


Prüfbericht-Nr.: <i>Test report no.:</i>	CN24TFIX 001	Auftrags-Nr.: <i>Order no.:</i>	168472323	Seite 1 von 46 Page 1 of 46
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	2547805	Auftragsdatum: <i>Order date:</i>	2024-03-04	
Auftraggeber: <i>Client:</i>	Chongqing Pingchuang Institute of Semiconductors Co., Ltd. No.1 Hongyu Avenue, Biquan street, Bishan District, 402760 CHONGQING P.R. CHINA			
Prüfgegenstand: <i>Test item:</i>	DC EV charger			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k			
Auftrags-Inhalt: <i>Order content:</i>	CE-RED Certification			
Prüfgrundlage: <i>Test specification:</i>	EN IEC 61851-1:2019 EN 61851-23:2014 EN 61851-24:2014			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-03-11			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003737940-004			
Prüfzeitraum: <i>Testing period:</i>	2024-03-18 - 2024-05-14			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
erstellt von: <i>created by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	2024-06-26	Ausstellungsdatum: <i>Issue date:</i>	2024-06-26	
Stellung / Position:	Project Engineer	Stellung / Position:	Reviewer	
Sonstiges / <i>Other:</i>	1.The test report is for TÜV Rheinland RED approval, which is based on TÜV Rheinland test report CN24410B 001 for CB certification. 2.The completed test report includes the following documents: -Test report (46 pages including 2 pages cover page); -Attachment 1: Photo documentation (10 pages)			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugswise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht-Nr.: CN24TFIX 001
Test report no.:


Seite 2 von 46
Page 2 of 46

Anmerkungen
Remarks

1	<p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>
2	<p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature</p> <p><i>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature</i></p>
3	<p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p>
4	<p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p>



<p>TEST REPORT IEC 61851-24 Electric vehicle conductive charging system – Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging</p>	
Report Number.	CN24TFIX 001
Date of issue	See cover page
Total number of pages	See cover page
Name of Testing Laboratory preparing the Report	See cover page
Applicant's name	See cover page
Address	See cover page
Test specification:	
Standard	IEC 61851-24:2014 for use in conjunction with IEC 61851-23:2014 EN 61851-24:2014 for use in conjunction with EN 61851-23:2014
Test procedure	CE-RED Certification
Non-standard test method	N/A
Test Report Form No.	IEC61851_24A
Test Report Form(s) Originator	TUV SUD Product Service GmbH
Master TRF	Dated 2016-10
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General disclaimer:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.</p>	

Test item description	DC EV charger	
Trade Mark		
Manufacturer	Same as applicant	
Model/Type reference	PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k	
Ratings	PCDC-YZ4-EU80/1k, Input:400Vac (3P+N+PE), 50/60Hz, Max.123A Output:200-1000Vdc, Max.250A, Max. 80kW PCDC-YZ4-EU60/1k Input:400Vac (3P+N+PE), 50/60Hz, Max.92A Output:200-1000Vdc, Max.200A, Max. 60kW	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s): N/A		
<input type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	
Testing location/ address		
Tested by (name, function, signature)		
Approved by (name, function, signature) ..		
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) ..		
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address		
Tested by (name, function, signature)		
Witnessed by (name, function, signature) . :		
Approved by (name, function, signature) ..		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):

- Attachment 1: Photo Documentation (10 pages)

Summary of testing:**Tests performed (name of test and test clause):**

PCDC-YZ4-EU80/1k was subjected to full test and was found to comply with the requirements of EN 61851-24:2014

Testing location:

TÜV Rheinland (Shanghai) Co., Ltd.
No.177, 178, Lane 777 West Guangzhong Road,
Jing'an District, Shanghai, CHINA



Summary of compliance with National Differences (List of countries addressed):

No EU Group Differences


The product fulfils the requirements of EN 61851-24:2014 for use in conjunction with EN 61851-23:2014

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Product name	DC EV Charger		
Model	PCDC-YZ4-EU60/1k		
Serial Number	CD3E1PAA244H0001		
Date	Apr 2024		








Input AC Power	3P+N+PE	Output Voltage	DC 200~1000V
Rated Frequency	50/60Hz	Max Output Current	DC 200A
Input Voltage	AC 400V±10%	Operating Temperature	-30~50℃
Rated Input Current	92A	Protection Level	IP54, IK10
Rated Power	60kW	Number of charging cables	2*CCS2



Dimensions: 730mm*550mm*1800mm

Chongqing Pingchuang Institute of Semiconductors Co., Ltd.


No.1 Hongyu Avenue, Biquan Street, Bishan District, 402760 Chongqing, P.R. China

www.pingalax.com

Product name	DC EV Charger		
Model	PCDC-YZ4-EU80/1k		
Serial Number	CD3E2PAA244I0001		
Date	Apr 2024		








Input AC Power	3P+N+PE	Output Voltage	DC 200~1000V
Rated Frequency	50/60Hz	Max Output Current	DC 250A
Input Voltage	AC 400V±10%	Operating Temperature	-30~50℃
Rated Input Current	123A	Protection Level	IP54, IK10
Rated Power	80kW	Number of charging cables	2*CCS2

Dimensions: 730mm*550mm*1800mm

Chongqing Pingchuang Institute of Semiconductors Co., Ltd.

No.1 Hongyu Avenue, Biquan Street, Bishan District, 402760 Chongqing, P.R. China

www.pingalax.com

Test item particulars	
Equipment mobility	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains.....	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> service access area <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input checked="" type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Mains supply tolerance (%) or absolute mains supply values	10%
Considered current rating (A)	See page 6
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input type="checkbox"/> PD 2 <input checked="" type="checkbox"/> PD 3
IP protection class	IP54
Altitude during operation (m)	Below 2000
Output Connector Interface Type	See page 10
Mass of equipment (kg)	240kg
Possible test case verdicts:	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
Testing	
Date of receipt of test item.....	2024-03-11
Date (s) of performance of tests	2024-03-18 to 2024-05-14

