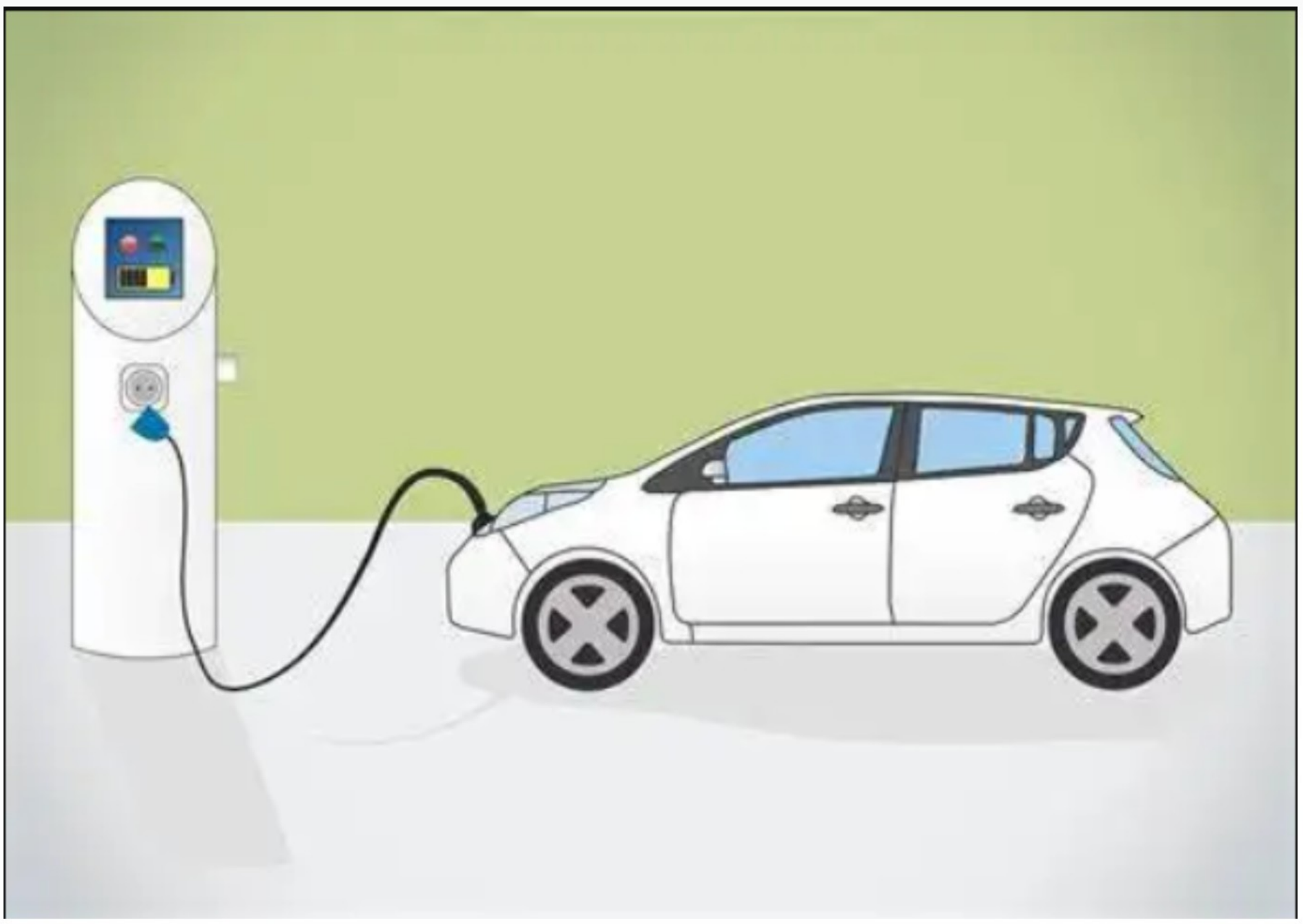

国外电动汽车充电标准学习与了解(二)

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最近刚刚康复回来上班，有症状后真是太难受了，到现在感觉身体还是虚的，食欲也不好，嗅觉与味觉还有点弱。

继续介绍IEC 62196-1:2022✦的内容，我们比较关注的充电接口类型在此标准中有一个总述，主要分为三种类似的接口：基本接口、直流接口和组合接口。

6 Connection between the power supply and the electric vehicle

6.1 Interfaces

This Clause 6 provides a description of the physical conductive electrical interface requirements between the vehicle and the power supply, which allows different types at the vehicle interface:

– a basic interface for mode 1, 2 and 3 charging only,
– DC interface,
– a combined interface.

