

STUDY OF THE SYNCHRONIZATION OF AN ALTERNATOR WITH THE ELECTRICAL GRID



Set of modules (H-250mm) and rotating machinery for studying the synchronization of an alternator 1500W with the electricity grid 3 x 400V.

EDUCATIONAL OBJECTIVES

- Understand the operation of a synchronous alternator.
- Understand the rules of synchronization with the electricity grid.
- Use a synchronoscope.
- Study the wiring diagram between a speed controller and an asynchronous motor.
- Creation of the configuration of a speed controller with software.
- Study the no-load and with-load behaviour of a 3-phase asynchronous motor 1500W.
- Study the no-load and with-load behaviour of an alternator.
- Read and plot the electrical and mechanical characteristics of the motor bench.

TEACHING RESOURCES STUDENT & TEACHER

ref. QUICK-JPLUS

ref. QUICK-J

without frame and console

The set can be supplied without the motor set, please ask for details.



Proposed Practical Works

- Creation of the wiring diagram of a speed controller and the asynchronous motor.
- Configuration of the speed controller with software.
- Creation of the wiring of the alternator and the synchronoscope.
- Creation of the no-load and with-load tests of the asynchronous motor.
- Creation of the no-load and with-load tests of the alternator.
- Calculations and plots of the electrical and mechanical characteristics of the motor bench.

Comprises

- 1 Single-phase power supply module with RC circuit-breaker and emergency stop button.
 - 1 Single-phase speed controller module 230V AC – 3x230V AC, 1500W. Adjustment of the rotation speed setting by potentiometer on the front.
 - 1 Wattmeter switch module.
 - 5 digital display modules:
Voltage - Current - Power - Motor torque - Rotation speed.
 - 1 Indicator module of phase order on the alternator side.
 - 1 Indicator module of phase order on the electricity grid side.
 - 1 Switching module with display of the matching of the voltages, speed of synchronism, frequency of the alternator, and output voltage of the alternator.
 - 1 Machinery set on wheeled cart comprised of:
 - 1 Asynchronous motor 1500W - 3x 230V/3x400V
 - 1 Brushless rotary dynamic torque sensor
 - 1 Synchronous machine 1500W - 3x230V/3x400V
 - 1 Tachometer generator 10V/1000 revs
 - 1 Analogue wattmeter RMS AC+DC.
 - 1 Variable power supply 0-240V AC/DC for supplying the polar wheel of the alternator.
 - 1 set of safety leads for carrying out the different practical works.
 - 1 frame with wheels (H x W x D): 1610 x 940 x 500mm equipped with rack for cords (30 fingers)
 - 1 three-phase power console:
 - 1 4-poles thermal magnetic circuit breaker (16A)
 - 1 Emergency stop push button with key
 - 1 Push button + LED indicator
 - 1 3-phase output 3x 400V+N+E on 4mm safety terminals
 - 2 230Vac sockets (2P + E)
 - 12 230Vac sockets (2P + E) with ON indicator (back side)
- Mains power supply 230V - 50/60Hz. 3-metre lead with plug 2P+E.



Sockets on the back of the console for connecting the modules