Testing systems for determining the energy efficiency rating of refrigerator / freezer combo units

Task
The elaborate long-term measurements to determine the energy efficiency rating supposed to be automated. It was imperative that the applicable standards are complied with. All results must be documented in a clearly understandable way. The concept should also be future-oriented and meet the highest metrology requirements.

In the past, it has been shown that new requirements result from new technologies, such as LED technology. The measurement of standby power consumption with the least currents is also a recent requirement.

Solution
Laptops were used for the PC-controlled system. High-precision measuring instruments are available for recording the electrical parameters. The entire layout was designed as 3-phase since high-power household appliances are powered by 3 phases. A programmable, 3-phase source was used to supply power to the DUT. In addition to the electric measuring instruments, there are still 50 channels for temperature measurements. The emergency power supply ensures uninterrupted recording of data over longer periods of time.

Advantages
+ In network operation, all test data is automatically saved at the specified location / database
+ Long service life and service-friendly design
+ All values and settings can be made using software
+ Workplace safety according to EN 50191
+ Customised hardware and software solution
+ For single and 3-phase DUT
+ Power range from a few mWs to several kW
+ High measurement accuracy
+ PC-controlled with laptops
+ Fully automatic long-term test without monitoring personnel

Specifications
• Function test 1/3-phase
• Controlled output voltage
• Measurement of the nominal power and “standby” power consumption [0.1 mW – x kW]
• Temperature measurements (PT100, thermal elements)
• Measurements over mains supply analysers [P, U, F, VA, cos φ]