



Power supply for EV charging

AC VS DC



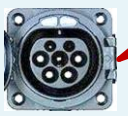




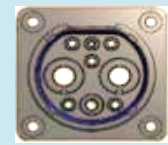
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PH DUPUY

GROUPE RENAULT

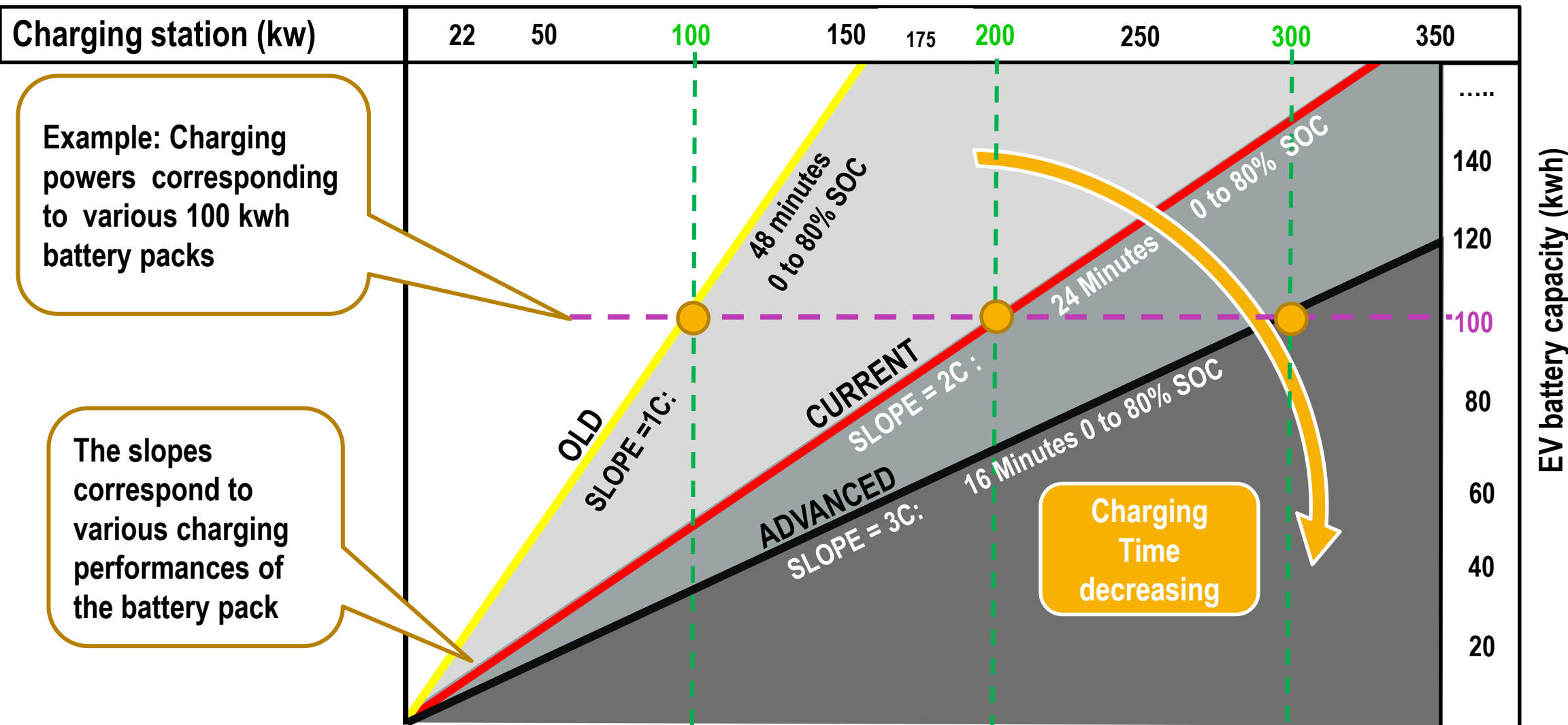
AC vs DC: Reminder of physical limitations of the inlets connections

AC	TYPE 2 IEC		<p>Current deployment State of art: → 32 amps (Normal charge) → 63 amps (Fast charge)</p> <p>IEC 63 amps is the current standard limit</p>	<p>150 AMP / CONTACT</p>	<p>400V between phases → 100 KVA</p>
	AC GB/T				
DC	  <p>CCS</p>	<p>Current deployment State of art → 125 amps Fast charge</p>	<p>350 AMP / CONTACT</p>	<p>@500V → 175 KVA</p> <p>@1000V → 350 KVA</p>	
	  <p>Chademo DC GB/T</p>				

