

# Kako preživeti zimo z električnim avtom?

Matjaž Vidmar





Ulica Sergeja Mašere 21, 5000 Nova Gorica

Tržaška cesta 25, 1000 Ljubljana

Dodaj cilj

Možnosti poti

Izogibaj se

☐ Avtoceste

☐ Cestnine

☐ Trajekti

Dolžinske enote

☒ Samodejno

☐ milje

☐ km

ZAPRI

Pošljite navodila v telefon

prek H4 in A1

1 h 2 min po praznih cestah

⚠ Ta pot vključuje cestnine.

PODRBNOСТИ

Avtocesta

The map displays a route from Ulica Sergeja Mašere 21 in Nova Gorica to Tržaška cesta 25 in Ljubljana. The route is highlighted in blue and passes through several towns including Nova Gorica, Ajdovščina, Vrhnika, and Ljubljana. The map shows various roads, including the A1 and E61, and includes a scale bar at the bottom right indicating 5 km. A small inset map in the bottom left corner shows the location of the route within the region of Trieste, Italy.



Ulica Sergeja Mašere 21, 5000 Nova Gorica

Tržaška cesta 25, 1000 Ljubljana

Dodaj cilj

Možnosti poti

Izogibaj se

☒ Avtoceste
 ☐ Cestnine
 ☐ Trajekti

Dolžinske enote

☒ Samodejno
 ☐ milje
 ☐ km

ZAPRI

Pošljite navodila v telefon

prek Kalce - Col

1 h 42 min po praznih cestah

87,0 km

PODROBNOSTI

prek Dornberk - Štanjel

2 h po praznih cestah

115 km

2 h 11 min

Prevrnjeni tovarnjaki?

The map displays a route from Ulica Sergeja Mašere 21 to Tržaška cesta 25. The route is highlighted in blue and passes through various towns including Nova Gorica, Idrija, Vrhnika, and Ljubljana. The map includes a sidebar with navigation options and a bottom bar with map controls.

**Route Details:**

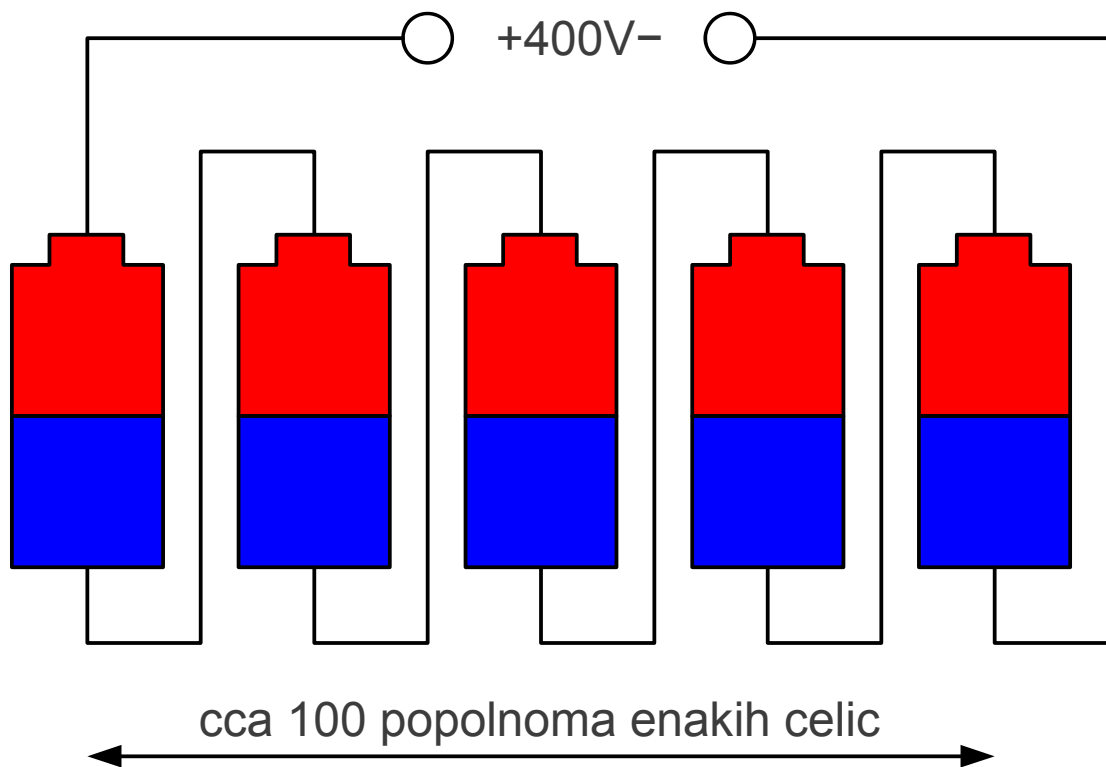
- Start:** Ulica Sergeja Mašere 21
- End:** Tržaška cesta 25
- Distance:** 87,0 km
- Estimated Time:** 1 h 48 min

**Map Features:**

- Legend:**
  - ☒ Avtoceste
  - ☐ Cestnine
  - ☐ Trajekti
  - ☒ Samodejno
  - ☐ milje
  - ☐ km
- Map Controls:**
  - Zoom in (+)
  - Zoom out (-)
  - Full screen (f)
  - Layers (layers icon)
  - Search (magnifying glass)

