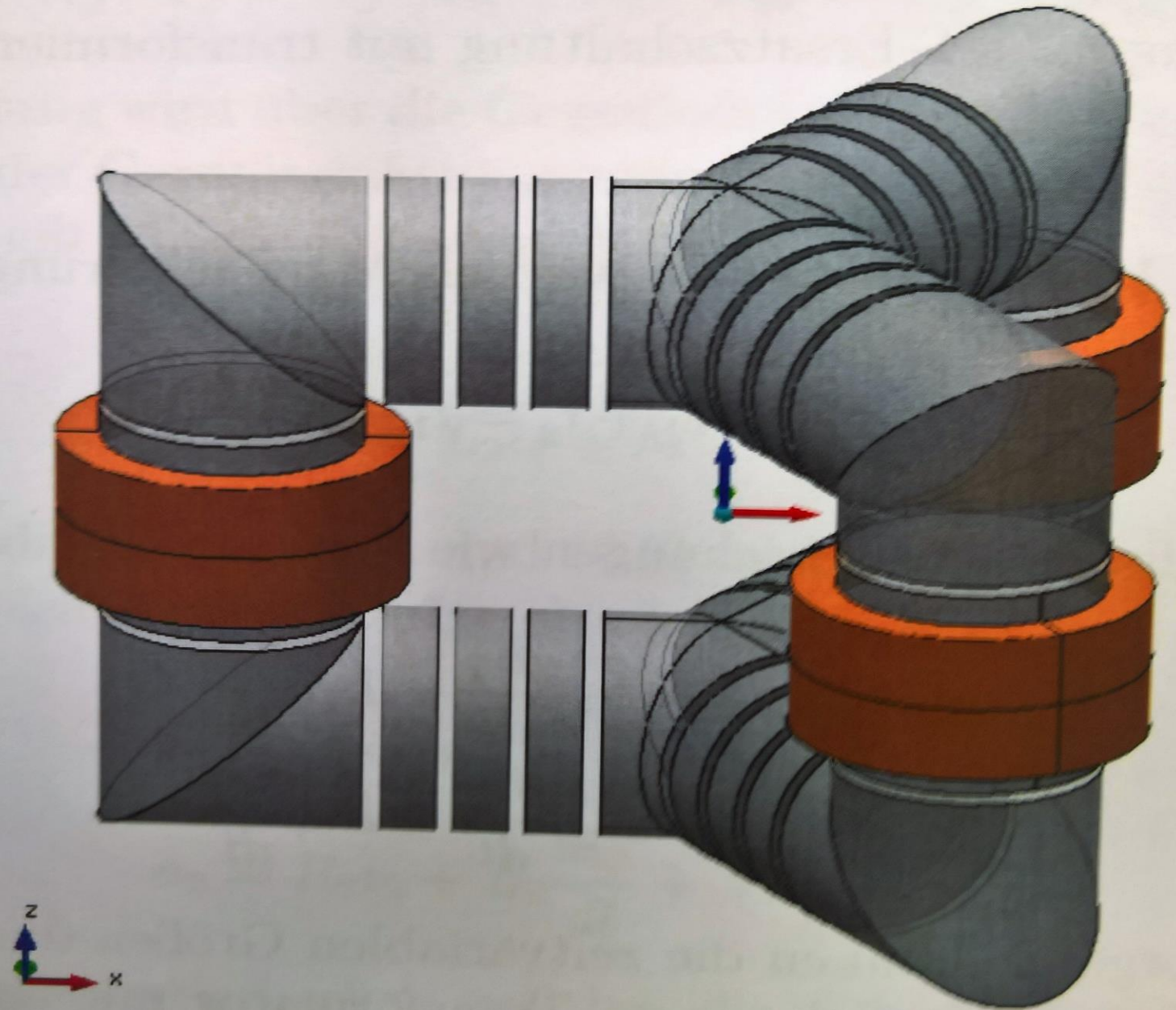


Three-phase inductive energy transmission system for electric vehicles

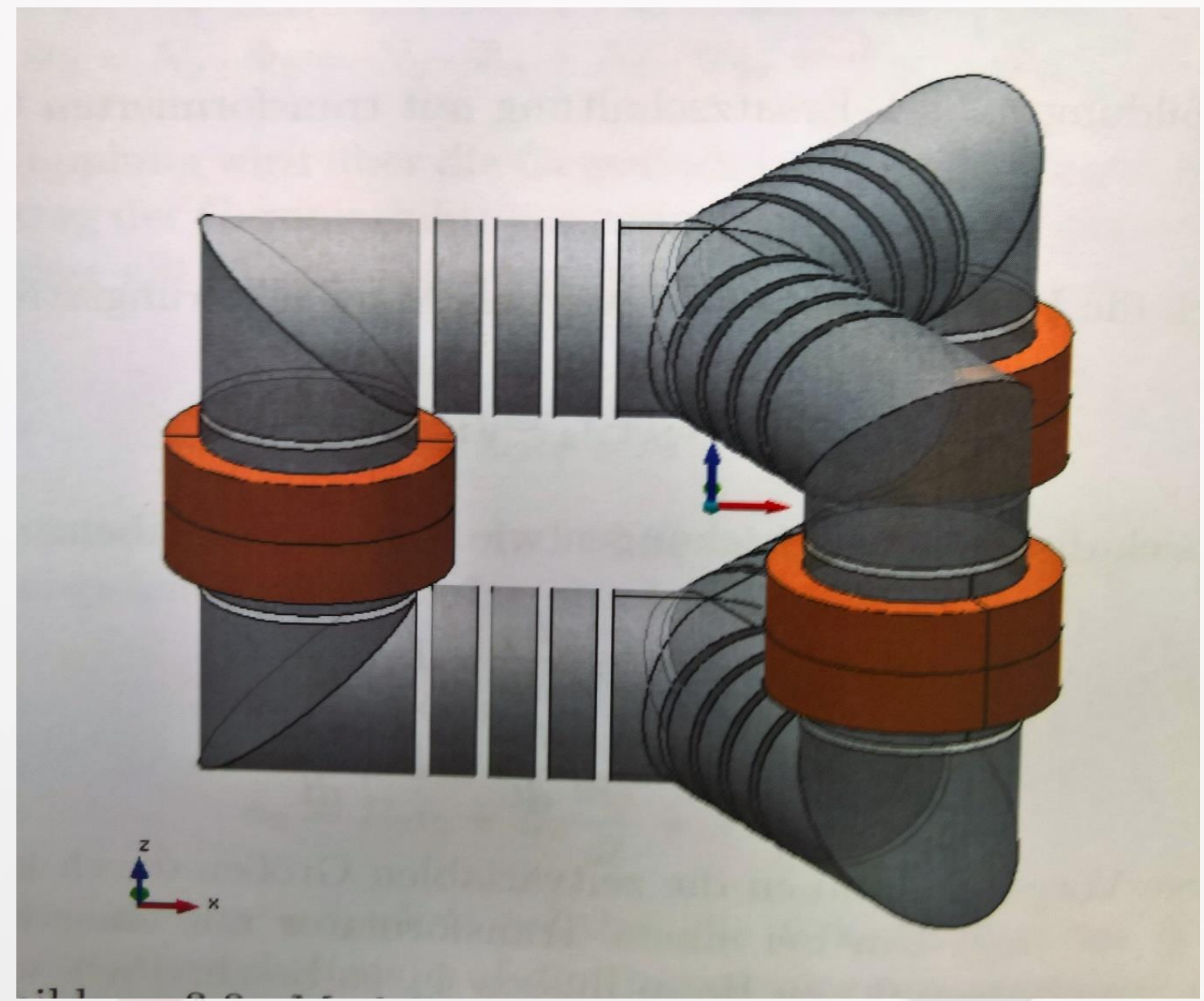
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The charge system

- ❖ Three-phase, inductive energy transmission system* with significantly higher power density and higher efficiency than single- and two-phase systems (Power currently 20 kW at 30x30x11 cm per transformer half)
- ❖ Efficiency over 95%
- ❖ Contactless
- ❖ Harmless to humans and animals
- ❖ No impermissible stray field
- ❖ Almost inaudible

*Patent holder and inventor: Georg Duschl-Graw
 Ingenieurbüro Duschl
 EP2686194, WO/2012/126465, EU, US, CN, J, AU, KR

