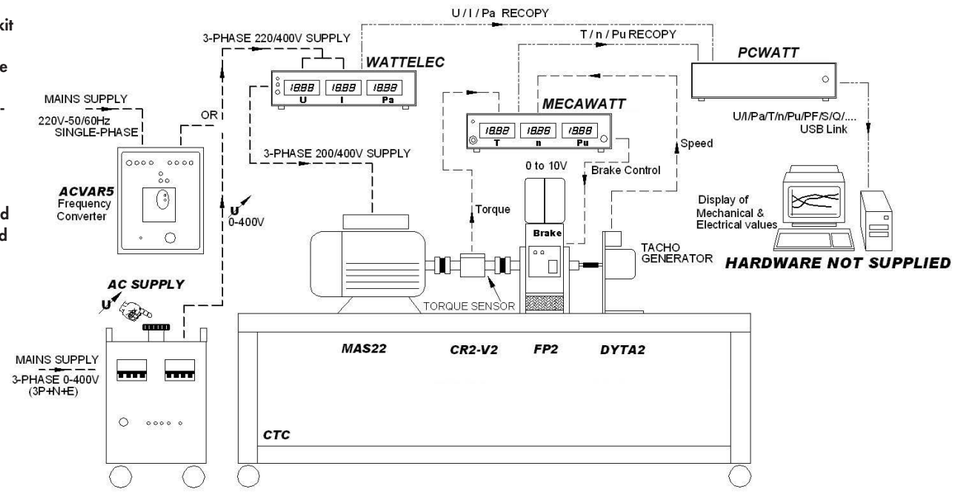
STUDYING THE 1.5KW ASYNCHRONOUS MOTOR WITH PC MONITORING

The PACK-AC1 power unit kit (power unit + accessories) can be used for studying the short-circuited 220/400V 1500W, 3-phase, asynchronous induction motor with rotor in short-circuit.

Several measurements can be taken and the motor load properties can be monitored on a PC.



ref. PACK-AC1

ALSO AVAILABLE IN 300W. CONTACT US.

TUTORIALS DESCRIBED IN THE INSTRUCTIONS SUPPLIED WITH PACK-AC1

- **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.
  - Measurement of properties on a PC.

- **Study of the operation of the motor controlled by the speed controller (frequency converter)**
  - Understanding and undertaking the wiring of the speed controller to the motor.
  - Adjustment of speed controller settings.
  - Adjustment of motor acceleration and deceleration rotation speed settings.
  - Measurement on a PC of the rotation speed properties as a function of time.

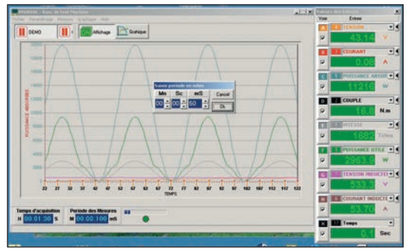
- **Study of motor operation with no load, with a load and with an overload, using the 230/400V three-phase power supply.**
  - Theoretical reminders of the mathematical formulae concerning an asynchronous induction motor.
  - Understanding and undertaking motor wiring with measuring and monitoring devices.
  - Calculation of the electrical and mechanical quantities of the motor based on its identification plate, such as:
    - ✔ *Synchronism speed*
    - ✔ *Number of pairs of motor poles*
    - ✔ *Slip*
    - ✔ *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*
    - ✔ *Power consumption*
    - ✔ *Rotation speed*
    - ✔ *Useful power*
    - ✔ *Motor torque*
    - ✔ *Power factor*
    - ✔ *Apparent power*
    - ✔ *Reactive power*
    - ✔ *Slip*
    - ✔ *Efficiency*
  - Monitoring on the PC and comments about the various motor load curves
  - Comparison of the theoretical calculation of values with those values measure during the motor tests
  - Plotting of properties based on motor measurements such as:
    - ✔ *Torque as a function of the speed (or other variable)*
    - ✔ *Torque as a function of useful power (or other variable)*
    - ✔ *Efficiency as a function of useful power (or other variable)*
    - ✔ *Reactive power as a function of useful power (or other variable)*
    - ✔ *Current as a function of useful power (or other variable)*
    - ✔ *Power factor as a function of useful power (or other variable)*
    - ✔ *Rotation speed as a function of useful power (or other variable)*
    - ✔ *Slip as a function of useful power (or other variable)*