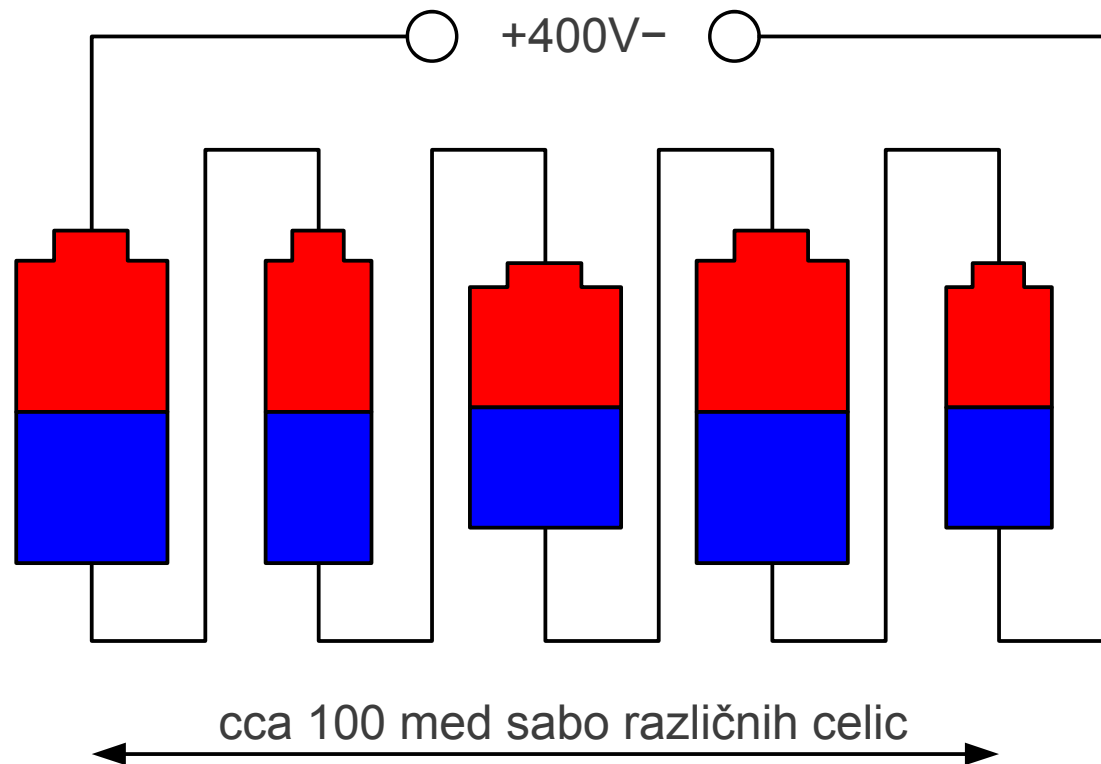




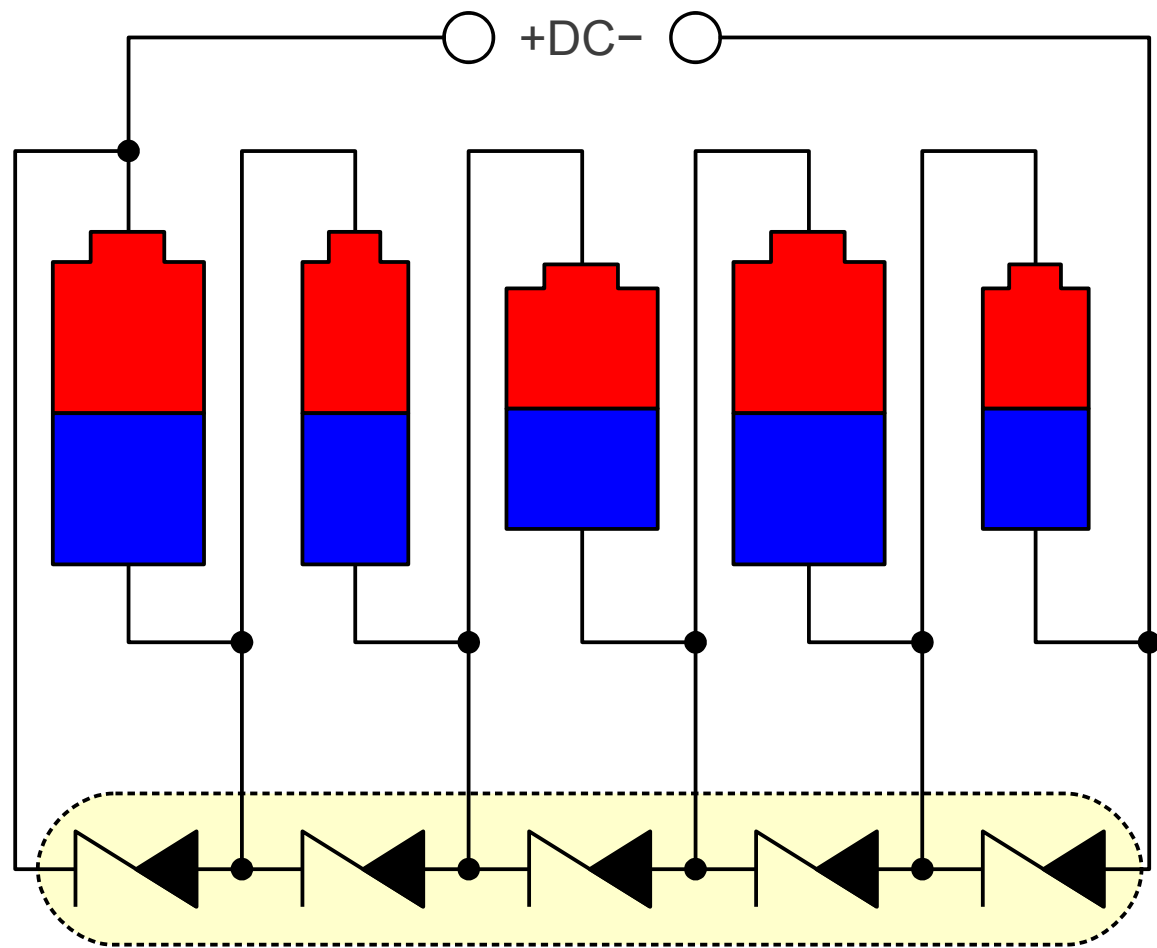


Idealna baterija  
električnega vozila

Resnična baterija  
električnega vozila

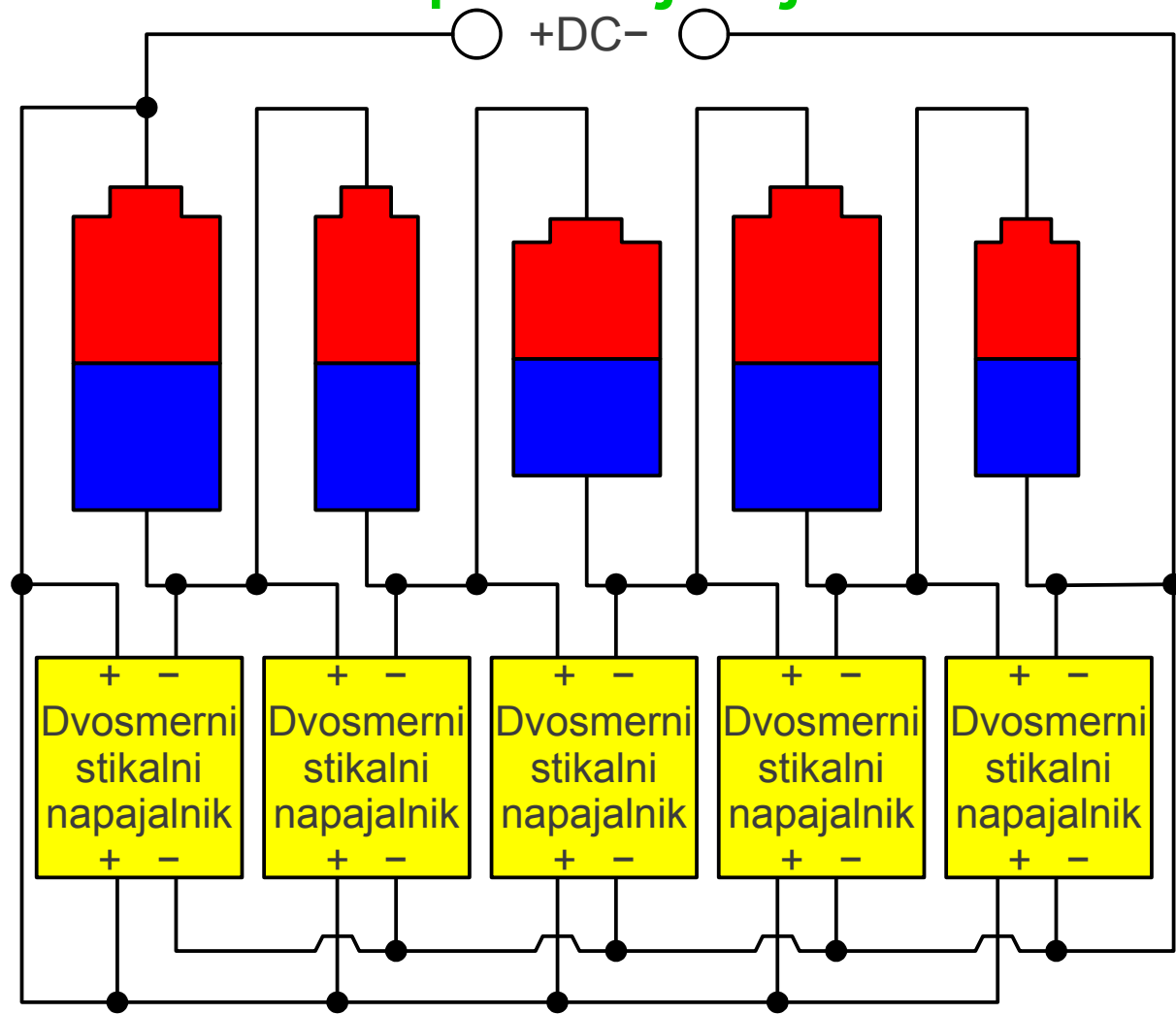






Preprost uravnoteževalec  
deluje samo pri polnjenju  
baterije do 100%

Celovit uravnoteževalec  
deluje med polnjenjem  
in praznjenjem





# Več javnih polnilnic kot električnih avtov?



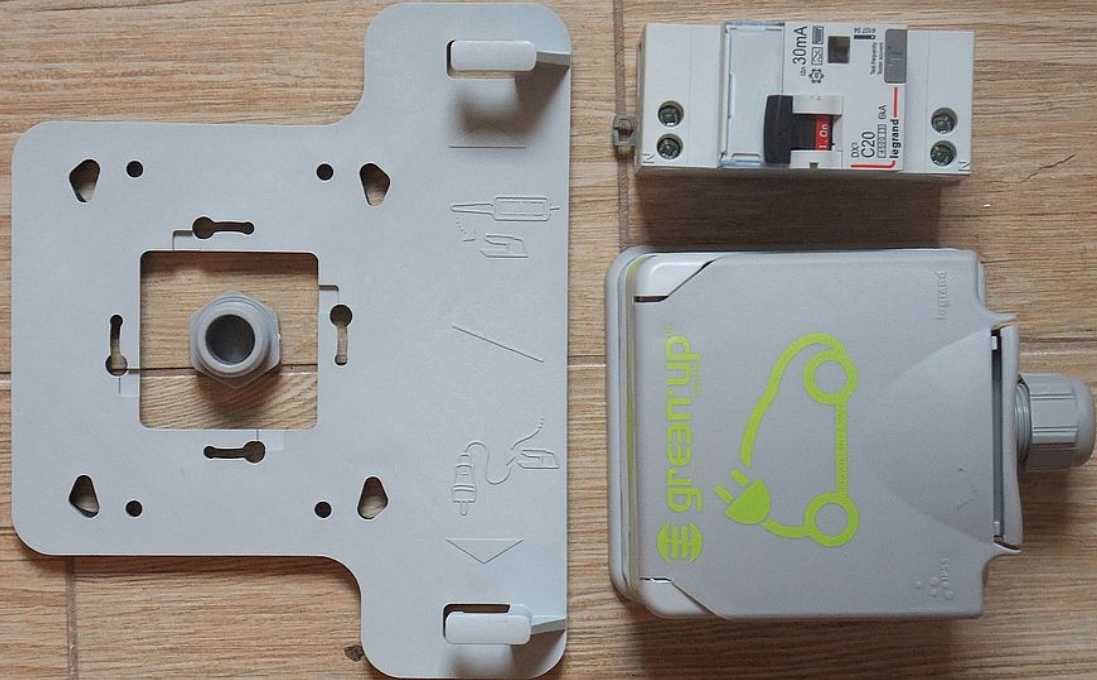
Neenoten dostop  
Slabo vzdrževane  
Nepraktična uporaba  
Neprimerne za  
obstoječe baterije



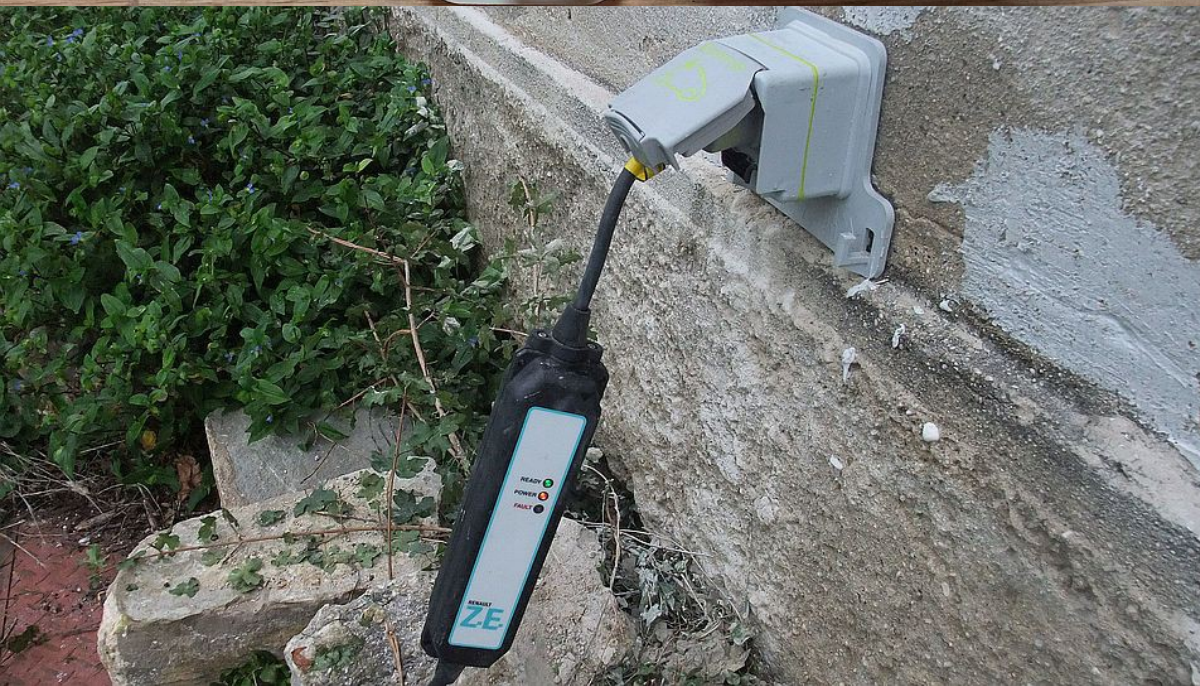
Ljubljana FE - enofazna vtičnica 16A  
+ kabel Renault ZE (omejen 8A) ~24h







Enofazna šuko vtičnica  
"GreenUp"  
posrebreni kontakti 14A  
vsebuje RFID tag,  
ki deluje samo s  
kablom Renault ZE (12A)





A white Renault ZOE electric car is parked at a charging station. The car is connected to a charging cable that is plugged into a charging port on the front of the vehicle. The charging station is a grey, wall-mounted unit with a green indicator light. The car is parked on a paved surface next to a concrete wall. In the background, there is a grassy area and some buildings. The text "Ljubljana FRI -trifazna polnilna postaja 3x32A ~2h" is overlaid on the bottom left of the image.

