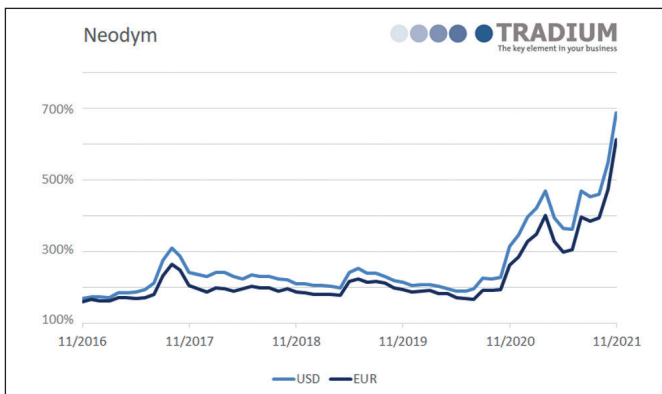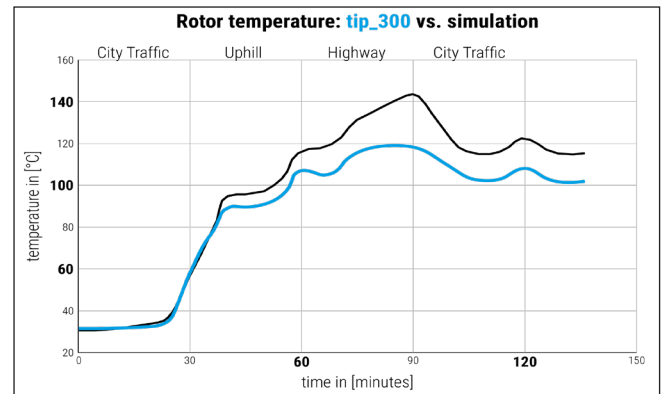# WHY **TEMPERATURE MEASUREMENT** IN THE **ROTOR**?

71% of the **costs** of an e-motor are material costs, a significant part of it: **magnets** (rising trend)

Our experiments show: the difference between the **calculated** and the **actual** temperature of the magnets can be almost 25 Kelvin.


Neodym — TRADIUM *The key element in your business*

Rotor temperature: **tip_300** vs. simulation

Information about the temperature of the magnets is needed to ...

- ☑ **avoid thermal damage** to the magnets in the rotor and thus enable the use of cheaper magnets.
- ☑ **maximize** the **power of utilisation** (avoid derating) and minimize the (thermal) reserves.
- ☑ improve the accuracy of the control quality and thus **increase** the **efficiency** in the driving cycle.

GET IT RIGHT.

tip_300
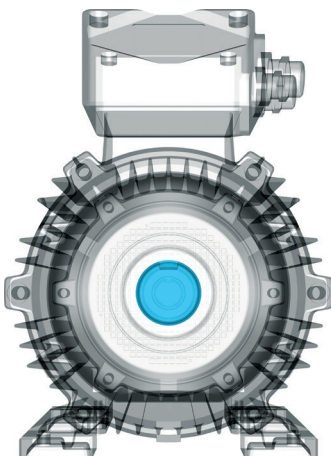
WHAT ONLY WE CAN DO:
### FROM THE **TEST BENCH** TO THE **STREET**

- In comparison to **telemetric** measurement systems:
  - ➔ **No influence** on the measurement by electro-magnetic disturbances of the motor
  - ➔ **No influence** on the measurement by cooling oil
  - ➔ **No modification** of the motor design necessary for sensor integration

- **High adaptability** to the geometry of the motor/various sensor specifications possible.

Therefore we want to help our customers in measuring the rotor temperature not only on the testbench but also on the street or in real life applications.
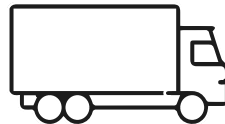
SOME OF OUR CUSTOMERS:

Top 10 of electric car manufacturers worldwide
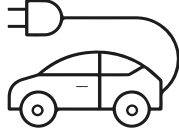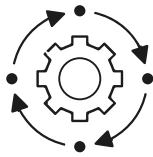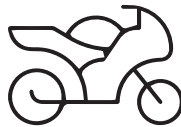
Top 5 of truck manufacturers worldwide

Aeroplane

Tooling

Tier-One-Supplier

TOP 5 of Motorcycle manufacturers in Europe

Formula 1

Train

FOR ALL KINDS OF E-MACHINES

WHY TEMPERATURE MEASUREMENT IN THE ROTOR?

TOGETHER WITH THE IAV GMBH WE FOUND OUT WHAT KNOWING THE TEMPERATURE MEANS ...

■ MORE POWER, SAME COST

Knowing the temperature better (for example by 15 K) can mean up tow **10% more continuous power,** if magnets are the thermic restricting factor.

■ SAME POWER, LESS COSTS

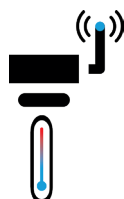For example: A reduction of thermal reserve by 10 K could save Tesla at least **10€ of magnet cost** in their Model 3.

SYSTEM COMPONENTS

→ High flexibility through modularity of the measuring system: from Plug&Play to individual solutions

→ 360° support: from development to production to successful installation, incl. analysis, consulting and support

→ Available interfaces: CAN, MOD, USB, COM Port, Ethernet

1 sensor with antenna

2 reader with antenna