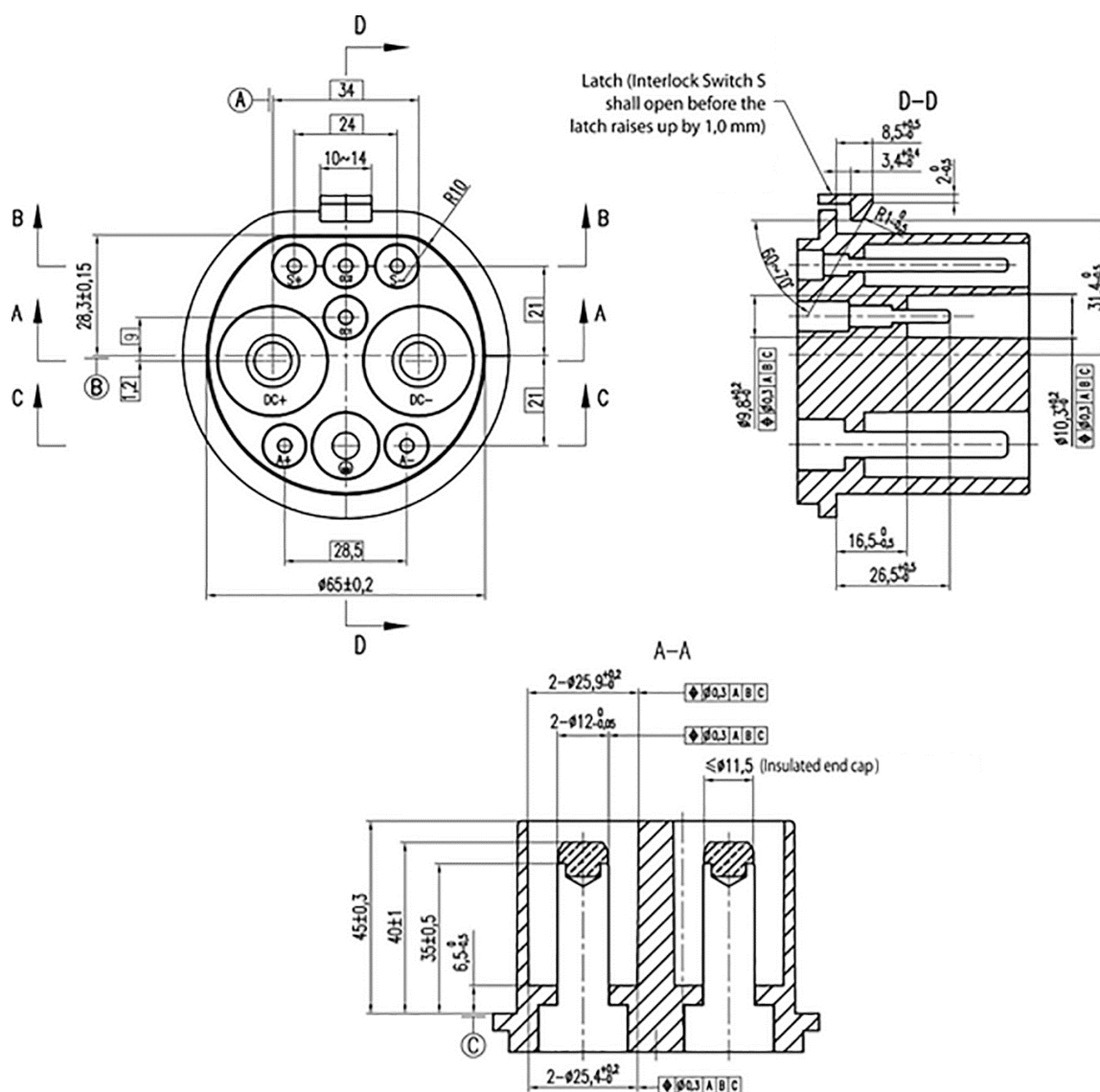
- Key**
- 32 Standard datum plane of vehicle connector
 - 33 Latch (the sketches are not intended to govern design of latch shape)
 - 34 Centre line of vehicle connector

**STANDARD SHEETS
CONFIGURATION BB****VEHICLE COUPLER 950 V DC AND UP TO 250 A****STANDARD SHEET 3-IIa
VEHICLE CONNECTOR***Sheet 1*

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

Dimensions in parentheses for reference



The dimension of $\phi 65$ is allowed to have draft; after the preliminary stage, the maximum dimensional position (datum plane C) should comply with the dimensional tolerance requirements.