Ljubljana FRI -trifazna  
polnilna postaja 3x32A ~2h



Maribor FERl - trifazna vtičnica 3x16A ~4h





Nova Gorica (doma)  
trifazni podaljšek 3x16A  
+ kabel Juice Booster 2 ~4h



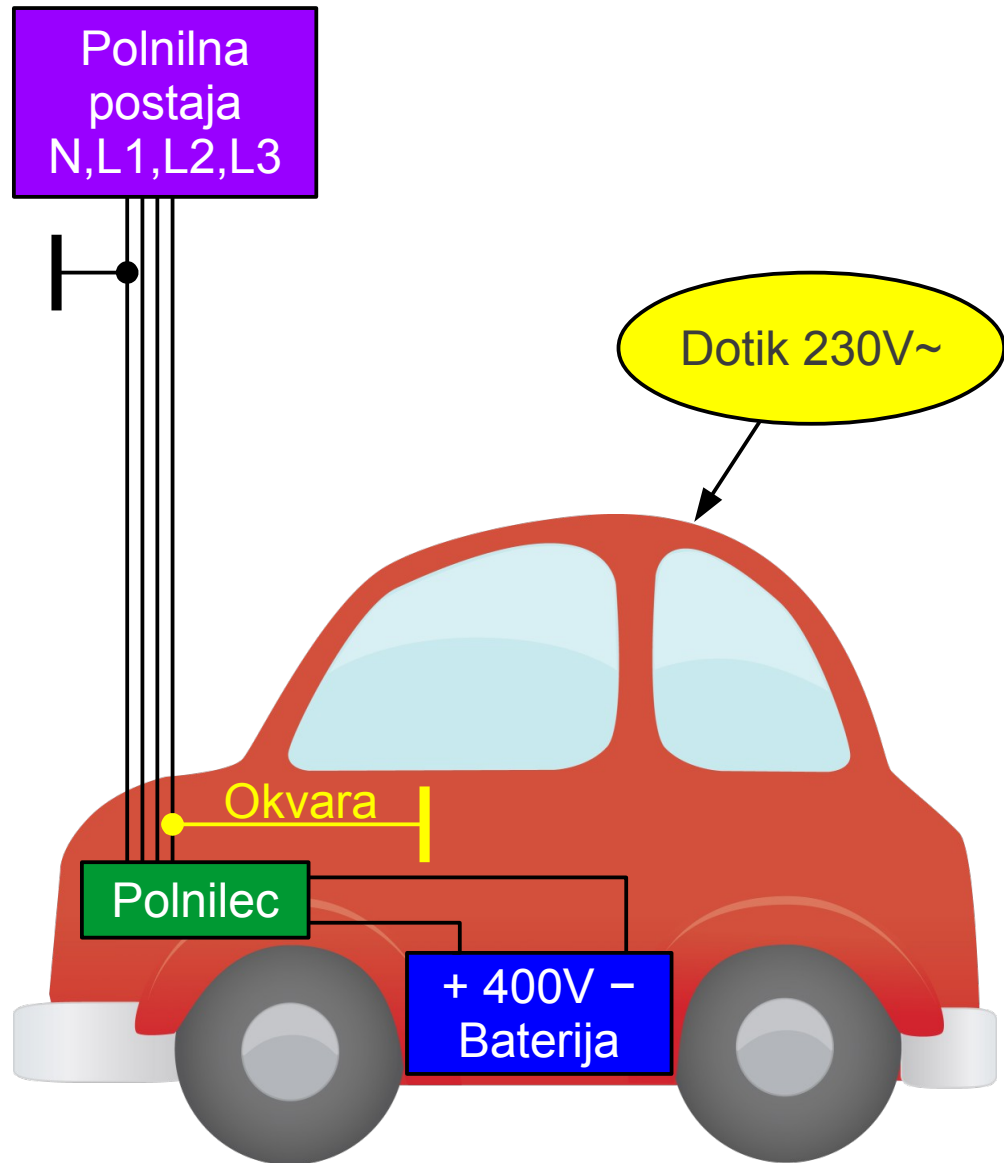


Ljubljana FE - enofazna vtičnica 16A  
+ shekan Juice Booster 2 (16A) ~12h

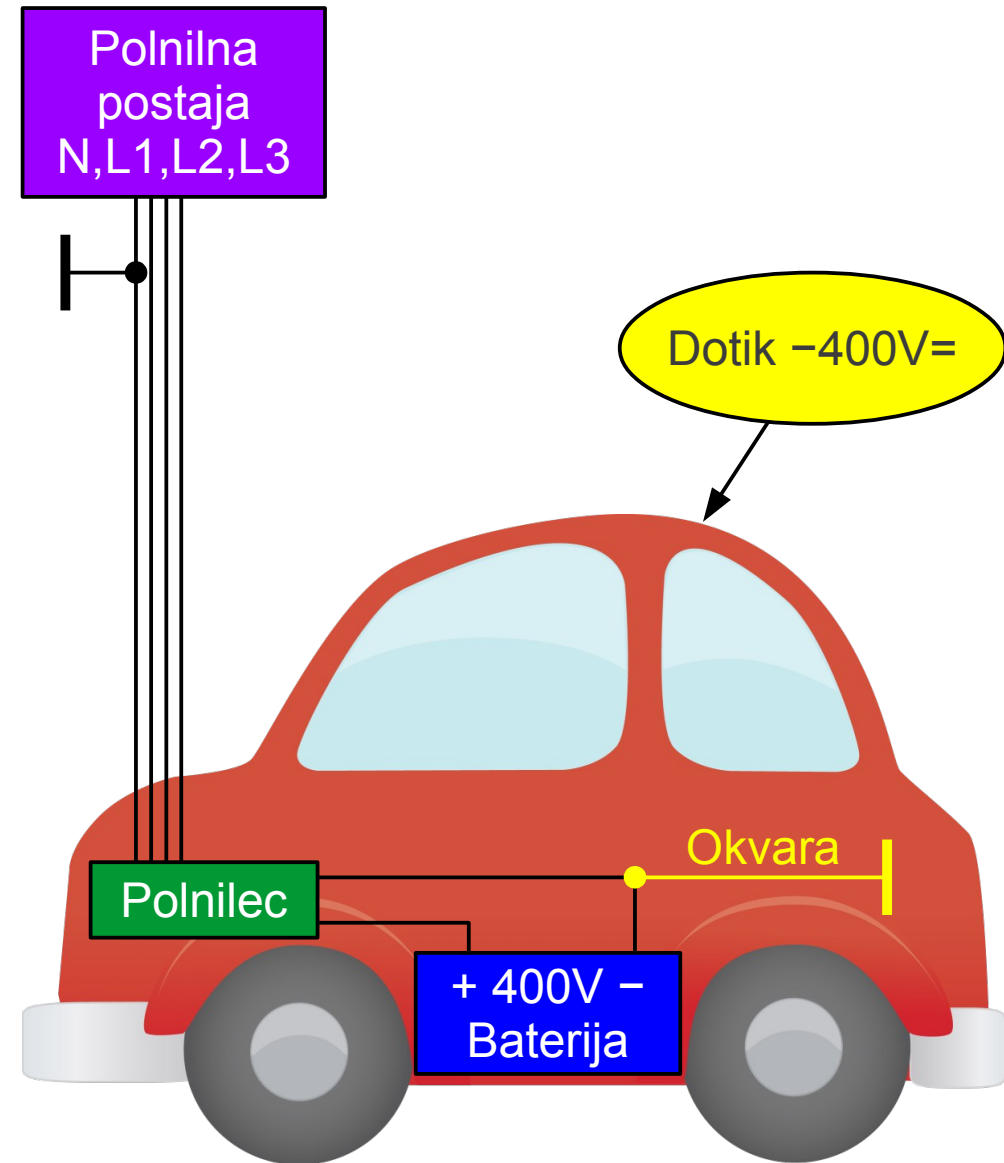


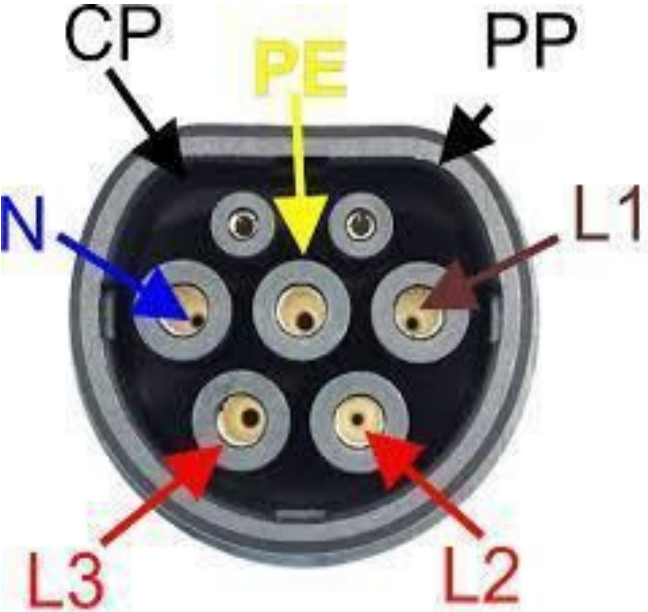


# Izmenična okvara

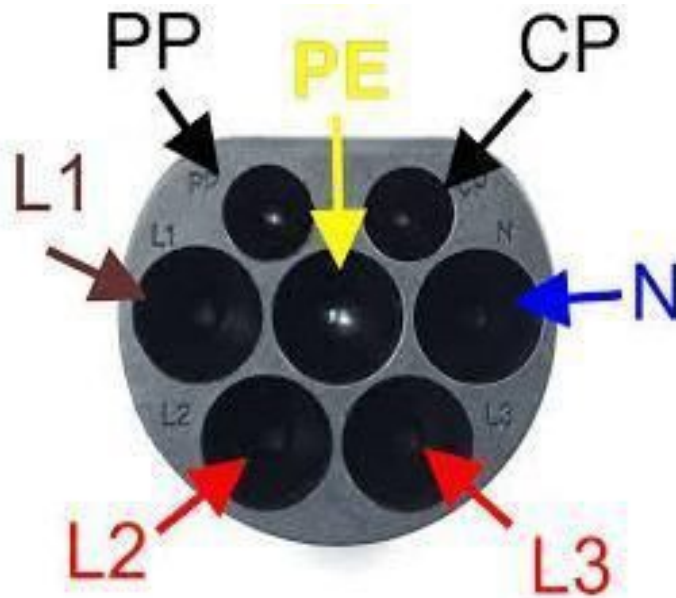