6.2 Basic interface

The description and requirements for basic interface are given in IEC 62196-2.

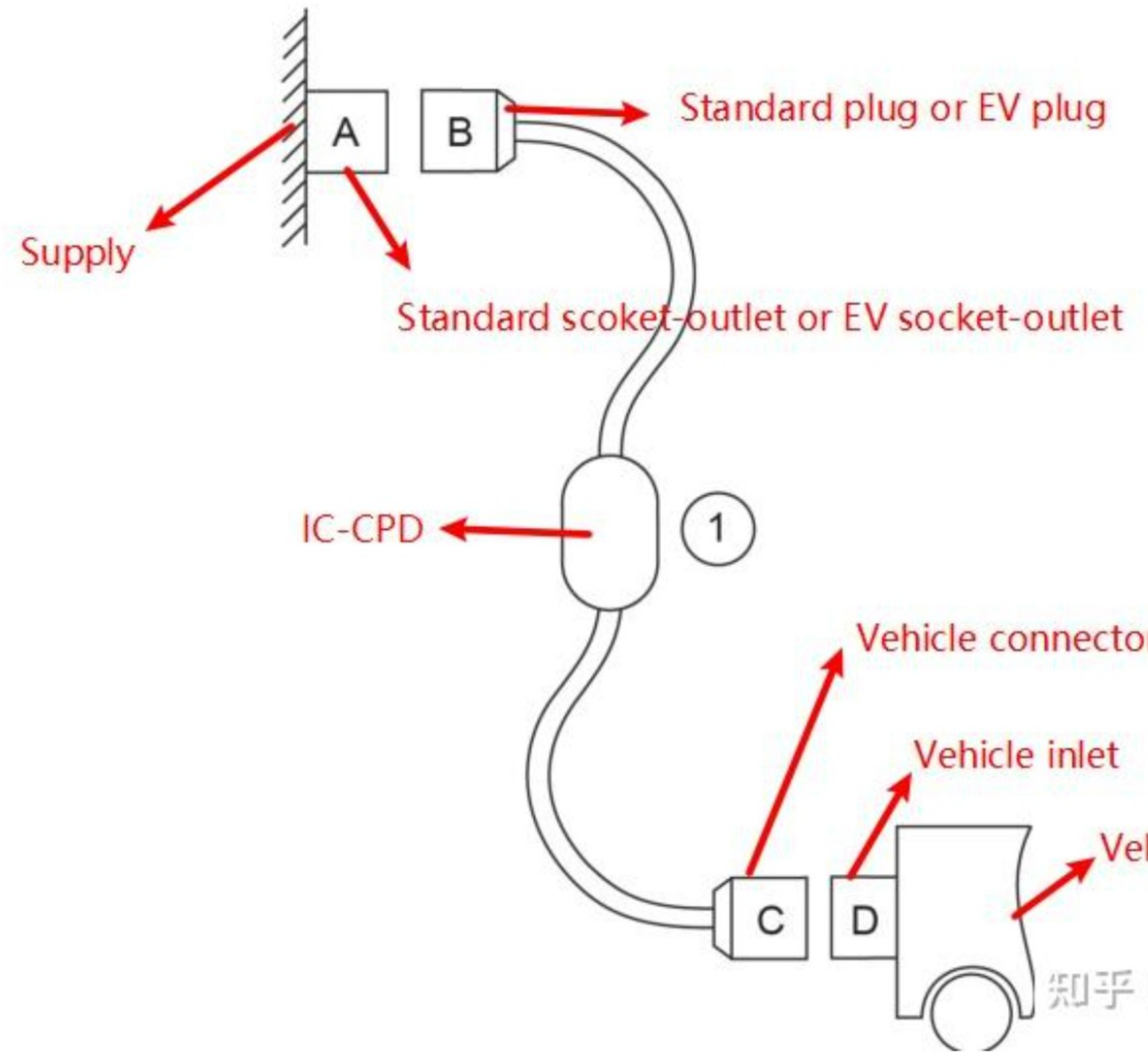
6.3 DC interface

The description and requirements for DC configuration are given in IEC 62196-3.