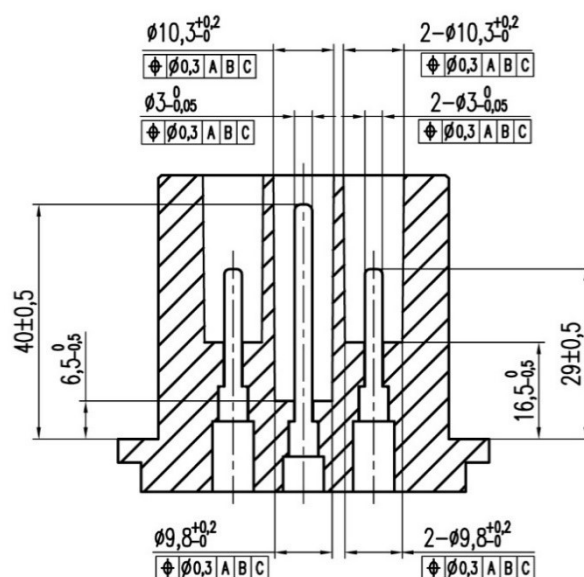
CONFIGURATION BBSTANDARD SHEET 3-IIa
VEHICLE CONNECTOR

Sheet 2 (continuation of Sheet 1)

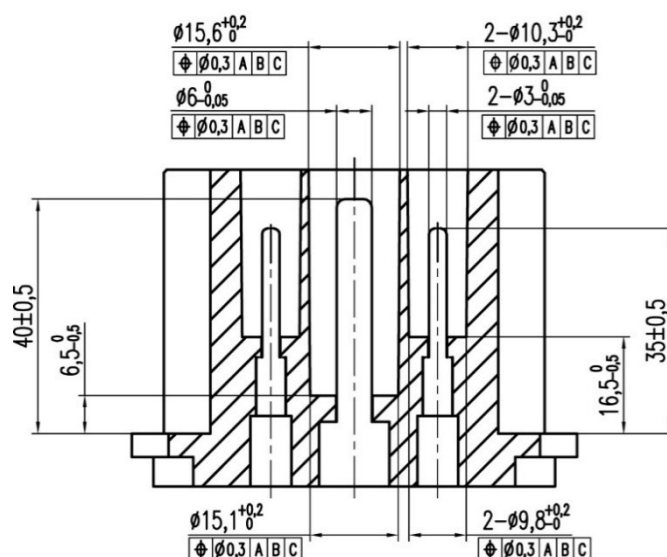
Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