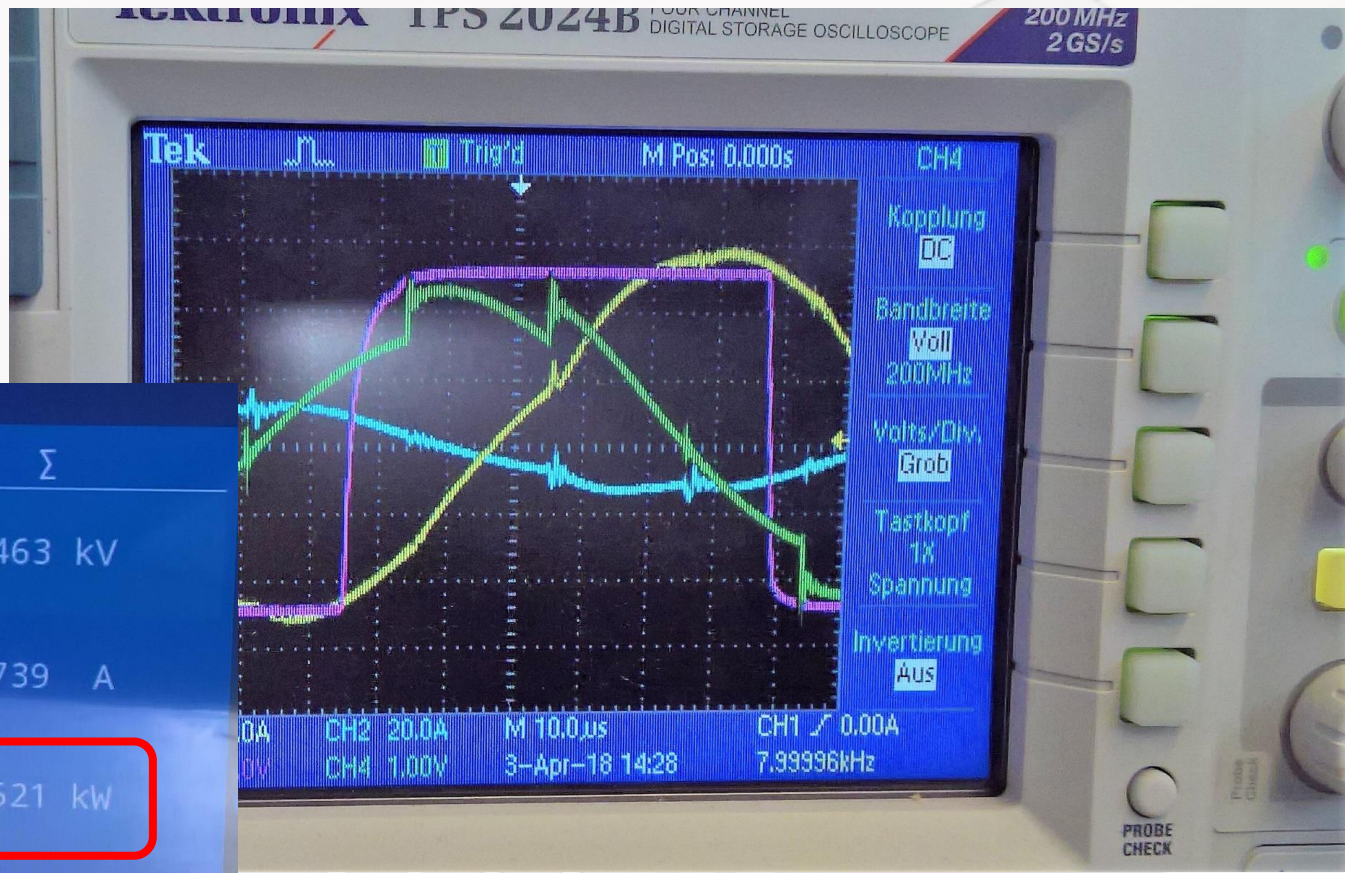


Der Prototyp

- ❖ **Rated power:** 20 kW at 95% efficiency
- ❖ **Input voltage:** 3~ variable, e.g. 3x 400 V three-phase current, 32A, 50/60 Hz
- ❖ **Output voltage:** DC or 3~ AC
- ❖ **Necessary positioning accuracy to achieve the rated output:** $\pm 5\text{mm}$
- ❖ **Magnetic stray field at a distance of 1m:** not detectable
- ❖ **Noise:** almost inaudible for switching frequencies $> 20\text{ kHz}$
- ❖ **Mass without power electronics:** 9 kg per half of the transformer (for 20 kHz, less for higher frequencies)
- ❖ **Dimensions:** edge length 29 cm, height 11 cm (for 20 kHz, less for higher frequencies)