General remarks:			
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>			
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60384-14:			
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable		
<p>When differences exist; they shall be identified in the General product information section.</p> <p>Name and address of factory (ies)..... : Chongqing Pingchuang Institute of Semiconductors Co., Ltd. No.1 Hongyu Avenue, Biquan street, Bishan District, 402760 CHONGQING P.R. CHINA</p>			
<p>General product information and other remarks:</p> <p>1. The charging system is Class I appliance with protection degree IP54 for indoor/outdoor used.</p> <p>2. The live part separated from metal enclosure by basic insulation. Main earthing terminal for fixed wiring was provided. The door is earthed to enclosure by wiring.</p> <p>3. The charging system is comprised of circuit breaker, power modules, control board, communication board, contactors, vehicle connector with cable (case C connection), emergency stop switch, touch screen, etc. Live parts separated from the earthed metal frame inside enclosure by B.I. The touch screen on enclosure is supplied by SELV output voltage of switch mode power supply.</p>			
Specifications			
Type designation		PCDC-YZ4-EU60/1k	PCDC-YZ4-EU80/1k
Supply	Power System	<input checked="" type="checkbox"/> TN-S <input checked="" type="checkbox"/> TN-C-S <input checked="" type="checkbox"/> TN-C <input type="checkbox"/> TT <input type="checkbox"/> IT <input type="checkbox"/> DC	
	Number of phases	<input type="checkbox"/> Single phase <input checked="" type="checkbox"/> 3 phase	
	Number of poles	3P+N+PE	
	Rated Voltage	400V~	
	Rated Current	92A Max.	123A Max.
	Rated Frequency	50/60Hz	
DC Output		<input type="checkbox"/> CCS1 <input checked="" type="checkbox"/> CCS2 <input type="checkbox"/> CAJ	
	Rated Voltage	200-1000VDC	
	Rated Current	200A	250A
	Rated Power	60kW	80kW

Equipment mobility	<input type="checkbox"/> Wall/pole/column/pipe-mounted <input type="checkbox"/> floor mounted <input checked="" type="checkbox"/> Ground mounted.
Construction	<input checked="" type="checkbox"/> Integrated-type <input type="checkbox"/> Split-type
split-type	<input type="checkbox"/> 1x power electronic converter unit <input type="checkbox"/> 1x pole <input type="checkbox"/> Pole
Input connection	<input checked="" type="checkbox"/> Permanently connected
EV charging mode	Mode 4
Type of EV connection	C
Output connection	See page 11
DC Charging System	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C
IP degree	IP54
Environmental condition	<input checked="" type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor
Pollution Degree	<input type="checkbox"/> PD II <input checked="" type="checkbox"/> PD III
Altitude	2000m
Isolation (AC-DC)	<input checked="" type="checkbox"/> Isolated (basic insulation): <u>for CCS2</u> <input type="checkbox"/> Isolated (reinforce insulation): <input type="checkbox"/> non-isolated: _____
<input type="checkbox"/> Bi-directional power flow control	<input checked="" type="checkbox"/> without inverter function <input type="checkbox"/> (bi-directional) grid-connected power converter (GCPC)
	<input type="checkbox"/> grid-connected AC port <input type="checkbox"/> off-grid AC port
High Power Charging (HPC)	<input type="checkbox"/> Yes: _____ <input checked="" type="checkbox"/> No
	Cooling system: _____
AC SPD	<input checked="" type="checkbox"/> Internal <input type="checkbox"/> external
Overvoltage Category	<input type="checkbox"/> I <input type="checkbox"/> II <input checked="" type="checkbox"/> III <input type="checkbox"/> IV
Rated impulse withstand voltage (U_{imp})	BI <input checked="" type="checkbox"/> 4kV RI or DI <input checked="" type="checkbox"/> 6kV
Maximum ambient temperature	<input type="checkbox"/> 40°C <input checked="" type="checkbox"/> 50°C
Minimum ambient temperature	<input type="checkbox"/> -5°C <input type="checkbox"/> -25°C <input checked="" type="checkbox"/> -30°C
Short-circuit protective device	<input checked="" type="checkbox"/> MCCB
SCPD specification	See Critical Components List
RCD	<input checked="" type="checkbox"/> Internal <input checked="" type="checkbox"/> external
Type	<input type="checkbox"/> Type B <input type="checkbox"/> Type A+DC 6mA <input checked="" type="checkbox"/> Type A 30mA (for AC input)
Rated current (I_n)	See Critical Components List

Rated residual operating current ($I_{\Delta n}$)	See Critical Components List	
rated conditional short-circuit current (I_{nc})	See Critical Components List	
Standard	See Critical Components List	
<input type="checkbox"/> Switch dis-connector (EN 60947-3)	---	
<input type="checkbox"/> AC Contactor (EN 60947-4-1)	---	
<input checked="" type="checkbox"/> DC Contactor (EN 60947-4-1)	See Critical Components List	
DC Fuse	See Critical Components List	
Relay (EN 61810-1)	See Critical Components List	
IMD	100k Ω (CCS2) 500k Ω (CCS2)	
Input cable	Rely on installation	
Nominal cross-sectional areas (mm ²)	Refer to the user manual	
Length (m)	Rely on installation	
Type of terminals	Refer to the user manual	
DC Vehicle connector	<input type="checkbox"/> Type 3-Ib (CAJ)	---
	<input type="checkbox"/> Type 3-IIa (CHINA)	---
	<input type="checkbox"/> Type 3-IIIb (CCS1, SAE J1772 Sheet C)	---
	<input checked="" type="checkbox"/> Type 3-IVc (CCS2)	See below
DC Output Cable (<input type="checkbox"/> Type 3-Ib (CAJ))	---	
Nominal cross-sectional areas (mm ²)	---	
Type of terminals	---	
Length (m)	---	
DC Output Cable (<input type="checkbox"/> Type 3-IIa (CHINA))	---	
Nominal cross-sectional areas (mm ²)	---	
Type of terminals	---	
Length (m)	---	

DC Output Cable (<input type="checkbox"/> Type 3-IIIb (CCS1, SAE J1772 Sheet C))	---
Nominal cross-sectional areas (mm ²)	---
Type of terminals	---
Length (m)	---
DC Output Cable (<input checked="" type="checkbox"/> Type 3-IVc (CCS2))	See Critical Components List
Nominal cross-sectional areas (mm ²)	See Critical Components List
Type of terminals	Fasten in copper bus by screw
Length (m)	5m
<input type="checkbox"/> AC Vehicle connector	<input type="checkbox"/> Type 2-I (SAE J1772 Sheet A)
	<input type="checkbox"/> Type 2-IIc
	<input type="checkbox"/> Type 2-IIe
<input type="checkbox"/> AC Output Cable (<input type="checkbox"/> Type 2-I (SAE J1772 Sheet A))	<input type="checkbox"/> EN 50620 <input type="checkbox"/> IEC 62893-3 <input type="checkbox"/> UL 62
Nominal cross-sectional areas (mm ²)	---
Type of terminals	---
Length (m)	---
<input type="checkbox"/> AC Output Cable (<input type="checkbox"/> Type 2-IIc)	<input type="checkbox"/> EN 50620 <input type="checkbox"/> IEC 62893-3
Nominal cross-sectional areas (mm ²)	---
Type of terminals	---
Length (m)	---
<input type="checkbox"/> AC Output Cable (<input type="checkbox"/> Type 2-IIe)	<input type="checkbox"/> EN 50620 <input type="checkbox"/> IEC 62893-3
Nominal cross-sectional areas (mm ²)	---
Type of terminals	---
Length (m)	---
<input type="checkbox"/> AC EV Socket outlet	<input type="checkbox"/> IEC/EN 62196 Type 2-II a <input type="checkbox"/> IEC/EN 62196 Type _____
Rating	AC _____ V _____ A
IK code	<input checked="" type="checkbox"/> IK10
Overall dimensions (H x W x D)	730x550x1800mm
Weight(kg)	240kg
Software	1.4.9