# Enosmerna okvara

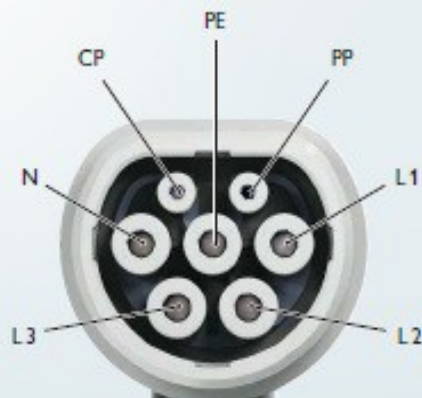




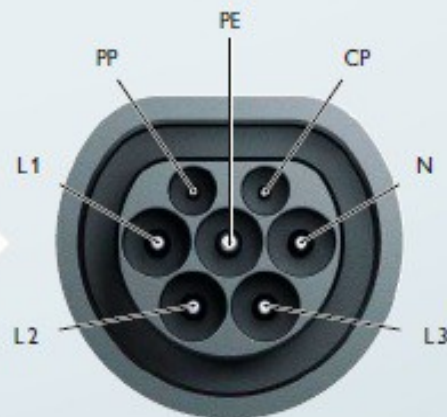
Type 2 Female Plug Pinout



Type 2 Male Plug Pinout



AC vehicle connector Type 2

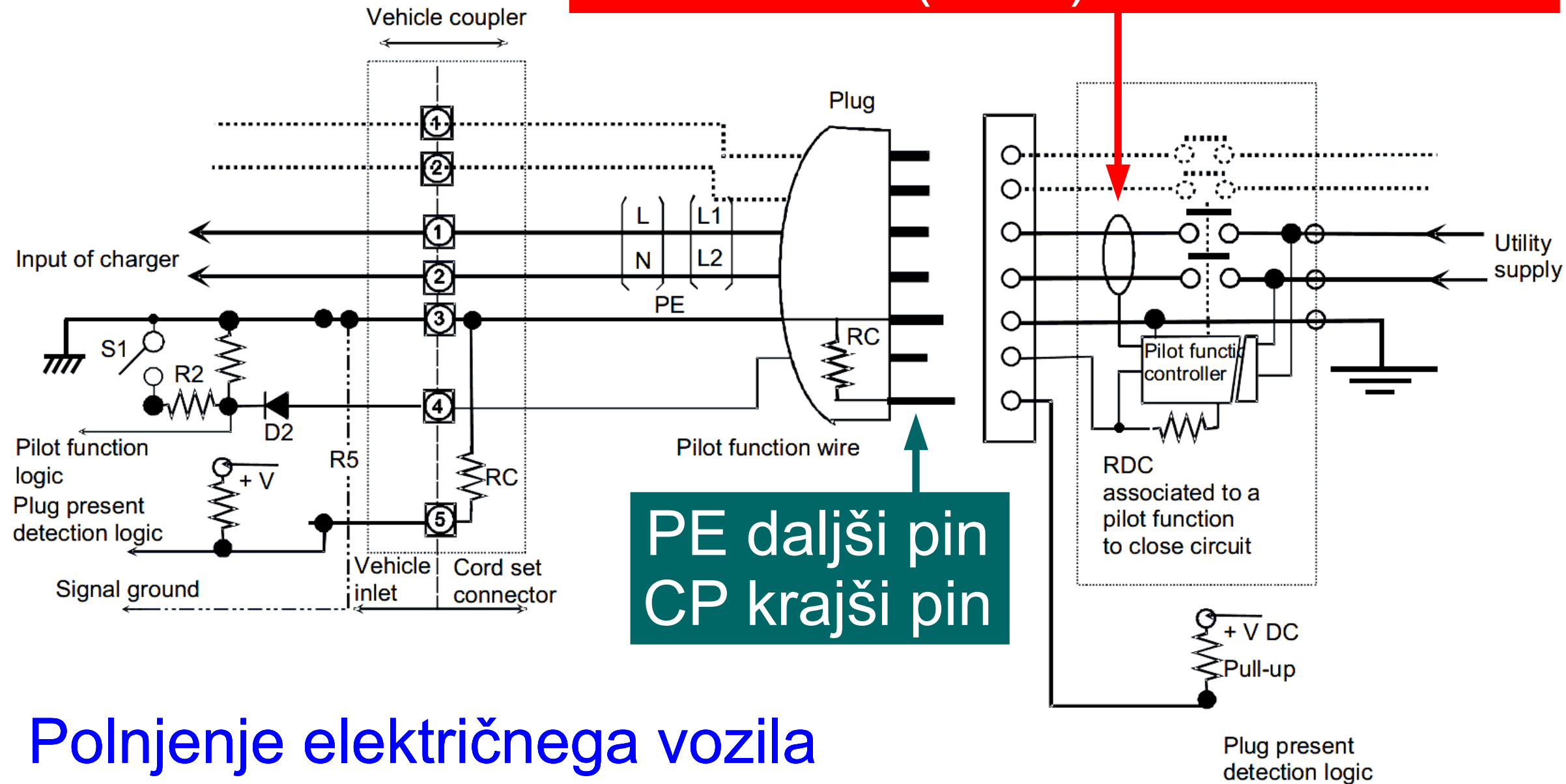


AC vehicle inlet Type 2

	AC ein - bis dreiphasig	max. 500V AC 3 x 63A oder 1 x 80A
	AC ein - bis dreiphasig DC-Low	max. 500V AC/DC 3 x 63A AC oder 1 x 70A AC oder 1 x 80A DC
	DC-Mid	max. 500V DC 1 x 140 A
	DC-High	≥ 500V DC 1 x 200A

