

## FAULT FINDING IN MOTOR

### EDUCATIONAL OBJECTIVES

- Simulating common failures encountered with a cage induction motor with brake: damage winding, cut, shorted to ground
- Diagnosis by performing measurements and safety tests

### TEACHING RESSOURCES + PRACTICAL WORKS

#### Practical works

- Cut Winding
- Winding in short circuit
- Winding to ground
- Damaged winding
- Cut brake control system

*The user's manual has been made by teachers, allowing the quick implementation of the product and the creation of practical work in the spirit of fault finding in the industry.*

#### ref. MOTODIAG

This complete kit on casters, comprising two back-to-back units and an asynchronous squirrel cage motor and a parking brake, can be used to simulate the faults which occur most frequently. The principle and the instructions have been devised by teachers who want to propose a method for diagnosing faults.

#### PRINCIPLE

Faults are recreated when the teacher rotates a single switch. Students can take measurements or perform tests in complete safety, regardless of the fault type. Faults can be looked for inside the student unit and in the motor terminal. The unit is isolated from the mains by means of an insulation transformer. In addition, a TT earthing system is recreated on the secondary for safety reasons. Therefore, even isolation faults are detected by a 30mA differential mechanism. All safety measures are implemented in order to protect individuals and equipment. (See the faults in the description of the teacher unit)

#### TEACHER SIDE UNIT

The teacher uses this lockable area to manage faults activated by key switches. He/she knows, and t views all of the simulator's workings thanks to indicator light. The position of the switches and indicator lights remain invisible to students.

The following faults are possible:

- 3 faults involving «damaged coil». A resistor is connected in series with a coil to change its impedance. One switch per phase, or three switches.
- 3 faults involving «power being cut in a coil». The power is cut in a coil. One switch per phase, or three switches.
- 3 faults involving a «short-circuit in a coil». The coils are short-circuited two at a time. One switch per possibility or three switches.
- 3 faults involving «coil earthing». A coil is earthed. One switch per phase, or three switches.
- 1 fault on the brake. The power in the parking brake is cut.

#### STUDENT SIDE UNIT

This lockable area is used for starting up the simulator (if authorised by the teacher). The transparent door gives the unit a highly didactic appearance.

The student control panel is simpler than the teacher control panel, offering standard normal operation indications. This means that fault finding, testing and measurement are identical to reality in the field.

- Overall dims: 670 x 750 x 1180 mm. Weight: 136 kg
- Laminated bench-top: 670 x 750 mm
- 4 casters Ø 80 mm
- 3-phase Hypra socket on 5m mains cable



*View of the teacher side, door closed and open.*



*View of the student side, with glass door.*



*Faults can be looked for inside the student unit and in the motor terminal.*



*Unit from the teacher side, open door*



*Unit from the student side, open door.*