6.4 Combined interface

The description and requirements for combined interface are given in IEC 62196-3.

在具体介绍之前，先要明确下面四个定义：即EV plug、EV socket-outlet、Vehicle connector、Vehicle inlet，具体图示如下，可以看到它们分别代表了供电设备端和电动汽车端与线束之间的连接接口名称；这些定义在标准中全篇都会涉及到，所以区分清楚是有必要的，这样划分主要是为了匹配不同的连接方式和充电模式，对于我们来讲，更关注的是车辆端的Vehicle connector与Vehicle inlet，并且二者合在一起被称为Vehicle coupler✦。



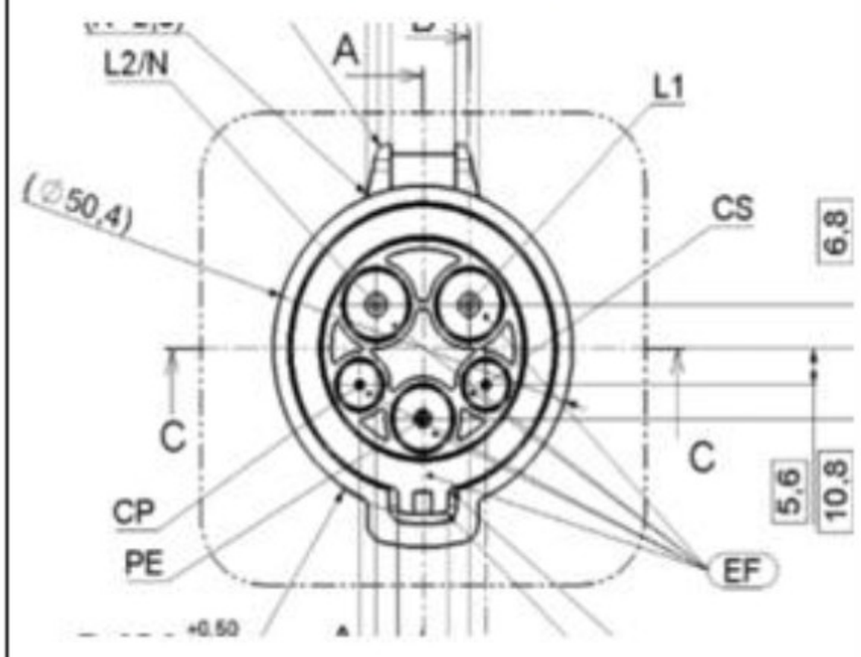
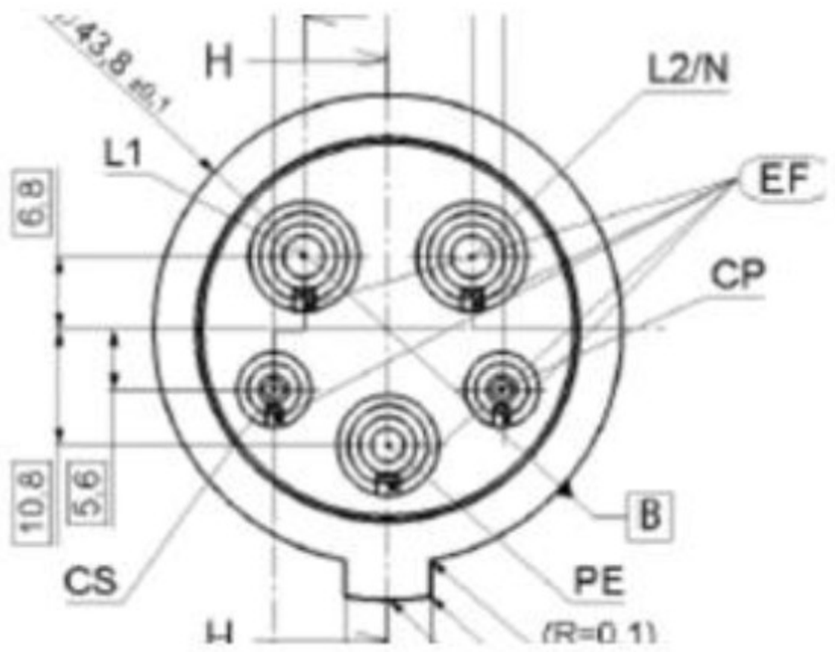
在IEC 62196-2:2022✦中，主要介绍了交流的充电接口，即Basic interface，里面又具体包含了三种类型接口，即Type1✦\Type2✦\Type3✦，总体的概述如下图所示：发现Type1只有单相电类型，Type2\Type3包括单相与三相电两种，下面具体介绍。

