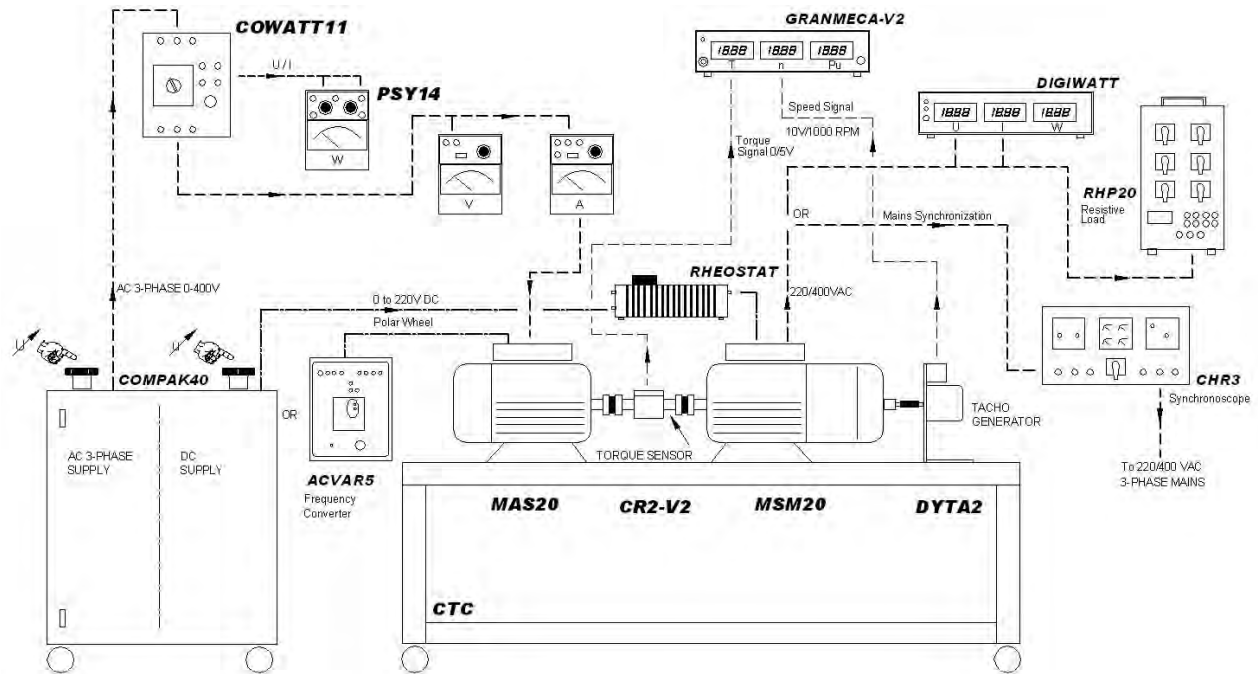




## Complete kit for studying the 1.5kW asynchronous motor

The PACK-AC2 power unit kit (power unit + accessories) can be used for studying a 1500W asynchronous motor. Charged by a 1500W three-phase alternator, the charge properties are plotted based on measurements taken by various analogue or digital devices.



### TUTORIALS DESCRIBED IN THE INSTRUCTIONS SUPPLIED WITH PACK-AC2

#### STUDY OF THE ASYNCHRONOUS INDUCTION MOTOR

- **Study of the star/delta coupling of the asynchronous motor.**
    - Understanding and undertaking motor wiring.
    - Measurements and comparison of the various voltage and current values according to the coupling type selected.
  - **Study of the "two powers" method.**
    - Understanding and undertaking of wiring.
    - Power measurements P1/P2.
    - Calculation of the total power and total speed consumed by the motor.
  - **Study of motor operation with no load, with a load and with an overload, using the 1500W alternator.**
    - Theoretical reminders of the mathematical formulae concerning an asynchronous motor.
    - Understanding and undertaking motor wiring with measuring devices.
    - Calculations of the electrical and mechanical quantities of the motor using its identification plate, such as:
      - ✓ Synchronism speed
      - ✓ Slip
      - ✓ Power consumption
      - ✓ Reactive power
      - ✓ Number of pairs of motor poles
      - ✓ Torque
      - ✓ Efficiency
      - ✓ Apparent power
    - Creation of a table containing calculations and measurements of electrical and mechanical quantities at various points of the motor load:
      - ✓ Current consumption
      - ✓ Rotation speed
      - ✓ Motor torque
      - ✓ Apparent power
      - ✓ Slip
      - ✓ Power consumption
      - ✓ Useful power
      - ✓ Power factor
      - ✓ Reactive power
      - ✓ Efficiency
    - Comparison of the theoretical calculation of values with those values measured during the motor tests
    - Plotting of properties based on motor measurements such as:
      - ✓ Torque as a function of useful power\*
      - ✓ Efficiency as a function of useful power\*
      - ✓ Current as a function of useful power\*
      - ✓ Rotation speed as a function of useful power\*
      - ✓ Slip as a function of useful power\*
- \* or other variable