Optional functions	<input type="checkbox"/> Ventilation during supply of energy
	<input type="checkbox"/> Wake up of DC EV charging station by EV
	<input type="checkbox"/> Detection/adjustment of the real time available load current of the DC EV charging station (smart charging)
	<input type="checkbox"/> Selection of charging current
	<input type="checkbox"/> Indicating means to notify users of locked status of vehicle coupler
	<input type="checkbox"/> Others: _____

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict
4	SYSTEM CONFIGURATION		P
	The system configuration is in accordance with 102.2 of IEC 61851-23.		P
5	DIGITAL COMMUNICATION ARCHITECTURE		P
	Two digital communication architectures are used:		P
	– one, based on CAN using a dedicated data communication circuit; CAN protocol is given in ISO 11898-1; refer to Annex A and Annex B for specific implementation details; and		P
	– the other, based on Homeplug Green PHY™ ¹ over the control pilot line; refer to Annex C for specific implementation details.		P
6	CHARGING CONTROL PROCESS		P
	The charging control process is in accordance with 102.5 of IEC 61851-23.		P
7	OVERVIEW OF CHARGING CONTROL		P
	The digital communication of d.c. charging control covered by this standard is as shown in Figure 1.		P
8	EXCHANGED INFORMATION FOR D.C. CHARGING CONTROL		P
	Information which is exchanged between a d.c. EV charging station and a vehicle during the charging process according to IEC 61851-23.	(see appended Table 1)	P
	The information in Table 1 is common to all systems described in Annexes A, B and C.		P
	Each information listed in Table 1 is defined as a parameter in each annex.		P
	Each system may need additional parameters, and these parameters are defined in each annex.		P
ANNEX A	DIGITAL COMMUNICATION FOR CONTROL OF D.C. EV CHARGING SYSTEM A		N/A
A.1	General		N/A
	The specification of digital communication for control of the d.c EV charging station of system A (in this annex, referred to as "system A station" or "station") as specified in Annex AA of IEC 61851-23. More detailed information on system A is defined in JIS/TSD0007.		N/A
A.2	Digital communication actions during charging control process		N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict
	The communication actions and parameters according to the charging control process as defined in Table 103 of IEC 61851-23 are shown in Table A.1.	(see appended Table A.1)	N/A
A.3	Digital communication of d.c. charging control		N/A
	The parameters for digital communication of d.c. charging control are exchanged according to the sequence diagram as shown in Figure A.1.		N/A
A.4	Parameter definition		N/A
	The definition of parameters during d.c. charging control process are shown in Table A.2.	(see appended Table A.2)	N/A
A.5	Physical/data link layer		N/A
A.5.1	Specifications		N/A
	The physical/data link layer specifications are shown in Table A.3.	(see appended Table A.3)	N/A
A.5.2	Communication circuit		N/A
	The CAN communication circuit is established to exchange parameters, i.e. voltage, current, status flags, and fault flags, which are necessary for the charging control.		N/A
	– Terminating resistor 1:1 communication is assumed.		N/A
	The vehicle and the d.c. EV charging station are equipped with terminating resistors.		N/A
	– Noise filter The vehicle and the d.c. EV charging station are equipped with noise filters to reduce the conducted noise of the common mode and differential mode.		N/A
	– Twisted-pair line Twisted pair line are utilized as the communication line that links the d.c. EV charging station with the vehicle so as to reduce differential mode noise.		N/A
	– CAN transceiver CAN transceiver is equipped to send and receive CAN communication data.		N/A
	The CAN-bus circuit is established independently for d.c. charging, as shown in Figure A.2.		N/A
A.5.3	Transmission		N/A
	Data frames are transmitted in ascending order of ID number specified in Table A.2.		N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict
	The data frames are continuously transmitted at 100 ms ($\pm 10\%$) interval through the charging process.		N/A
	Interval duration (ms).....:		--
A.5.4	Reception		N/A
	When the vehicle or the d.c. EV charging station receives data frames from the other party, the received frames are echoed.		N/A
	Furthermore, the received error frames are destroyed.		N/A
A.5.5	CAN communication		N/A
	Figure A.3 shows the basic specifications related to the dedicated CAN communication between the vehicle and the d.c. EV charging station.		N/A
ANNEX B	DIGITAL COMMUNICATION FOR CONTROL OF D.C. EV CHARGING SYSTEM B		N/A
B.1	General		N/A
	The specification of d.c. charging control digital communication for the d.c EV charging station of system B (in this annex, referred to as "System B station" or "charger") as specified in Annex BB of IEC 61851-23.		N/A
B.2	Digital communication of d.c. charging control		N/A
	The parameters for digital communication of d.c. charging control are exchanged according to the sequence diagram as shown in Figure B.1.		N/A
B.3	Digital communication actions during charging control process		N/A
	The communication actions and parameters during d.c. charging control process are shown in Table B.1.	(see appended Table B.1)	N/A
B.4	Parameter definition		N/A
	The definition of parameters during d.c. charging control process are shown in Tables B.2, B.3, B.4, B.5 and B.6.	(see appended Tables B.2, B.3, B.4, B.5, and B.6)	N/A
B.5	Physical/data link layer		N/A
	The physical/data link layer specifications are shown in Table B.7.	(see appended Table B.7)	N/A
	The physical/data link layer refers to SAE J1939-11 and SAE J1939-21.		N/A
	The application layer refers to GB/T 27930.		N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX C	DIGITAL COMMUNICATION FOR CONTROL OF D.C. CHARGING SYSTEM C (COMBINED SYSTEM)		P
C.1	General		P
	The digital communication for the d.c EV charging station of system C as specified in Annex CC of IEC 61851-23 is defined in the following standards: DIN SPEC 70121, ISO/IEC 15118-1, ISO/IEC 15118-2 and ISO/IEC 15118-3.		P
	The following SAE specifications can also be used as information: SAE J2836/2™, SAE J2847/2, SAE J2931/1 and SAE J2931/4.		P
	Systems implementing these specifications incorporate the following features:		P
	• security concept including encryption, signing, key management, etc.		P
	• robust PLC-based communications,		P
	• automatic address assigning and association,		P
	• IPv6-based communications,		P
	• compressed XML messages,		P
	• client-server approach,		P
	• safety concept including cable check, welding detection, etc.		P
	• extension concept for added-value services.		P
C.2	Required exchange parameters		P
	The parameters to be exchanged for d.c. charging control are shown in Table C.1, corresponding to Table 1.	(see appended Table C.1)	P
	Additional parameters can be found in DIN SPEC 70121 and ISO/IEC 15118-2.		P