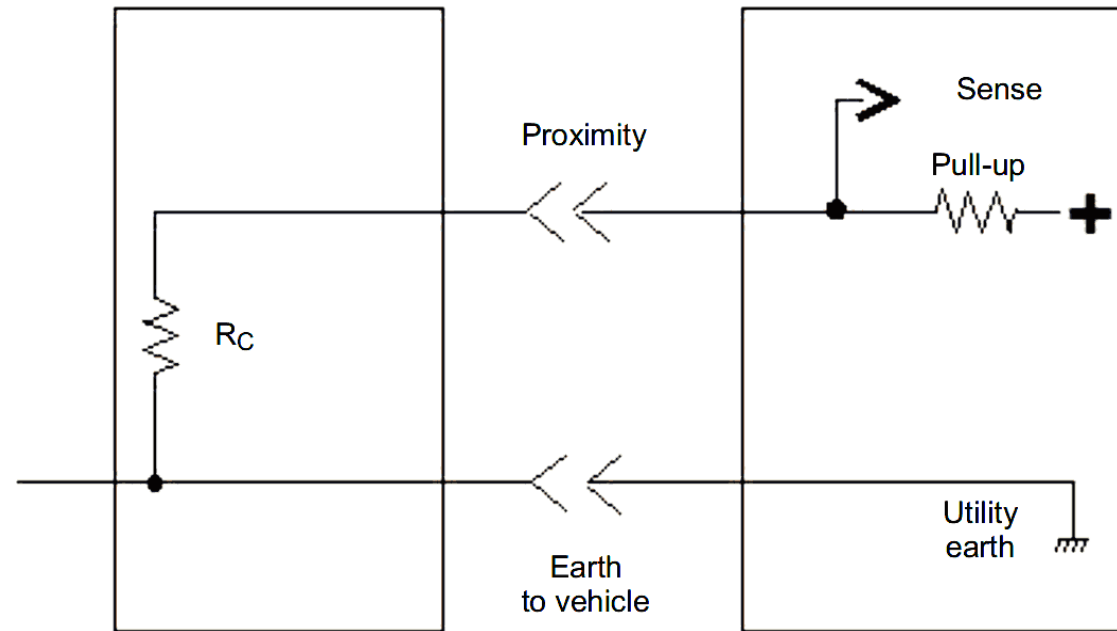
EN 61851

FID zaščita (RCD) 30mA~ & 6mA=



Polnjenje električnega vozila

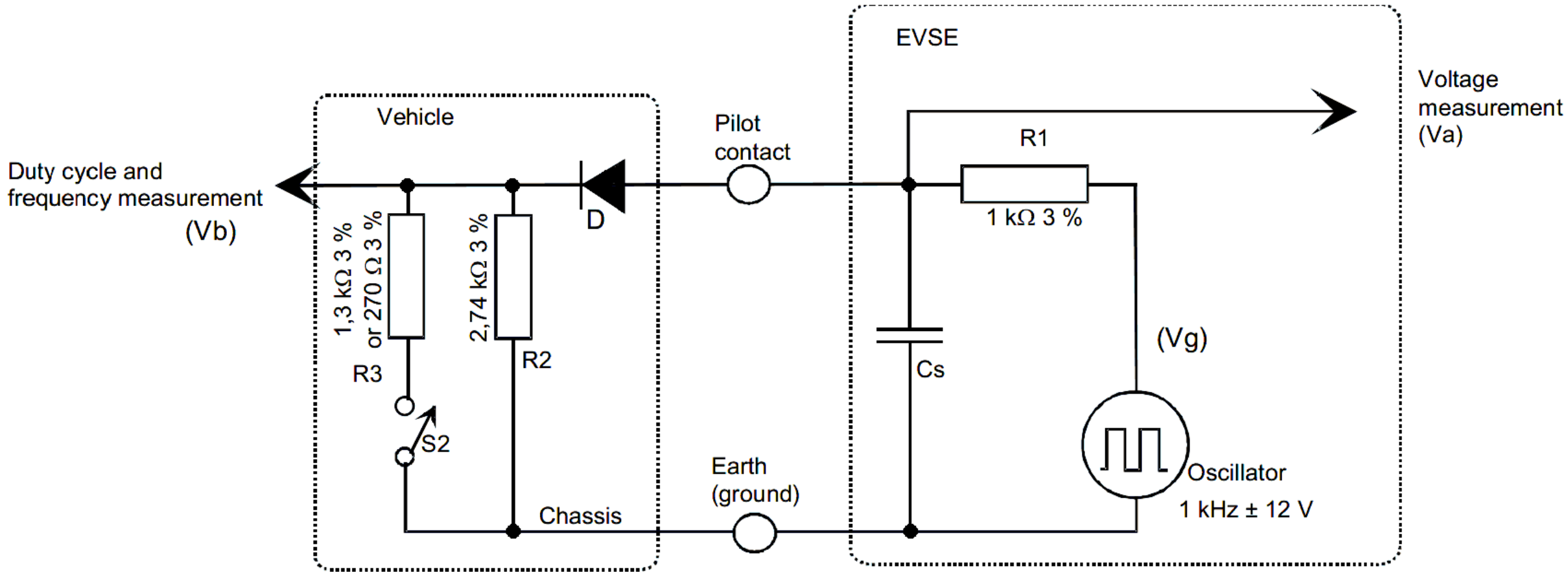
# Vezava signala Proximity Pilot (PP)



Current capability of the cable assembly	Equivalent resistance of $R_c$ Tolerance $\pm 3\%$ <sup>c</sup>
13 A	1,5 k $\Omega$ 0,5 W <sup>a, b</sup>
20 A	680 $\Omega$ 0,5 W <sup>a, b</sup>
32 A	220 $\Omega$ 0,5 W <sup>a, b</sup>
63 A (3 phase) / 70 A (1 phase)	100 $\Omega$ 0,5 W <sup>a, b</sup>
<sup>a</sup> The power dissipation of the resistor caused by the detection circuit shall not exceed the value given above. The value of the pull-up resistor shall be chosen accordingly. <sup>b</sup> Resistors used should preferably fail open circuit failure mode. Metal film resistors commonly show acceptable properties for this application. <sup>c</sup> Tolerances to be maintained over the full useful life and under environmental conditions as specified by the manufacturer.	



# EN 61851



Vezava signala Control Pilot (CP)



Vehicle state		Vehicle connected	S2	Charging possible		Va <sup>a</sup>	
A		no	open	no		12 V <sup>d</sup>	Vb = 0 V
B		yes	open	no		9 V <sup>b</sup>	R2 detected
C	}	yes	closed	Vehicle ready	{	6 V <sup>c</sup>	R3 = 1,3 kΩ ± 3 % Charging area ventilation not required
D						3 V <sup>c</sup>	R3 = 270 Ω ± 3 % Charging area ventilation required
E		yes	open	no		0 V	Vb = 0: EVSE, utility problem or utility power not available, pilot short to earth ...
F		yes	open	no		-12 V	EVSE not available

<sup>a</sup> All voltages are measured after stabilization period, tolerance ±1 V.

<sup>b</sup> The EVSE generator may apply a steady state DC voltage or a ±12 V square wave during this period. The duty cycle indicates the available current as in Table A.5.

