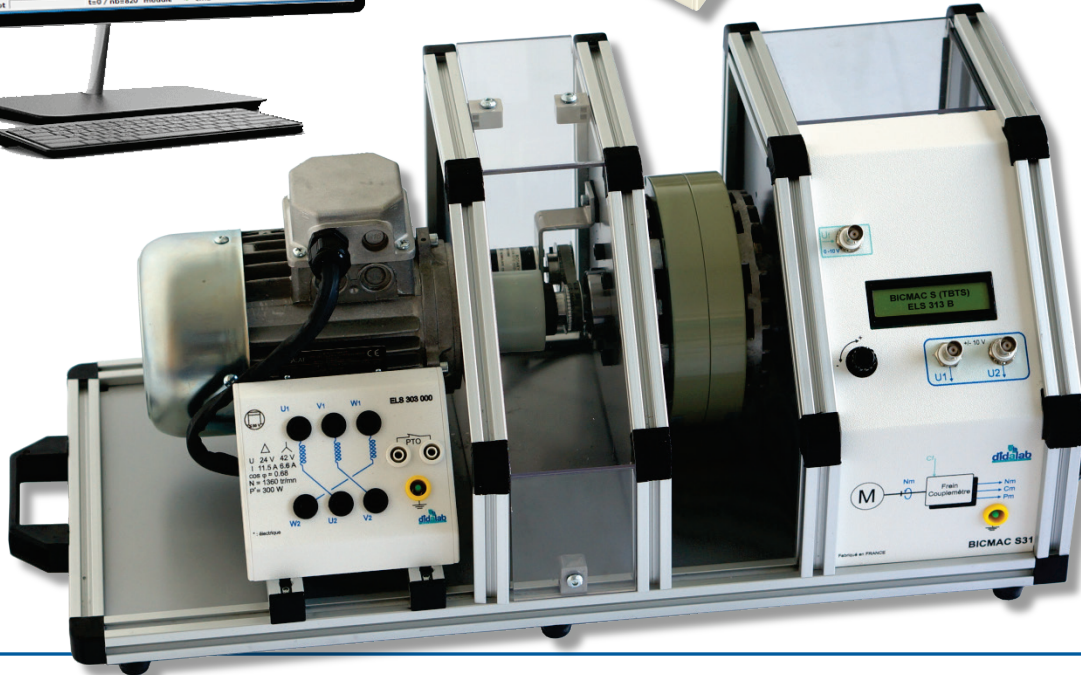
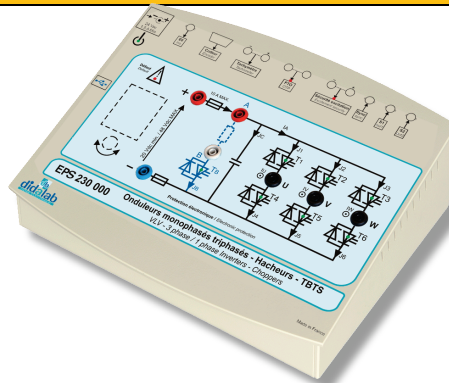
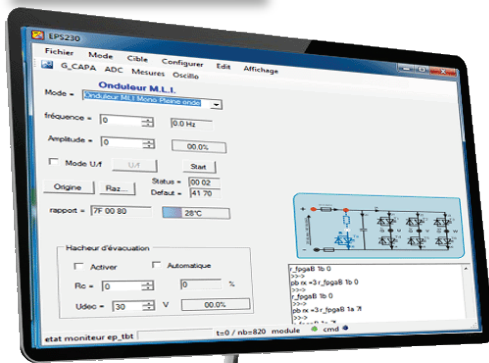


**BICMAC-S - ELS310**



**Instrumented Load Bench with DC or AC machines, 300 W,**

**Safety Extra Low Voltage**

## Main features:

The load bench **BICMAC-S- 300** is specially designed for:

- **ELECTROTECHNICS**, study of rotating machines characteristics (relation speed/voltage, current/torque, power efficiency,  $\cos\phi$ ...),
- **POWER ELECTRONICS**, compatible with the range EPS100 EPS200, power converters SELV (rectifiers, AC controllers, inverters...)
- **AUTOMATIC CONTROL**, creation of a programmable mechanical load depending on dynamic criteria (constant torque, as function of the speed, square of the speed...)
- The load generator is instrumented, which enables to read in real-time the mechanical variables from the experimented machine (speed, torque, power)
- It works, in accordance with the standard SELV « Safety Extra-Low Voltage, 48 V<sub>DC</sub> and 24 V<sub>AC</sub> », at voltage rates avoiding to use complex and expensive electrotechnic tables..