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

8		TABLE 1: Exchanged information for d.c. charging control			P
No.	Information	Description	Relevant requirement in IEC 61851-23 (unless specified as IEC 61851-1)	Other remarks	Verdict
a-1	Current request for the controlled current charging (CCC) system	Exchange of current value requested by EV	6.4.3.101, DC supply	--	P
a-2	Voltage request for the controlled voltage charging (CVC) system	Exchange of voltage value requested by EV	6.4.3.101, DC supply	--	P
a-3	Maximum rated voltage of d.c. EV charging station	Exchange of maximum rated voltage value of d.c. EV charging station	6.4.3.101, DC supply	--	P
			6.4.3.105, Compatibility assessment	--	P
			6.4.3.107, Protection against overvoltage at the battery	--	P
a-4	Maximum rated current of d.c. EV charging station	Exchange of maximum rated current value of d.c. EV charging station	6.4.3.101, DC supply for EV	--	P
			6.4.3.105, Compatibility assessment	--	P
b-1	Communication protocol	Exchange of software version of a charging system	6.4.3.105, Compatibility assessment	--	P

IEC 61851-24					
Clause	Requirement + Test		Result - Remark		Verdict
b-2	Maximum voltage limit of EV	Exchange of maximum voltage limit value of vehicle.	6.4.3.105, Compatibility assessment	--	P
b-3	EV minimum current limit, only for the controlled voltage charging (CVC) system	not defined yet	6.4.3.105, Compatibility assessment	--	P
c	Insulation test result	Exchange of the result of insulation test before charging	6.4.3.106, Insulation test before charging	--	P
		- If insulation test fails, a signal is sent that charging is not allowed.	6.4.3.106, Insulation test before charging	--	P
d	Short circuit test before charging	Exchange of information on short circuit test before charging	6.4.3.110, Short circuit test before charging	--	P
e	Charging stopped by user	Exchange of information on charge stop command by the user of d.c. EV charging station	6.4.3.111, User initiated shutdown	--	P
f	EVSE real time available load current (optional)	Exchange of EVSE real time available load current for demand management. Required for system providing that function.	6.4.4.2 (of IEC 61851-1), Detection/adjustment of the real time available load current of EVSE	--	P
g	Loss of digital communication	Detection of loss of digital communication	9.4, Breaking capacity	--	P

IEC 61851-24					
Clause	Requirement + Test		Result - Remark		Verdict
		- If a receiver does not get information expected to receive within time out period, it is considered as loss of digital communication.	9.4, Breaking capacity	--	P
h-1	Zero current confirmed	Notification of zero current confirmed	102.5, Charging control process and state	--	P
		- Station informs EV that low current condition has been met (to allow connector unlocking)	102.5, Charging control process and state	--	P
h-2	Welding detection	Exchange of information on the whole process of welding detection	102.5, Charging control process and state	--	P
Supplementary information:					

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A.2		TABLE A.1 – Communication actions and parameters during d.c. charging control process between system A station and vehicle						N/A
Charging control stage	State	High level action at system level ^a	Digital communication action	Parameter			Verdict	
				From d.c. EV charging station	From vehicle	Other remarks		
⊖ = ⊗ ⊘ ⊙	DC-A	Vehicle unconnected	None	N/A	N/A	--	N/A	
	DC-B1	Connector plugged in	None	N/A	N/A	--	N/A	
	DC-B1	Wake up of DCCCF and VCCF	None	None	(default CAN)	--	N/A	
		Communication data initialization	Preparation for digital communication	(default CAN)	(default CAN)	--	N/A	

IEC 61851-24								
Clause	Requirement + Test				Result - Remark			Verdict
		DC-B1 → DC-B2	Communication established, parameters exchanged, and compatibility checked	Exchange of charging control parameters	- Control protocol number - Available output voltage - Available output current - Battery incompatibility	- Control protocol number - Rated capacity of battery - Maximum battery voltage - Maximum charging time - Target battery voltage - Vehicle charging enabled	--	N/A
	Charge preparation	DC-B2 → DC-B3	Connector locked	Notification of connector locked status	- Vehicle connector lock	None	--	N/A
		DC-B3	Insulation test for d.c. power line	None	Charging system malfunction	None	--	N/A
		DC-B3	Pre-charge (depending on the system architecture)	N/A	N/A	N/A	--	N/A
Energy transfer		DC-C or DC-D	Vehicle side contactors closed	Notification of vehicle main contactor closed status	None	None	--	N/A

IEC 61851-24							
Clause	Requirement + Test			Result - Remark			Verdict
	DC-C or DC-D	Charging by current demand (for CCC)	Notification of request value of charging current (or voltage)	<ul style="list-style-type: none"> - Station status - Output voltage - Output current - Remaining charging time - Station malfunction - Charging system malfunction 	<ul style="list-style-type: none"> - Charging current request - Charging system fault - Vehicle shift lever position 	--	N/A
	DC-C or DC-D	Charging by voltage demand (for CVC)	N/A	N/A	N/A	--	N/A
	DC-C,(D) → DC-B'1	Current suppression	Request of energy transfer shut-off	<ul style="list-style-type: none"> - Station status - Charging stop control - Output voltage - Output current 	Vehicle charging enabled	--	N/A
Shutdown	DC-B'1	Zero current confirmed	Notification of energy transfer shut-off	<ul style="list-style-type: none"> - Station status - Charging system malfunction 	-	--	N/A
	DC-B'1 → DC-B'2	Welding detection (by vehicle)	-	None	None	--	N/A
	DC-B'2	Vehicle side contactors open	None	None	None	--	N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

	DC-B'2	DC power line voltage verification	Notification of present voltage	Output voltage	None	--	N/A
	DC-B'3	Connector unlocked	Notification of connector unlocked status	Vehicle connector lock	None	--	N/A
	DC-B'4	End of charge at communication level	Terminate the digital communication	None	None	--	N/A
	DC-A	Connector unplugged		N/A	N/A	--	N/A

^a The order of actions does not refer to the procedure of charging control process.

