

# Celeroton

## ZES ZIMMER

### AIMING FOR HIGHEST EFFICIENCY

### ZES ZIMMER AND CELEROTON



Ultra-high-speed - measurement and loss minimization

### TWO CHALLENGES - highly efficient results

#### Loss minimization in ultra-high-speed machines

Ultra-high-speed motors allow for very high power densities. However, this also results in small cooling surfaces. Therefore, a reduction of losses is even more important at high speed. Celeroton therefore optimizes each machine for highest efficiency.

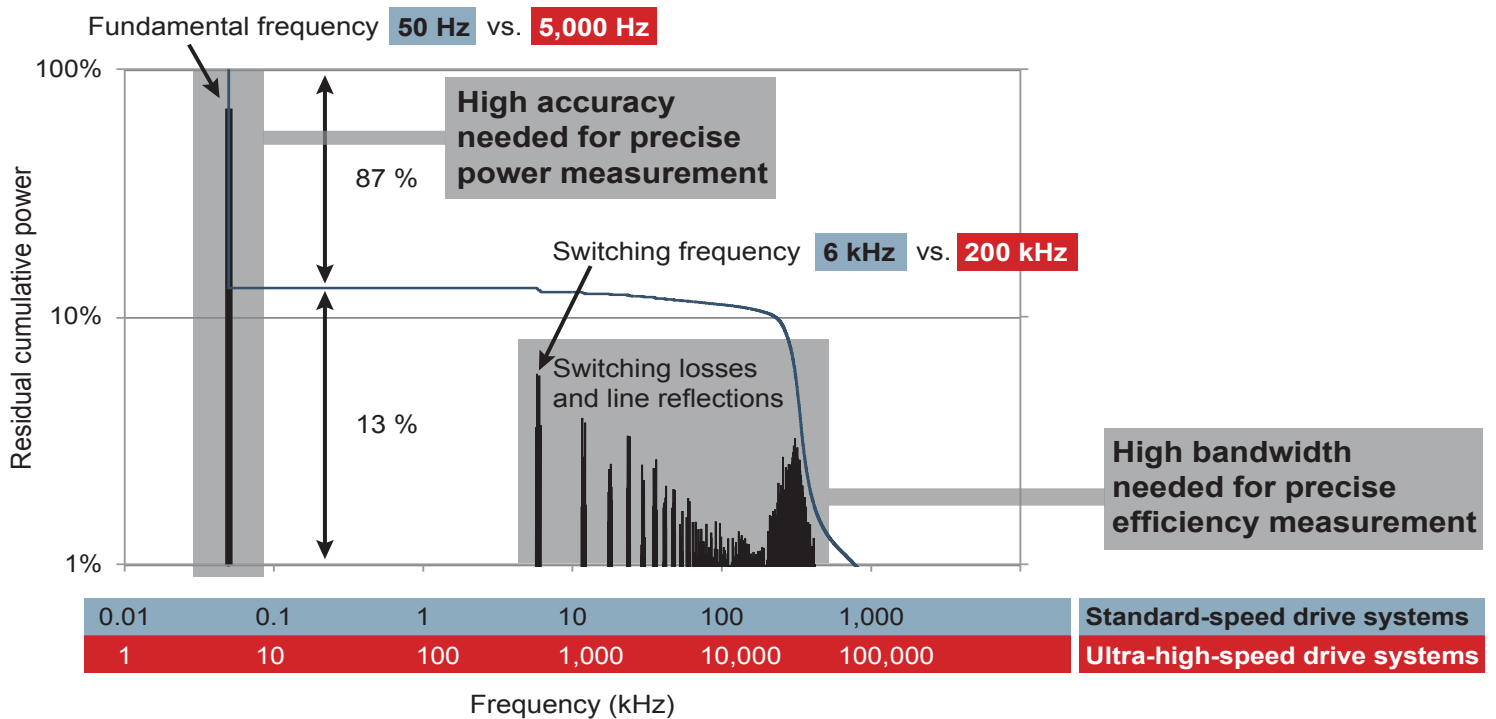
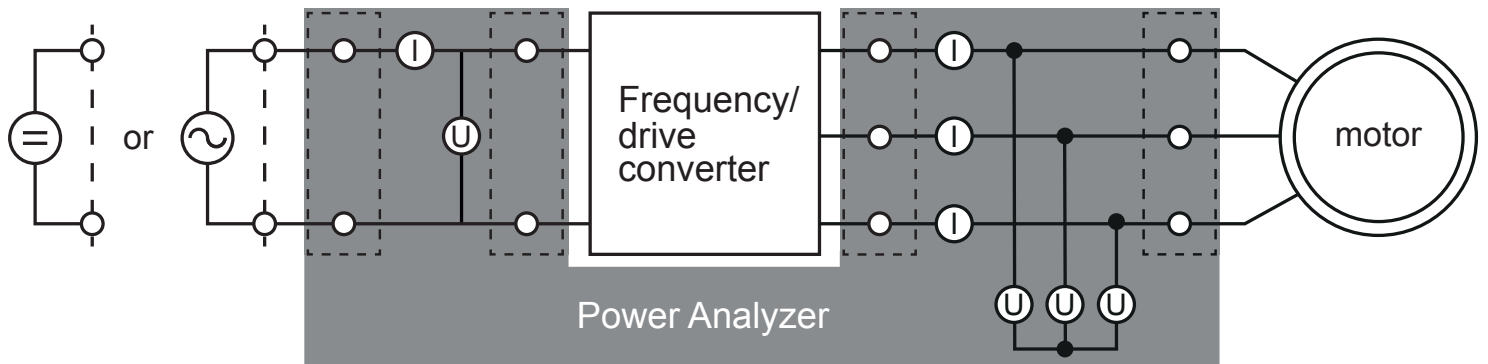
#### Measuring with high bandwidth and accuracy

Ultra-high-speed electrical drive systems and high inverter switching frequencies require high bandwidth AND high accuracy in the power measurement. ZES ZIMMER has solutions to do it both in one device.

#### The result

When Celeroton's efficiency optimization tools and loss minimization measures can be experimentally verified with ZES ZIMMER's power analyzers, the result is highly efficient motors and inverters.

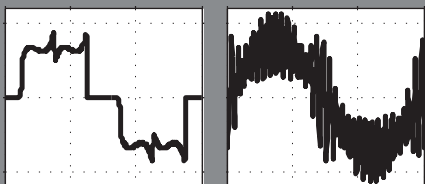
Measuring Converter and Motor Power and Efficiency



Loss Minimization Measures

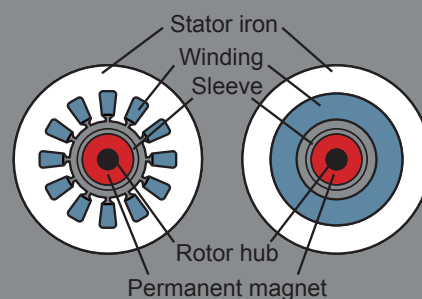
Choosing the right modulation

PAM or PWM?



Choosing the right stator

Slotted or slotless?



Choosing the right rotor

Segmentation or coating?

