



NUSANTARA

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EV Charging:

Market Briefing
Supplementary Material

Kedeputian Transformasi Hijau dan Digital
Otorita Ibu Kota Nusantara



NUSANTARA

Ibu Kota Negara
Indonesia



Nusantara EV Charging Infrastructure: A Brief

- Vehicle electrification is widely recognized as a strategy that can diminish reliance on petroleum fuels and mitigate the environmental footprint of road transportation.
- The development of Electric Vehicle (EV) charging infrastructure is an integral part of the establishment of the EV ecosystem in IKN to encourage the transition of public behavior from the use of Internal Combustion Engine (ICE) vehicles to EVs.
- Electric Vehicle supporting infrastructure is included in the IKN Development Staging.

Nusantara EV Charging Configuration based on Best Practices

Type of Charging Infrastructure based on Charging Speed

Type	Maximum Power Delivery
Medium Charging	≥ 8 kW – 22 kW
Fast Charging	≥ 22 kW – 50 kW
Ultrafast Charging	> 50 kW

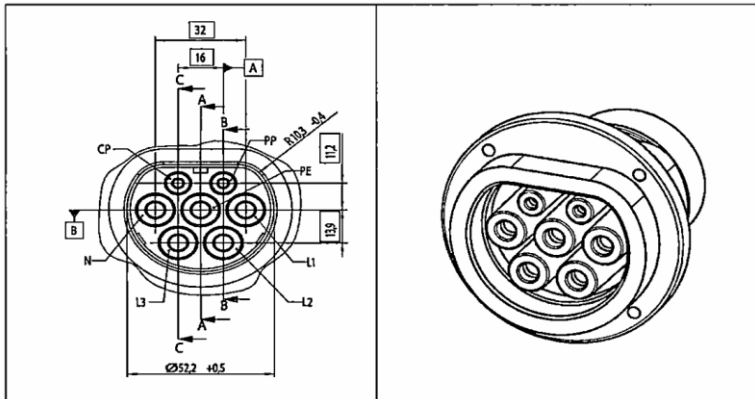
Configuration Type of Charging Sockets, Plugs and Connectors

Connector Type	Standard	Description
Type 2 Series	SNI IEC 62196-2:2016	AC Charging System
Type AA Series	SNI IEC 62196-3:2014	DC Charging System
Type FF Series	SNI IEC 62196-3:2014	Combined Charging System

Referring to
Permen
ESDM No. 1
Tahun 2023

Design Criteria based on Best Practices: Type 2

A. Pengisian Ulang Arus Bolak-Balik (*Alternating Current Charging System*) Menggunakan Konektor Tipe 2 (*Type 2 Series*) Berdasarkan SNI IEC 62196-2:2016 dan Perubahannya



Gambar 1. Stop Kontak (*Socket Outlet*)
Tidak Melebihi 480 Volt, 63 Ampere *Fasa Tiga* atau 70 Ampere *Fasa Tunggal*

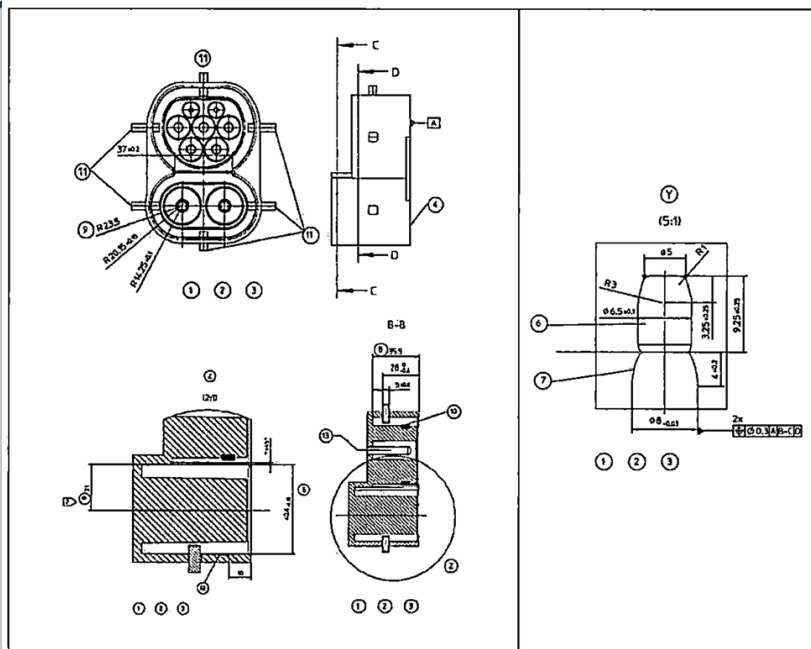
Type 2 Series Connector is used for **AC Charger**.
The Socket Outlet shape and geometry are drawn as follows.