## AREAS OF APPLICATION:

Technical/Vocational training sectors, Prep schools, Universities, Engineering schools

# BICMAC-S-310 – Details:

Area for machines coupling & connections (soft coupling. It includes an incremental coder 360 pts/rev.

Instrumented load system (case of the magnetic power brake), torque, speed, position measurements. Configurable with a joystick display or a PC via USB.

Motor to be tested

External control input by BNC (+/-10V)

2 configurable external outputs, to be visualized by BNC (+/-10V)

Integrated power supply (230 VAC)

Keyboard-Display system to configure in autonomous mode, choice of the load profile (constant torque, as a function of the speed).

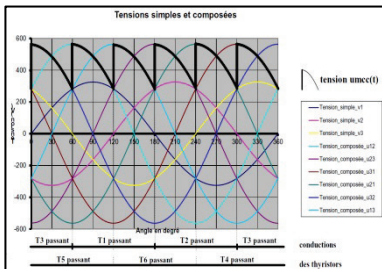
## ELS310100, control program, load creation & acquisition of all mechanical variables

It is used to set the condition of the loads' creation, the data acquisition for the response curves (speeds, torques, voltages ...) and the display of these responses

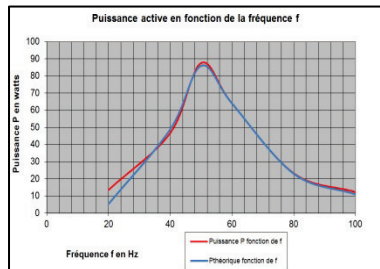
## Power electronics:

3-phase rectification(EPS130000)\*\*

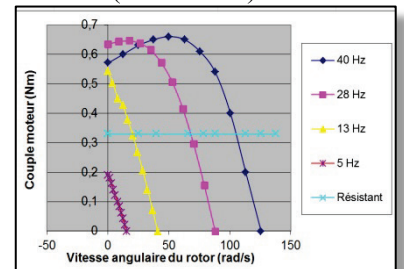
\*\*electrical measurements on the power bridge



P/F ratio (EPS210000)



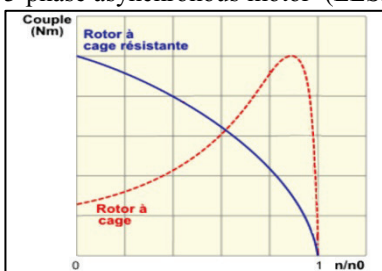
Torque for asynchronous motor f N (EPS230000)



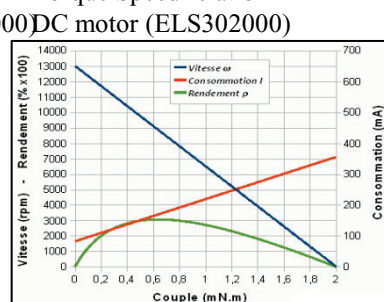
## Electrotechnics:

Torque Speed relation

3-phase asynchronous motor (ELS303000) DC motor (ELS302000)

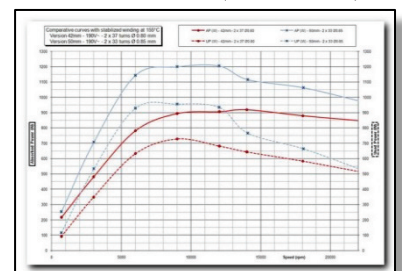


Torque Speed relation



Torque Speed relation

Brushless motor (ELS306000)



# Test motors, Safety Extra Low Voltage:

You can put several motors on the bench. Usually, we suggest the following 4 motors.  
For other motors, please ask us.

| ELS301000 : 300-W** DC motor, separate excitation |        |        |
|---------------------------------------------------|--------|--------|
| MOTOR CHARACTERISTICS                             | Value  | Units  |
| Power voltage                                     | 48     | Vdc    |
| Nominal current                                   | 7,2    | A      |
| Excitation current                                | 1,4    | A      |
| Electrical power                                  | 412    | W      |
| Speed at nominal current                          | 2 000  | Tr/min |
| Mechanical power                                  | 270    | W/S2*  |
| Nominal torque                                    | 1,87   | Nm     |
| Max efficiency                                    | 65     | %      |
| Protection                                        | klixon |        |