Supplementary information:

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A.4		TABLE A.2 – Exchanged parameter during d.c. charging control process between system A station and vehicle									N/A
Item in Table 1	Parameter	Content	CAN ID ID.byte (bit)	Source	Destination	Data update rate	Unit	Status flag	Resolution (range)	Other remarks	Verdict
b-2	Maximum battery voltage	The maximum voltage value at the vehicle inlet terminals, at which the station stops charging to protect the vehicle battery	H'100.4 H'100.5	EV	System A station	100 ms	V	-	1 V/bit	--	N/A
	Rated capacity of battery	Rated capacity of battery	H'101.5 H'101.6	EV	System A station	100 ms	kWh	-	0,1 kWh/bit	--	N/A
	Constant of charging rate indication	Fixed value for charging rate indication, which is the maximum charging rate (100 %) of vehicle battery	H'100.6	EV	System A station	100 ms	%	-	1 %/bit, 100 % (fixed)	--	N/A

IEC 61851-24											
Clause	Requirement + Test						Result - Remark				Verdict
	Maximum charging time (set by 10 s)	Maximum charging time permitted by EV, set by 10 s	H'101.1	EV	System A station	100 ms	s	-	10 s/bit (0 to 2 540 s)	--	N/A
	Maximum charging time (set by minute)	Maximum charging time permitted by EV, set by minute	H'101.2	EV	System A station	100 ms	min	-	1 min/bit (0 to 255 min)	--	N/A
	Estimated charging time	Estimated remaining time before the end of charging calculated by EV	H'101.3	EV	System A station	100 ms	min	-	1 min/bit (0 to 254 min)	--	N/A
b-1	Control protocol number	Software version of control protocol to which EV corresponds	H'102.0	EV	System A station	100 ms	-	-	1 /bit (0 to 255)	--	N/A
	Target battery voltage	Targeted charging voltage at the vehicle inlet terminals	H'102.1 H'102.2	EV	System A station	100 ms	V	-	1 V/bit (0 to 600 V)	--	N/A

IEC 61851-24											
Clause		Requirement + Test					Result - Remark				Verdict
a-1	Charging-current-request	Current value requested by EV during charging	H'102.3	EV	System A station	100 ms	A	-	1 A/bit (0 to 255 A)	--	N/A
	Charging rate	Charging rate of vehicle battery	H'102.6	EV	System A station	100 ms	%	-	1 %/bit (0 % to 100 %)	--	N/A
g	Vehicle charging enabled	Status flag indicating charge permission status of EV	H'102.5(0)	EV	System A station	-	-	0: disabled 1: enabled	-	--	N/A
	Vehicle shift lever position	Status flag indicating the shift lever position	H'102.5(1)	EV	System A station	-	-	0: "Parking" position 1: other position	-	--	N/A
	Charging system fault	Status flag indicating a malfunction caused by EV or the station, and detected by EV	H'102.5(2)	EV	System A station	-	-	0: normal 1: fault	-	--	N/A

IEC 61851-24											
Clause		Requirement + Test					Result - Remark				Verdict
	Vehicle status	Status flag indicating the EV contactor status	H'102.5(3)	EV	System A station	-	-	0: EV contactor closed or during welding detection, 1: EV contactor open or welding detection finished	-	--	N/A
	Normal stop request before charging	Status flag indicating the request of EV to stop charging control	H'102.5(4)	EV	System A station	-	-	0: no request 1: request to stop	-	--	N/A

IEC 61851-24											
Clause	Requirement + Test							Result - Remark			Verdict
	Battery overvoltage	Status flag indicating whether or not the vehicle battery voltage exceeds the maximum limit specified by EV	H'102.4(0)	EV	System A station	-	-	0: normal, 1: fault	-	--	N/A
	Battery undervoltage	Status flag indicating whether or not the vehicle battery voltage is less than the lower limit specified by EV	H'102.4(1)	EV	System A station	-	-	0: normal 1: fault	-	--	N/A
	Battery current deviation error	Status flag indicating whether or not the output current deviates from EV requested current	H'102.4(2)	EV	System A station	-	-	0: normal 1: fault	-	--	N/A

IEC 61851-24											
Clause	Requirement + Test							Result - Remark			Verdict
	High battery temperature	Status flag indicating whether or not the temperature of vehicle battery exceeds the maximum limit	H'102.4(3)	EV	System A station	-	-	0: normal 1: fault	-	--	N/A
	Battery voltage deviation error	Status flag indicating whether or not the vehicle battery voltage deviates from the output voltage measured by the station	H'102.4(4)	EV	System A station	-	-	0: normal, 1: fault	-	--	N/A

IEC 61851-24											
Clause	Requirement + Test						Result - Remark				Verdict
h-2	EV contactor welding detection support identifier	Identifier indicating whether or not the station deals with EV contactor welding detection	H'108.0	System A station	EV	100 ms	-	0: not supporting vehicle welding detection, 1 or more: supporting vehicle welding detection	-	--	N/A
a-3	Available output voltage	Maximum output voltage value at the vehicle connector terminals	H'108.1 H'108.2	System A station	EV	100 ms	V	-	1 V/bit (0 to 600 V)	--	N/A
a-4	Available output current	Maximum output current value of the station	H'108.3	System A station	EV	100 ms	A	-	1 A/bit (0 to 255 A)	--	N/A
b-2	Threshold voltage	Threshold voltage to stop the charging process in order to protect vehicle battery	H'108.4 H'108.5	System A station	EV	100 ms	V	-	1 V/bit (0 to 600 V)	--	N/A

IEC 61851-24											
Clause		Requirement + Test						Result - Remark			Verdict
b-1	Control protocol number	Software version number of control protocol or charging sequences that the station deals with	H'109.0	System A station	EV	100 ms	-	-	1 / bit (0 to 255)	--	N/A
	Output voltage	Supply voltage value of the output circuit in the station	H'109.1 H'109.2	System A station	EV	100 ms	V	-	1 V/bit (0 to 600 V)	--	N/A
	Output current	Supply current value of the output circuit in the station	H'109.3	System A station	EV	100 ms	A	-	1 A/bit (0 to 255 A)	--	N/A
	Remaining charging time (counted by 10 s)	Remaining time before the end of charging (counted by 10 s)	H'109.6	System A station	EV	100 ms	s	-	10 s/bit (0 to 2540 s)	--	N/A
	Remaining charging time (counted by min)	Remaining time before the end of charging (counted by min)	H'109.7	System A station	EV	100 ms	min	-	1 min/bit (0 to 255 min)	--	N/A

IEC 61851-24												
Clause		Requirement + Test						Result - Remark				Verdict
c h-1	Station status	Status flag indicating the energy transfer from the station	H'109.5(0)	System A station	EV	100 ms	-	0: standby 1: charging	-	--	N/A	
	Station malfunction	Status flag indicating whether or not there is a malfunction caused by the station	H'109.5(1)	System A station	EV	100 ms	-	0: normal, 1: fault	-	--	N/A	
	Vehicle connector lock	Status flag indicating the electromagnetic lock status of vehicle connector	H'109.5(2)	System A station	EV	100 ms	-	0: unlocked 1: locked	-	--	N/A	
	Battery in-compatibility	Status flag indicating the compatibility of vehicle battery with the output voltage of station	H'109.5(3)	System A station	EV	100 ms	-	0: compatible 1: in compatible	-	--	N/A	

IEC 61851-24												
Clause		Requirement + Test						Result - Remark				Verdict
d	Charging system malfunction	Status flag indicating whether or not there is a problem with EV, such as improper connection	H'109.5(4)	System A station	EV	100 ms	-	0: normal 1: mal function	-	--	N/A	
e	Charger stop control	Status flag indicating whether or not the station proceeds with shutdown process	H'109.5(5)	System A station	EV	100 ms	-	0: operating, 1: shutdown or stop charging	-	--	N/A	