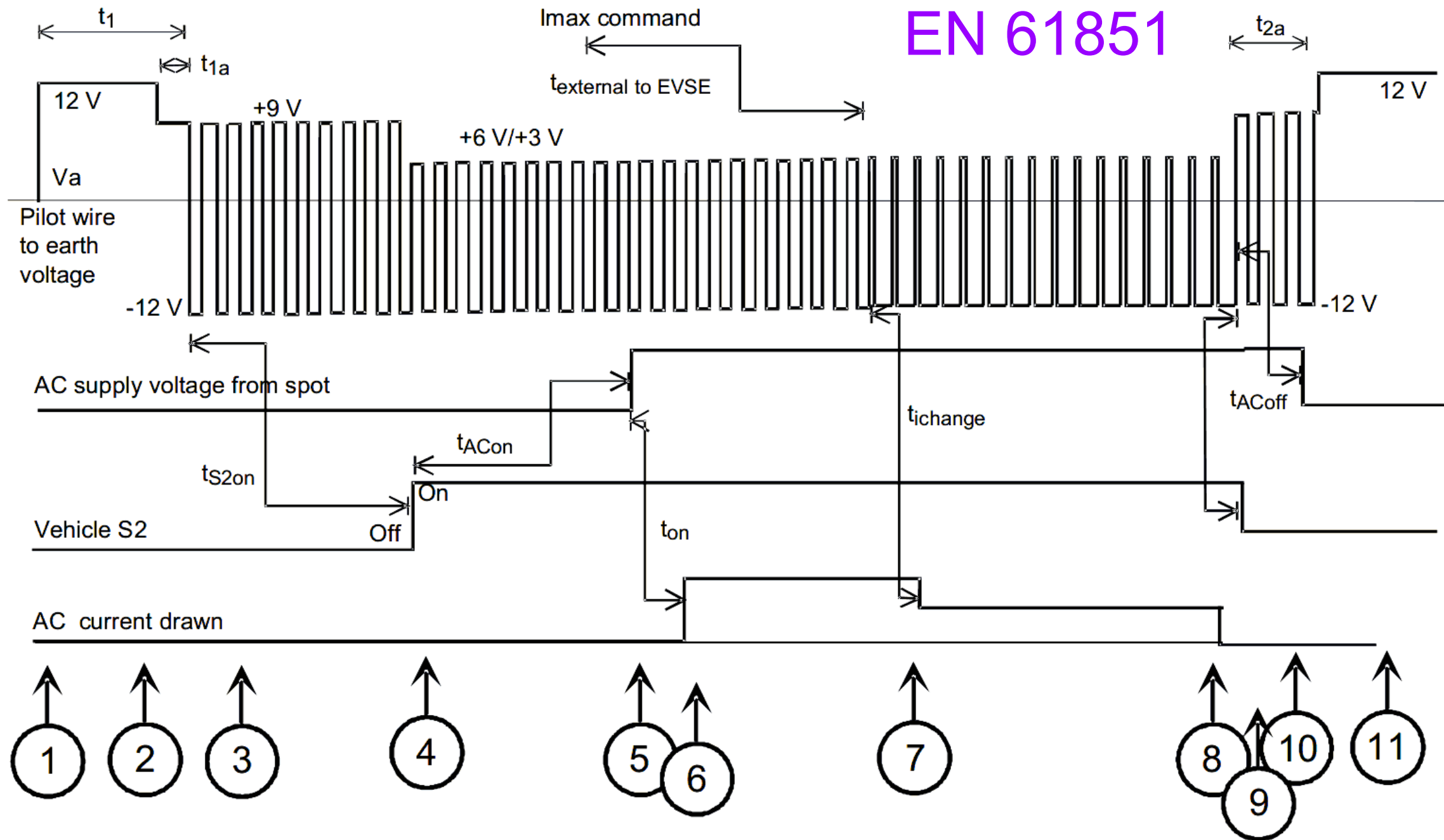
<sup>c</sup> The voltage measured is function of the value of R3 in Figure A.1 (indicated as Re in Figure A.2).

<sup>d</sup> 12 V static voltage.

## Protokol polnjenja Control Pilot (CP)



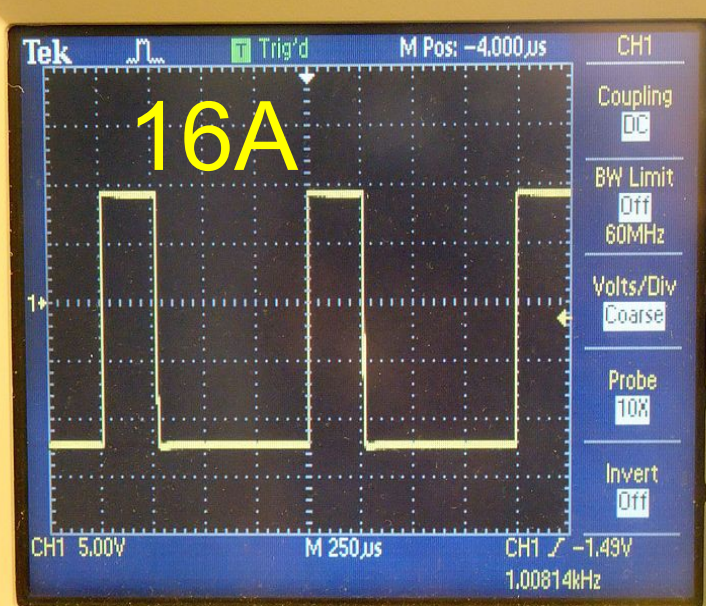
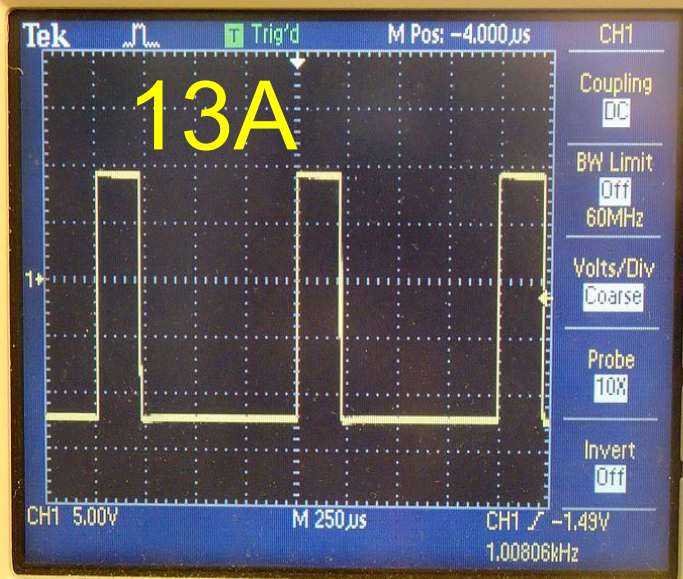
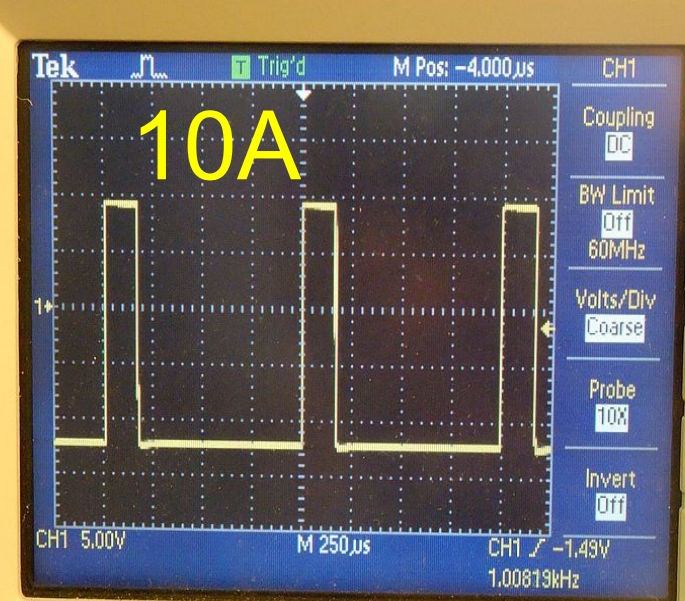
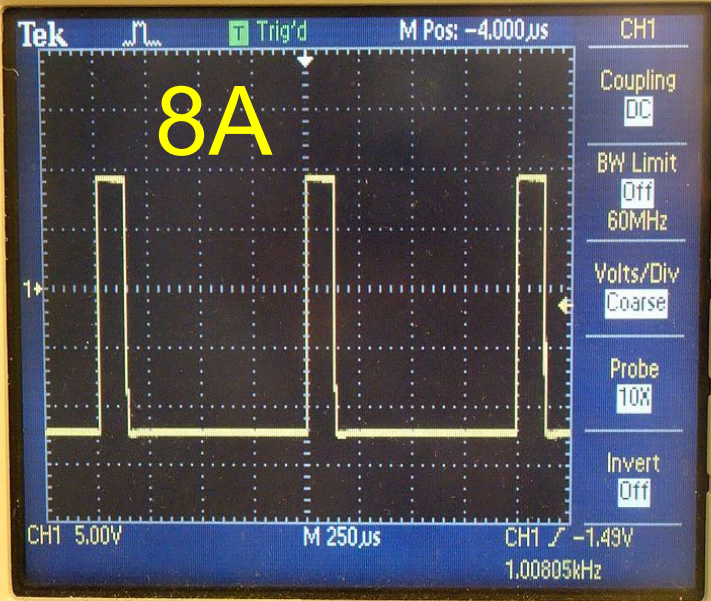
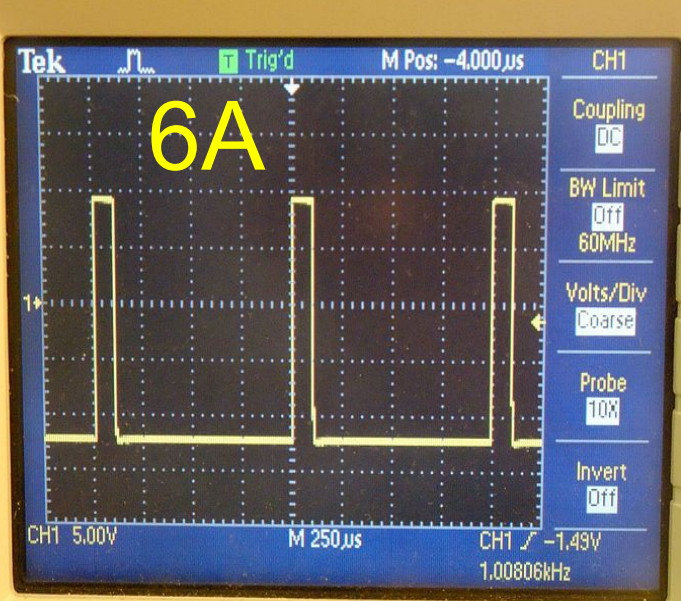
# EN 61851