Table 203 – Configuration types and standard sheets

Configuration type	Standard sheet	Applicable accessories	Rated voltage V	Rated current A	Phase
1	2-I	Vehicle couplers	250	32	Single phase
2	2-II	Accessories	250	70	Single phase
			480	63	Three phase
3	2-III	Accessories	250	16	Single phase
			250	32	Single phase
			480	63	Three phase

Type1：

Type1是5PIN形式，用于单相电充电，具体的样子如下图所示：需要注意的是在车辆插座端（Vehicle inlet）是PIN针的形式，而在车辆插头端（Vehicle connector）则是铜管的形式，这种形式与我国的充电标准定义是相反的。

Type1	车辆插座 (Vehicle inlet)	车辆插头 (Vehicle connector)
	32A/250VAC单相	32A/250VAC单相
标准定义		
实际图片		

接下来具体看一下接口定义，Type1的5个引脚的定义如下表，即L1\N\PE\CP\CS这五条线，其中CP与CS分别代表控制导引功能与连接确认功能，这两个引脚需要整车做检测的。

Position number [a]	AC	Functions [c]
1	250 V 32 A[b]	L1 (mains 1)
2	250 V 32 A	L2 (mains 2) / N (neutral)
3	Rated for fault	PE (ground/earth)
4	30 V 2 A	CP (Control pilot)
5	30 V 2 A	CS (Connection switch)

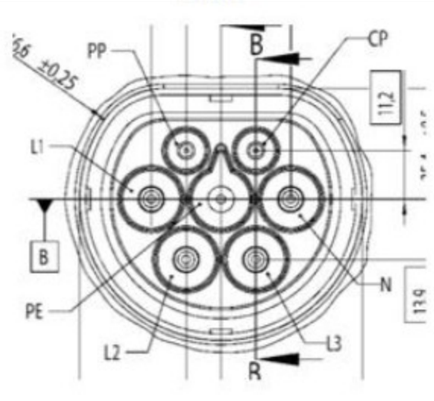
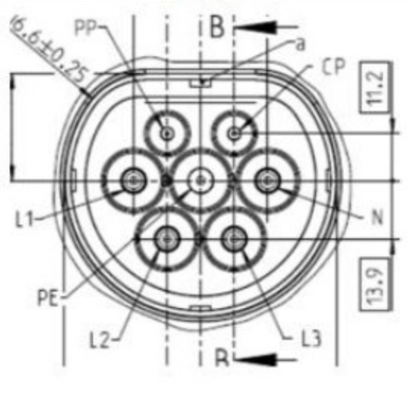
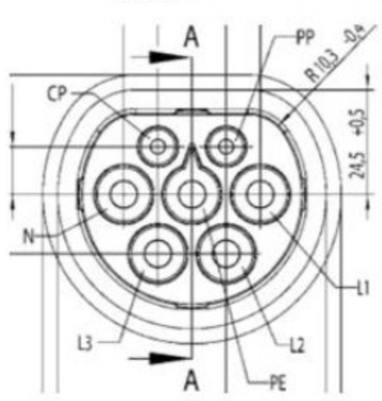
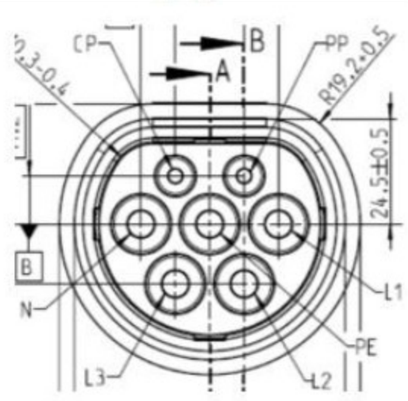
[a] Position number does not refer to the location and/or identification of the contact in the accessory.

