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Electric vehicle conductive charging system –
Part 1-1: Specific requirements for electric vehicle conductive charging system using type 4 vehicle coupler

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –

Part 1-1: Specific requirements for electric vehicle conductive charging system using type 4 vehicle coupler

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IEC PAS 61851-1-1 has been processed by IEC technical committee 69: Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
69/860/DPAS	69/869/RVDPAS

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 2 years starting from the publication date. The validity may be extended for a single period up to a maximum of 2 years, at the end of which it shall be published as another type of normative document or shall be withdrawn.

This document is to be read in conjunction with IEC 61851-1:2017. The clauses of particular requirements in this document supplement or modify the corresponding clauses in IEC 61851-1:2017. Where the text of subsequent clauses indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of IEC 61851-1:2017, these changes are made to the relevant text of IEC 61851-1:2017, which then becomes part of this document. Where no change is necessary, the words "Clause X or Subclause X.Y of IEC 61851-1:2017 is applicable" are used."

INTRODUCTION

Currently, three AC charging couplers are defined in the IEC 62196 series, namely type 1 adopted in North America and Japan, type 2 proposed by Germany, and type 3, which is not widely used.

This document introduces an AC charging system widely used in China and some other markets. The number of BEV and PHEVs using the Chinese AC system has exceeded 5 million, and public AC charging facilities have exceeded 400 000 in China alone. At the IEC TC69 WG12 meeting held in Shanghai in November 2019, China's interpretation of the control pilot circuits and compatibility with existing IEC 61851-1 was accepted.

Taking into account the long standard maintenance cycle for IEC 61851-1, at the WG12 meeting of TC 69 in December 2021, it is recommended that the Chinese AC charging system be published in IEC as PAS first and then be discussed and merged into IEC 61851-1 Ed.4 when it is published in this maintenance cycle.

ELECTRIC VEHICLE CONDUCTIVE CHARGING SYSTEM –

Part 1-1: Specific requirements for electric vehicle conductive charging system using type 4 vehicle coupler

1 Scope

This document applies to a new type of AC EV supply equipment for charging electric road vehicles, with a rated supply voltage up to 1 000 V AC and a rated output voltage up to 1 000 V AC.

This document provides specific requirements for AC charging system using type 4 vehicle coupler.

Type 4 vehicle coupler is under consideration by SC23H.

Vehicle inlet and vehicle connector of type 4 are intended to be used for charging in modes 2 and 3, case C.

2 Normative references

This clause of IEC 61851-1:2017 is applicable.

3 Terms and definitions

This clause of IEC 61851-1:2017 is applicable.

4 General requirements

This clause of IEC 61851-1:2017 is applicable.

5 Classification

This clause of IEC 61851-1:2017 is applicable, except as follows.

5.1.2 Characteristics of power supply output

This subclause of IEC 61851-1:2017 is not applicable.

6 Charging modes and functions

This clause of IEC 61851-1:2017 is applicable, except as follows:

6.2.3 Mode 3

Addition after the last paragraph:

NOTE In the following countries, the rated output current of the EV supply equipment is limited to 32 A for single phase and to 63 A for three phases: CN.

7 Communications

This clause of IEC 61851-1:2017 is applicable.

8 Protection against electric shock

This clause of IEC 61851-1:2017 is applicable.

9 Conductive electrical interface requirements

This clause of IEC 61851-1:2017 is applicable, except as follows:

9.3 Functional descrption of the basic interface

Addition after the last paragraph:

NOTE In the following countries, proximity contact (PP) is also known as CC (connection confirmation): CN.

10 Requirements for adaptors

This clause of IEC 61851-1:2017 is applicable.

11 Cable assembly requirements

This clause of IEC 61851-1:2017 is applicable.

12 EV supply equipment constructional requirements and tests

This clause of IEC 61851-1:2017 is applicable.

13 Overload and short-circuit protection

This clause of IEC 61851-1:2017 is applicable.

14 Automatic reclosing of protective devices

This clause of IEC 61851-1:2017 is applicable.

15 Emergency switching or disconnect (optional)

This clause of IEC 61851-1:2017 is applicable.

16 Marking and instructions

This clause of IEC 61851-1:2017 is applicable.

Annex A
(normative)

Control pilot function through a control pilot circuit using a PWM signal and a control pilot wire

This annex of IEC 61851-1:2017 is applicable, except as follows:

A.2.3 Simplified control pilot circuit

Addition after the existing note:

NOTE 2 In the following countries, an EV using the simplified control pilot circuit must limit itself to single phase charging and must not draw a current of more than 8 A: CN.

Annex B
(normative)

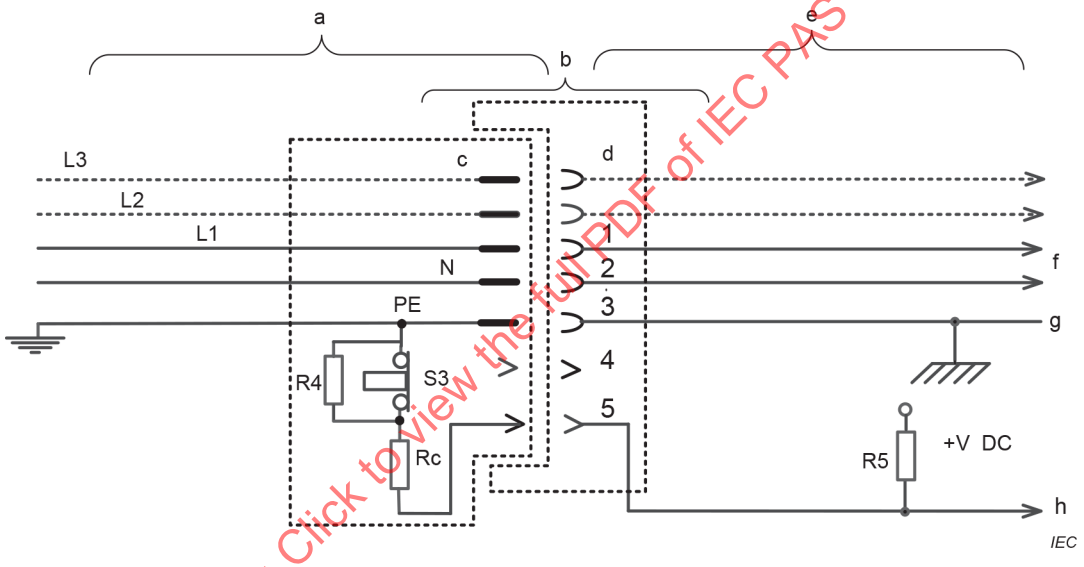
Proximity detection and cable current coding circuits for the basic interface