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

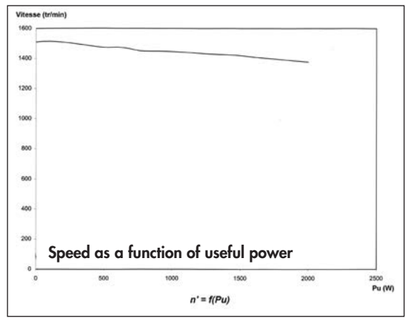
Rotary machines www.langlois-france.com

OPERATING PRINCIPLE

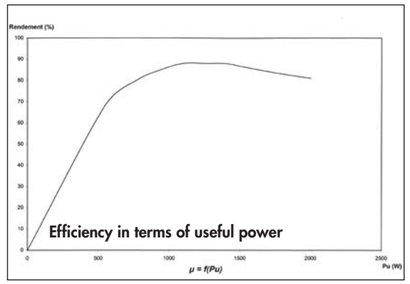
A speed controller, constant V/F frequency converter, controls the motor's rotation speed according to the various acceleration or deceleration ramps. A three-phase power supply on casters is also used to supply power to the motor, replacing the speed controller.
A 1500W ventilated powder brake loads the motor with values of between 0 and 125% inclusive of the rated load.
A brushless torque sensor (requiring no maintenance) measures the various torque values, whereas a DC tacho-generator provides an image signal of the motor's rotation speed.
A first unit, with three digital displays, shows the electrical quantities such as voltage, current and power used by the motor. The second unit, which also has three displays, shows the mechanical quantities such as torque, rotation speed and useful power.
All of these quantities, as well as the motor load curves, can be displayed in real time on a PC, before being printed out.



Example of monitoring with a display of curves and values

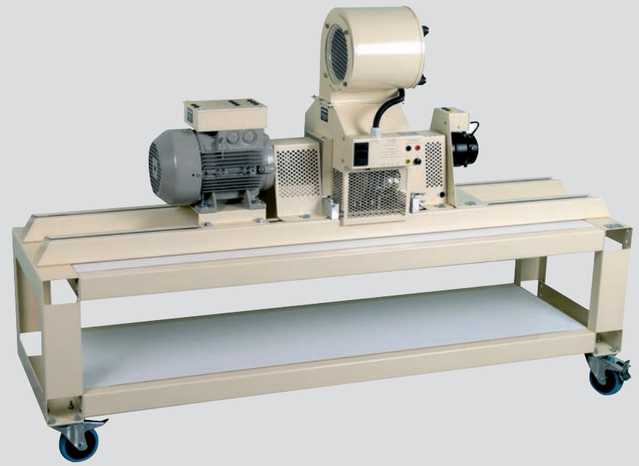


Speed as a function of useful power



Efficiency in terms of useful power

DESCRIPTION OF THE 12 ITEMS INCLUDED IN PACK-AC1 REFERENCE



3-phase asynchronous motor Ref. MAS22 - Qty 1 **Rotary torque sensor Ref.CR2-V2 - Qty 1**	**Powder brake Ref. FP2 - Qty 1** **DC tachogenerator Ref. DYTA2 - Qty 1**	**Stand on wheels Ref. CTC - Qty 1** **Guide rails Ref. RGC - Qty 1**
 **3-phase supply on wheels Ref. TRT8PE - Qty 1**	 **Frequency converter Ref. ACVAR5 - Qty 1**	 **Set of 38 safety leads Ref. 400S - Qty 1 set**
 **Digital wattmeter Ref. WATTELEC - Qty 1**	 **Measurement of mechanical quantities Ref. MECAWATT - Qty 1**	 **Real time and monitoring system Ref. PCWATT - Qty 1**

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