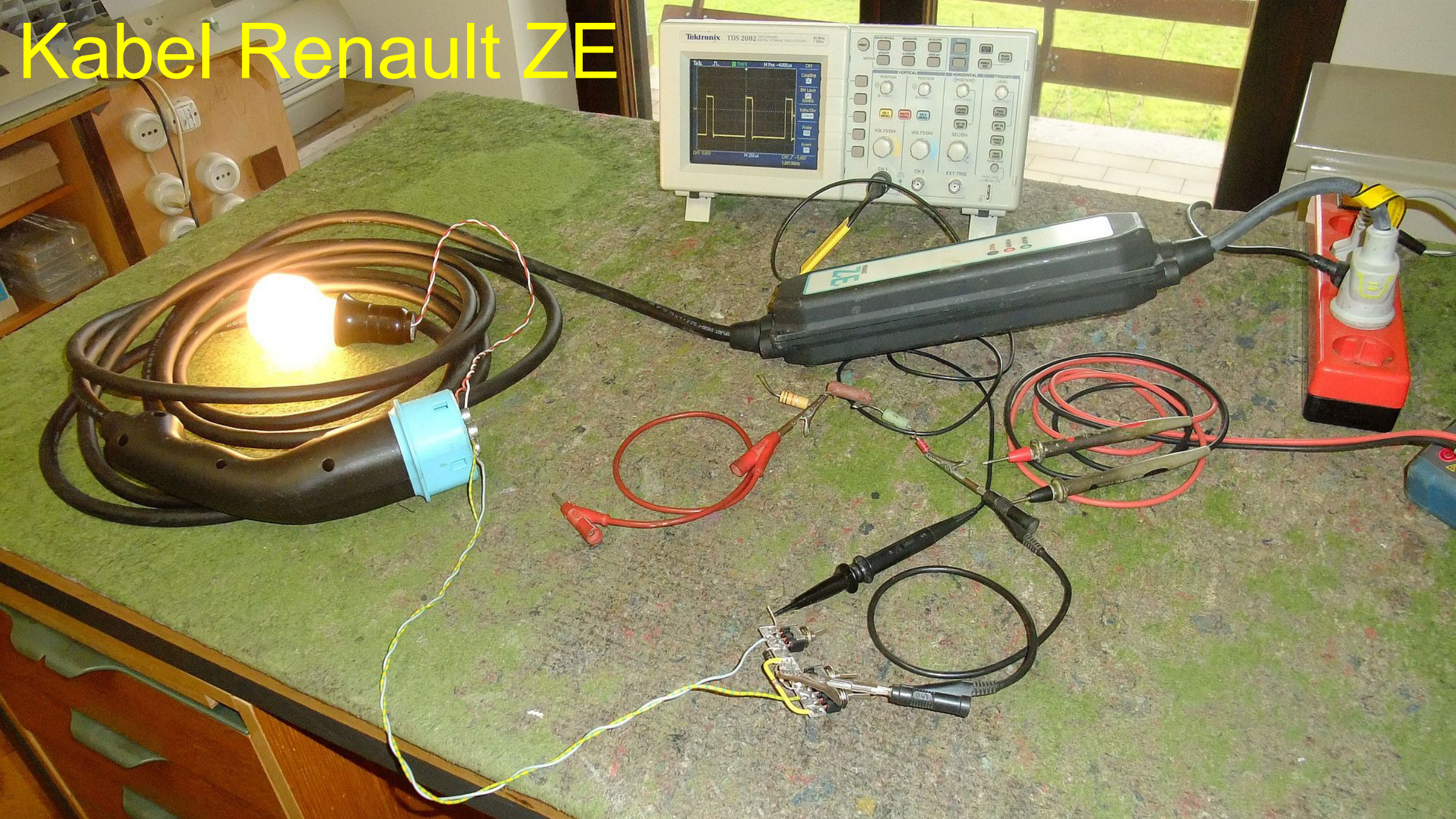
Nominal duty cycle interpretation by vehicle	Maximum current to be drawn by vehicle EN 61851
Duty cycle < 3 %	Charging not allowed
3 % ≤ duty cycle ≤ 7 %  <div>Se ne uporablja</div>	Indicates that digital communication will be used to control an off-board DC charger or communicate available line current for an on-board charger. Digital communication may also be used with other duty cycles.  Charging is not allowed without digital communication.  5 % duty cycle shall be used if the pilot function wire is used for digital communication
7 % < duty cycle < 8 %	Charging not allowed
8 % ≤ duty cycle < 10 %	6 A
10 % ≤ duty cycle ≤ 85 %	Available current = (% duty cycle) × 0,6 A
85 % < duty cycle ≤ 96 %	Available current = (% duty cycle - 64) × 2,5 A
96 % < duty cycle ≤ 97 %	80 A
Duty cycle > 97 %	charging not allowed
If the PWM signal is between 8 % and 97 %, the maximum current may not exceed the values indicated by the PWM even if the digital signal indicates a higher current.	







# Kabel Renault ZE





# Juice Booster 2























