



## DL 10280 - SET OF COMPONENTS

It includes the following components:

1. Base plate
2. Supports with bearing
3. Coupling joints
4. Flexible coupling
5. Electronic speed transducer
6. Assembling screws
7. Wrenches
8. DC stator
9. AC stator
10. Rotor with commutator
11. Brush holder with 2 brushes
12. Cage rotor
13. Ring rotor
14. Brush holder with 6 brushes

Besides, a magnetic probe is foreseen to display the magnetic fields and a transparent covering, for safety reasons, prevents students from the accidental contact with the rotating parts.



The **AC STATOR** is composed of a metal frame supporting the laminated magnetic circuit, because interested by a flux variable in time, and the electrical winding.

The sheet iron pack is 60 mm long, with internal diameter of 80 mm and external one of 150 mm and it presents 24 half-closed slots inside of which there is a double three-phase winding: the beginnings and the ends of the different phases are shown outside the stator on a suitable educational terminal board.

The winding is a double layer one of the long coil lap type, with winding span 6 (1÷7).

Every slot contains two coils of 19 turns each of enameled wire of diameter 1.12 mm.



# ELECTRIC MACHINES – OPENLAB - 0.2 kW



The **SQUIRREL CAGE ROTOR** is composed of a shaft to which a pack of magnetic sheet irons is fixed, where the slots suitable to contain the rotor winding are set. The sheet iron pack is 60 mm long, with external diameter of about 78 mm.

To avoid the phenomenon of the motor crawling in starting phase and to reduce the noise, the slots are inclined as regards the stator ones. The rotor winding is composed of the squirrel cage.

The cage is carried out by setting in every rotor slot some conducting bars that are closed in short-circuit at both ends by means of some conducting rings.

The rotor winding can be therefore considered a multi-phase winding, with a single conductor for pole-phase, so it does not present its proper pole number but it assumes one that is equal to the stator winding one.

The **RING ROTOR** is composed of a shaft to which the collector rings and a magnetic sheet iron pack are fixed: the iron pack has 21 semi-closed slots suitable to contain the winding.

The sheet iron pack is 60 mm long, with external diameter of about 78 mm. To avoid a noisy mechanical running the rotor slots are inclined as regards the stator ones.

The rotor winding is composed of coils and it is two pole three-phase.

The winding is a double layer one of the long coil lap type, with winding span 9 (1-10).

Every slot contains two coils of 8 turns each of enameled wire of diameter 1.5 mm.

The winding is star connected and it is subordinate to the collector rings while the star centre is internal and not accessible.

The terminals of the rotor winding are accessible by means of the collector rings on which the bushes supported by a brush holder graze.

The brushes are two for each phase and they are subordinate to an external terminal board that shows the synoptic of the rotor winding.

The **DC STATOR** is composed of a metal frame supporting the laminated magnetic circuit, with 2 main poles and 2 inter poles, and the electrical windings.

The sheet iron pack is 60 mm long, with internal diameter of 80 mm. On the poles the coils are wound whose terminals are shown on a suitable educational terminal board.

The **DC ROTOR** is composed of a shaft to which the segment commutator is fixed and of a magnetic sheet iron pack where 20 semi-closed slots suitable to contain the electrical winding are set.

The sheet iron pack is 60 mm long, with external diameter of about 80 mm.

The winding is a double layer one of the long coil lap type, with winding span 9 (1÷10).

Every slot contains two coils with two sections of 5+5 turns carried out with enameled wire of diameter 1.12 mm.

The winding is subordinate to the 40 segments of the commutator on which two brushes are supported by a brush holder graze.

The brushes are subordinate to terminals set on two external boards that show the synoptic of the rotor winding.

## DL 10281 - POWER SUPPLY

Outputs in ac:

- Three-phase: 24 V/14 A, 42V/10A
- Single-phase: 0 – 48 V/5 A, 0 – 10 V/12A

Outputs in dc:

- 32 V/14 A, 42 V/10 A, 0 – 40 V/5 A, 0 – 8 V/12 A

Three-phase power supply from mains.

Complete with over-speed protection