ANNEX 5.1	TABLE A.3 – The physical/data link layer specifications for system A				N/A
				Other remarks	Verdict
Communication system	Communication protocol	ISO 11898-1 and ISO 11898-2 The extension bit (12 - 29 bit) is not used.		--	N/A
	Transmission rate (kbps)	500		--	N/A
	Cycle	100 ms ± 10 %		--	N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

ANNEX B.3	TABLE B.1 – Communication actions and parameters during d.c. charging control process between system B station and vehicle						N/A
Charging control stage (process)	Digital communication action	Information	Source	Destination	Parameter cycle	Other remarks	Verdict
Handshaking	Confirm the necessary parameters of battery and charger.	Charger recognition parameter	Charger	Vehicle	250 ms	--	N/A
		Vehicle recognition parameter	Vehicle	Charger	250 ms	--	N/A
Charging parameter configuration	Exchange of charging control parameters.	Battery charge parameter	Vehicle	Charger	500 ms	--	N/A
		Charger time synchronization	Charger	Vehicle	500 ms	--	N/A
		Charger max/min output parameter	Charger	Vehicle	250 ms	--	N/A
		Vehicle charge ready	Vehicle	Charger	250 ms	--	N/A
		Charger output ready	Charger	Vehicle	250 ms	--	N/A
Charging stage	Send charging status to each other, according to the battery charge level requirements sent by	Battery charge requirement	Vehicle	Charger	50 ms	--	N/A
		Charger charge status	Charger	Vehicle	50 ms	--	N/A

IEC 61851-24							
Clause	Requirement + Test	Result - Remark					Verdict
	Vehicle; the charger adjusts the charging process.	Battery charge status 1	Vehicle	Charger	250 ms	--	N/A
		Battery charge status 2	Vehicle	Charger	250 ms	--	N/A
		Battery cell voltage	Vehicle	Charger	1 s	--	N/A
		Battery temperature	Vehicle	Charger	1 s	--	N/A
		Vehicle stopping command	Vehicle	Charger	10 ms	--	N/A
		Charger stopping command	Charger	Vehicle	10 ms	--	N/A
Charging ending stage	Energy transfer shut-off.	Vehicle statistic data	Vehicle	Charger	250 ms	--	N/A
		Charger statistic data	Charger	Vehicle	250 ms	--	N/A
Communication error	Restart communication program or stop charging process.	Vehicle receiving error	Vehicle	Charger	250 ms	--	N/A
		Charger receiving error	Charger	Vehicle	250 ms	--	N/A
Supplementary information:							

ANNEX B.4	TABLE B.2 – Parameters in charge handshake stage for system B							N/A
Information	Parameter	M ^a / O ^b	Unit	Resolution	Status flag	Item in Table 1	Other remarks	Verdict

IEC 61851-24								
Clause	Requirement + Test	Result - Remark					Verdict	
Charger recognition parameter	Recognition result	M	-	-	0x00: unrecognized 0xAA: re-cognized	-	--	N/A
	Charger number	M	-	-	-	-	--	N/A
	Charger/charge station location code	O	-	-	-	-	--	N/A
Vehicle recognition parameter	Vehicle communication protocol version	M	-	-	-	b-1	--	N/A
	Battery type code	M	-	-	-	-	--	N/A
	Battery system rated capacity	M	Ah	0,1 Ah/bit	-	-	--	N/A
	Battery system rated voltage	M	V	0,1 V/bit	-	-	--	N/A
	Battery manufacturer code, ASCII	O	-	-	-	-	--	N/A
^a M = Mandatory ^b O = Optional NOTE The communication protocol version includes 3 bytes. The current version is V1.0, which is expressed: Byte 3, Byte 2 – 0001H; Byte1 – 00H.								
Supplementary information:								

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX B.4	TABLE B.3 – Parameters in charge parameter configuration stage for system B							N/A
Information	Parameter	M ^a /O ^b	Unit	Resolution	Status flag	Item in Table 1	Other remarks	Verdict
Battery charge parameter	Maximum permissible charge voltage of battery cell	M	V	0,01 V/bit	-	-	--	N/A
	Maximum permissible charge current	M	A	0,1 A/bit	-	-	--	N/A
	Maximum permissible charge energy	M	kWh	0,1 kWh/bit	-	-	--	N/A
	Maximum permissible charge voltage of battery system	M	V	0,1 V/bit	-	b-2	--	N/A
	Maximum permissible temperature	M	°C	1 °C/bit	-	-	--	N/A
	The initial SOC	M	%	0,1 %/bit	-	-	--	N/A
	Total voltage of battery system	M	V	0,1 V/bit	-	-	--	N/A
Charger time synchronization	Year/month/date/hour/minute/second	O	-	-	-	-	--	N/A
Charger max/min	Maximum output voltage	M	V	0,1 V/bit	-	a-3	--	N/A

IEC 61851-24								
Clause	Requirement + Test	Result - Remark					Verdict	
output parameter	Minimum output voltage	M	V	0,1 V/bit	-	-	--	N/A
	Maximum output current	M	A	0,1 A/bit	-	a-4	--	N/A
Vehicle charge ready	If the vehicle is ready to be charged	M	-	-	0x00: unready 0xAA: ready	-	--	N/A
Charger output ready	If the charger is ready to charge	M	-	-	0x00: unready 0xAA: ready	-	--	N/A
^a M = Mandatory ^b O = Optional								
Supplementary information:								

ANNEX B.4	TABLE B.4 – Parameters in charging stage for system B							N/A
Information	Parameter	M ^a /O ^b	Unit	Resolution	Status flag	Item in Table 1	Other remarks	Verdict
Battery charge requirement	Voltage requirement	M	V	0,1 V/bit	-	a-2	--	N/A
	Current requirement	M	A	0,1 A/bit	-	a-1	--	N/A

IEC 61851-24								
Clause	Requirement + Test	Result - Remark					Verdict	
	Charge mode	M	-	-	-	-	--	N/A
Charger charge state	Output voltage	M	V	0,1 V/bit	-	-	--	N/A
	Output current	M	A	0,1 A/bit	-	h-1	--	N/A
	Accumulated charge time	M	min	1 min/bit	-	-	--	N/A
Battery charge state 1	Measured charge voltage	M	V	0,1 V/bit	-	-	--	N/A
	Measured charge current	M	A	0,1 A/bit	-	-	--	N/A
	Maximum cell voltage and corresponding battery pack number ^c	M	V	0,01 V/bit	-	-	--	N/A
	SOC	M	%	1 %/bit	-	-	--	N/A
	Estimated remainder time	M	min	1 min/bit	-	-	--	N/A
Battery charge state 2	Cell number of maximum cell voltage	M	-	-	-	-	--	N/A
	Maximum battery temperature	M	°C	1 °C/bit	-	-	--	N/A
	Test point number of maximum temperature	M		-	-	-	--	N/A