B-B



C-C



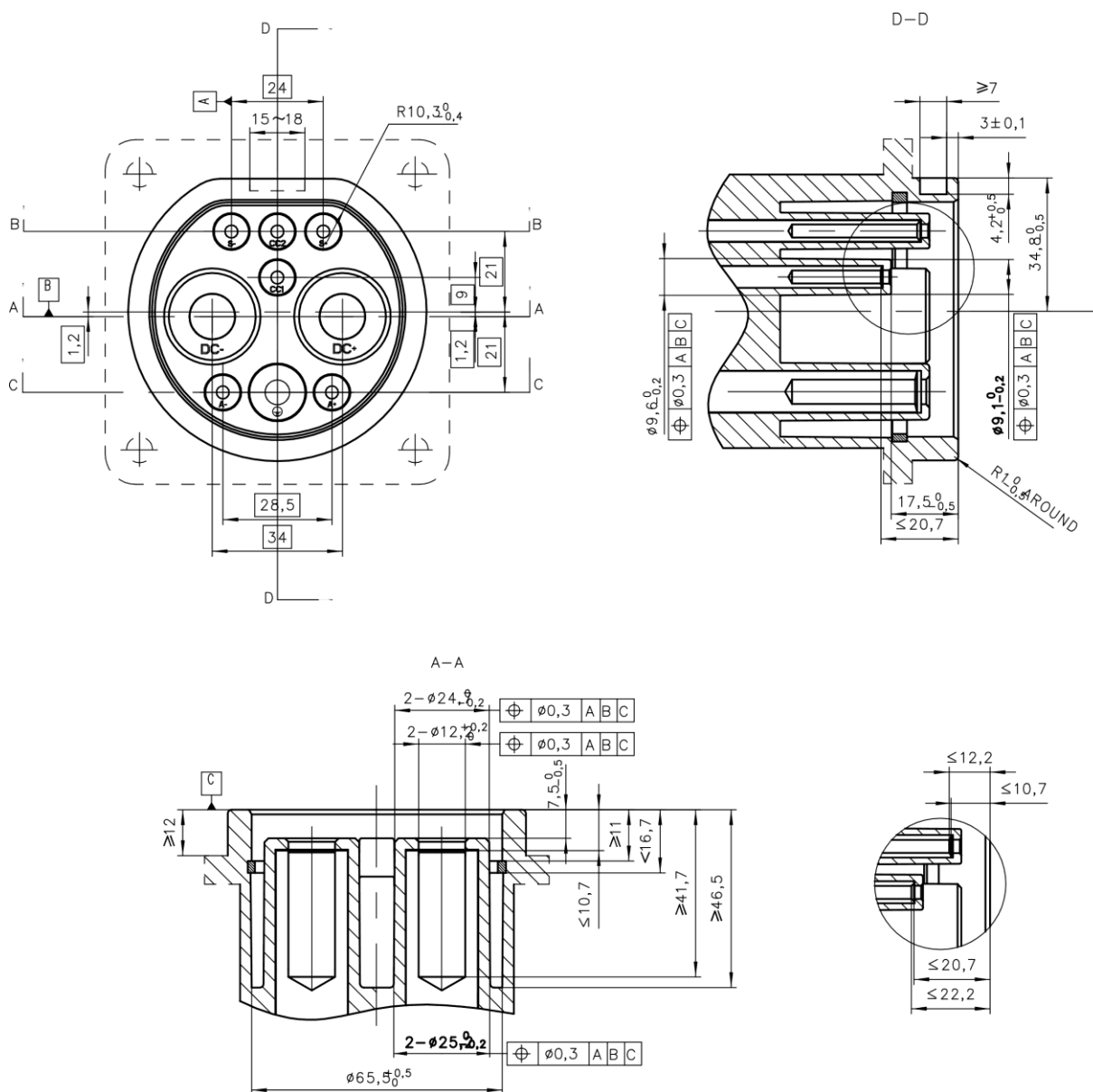
CONFIGURATION BB

STANDARD SHEET 3-IIb
VEHICLE INLET

Sheet 1

Sec note: Drawings in Standard Sheet to be improved at the next stage

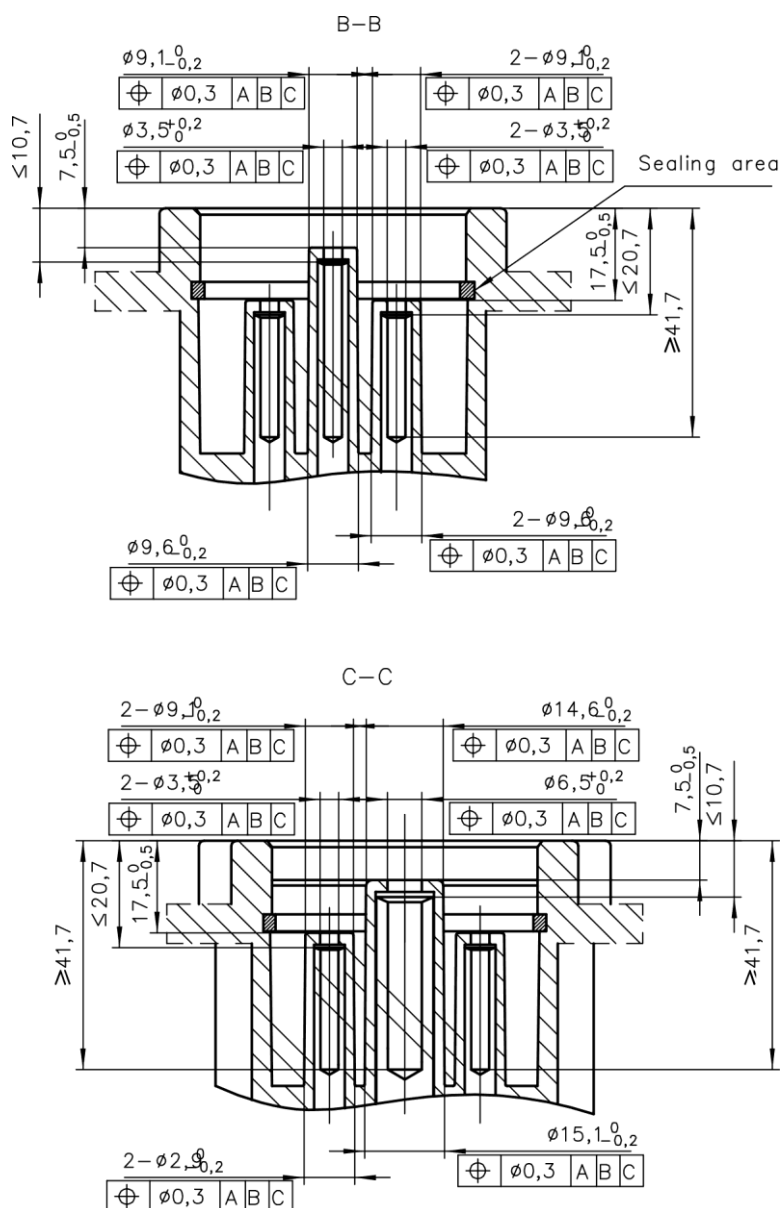
Dimensions in millimetres



CONFIGURATION BB**STANDARD SHEET 3-IIb
VEHICLE INLET***Sheet 2 (continuation of Sheet 1)*