[b] In the following country, the branch circuit overcurrent protection is based upon 125 % of the device rating: US.

[c] For contacts 4 and 5, environmental conditions may demand larger conductor cross-sections.

Type2：

Type2中定义的车辆端的接口如下图所示，为7PIN样式，进一步可以看出车辆端的接口又存在两种形式，结构上的区别是中间的PE孔的形状，我们更常见的是2-IIe与2-IIf这两种接口；另外，针对单相与三相的接口定义与结构都是一致的，同样在车辆插座端（Vehicle inlet）也是PIN针的形式。

Type2	车辆插座 (Vehicle inlet)		车辆插头 (Vehicle connector)	
标准定义	70A/250VAC单相 or 63A/480VAC三相		70A/250VAC单相 or 63A/480VAC三相	
	2-IId	2-IIf	2-IIc	2-IIe
				
实际图片			未找到	

通过标准中可以看出，2-IIc主要用于充电模式1，而2-IIe与2-IIf主要用于充电模式2和充电模式3，而2-IId支持3种模式，如下图所示。

Table 204 – Interoperation of configuration type 2 accessories

Accessory [a]	EV plug (mode 3) Sheet 2-IIb	Vehicle inlet (all modes) Sheet 2-IId	Vehicle inlet (modes 2 and 3) Sheet 2-IIf
EV socket-outlet (mode 3) Sheet 2-IIa	Yes	n.a. [d]	n.a. [d]
Vehicle connector (mode 1) Sheet 2-IIc	No[b]	Yes	No[b]
Vehicle connector (modes 2 and 3) Sheet 2-IIe	No[c]	Yes	Yes

[a] Type 2 accessories shall only be used in the modes as listed in this Table 204.

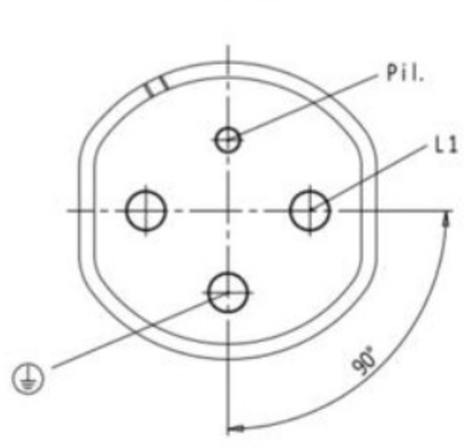
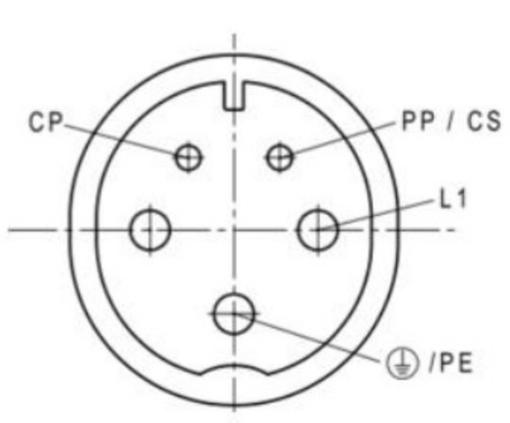
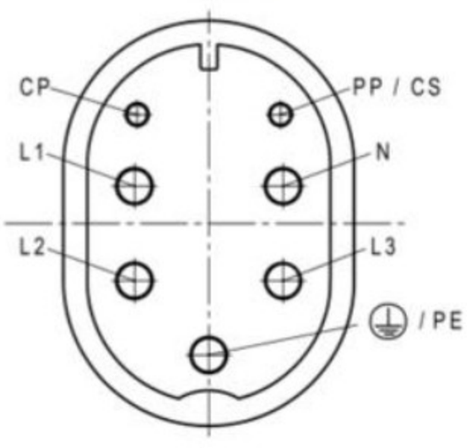
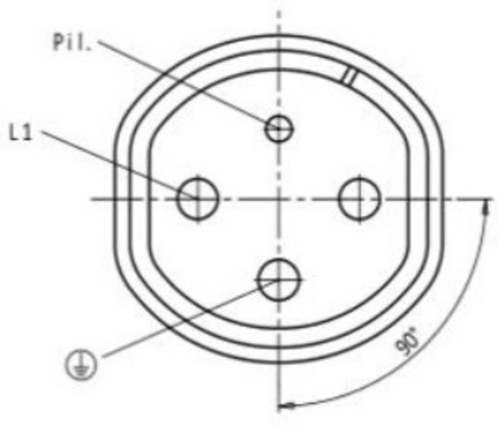
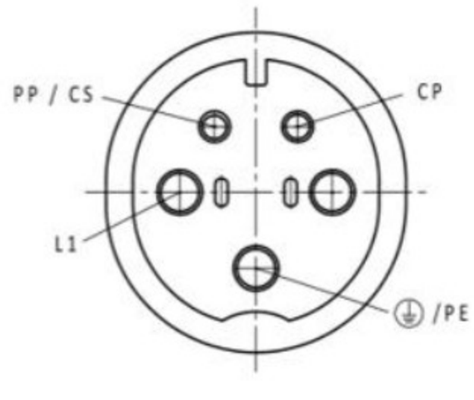
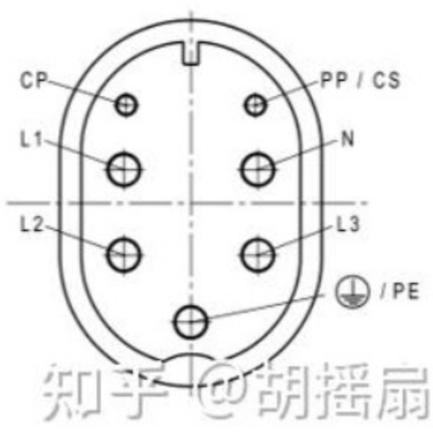
[b] Interoperability excluded by mechanical coding.