IEC 61851-24								
Clause	Requirement + Test				Result - Remark			Verdict
	Minimum battery temperature	M	°C	1 °C/bit	-	-	--	N/A
	Test point number of minimum temperature	M	-	-	-	-	--	N/A
	Cell voltage over-high	M	-	-	0: normal 1: over-high	-	--	N/A
	Cell voltage over-low	M	-	-	0: normal 1: over-low	-	--	N/A
	Battery charge overcurrent	M	-	-	0: normal 1: over-current	-	--	N/A
	Battery temperature overhigh	M	-	-	0: normal 1: over-high	-	--	N/A

IEC 61851-24								
Clause	Requirement + Test					Result - Remark		Verdict
	Battery insulation state	M	-	-	0: normal 1: abnormal	-	--	N/A
	Connection state of battery output connector	M	-	-	0: normal 1: abnormal	-	--	N/A
	Charge permission	M	-	-	0: forbidden 1: permission	c, d	--	N/A
Battery cell voltage	Voltage of each battery cell	O	V	0,01 V/bit	-	-	--	N/A
Battery temperature	Temperature of each test point	O	°C	1 °C/bit	-	-	--	N/A
Vehicle stopping command	Vehiclestopping reason	M	-	-	-	-	--	N/A
	Vehiclestopping failure reason	M	-	-	-	h-2	--	N/A
	Vehicle stopping error reason	M	-	-	-	-	--	N/A
Charger stopping	Charger stopping reason	M	-	-	-	e	--	N/A

IEC 61851-24								
Clause	Requirement + Test					Result - Remark		Verdict
command	Charger stopping failure reason	M	-	-	-	-	--	N/A
	Charger stopping error reason	M	-	-	-	-	--	N/A
^a M = Mandatory ^b O = Optional ^c Maximum cell voltage and corresponding battery pack number includes 2 bytes. 1 – 12 bit: the maximum cell voltage in the battery system, 0,01 V/bit; 13 – 16 bit: the battery pack number in which the maximum cell voltage has occurred, 1/bit.								
Supplementary information:								

ANNEX B.4	TABLE B.5 – Parameters in charge ending stage for system B							N/A
Information	Parameter	M ^a /O ^b	Unit	Resolution	Status flag	Item in Table 1	Other remarks	Verdict
Vehicle statistic data	The final SOC	M	%	1 % /bit	-	-	--	N/A
	Minimum cell voltage	M	V	0,01 V/bit	-	-	--	N/A
	Maximum cell voltage	M	V	0,01 V/bit	-	-	--	N/A
	Minimum battery temperature	M	°C	1 °C/bit	-	-	--	N/A
	Maximum battery temperature	M	°C	1 °C/bit	-	-	--	N/A

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

Charger statistic data	Accumulated charge time	M	min	1 min/bit	-	-	--	N/A
	Accumulated output energy	M	kWh	0,1 kWh/bit	-	-	--	N/A

^a M = Mandatory

^b O = Optional

Supplementary information:

ANNEX B.4	TABLE B.6 – Error parameters for system B	N/A
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Information	Parameter	M ^a /O ^b	Unit	Resolution	Status flag	Item in Table 1	Other remarks	Verdict
Vehicle receiving error	Receiving timeout of information from charger	M	-	-	-	g	--	N/A
Charger receiving error	Receiving timeout of information from vehicle	M	-	-	-	g	--	N/A

^a M = Mandatory

^b O = Optional

Supplementary information:

ANNEX B.5	TABLE B.7 – Physical/data link layer specifications for system B	N/A
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IEC 61851-24					
Clause	Requirement + Test	Result - Remark		Verdict	
			Other remarks	Verdict	
Communication system	Communication protocol	CAN 2,0 B, ISO 11898-1		--	N/A
	Transmission rate (kbps)	250		--	N/A
	Cycle	10/50/250/500/1 000 ms \pm 10 %		--	N/A
Supplementary information:					

IEC 61851-24			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX C.2		TABLE C.1 – Required exchanged parameters for d.c. charging control for system C		
Item in Table 1	Information	Parameter name (ISO/IEC 15118-2)	Other remarks	Verdict
a-1	Current request for the controlled current charging (CCC) system	CurrentDemandReq/EVTargetCurrent	--	P
a-2	Voltage request for the controlled voltage charging (CVC) system	CurrentDemandReq/EVTargetVoltage	--	P
a-3	Maximum rated voltage of d.c. EV charging station	CurrentDemandRes/EVSEMaximumVoltageLimit	--	P
a-4	Maximum rated current of d.c. EV charging station	CurrentDemandRes/EVSEMaximumCurrentLimit	--	P
b-1	Communication protocol	supportedAppProtocol{Req,Res}	--	P
b-2	Maximum voltage limit of EV	CurrentDemandReq/EVMaximumVoltageLimit	--	P
b-3	EV minimum current limit, only for the controlled voltage charging (CVC) system	ChargeParameterDiscoveryRes / DC_EVSEChargeParameter / EVSEMinimumCurrentLimit	--	P
c	Insulation test result	{PowerDeliveryRes, CableCheckRes, PreChargeRes, CurrentDemandRes, WeldingDetectionRes} / DC_EVSEStatus / EVSEIsolationStatus	--	P
d	Short circuit test before charging	CableCheck{Req,Res}	--	P

IEC 61851-24				
Clause	Requirement + Test	Result - Remark	Verdict	
e	Charging stopped by user	{ChargeParameterDiscoveryRes, PowerDeliveryRes, CableCheckRes, PreChargeRes, CurrentDemandRes, WeldingDetectionRes} / DC_EVSEStatus / EVSEStatusCode / EVSE_Shutdown {ChargeParameterDiscoveryRes, PowerDeliveryRes, CableCheckRes, PreChargeRes, CurrentDemandRes, WeldingDetectionRes} / DC_EVSEStatus / EVSENotification / StopCharging	--	P
f	EVSE real time available load current (optional)	CurrentDemandRes/EVSEMaximumCurrentLimit	--	P
g	Loss of digital communication	Message timers Control pilot state	--	P
h-1	Zero current confirmed	PowerDeliveryRes/ResponseCode CurrentDemandRes/EVSEPresentCurrent	--	P
h-2	Welding detection	WeldingDetection{Req, Res}	--	P
Supplementary information:				