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres



**STANDARD SHEETS
CONFIGURATION EE****VEHICLE COUPLER 1 000 V DC AND UP TO 400 A****CONTACT FUNCTIONALITY**

The functionality for configuration EE charging is defined in Table 304.

NOTE The coding for the DC charging is described in IEC 61851-23:—, Table CC.5 and IEC 61851-1:2017, Annex B.

Table 304 – Functionality of the contacts for configuration EE

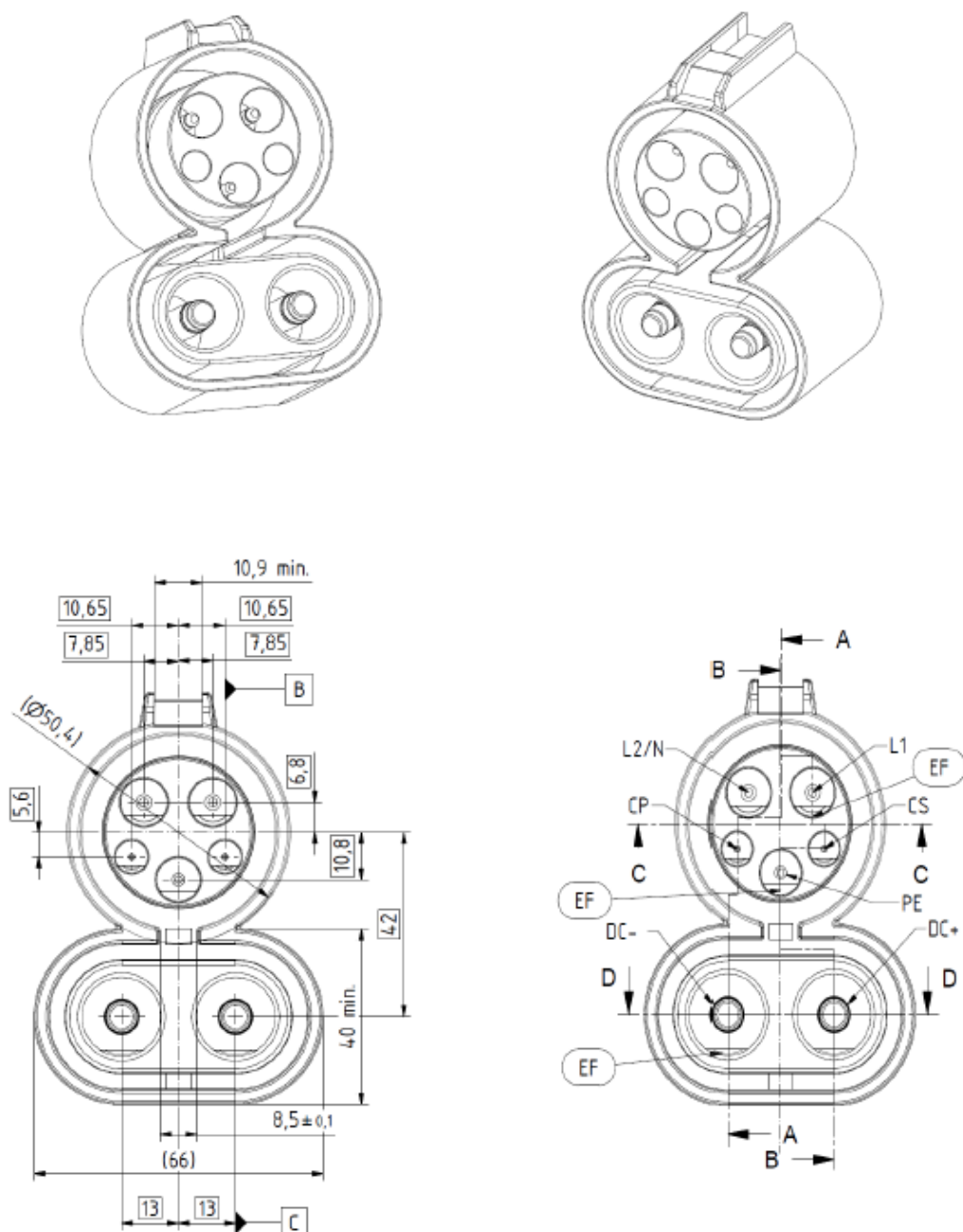
Name according to IEC 62196-2:2022 Standard Sheet 2-I	Functionality
L1	L1
L2	L2/N
PE	PE ^a
CP	CP ^a
PP	PP ^a
Additional DC power contacts	
DC+	DC+
DC-	DC-
^a Same function as in IEC 62196-2:2022, Configuration Type 1, Standard Sheet 2-I.	

