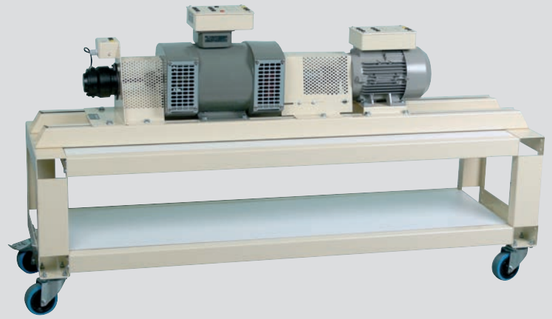
STUDYING THE 1.5KW ASYNCHRONOUS MOTOR & 3-PHASE ALTERNATOR

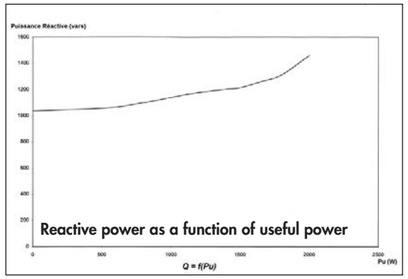
DESCRIPTION OF THE 18 ITEMS INCLUDED IN PACK-AC2 REFERENCE



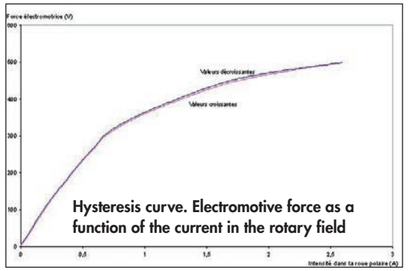
3-phase asynchronous motor Ref. MAS22 - Qty 1 Rotary torque sensor Ref.CR2-V2 - Qty 1	3-phase alternator Ref. MSM20 - Qty 1 DC tachogenerator Ref. DYTA2 - Qty 1	Stand on wheels Ref. CTC - Qty 1 Guide rails Ref. RGC - Qty 1
 DC variable supply Ref. COMPAK40 - Qty 1	 2000W Resistive load Ref. RHP20 - Qty 1	 3-phase wattmeter Ref. W17 - Qty 1
 Synchronoscope Ref.CHR3 - Qty 1	 Safety wattmeter switch Ref. COWAT11 - Qty 1	 Magnetoelectric voltmeter Ref. V1001 - Qty 1
 Digital wattmeter Ref. WATTELEC - Qty 1	 Measurement of mechanical quantities Ref. MECAWATT - Qty 1	 Rheostat Ref. ECO2-106 - Qty 1
 Set of 67 safety leads Ref. 400S - Qty 1 set	 20A magnetoelectric ammeter Ref. A11 - Qty 1	 Frequency converter Ref. ACVAR5 - Qty 1

OPERATING PRINCIPLE

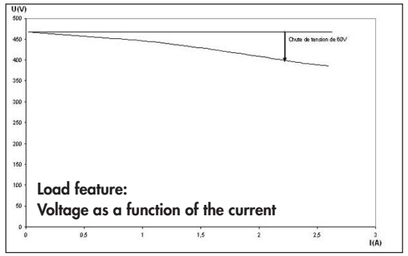
A 1500W asynchronous motor, powered by a 3 X 400V source, is charged by means of an alternator.
The electrical power generated by the alternator is drained either in the form of an adjustable resistive charge or throughout the public network.
The power consumed by the motor is measured using the "two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



Reactive power as a function of useful power



Hysteresis curve. Electromotive force as a function of the current in the rotary field



Load feature:
Voltage as a function of the current

Rotary machines
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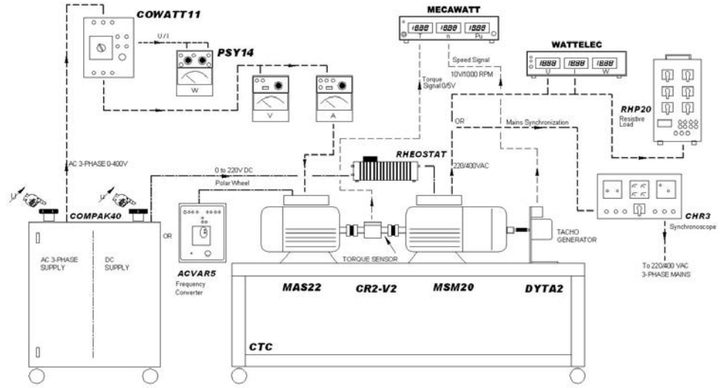

The PACK-AC2 power unit kit (power unit + accessories) can be used for studying a 1500W asynchronous motor.

Charged by a 1500W three-phase alternator, the charge properties are plotted based on measurements taken by various analogue or digital devices.

Comprises 18 items, motors + accessories.

ref. PACK-AC2
ALSO AVAILABLE IN 300W. CONTACT US.

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*
    - *Number of pairs of motor poles*
    - *Slip*
    - *Torque*
    - *Power consumption*
    - *Efficiency*
    - *Reactive power*
    - *Apparent power*
  - Creation of a table containing calculations and measurements of electrical and mechanical quantities at various points of the motor load:
    - *Current consumption*
    - *Power consumption*
    - *Rotation speed*
    - *Useful power*
    - *Motor torque*
    - *Power factor*
    - *Apparent power*
    - *Reactive power*
    - *Slip*
    - *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 & the current in the rotary field
  - Plotting of properties

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