This annex of IEC 61851-1:2017 is applicable, except as follows:

Additional clause:

B.3 Circuit diagram for vehicle couplers using an auxiliary switch and current coding resistor

Vehicle connectors using the proximity contact with an auxiliary switch and coding resistors indicating current capability of the cable assembly shall use the circuit diagram as shown in Figure B.3 and Table B.3.



Key

a	Cable assembly	f	AC supply to the vehicle
b	Vehicle coupler	g	Vehicle chassis connection
c	Vehicle connector	h	to proximity detection circuit
d	Vehicle inlet	S3	Auxiliary switch
e	Circuit on the vehicle	R4,Rc	Defined in Table B.3
		R5	Pull-up resistor, defined by vehicle

NOTE 1 The control pilot function is not indicated in this drawing.

NOTE 2 The switch S3 can be used for prevention of unintentional disconnect.

NOTE 3 This scheme is used on type 4 vehicle connectors and inlets (under consideration in IEC 62196-2).

Figure B.3 – Equivalent circuit diagram for vehicle couplers using an auxiliary switch and current coding resistor

Table B.3 – Component value proximity circuit with current coding

Current capability of the cable assembly A	Nominal resistance of Rc (tolerance ±3 %) Ω	Minimum dissipation rating of Rc W	R4 (tolerance ±3 %) Ω	Minimum dissipation rating of R4 (S3 is open) W
10	1500	0,5	1800	0,5 W
16	680	0,5	2700	0,5 W
32	220	0,5	3300	0,5 W
63	100	0,5	3300	0,5 W

Annex C
(informative)

Examples of circuit diagrams for a basic and universal vehicle couplers

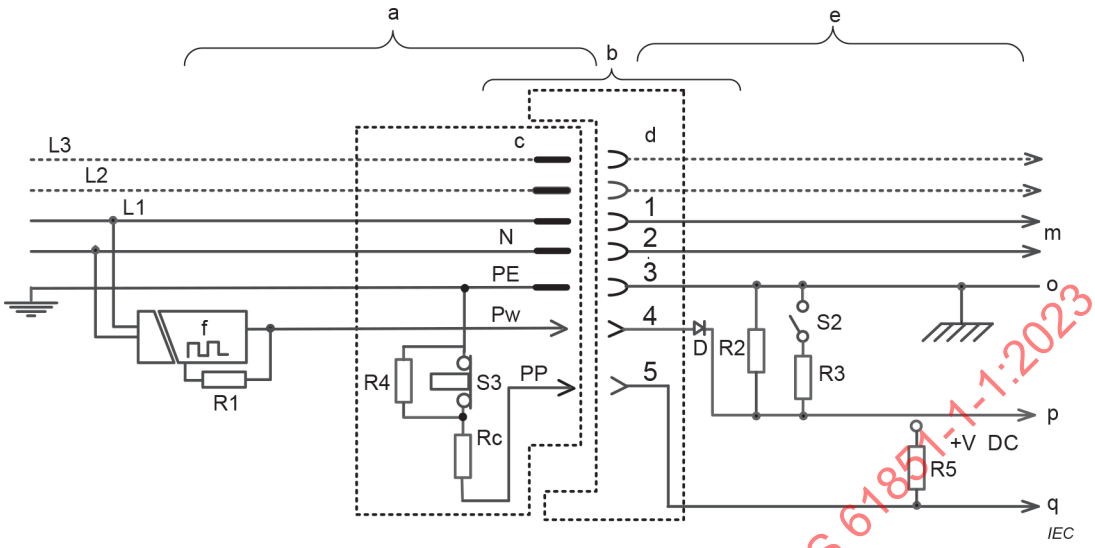
This annex of IEC 61851-1:2017 is applicable, except as follows:

Additional clause:

C.5 Circuits diagrams for Mode 3 case C, using a basic single phase or three-phase accessory with proximity switch and resistor coding

Figure C.7 shows the application of a three-phase basic interface that is fitted with a proximity switch and current coding resistor on the proximity circuit, used for single and three-phase supply.

The current coding function described in Clause B.3 is indicated. Values of the pull-up resistances are given in Table B.3.



Key

a	cable assembly	p	to the vehicle pilot function logic circuit
b	vehicle coupler	q	to the proximity control logic circuit
c	vehicle connector	Pw	control pilot conductor
d	vehicle inlet	D, S2, R1, R2, R3	components for control pilot function
e	circuit on the vehicle		(values are given in Table A.2 and Table A.3)
f	control circuit for pilot function	S3	auxiliary switch
m	to charger and other AC load	R5	pull-up resistor, defined by vehicle
o	electric chassis of EV		

Figure C.7 – Example of Mode 3 case C using proximity switch and resistor coding