CONFIGURATION EE**STANDARD SHEET 3-IIIa
VEHICLE INLET***Sheet 1*

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

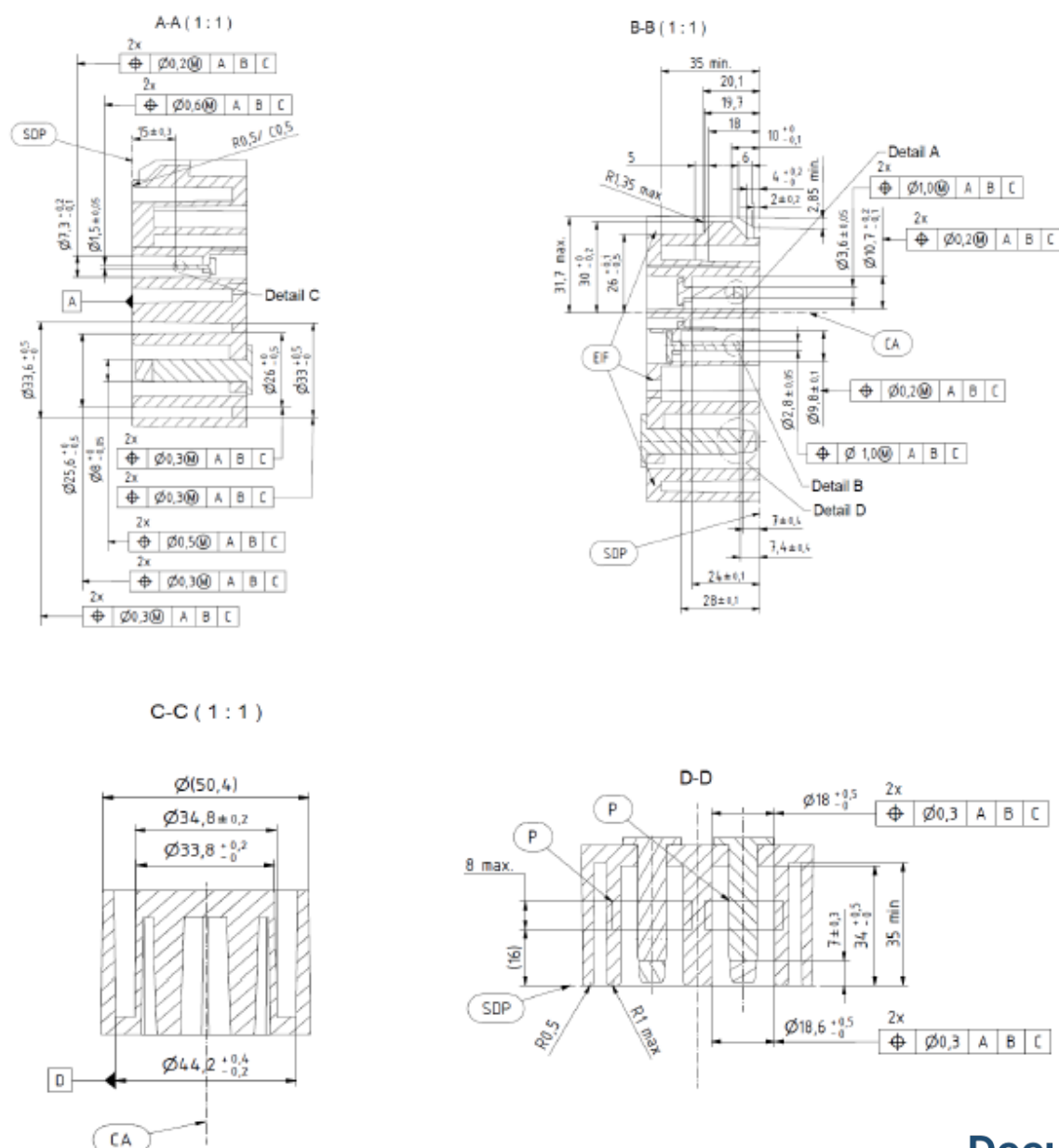
Dimensions in parentheses for reference



**CONFIGURATION EE****STANDARD SHEET 3-IIIa
VEHICLE INLET***Sheet 2 (continuation of Sheet 1)*

Sec note: Drawings in Standard Sheet to be improved at the next stage

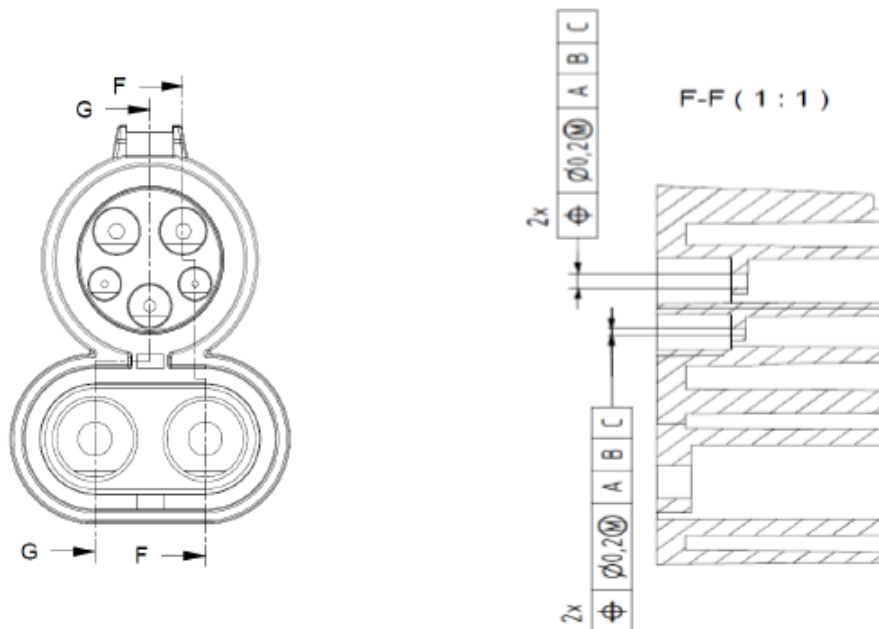
Dimensions in millimetres

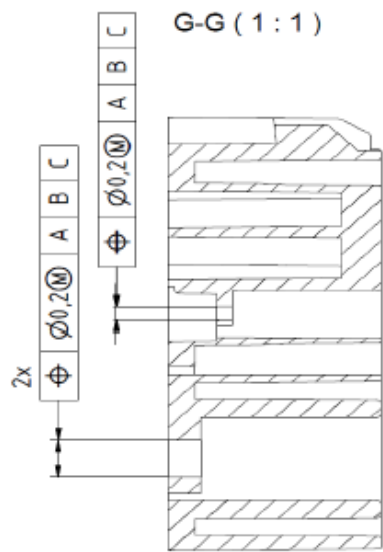


**CONFIGURATION EE****STANDARD SHEET 3-IIIa
VEHICLE INLET***Sheet 3 (continuation of Sheet 2)*

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres





Key (STANDARD SHEET 3-IIIa)

