

PHYSICS

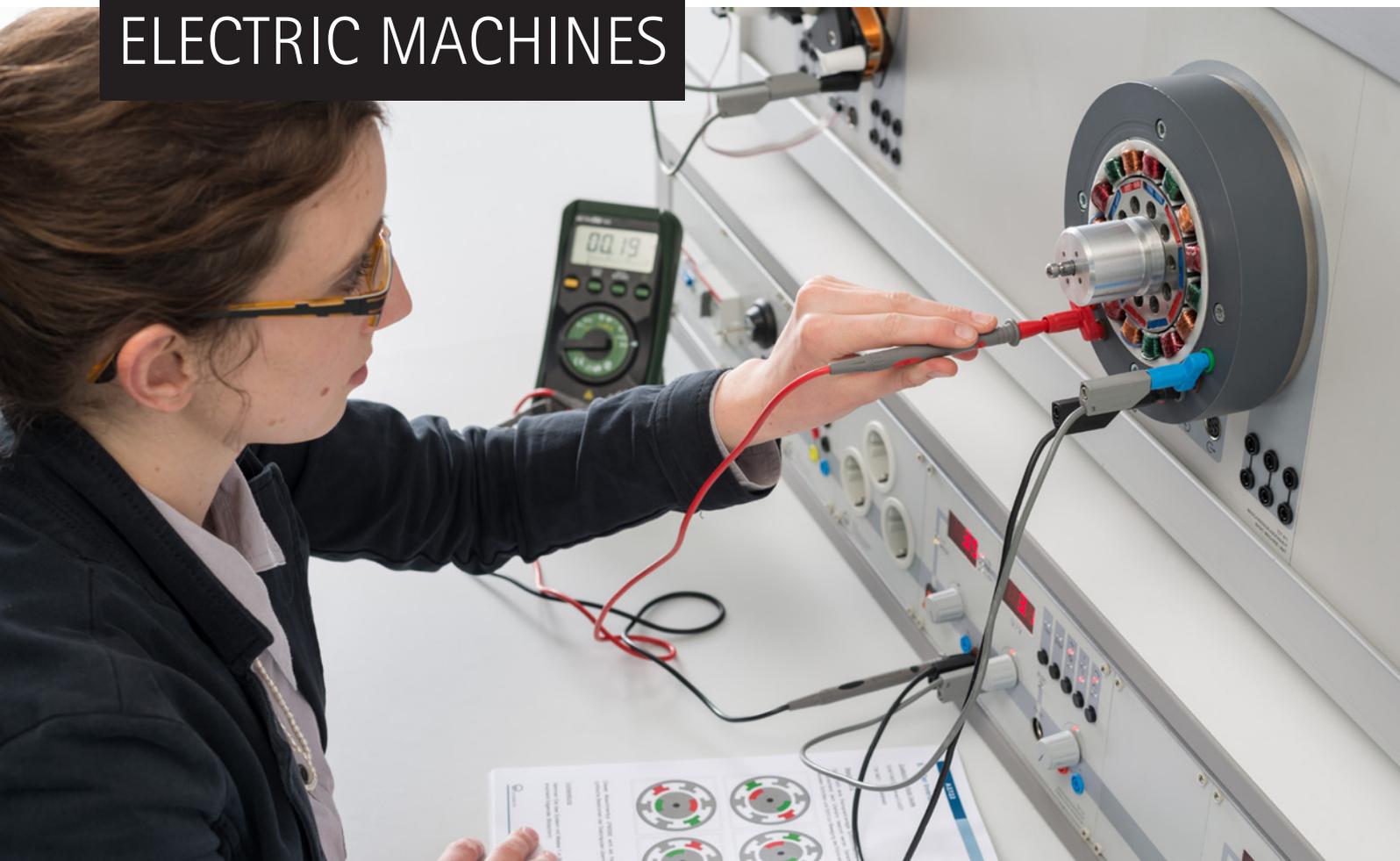
CHEMISTRY
BIOLOGY

ENGINEERING



NEW

HIGH EFFICIENCY ELECTRIC MACHINES



PERMANENT MAGNET ROTOR ELECTRICAL MACHINE MODELS

- Vertical design for teaching
- Rotating current stator with colored windings
- Color-coded rotor magnets

LEYBOLD®

PERMANENT MAGNET ROTOR ELECTRICAL MACHINE MODELS

Electrical rotating field machines built with rare-earth permanent magnets can utilise very strong magnetic fields without the use of external electrical power. This feature, together with lower raw material usage, (Al, Fe, Cu) results in higher overall energy efficiency compared with an asynchronous motor. When operated as a high-quality synchronous machine using rotors with surface-mounted or embedded magnets, a pulse wheel can be formed with the further advantage of additional reluctance torque.

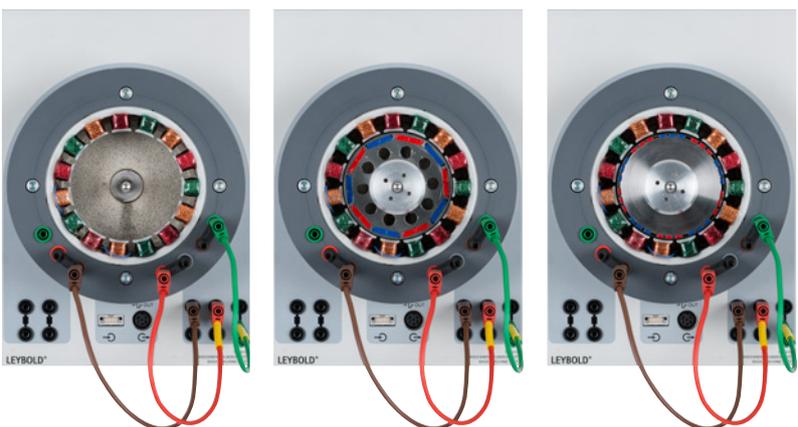
Used "off grid", with an inverter, as a low power direct drive motor, higher efficiency than with conventional geared motors is possible. Permanent magnet motors are also nearly wear-free and they require no gear-train lubricant.

Working as the generator in micro power plants, such machines result in higher efficiency than previous solutions allowed. Even when the power converter is included in the energy balance, the permanent magnet motor solution can be more efficient.

The instructor can expand the "Electric instruction machine (ELM)" system with a stator and, optionally, two rotors in the "Electrical machine models" system. Both rotors are provided with rare-earth permanent magnets, one with them surface-mounted and the other with internal embedded magnets. The poles are color-coded. The stator windings are also color-coded, to illustrate the three phases.

The machines can be used as:

- Synchronous motor (PMSM)
- BLDC driving motor or
- modern generator



Using the three-phase generator (725 721), block and sinusoidal modulation types can be examined as well as the operation of a Hall effect rotor position encoder. By simply connecting the windings with bridging plugs, star and delta connections can be assembled quickly and easily.

Further product information are available on our website under:

ELM Set Multipole stator and rotor	727 815
ELM PM magnet rotor with inner magnets	727 816

The complete experiment equipment is available under E.2.1.3.1.