#### STUDY OF THE ALTERNATOR

- **Study of the star/delta coupling of the asynchronous motor.**
  - Understanding and undertaking alternator wiring.
  - Measurements and comparison of the various voltage and current values according to the coupling type selected.
- **Study of alternator operation with no load, with a load and with an overload, using a resistive load:**
  - Theoretical reminders of the mathematical formulae which apply to the alternator.
  - Understanding and undertaking alternator wiring with measuring devices.
  - Measurement and plotting of the properties of the magnetic circuit's hysteresis cycle.
  - Calculations of the electrical quantities of the alternator based on its identification plate, such as:
    - ✓ Number of pairs of poles
    - ✓ Power supplied
    - ✓ Power consumed by the rotary field
    - ✓ Joule loss
  - Creation of a table containing calculations and measurements of electrical and mechanical quantities at various points of the motor load
  - Comparison of the theoretical calculation of values with those values measured during the practical tests
  - Plotting the properties of the alternator's load: voltage as a function of the supplied current
  - Calculation of the voltage decrease as a function of the load
  - Theoretical plotting of the shapes of the capacitive and inductive loads, compared with a resistive load
  - Analysis of results and conclusion
- **Study of the operation of the synchronised alternator on the public network**
  - Understanding and undertaking alternator wiring on the network.
  - Use of the speed controller
  - Use of the synchroscope with its various displays
  - Synchronisation on the mains network
- **Study of the operation of a short-circuited alternator:**
  - Measurement of the short-circuit current and the current in the rotary field
  - Plotting of properties

ref. PACK-AC2

ALSO AVAILABLE IN 300W. CONTACT US.

DELIVERED COMPLETE WITH TEACHING RESOURCES  
 STUDENT BOOKLET :  
 THEORETICAL STUDIES AND PRACTICAL WORK  
 TEACHER BOOKLET :  
 WITH CORRECT VERSIONS OF THE PRACTICAL WORKS





## and three-phase alternator

### OPERATING PRINCIPLE

A 1500W asynchronous motor, powered by a 3 X 400V source, is charged by means of an alternator. The electrical power generated by the alternator is drained either in the form of an adjustable resistive charge or throughout the public network.

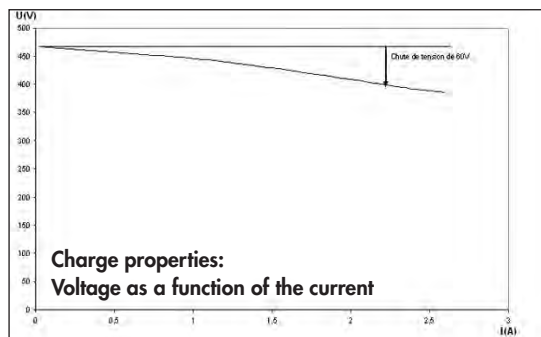
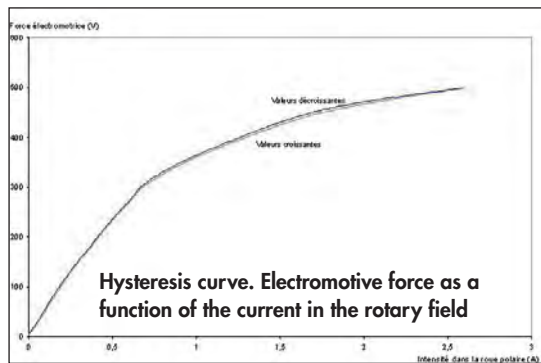
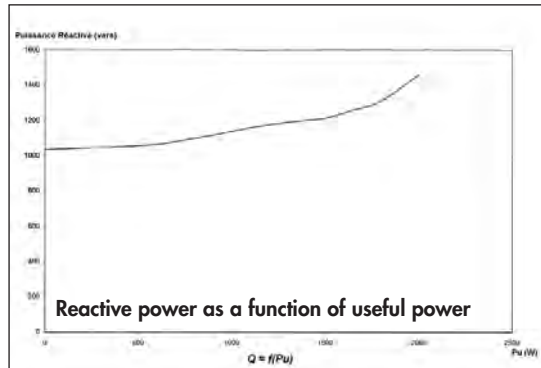
The power consumed by the motor is measured using the "two powers" method by using a wattmeter switch and an analogue wattmeter.