END OF REPORT

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 1 Overview



Figure 2 Overview

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 3 Overview



Figure 4 Overview

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k

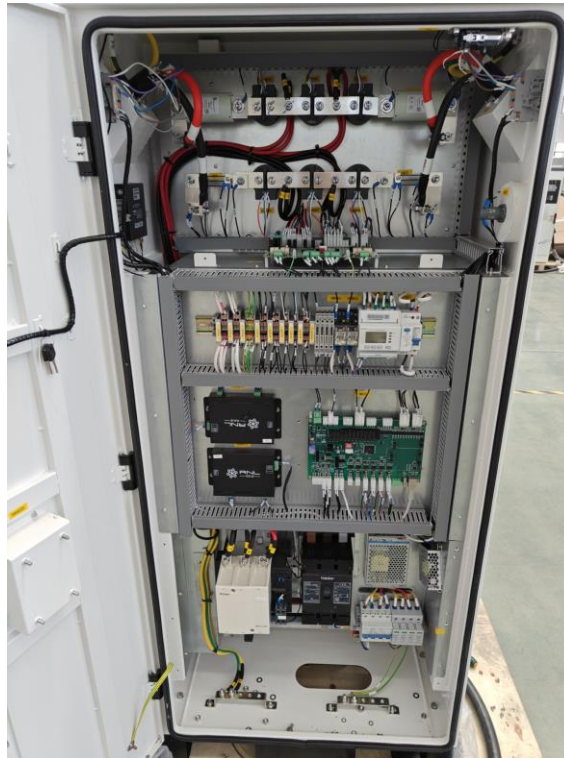


Figure 5 Open the door(front)



Figure 6 Internal view

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 7 Internal view



Figure 8 Main circuit breaker

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 9 AC Contactor



Figure 10 SPD

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k

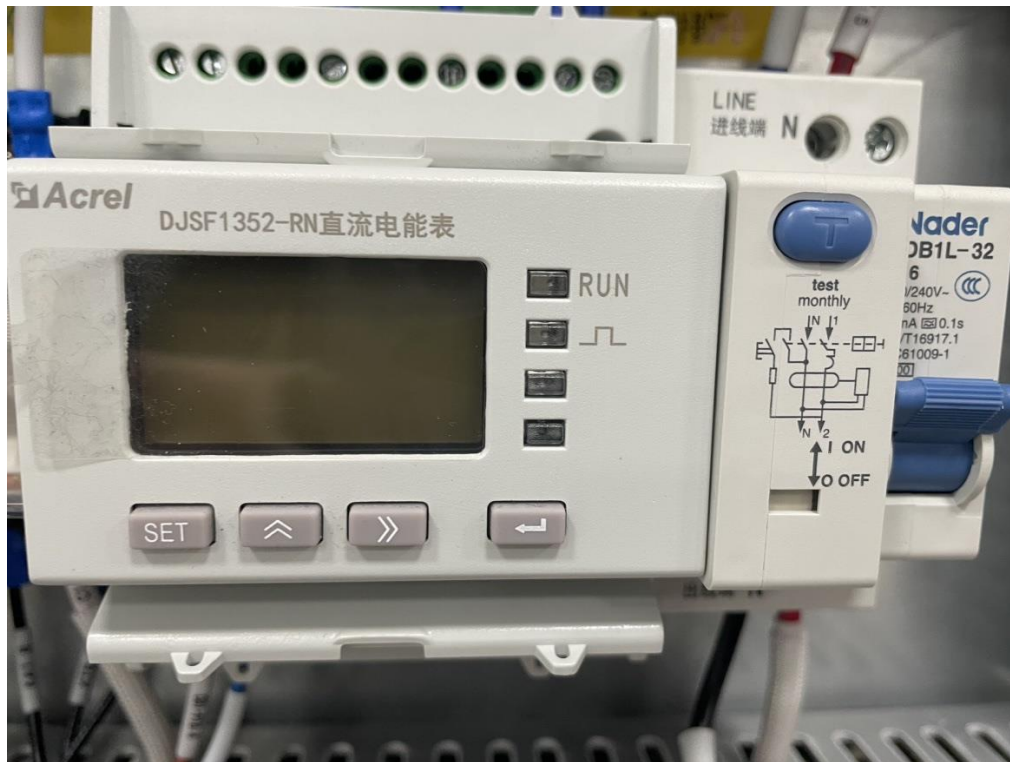


Figure 11 Power meter



Figure 12 DC Fuse and DC Contactor

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 13 Restoration switch



Figure 14 Emergency stop switch

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 15 Switching Power Supply



Figure 16 Switching Power Supply

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k



Figure 17 Main control board



Figure 18 PLC module

Product: DC EV charger
Type Designation: PCDC-YZ4-EU80/1k, PCDC-YZ4-EU60/1k

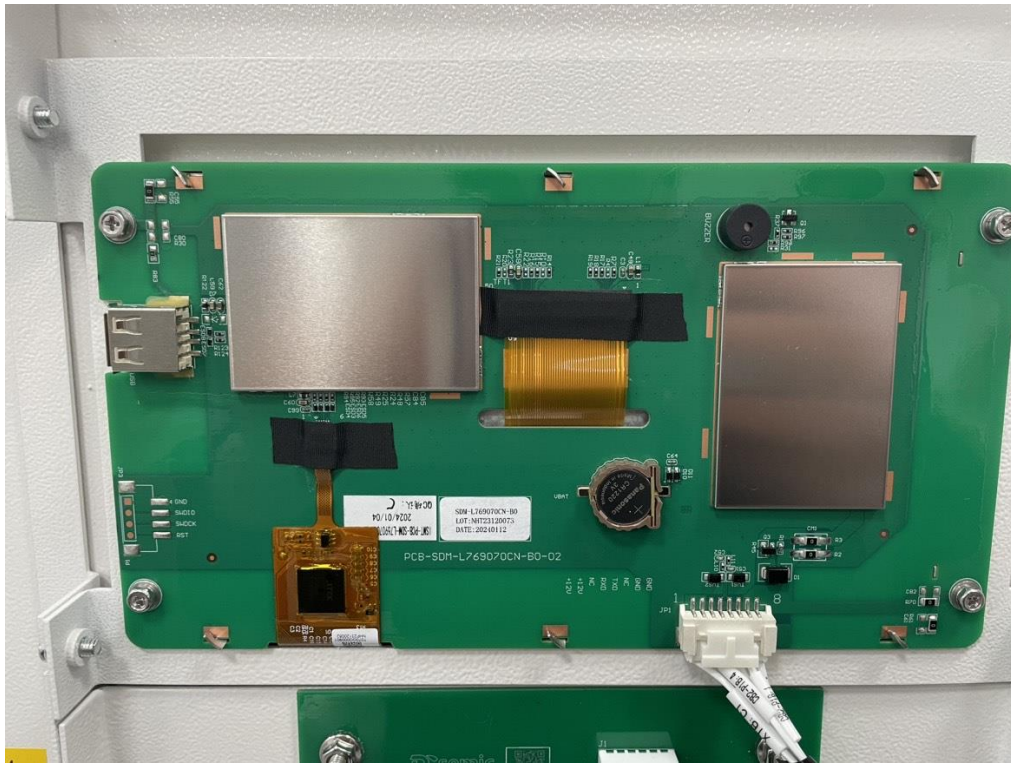


Figure 19 LCD screen



Figure 20 Ground copper bar