The operation of this type of Socket should **not** exceed:

- 480 Volt
- 63 Ampere (with 3-phase system) or 70 (single phase system)

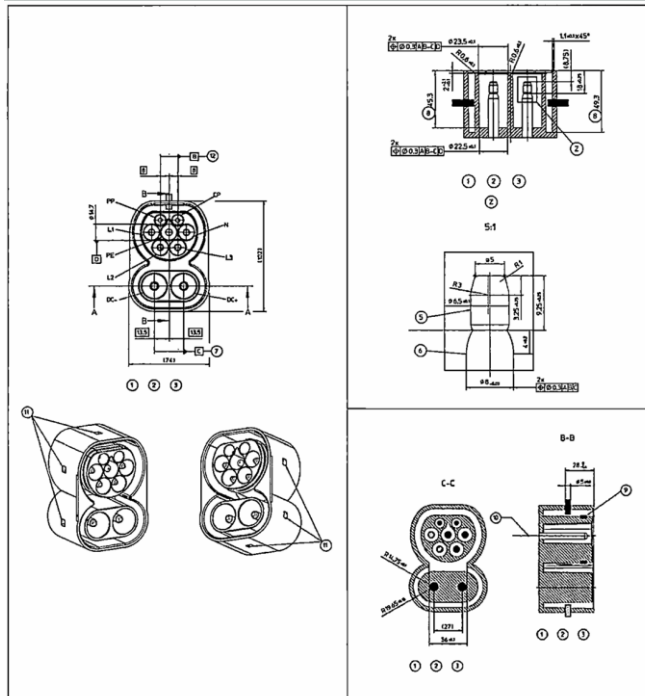
Design Criteria based on Best Practices: Type FF

Mode 2, 3 and 4



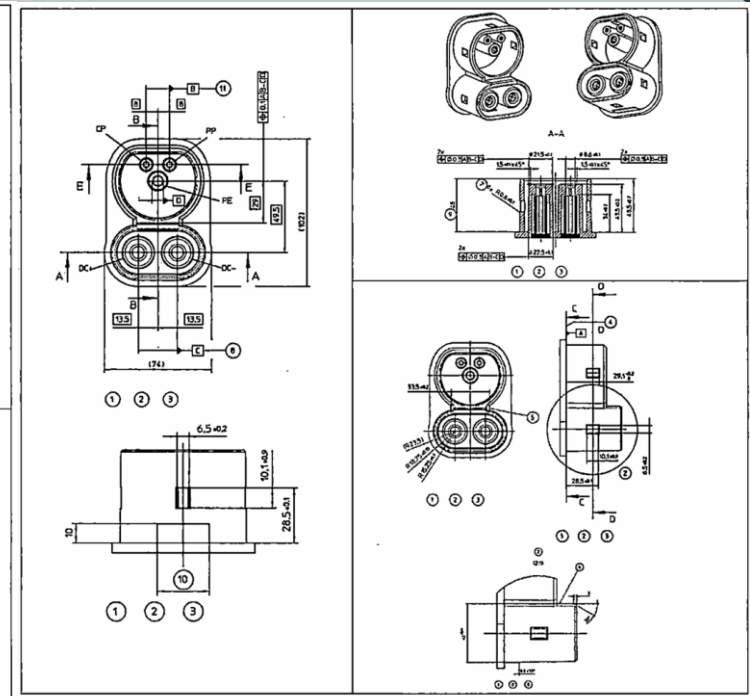
Gambar 10. Inlet Kendaraan Mode 2, 3, dan 4
(Vehicle Inlet Modes 2, 3, and 4)

All Mode



Gambar 11. Inlet Kendaraan Semua Mode (Vehicle Inlet All Modes)

Mode 4



Gambar 12. Konektor Kendaraan Mode 4 (Vehicle Connector Mode 4)

Type FF Series Connector is used for **Combined (AC+DC) Charger**.

- Mode 2 is suitable for convenient & portable charging unit → Slow & Medium Charging
- Mode 3 is typically found in fixed charging unit → Medium & Fast Charging
- **Mode 4 is High Powered Charging Stations → Fast & Ultrafast Charging (preferable)**

Indicative Requirements for Phase 1 in Nusantara (Minimum Scenario)

Parameter	Estimated Value	Remarks
Maximum EV served/day	~900	~854 ASN Eselon I dan II move to IKN in Phase 1
EV : Charging Station (Ratio)	10 : 1	Recommended by <i>IEA</i> in <i>Global EV Outlook</i> Document.
% jumlah <i>Fast Chargers</i>	30%	Percentage (%) of fast chargers in the World in 2021
Number of <i>Fast Charger</i>	27	30% of total (90-unit SPKLU)
Number of <i>Medium Charger</i>	63	70% of total (90-unit SPKLU)
Maximum EV served/hour	2	Medium Charger with minimums of 8 kW , 30 mins/session will provide up to ~4 kWh of charge (equals to ~45 km of range ^{**})
	3	Fast Charger with minimums of 22 kW , 15 mins/session will provide up to ~5.5 kWh of charge (equals to ~62 km of range ^{**})
Operational Hour	≥ 6	Operational within <i>Work-Hour</i>