- SDP Standard datum plate
- POC Point of contact
- P Packing, sealing method (if any)
- EF Egress of fluids (if necessary)
- CA Centre axis
- CT Contact
- IC Isolated cap



756

757

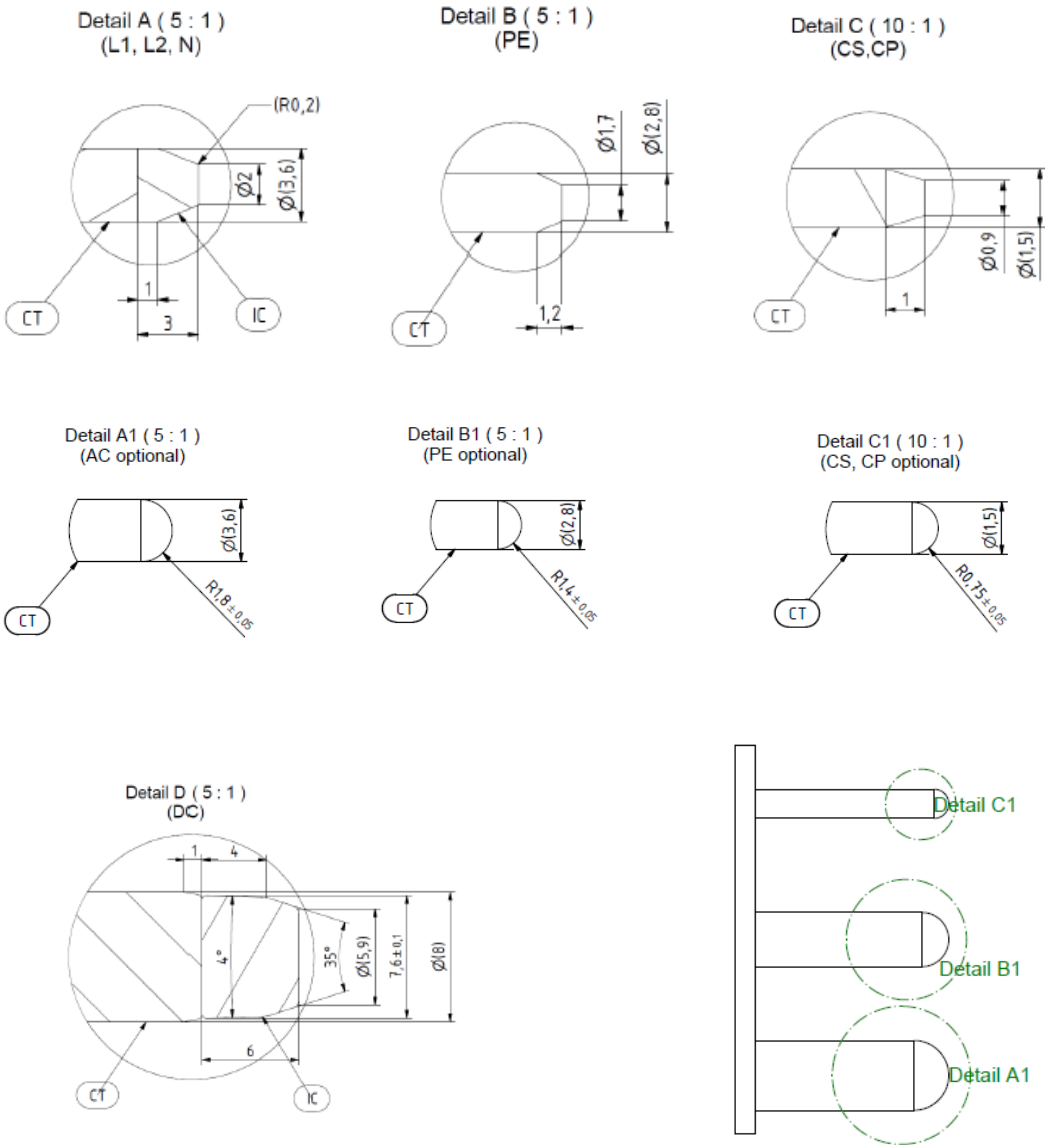
CONFIGURATION EE

STANDARD SHEET 3-IIIa
VEHICLE INLET

Sheet 4 (continuation of Sheet 3)