1KVolts 350 Amps

IEC 

Relation between EV battery capacity and charging power capability



Example: Charging powers corresponding to various 100 kwh battery packs

The slopes correspond to various charging performances of the battery pack

Charging Time decreasing



EV Charging supply in AC or DC: Trends and thresholds

DC

1000 V DC

500 V DC

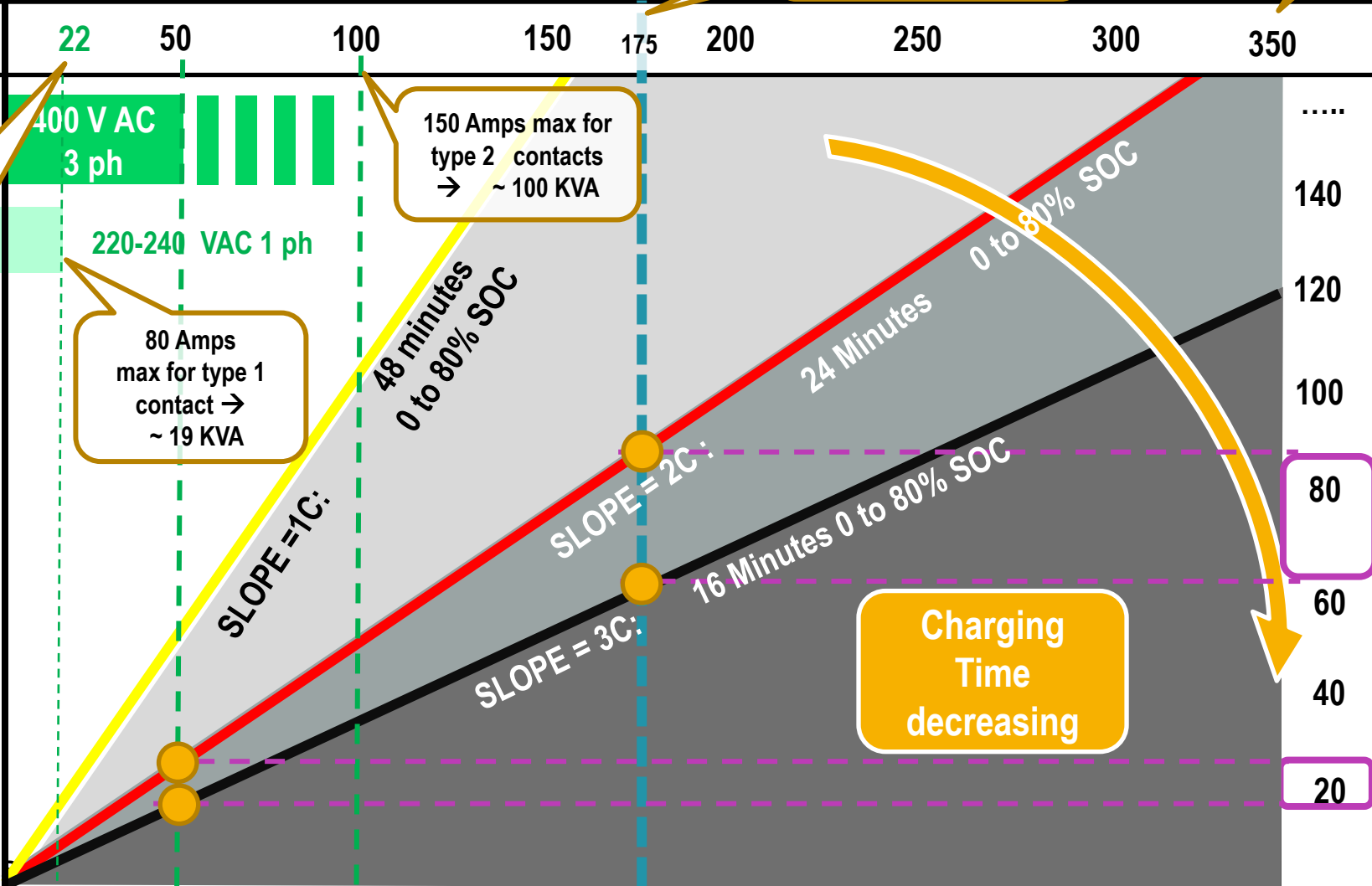
350 A, 500V →
175 KVA

1KVolts 350
Amps

Charging station (kw)

AC

22 KVA
limit of normal
charge according to
2014/94/EU



EV battery capacity (kwh)



IQPC BE

Previous diagrams show clearly the limits of AC & DC supply, in addition:

- About 100K public accessible charging points in AC in EU. Large majority in 3 phases.
- So far, the first generation of fast charge have mainly considered combined AC/DC stations with multi gun standards :

DC COMBO 50 KW, DC CHADEMO 50 KW, AC 3 PHASES 43 KVA

- According to 2014/94/Eu and corresponding national transpositions, beyond 22 KVA in DC → **mode 4 supply with Combo Type 2 at least is mandatory**
- According to 2014/94/Eu and corresponding national transpositions, starting from 3.7 KVA to 22 KVA included → **AC charging mode 3 Type 2 at least is mandatory**



AC



NORMAL CHARGE

3 to 22 KVA

AC+DC



FAST CHARGE

43KVA /50 KW

DC



ULTRA FAST CHARGE

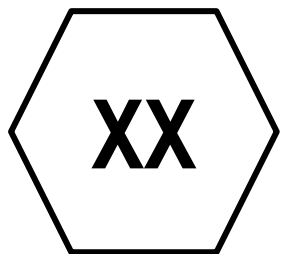
175 KVA 350 KVA

Some orientations from TC301/WG 14, in charge of standard edition for Electric Fuel Labelling, in the frame of CEN-CENELEC works to answer to commission expectations (Mandate M533)

MANDATORY PART OF THE LABEL(S)

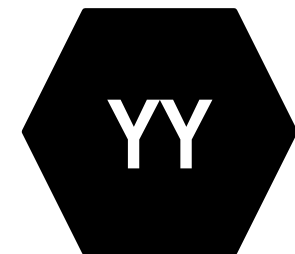
1. A unique geometrical frame (different from Bio-Fuel existing ones)
2. No graphic expression on the interface, use of letters/ numbers only
3. 2 kinds of interfaces, to be precised through :
 - STATION SIDE CONNECTION → Socket outlet and plug: Positive drawing (Black graphical term and texts on white background)
 - CAR SIDE CONNECTION → Connector and véhicule inlet: Negative drawing (white graphical term and texts on black background)

Work in progress



Connection towards
infra side

Connection towards
vehicle side



If confirmed within the WG,
AC or DC supply should be indicated in the optional part of the label