The voltage and current consumed by the motor are measured using an analogue voltmeter and ammeter.

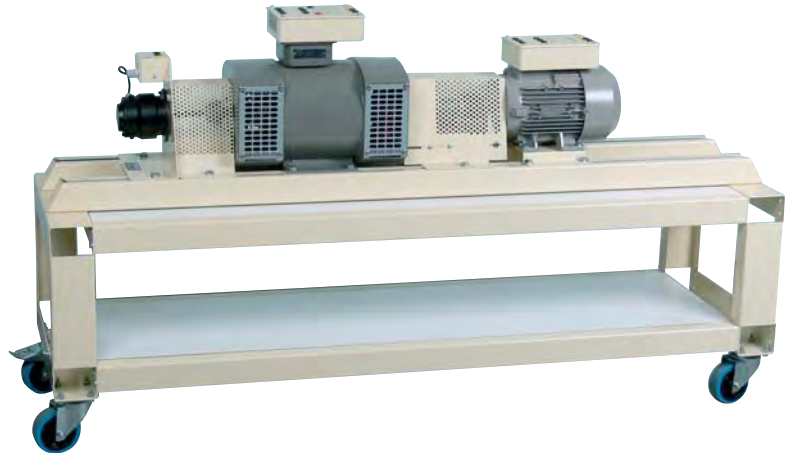
On the alternator, the electrical quantities such as power, voltage and current supply are measured using a digital wattmeter with three displays.

A brushless torque sensor (requiring no maintenance) measures the motor torque, whereas the tachometer generator measures the rotation speed. An analogue unit with three displays shows the torque, speed and useful power values.

### COMPLETE RANGE ROTARY MACHINES



### DESCRIPTION OF THE 18 ITEMS INCLUDED IN PACK-AC2 REFERENCE



<b>3-phase asynchronous motor</b> Ref. MAS20 - Qty 1 (features P. 58) <b>Rotary torque sensor</b> Ref. CR2-V2 - Qty 1 (features P. 60)	<b>3-phase alternator</b> Ref. MSM20 - Qty 1 (features P. 58) <b>DC tachogenerator</b> Ref. DYTA2 - Qty 1 (features P. 60)	<b>Stand on wheels</b> Ref. CTC - Qty 1 (features P. 60) <b>Guide rails</b> Ref. RGC - Qty 1 (features P. 59)
 <b>DC single-phase &amp; 3-phase variable supply</b> Ref. COMPAK40 (features P. 88)	 <b>Resistive load 2000W</b> Ref. RHP20 (features P. 83)	 <b>3-phase wattmeter</b> Ref. PSY14 - Qty 1 (features P. 196)
 <b>Synchronoscope</b> Ref. CHR3 - Qty 1 (features P. 58)	 <b>Safety wattmeter switch</b> Ref. COWATT11 - Qty 1 (features P. 195)	 <b>Magnetoelectric voltmeter</b> Ref. V1001 - Qty 1 (features P. 199)
 <b>Digital wattmeter</b> Ref. DIGIWAT - Qty 1 (features P. 68)	 <b>Measurement of mechanical quantities</b> Ref. GRANMECA-V2 - Qty 1 (features P. 68)	 <b>Rheostat</b> Ref. ECO2-106 - Qty 1 (features P. 94)
 <b>Set of 67 safety leads</b> Ref. 300S - Qty 1 set (features P. 211)	 <b>20A magnetoelectric ammeter</b> Ref. A11 - Qty 1 (features P. 199)	 <b>Frequency converter</b> Ref. ACVAR5 - Qty 1 (features P. 84)