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres

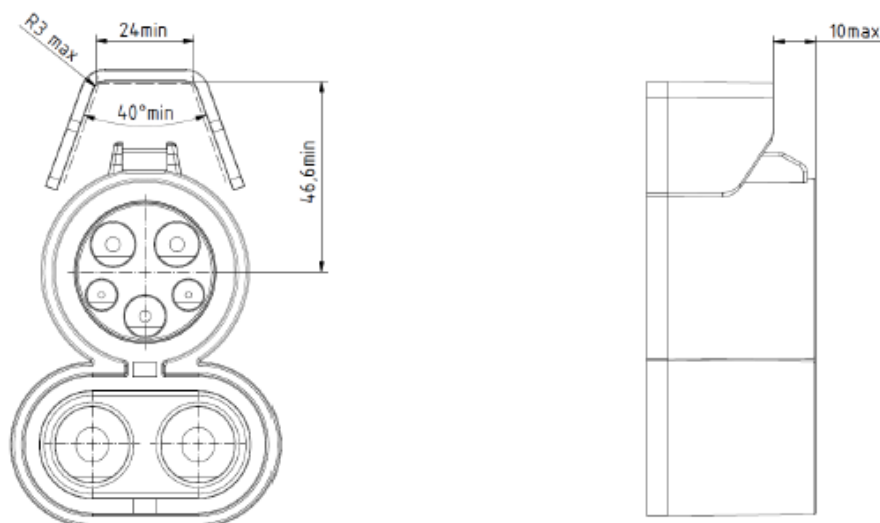


CONFIGURATION EE**STANDARD SHEET 3-IIIa
VEHICLE INLET***Sheet 5 (continuation of Sheet 4)*

Sec note: Drawings in Standard Sheet to be improved at the next stage

DETAIL E
Shroud (optional)

Dimensions in millimetres

**Notes to STANDARD SHEET 3-IIIa**

- 1 All dimensions in millimetres
- 2 Not used
- 3 General tolerance ISO 2768-mH
- 4 Standard datum plane
- 5 Space for optional face sealing
- 6 Dimension for CP contact sequence
- 7 Undimensioned radii R 0,5 to 0,7
- 8 Dimensions in parentheses for reference
- 9 Egress of fluid (if needed)
- 10 Not used
- 11 Optional shroud to cover the locking mechanism
- 12 Not used
- 13 Not used
- SDP Standard Datum Plane
- EF Egress of fluids
- CA Center axis of AC Part
- P Packing sealing (if any)

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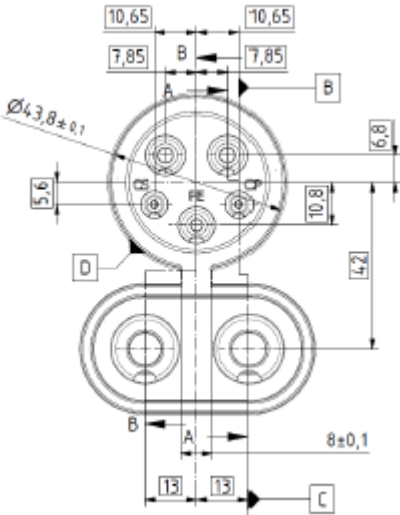
CONFIGURATION EE

STANDARD SHEET 3-IIIb
VEHICLE CONNECTOR

Sheet 1

Sec note: Drawings in Standard Sheet to be improved at the next stage

Dimensions in millimetres



Key (STANDARD SHEET 3-IIIb)

- SDP Standard datum plate
- POC Point of contact
- P Packing sealing method (if any)
- EF Egress of fluids (if necessary)
- CA Centre axis
- FIT Area connector shall fit inside
- ACP AC pin