^{**}assumption of kWh range using the specification of *Wuling Air EV Long Range*

Indicative Requirements for Phase 1 in Nusantara (Optimistic Scenario)

Parameter	Estimated Value	Remarks
Maximum EV served/day	~1500	~854 ASN Eselon I dan II ~600 Private EV based of 20% x 3000* Total Private EV (*based on the results of the study done by International Consultant using the assumption of the number of vertical residential occupants)
EV : Charging Station (Ratio)	10 : 1	Recommended by <i>IEA</i> in <i>Global EV Outlook</i> Document.
% jumlah <i>Fast Chargers</i>	30%	Percentage (%) of fast chargers in the World in 2021
Number of <i>Fast Charger</i>	45	30% of total (150-unit SPKLU)
Number of <i>Medium Charger</i>	105	70% of total (150-unit SPKLU)
Maximum EV served/hour	2	Medium Charger with minimums of 8 kW , 30 mins/session will provide up to ~4 kWh of charge (equals to ~45 km of range**)
	3	Fast Charger with minimums of 22 kW , 15 mins/session will provide up to ~5.5 kWh of charge (equals to ~62 km of range**)
Operational Hour	≥ 6	Operational within <i>Work-Hour</i>

**assumption of kWh range using the specification of *Wuling Air EV Long Range*

Indicative Requirements for Phase 1 in Nusantara (Summarizing Options)

Charging Type	Minimum Scenario		Optimistic Scenario	
	Single Port	Dual Port	Single Port	Dual Port
Fast Charging	27	14	45	23
Medium Charging	63	31	105	52
Total	90	45	150	75

Summarizing the options, the indicative requirements for Phase 1 Implementation is **45 – 75 EVCS** (assuming Dual Port per Station)

Simulation of Daily Utilization (Optimistic Scenario)

Parameter	Estimated Value	Remarks
Number of <i>Fast Charger</i>	45	30% of total (150-unit SPKLU)
Number of <i>Medium Charger</i>	105	70% of total (150-unit SPKLU)
Maximum EV served/hour	2	Medium Charger with minimums of 8 kW , 30 mins/session will provide up to ~4 kWh of charge (equals to ~45 km of range**)
	3	Fast Charger with minimums of 22 kW , 15 mins/session will provide up to ~5.5 kWh of charge (equals to ~62 km of range**)
Operational Hour	≥ 6	Operational within <i>Work-Hour</i>
Assuming <i>Utilization Ratio</i> SPKLU is 100% (6 hour per day)		
Number of cars charged with <i>Fast Charger</i>	810	45-unit x 3 car/hour x 6 hour/day
Number of cars charged with <i>Medium Charger</i>	1260	105-unit x 2 car/hour x 6 hour/day
Total	2070	In conclusion, served more than 1500/day

Therefore, with 45-unit *Fast Charger* and 105-unit *Medium Charger*, could fulfill the charging requirement of every car (1500 cars) with daily mileage (range) of 40 - 60 km

**assumption of kWh range using the specification of *Wuling Air EV Long Range*

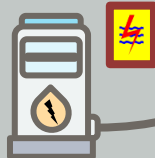
Business Scheme

referring to Permen ESDM No. 13/2020

PT PLN (PERSERO)



SPKLU



BU SPKLU PWU LP



SPKLU



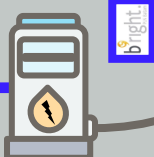
SPKLU



IUPTL-PWU



SPKLU



Catatan:

1. IUPTL = Izin Usaha Penyediaan Tenaga Listrik
2. WU = Wilayah Usaha

Currently Applicable for Phase 1:

B2B with PT. PLN as the holder of Wilayah Usaha (Zone) and IUPTL

Tidak perlu izin baru (hanya SLO)

Memerlukan izin:

- a. Penetapan Wilayah Usaha Penyediaan Tenaga Listrik, dengan persyaratan:
 1. NIB (Nomor Induk Berusaha); dan
 2. SPKLU yang berlokasi di **minimal 2 (dua) provinsi.**
- b. IUPTL, dengan persyaratan:
 1. Studi Kelayakan; dan
 2. RUPTL **yang disahkan oleh menteri.**

Tidak perlu izin baru (hanya SLO)

PLN Partnership: Scheme 3

Skema 1



Skema 2



Skema 3



Skema 4

