

## STUDY OF THE 3-PHASE ASYNCHRONOUS MOTOR &amp; THE SYNCHRONOUS MACHINE 300W

## Ref. PACK-ACAC1

## COMPOSITION OF THE SET

- 1 Squirrel cage three-phase induction motor
- 1 3-phase synchronous machine - alternator
- 1 Torque sensor
- 1 DC tachogenerator
- 1 Variable three-phase power supply
- 1 Polar wheel power supply
- 1 Synchronoscope
- 1 Resistive load
- 1 Display unit torque and speed
- 3 Magnétoelectric voltmeters
- 2 Magnétoelectric ammeters
- 1 AC & DC multimeter clamp



DELIVERED WITH TEACHING RESSOURCES

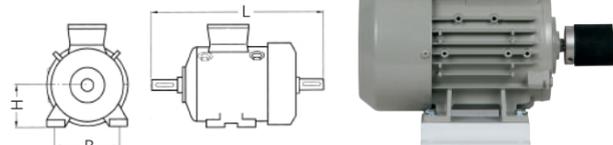
## EDUCATIONAL OBJECTIVES

- Study the stator and the rotor of an asynchronous motor.
- Study the pairs number of poles and the influence on the rotating speed.
- Note, calculate and plot the electrical and mechanical quantities of the motor.
- Realize the balance sheet of motor powers.
- Study the functioning of a synchronous machine in Hypo-synchrone and Hyper-synchrone connected to the national electrical grid.
- Understand the functioning and the use a synchronoscope.
- Study the functioning of a synchronous machine in Hypo-synchrone and Hyper-synchrone connected to a resistive load.
- Note, calculate and plot the electrical and mechanical quantities of the alternator.
- Use an ammeter clamp

## SQUIRREL CAGE INDUCTION MOTOR

This engine works as well with a speed variator as directly connected to a 3-phase supply.

U (V)	230/400V
I (A)	1.5 / 0.9
H / B / L	90 / 172 / 235mm
Weight	8.2 kg

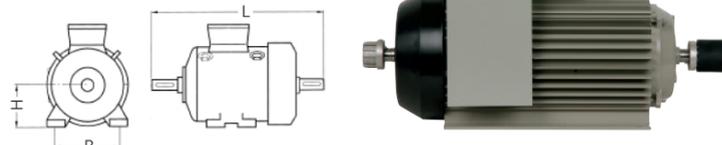


## 3-PHASE SYNCHRONOUS MACHINE

Works as a synchronous motor and 3-phase alternator.

Equipped with LEBLANC poles for the mains network synchronization.

U (V)	230/400V
H / B / L	90 / 172 / 470mm
Weight	18 kg



## TORQUE SENSOR

Sensor range	20 Nm
Use with	an important inertia
Torque output signal	0 to 5V for the measuring span in Nm (0 to -5V according the rotating way).
Maximum rotating speed	2000rpm.
Sensor supply	between 12 and 28 VDC.



## TORQUE &amp; SPEED DISPLAY UNIT

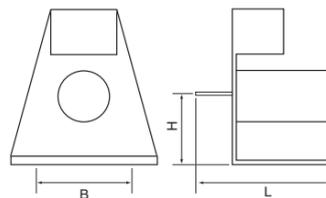
Range (torque)	200,0 Nm
Analogical output	-5V / 0 / +5V
Range (speed)	2000 rpm



## DC TACHOGENERATOR

Deliver a continuous voltage proportional to the rotating speed.

Voltage at 1000 rpm	10V
Connector	safety terminals
H / B / L	90 x 172 x 170mm



## AC/AC FREQUENCY CONVERTER

PRIMARY IN 230V SINGLE-PHASE 50/60Hz  
Output voltages: 3-phase 230V variable frequency.

For motor power	300W
Constant output current	4.4A
Maximum transient current	5A

## RESISTIVE LOAD

Power 0.5kW  
Nb switches: 6  
Variation in steps of 5%  
Type portable  
Weight: 15kg



## POLAR WHEEL POWER SUPPLY



INDEPENDENT 1	2 x 0 to 30V - 2 x 0 to 3A
SERIAL 1	0 to 60V - 0 to 3A
PARALLELE	0 to 30V - 0 to 6A
Dims	255 x 145 x 265mm
Weight	8kg
Power source	Mains 120-240V - 50/60Hz

## SYNCHRONOSCOPE - 16A - 400V

Allows to securely connect a rotating electric machine to the national 3 x 400V power grid.

- 2 displays indicate the presence and order of the phases.
- 1 central display makes it possible to compare the voltage and frequency difference between the 3-phase 400V network and the rotating machine.
- 1 set of LEDs shows the best time to switch the synchronization switch on.



## SAFETY LEADS Ø4 REAR STACKING



- Very supple wire 30A
- Contacts formed into spring strips
- Working voltage 600V CAT III
- Test voltage 7400V during 1 mn
- Conforms to the standard CEI1010



## MAGNETOELECTRIC AMMETER

IDC	100µA to 10A (1,5%)
IAC	10mA to 10A (2%)
mV	100mV for the use of external shunts
Scale length	90mm
Protection	CAT III 600V Pol 2
Safety terminals	yes
Fuses	HPC 500V 3A + HPC 500V 10A
Dims / Weight	170 x 110 x 53mm / 500g



## MAGNETOELECTRIC VOLTMETER

VDC	100mV to 1000V (1,5%)
VAC	3 to 1000V (2%)
Scale length	90mm
Protection	CAT III 600V Pol 2
Safety terminals	yes
Fuses	HPC 500V 500mA
Impedances	VDC : 20kΩ/V - VAC : 6,3kΩ/V
Dims / Weight	170 x 110 x 53mm / 500g



## CLAMP / MULTIMETER AC &amp; DC

- Auto power off after 25mn
- Recopy output 10mV/A 20kHz
- Back lighting of the screen

Display	4.000 counts
Converter	AC & DC
Bandwidth	50Hz to 500Hz
opening of the jaws	12mm
VDC / VAC	400mV to 600V
IDC / IAC	4 to 80A
OHM	4Ω to 40MΩ
Farad	40nF to 100µF
Fréquencymeter	5Hz to 10MHz
..)))	Ring for R < 150Ω
Ranging	Auto & Manual
Protection	CATIII 600Vrms pol2
Power source	2 batteries LR03
Dimensions / Weight	210 x 70 x 37mm / 200g

## MOTORS STAND AND ACCESSORIES

The pack is supplied with coupling, fastening, covers and guide rails