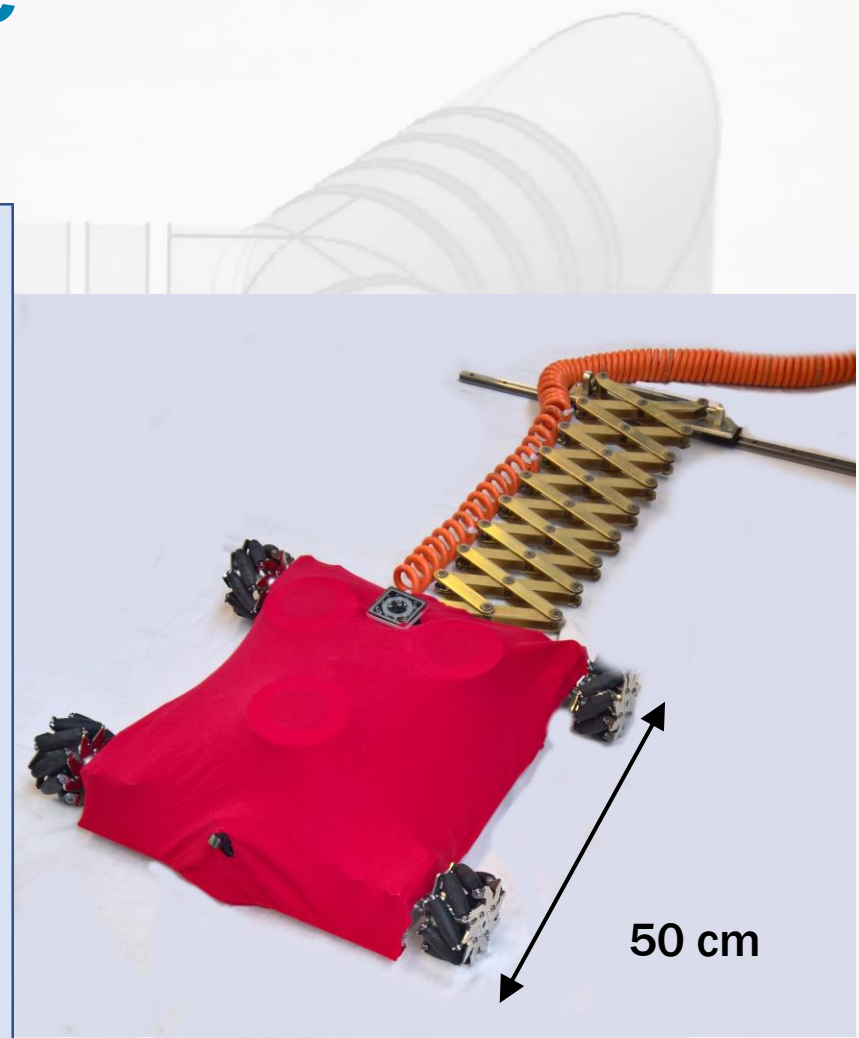
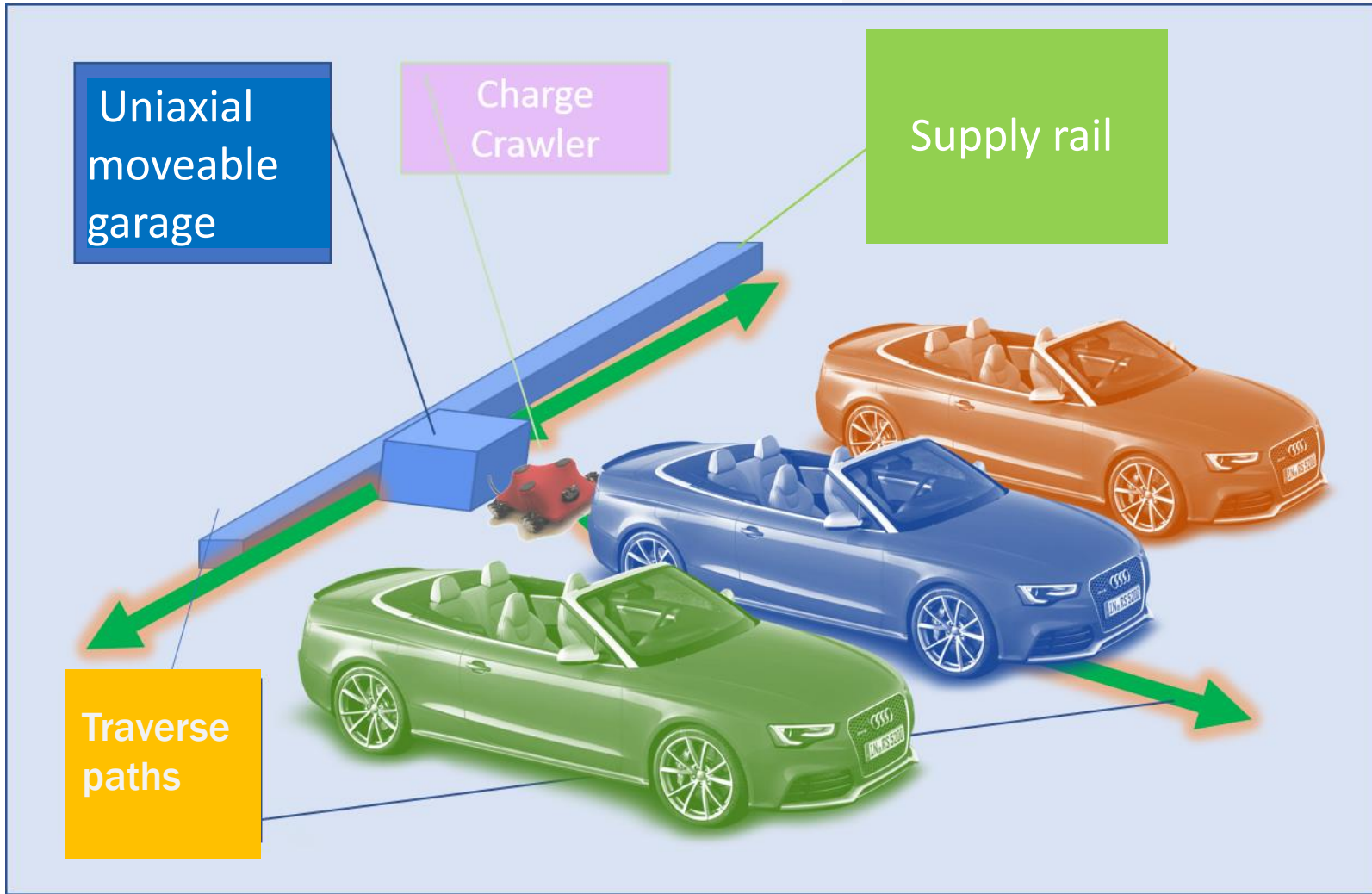
Measurement results



	1	2	3	Σ
U_{rms}	710.234 V	586.149 V	792.034 V	1.21463 kV
I_{rms}	9.9611 A	7.90638 A	9.9928 A	16.1739 A
P	7.0730 kW	4.57868 kW	7.9003 kW	19.5521 kW
PF	0.99976 ind	0.98800 ind	0.99819 ind	0.99526
S	7.0747 kVA	4.63431 kVA	7.9147 kVA	19.6452 kVA
Q	0.1566 kvar	0.71592 kvar	0.4766 kvar	1.91093 kvar



The automatic charging station with the charge crawler



Automatic charging of electric cars e.g. in parking garages with the charge crawler

The Charge-Butler

The charge butler, a more robust one variant of the charge crawler, is a SCARA- robot that is poseable attached to a supply rail.

The robot is uniaxial mobile. Guided by an optical imaging system, his arm dives under the floor of the vehicle and independently docks onto the secondary part of the transformer.



Higher power loading platforms (planned)

Inductive energy transmission with e.g. 200 kW for buses and vans

Ten three-phase transformers connected in parallel can transmit power of 200 kW with a total floor area of approx. 1m x 1m and a mass

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