[c] Interoperability excluded by gap in control pilot circuit.

[d] Fixed accessories cannot be connected together.

Type3：

Type3的需求来源于意大利，实际应用中接触的不多；Type3又根据电气属性不同而分成了3种接口，3种接口彼此的结构尺寸以及定义各不相同，如下图所示：它们与Type1和Type2的结构也很不一样，实物图片没有找到，大家简单感受一下。

Type3	16A/250VAC单相	32A/250VAC单相	63A/480VAC三相
	2-IIIa	2-IIIb	2-IIIc
车辆插座 (Vehicle inlet)			
车辆插头 (Vehicle connector)			

最后，Type2和Type3的接口引脚定义如下，需要注意的是Type3中的2-IIIa充电接口只有一个控制引脚CP，没有PP或CS。

Position number [f]	U_{max}	Three phase		Single phase		Functions
		I_{max} [a]		I_{max} [a]		
	V AC	A		A		
		Type 2	Type 3	Type 2 [b]	Type 3	
1	480	63		70	63	L1 (mains 1) [b]
2	480	63		- [c]	- [c]	L2 (mains 2)
3	480	63		- [c]	- [c]	L3 (mains 3)
4	480	63		70	63	N (neutral) [b, e]
5	—	Rated for fault				PE (ground/earth)
6	30	2				CP (Control pilot)
7	30	2				PP (Proximity) [d] or CS (Connection switch) [d]

[a] In the following country, the branch circuit overcurrent protection is based upon 125 % of the device rating: US.

[b] For single phase charging, contacts 1 and 4 shall be used.

[c] Unused contacts need not be installed. Not provided for Standard Sheets 2-IIIa and 2-IIIb.

[d] Not provided for Standard Sheet 2-IIIa.

[e] For single phase system supply phase to phase this contact can be used for L2 (mains 2).

[f] Position number does not refer to the location and/or identification of the contact in the accessory.

后面继续介绍 IEC62196-3✦中的直流以及组合充电接口，这次就先到这里了。

总结：

上了一周多班，身体感觉逐渐恢复中，也终于有精力晚上可以正常学习了，前面大概耽误了三周；
以上所有，仅供参考。