| ELS302000 : 300-W** DC motor, permanent excitation |        |        |
|----------------------------------------------------|--------|--------|
| CARACTERISTIQUES MOTEUR                            | Value  | Units  |
| Power voltage                                      | 48     | Vdc    |
| Nominal current                                    | 6,7    | A      |
| Electrical power                                   | 321    | W      |
| Speed at nominal current                           | 2 000  | Tr/min |
| Mechanical power                                   | 180    | W/S2*  |
| Nominal torque                                     | 1,25   | Nm     |
| Max efficiency                                     | 60     | %      |
| Protection                                         | klixon |        |



| ELS303000 : AC motor, 300W*** 3-phase; squirrel |                             |
|-------------------------------------------------|-----------------------------|
| Nominal voltages                                | 24 / 42 VAC                 |
| Nominal current                                 | 11.5 A / 6.6 A              |
| Cos φ                                           | 0,68                        |
| Usable power                                    | 180 W                       |
| Nominal torque                                  | 1.23 Nm                     |
| Efficiency                                      | 60%                         |
| Speed( synchronism)                             | 1 380 rd/min (1 500 rd/min) |
| Thermal Protection                              | Klixon                      |



| ELS306000 : Brushless motor, 300 W |        |        |
|------------------------------------|--------|--------|
| MOTOR CHARACTERISTICS              |        | Unit   |
| Power voltage                      | 23 rms | 3xAC   |
| Trapezoid supply voltage:          | 35     | DC     |
| Speed at nominal current           | 2000   | Tr/min |
| Mechanical power                   | 300    | W      |
| Nominal torque                     | 1,5    | Nm     |
| Sine nominal current               | 7,9    | AC     |
| Thermic protection                 |        | PTC    |
| Hall effect probe connection       | 3      | DB15   |

S2\*\* : intermittent 30 min

## Related products:

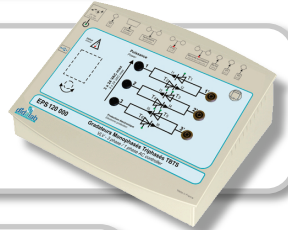
### EMS 300 : SELV Power supply ; 430 W ; 1-phase, 3-phase, DC



- 3-phase power supply 3\* 24 VAC 6A ; from 1-phase Mains (240VAC 16A)
- Protected against overvoltage, overcurrent, over power, temperature
- HMI via LCD display
- Display (voltage, current, phase shift,  $\cos \phi$  & )

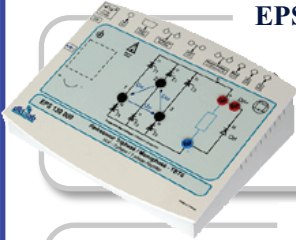
### EPS 120 B 1-phase, 3-phase AC converter, 300 W, SELV

- Up-line 1-phase AC controller: - phase angle mode, - burst firing mode
- Up-line 1-phase AC controller: - phase angle mode with neutral, phase angle mode without neutral - burst firing mode



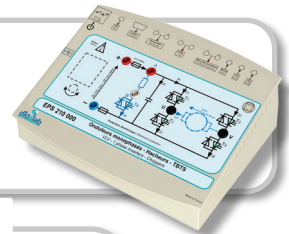
### EPS 130 B 1-phase, 3-phase rectifier, 300 W, SELV

- 1-phase rectification : commuting cell, all diodes, all thyristors, mixed and symmetrical, mixed and assymetrical
- 3-phase rectification: all diodes, mixed, all thyristors.
- Assisted inverter.



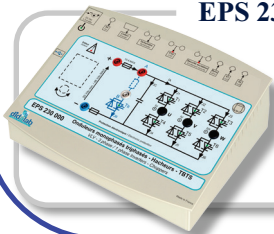
### EPS 210 B Chopper, 1-phase inverter, 300 W, SELV

- Study of choppers: serial, voltage reversible, current reversible, four quadrants, over-fitted double serial,
- Study of 1-phase inverter: Shift control full wave with fixed frequency, with variable frequency, PWM +E/-E, MLI +E/0/-E, constant U/F ratio.



### EPS 230 B Chopper, 1-phase inverter, 3-phase inverter 300 W, SELV

- choppers: serial, voltage reversible, current reversible, four quadrants
- 1-phase inverter: Shift control full wave with fixed frequency, with variable frequency, PWM
- 3-phase inverter: Shift control full wave with fixed frequency, with variable frequency, PWM



## Standard configurations:

| BICMAC-S, Instrumented Load Bench with DC or AC motors: |                                                                                                                                     |     |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----|
| References                                              | Description                                                                                                                         | Qty |
| ELS310000                                               | Test motor bench with magnetic brake load, control electronic board, power supply<br>Set on a aluminium frame with carrying handles | 1   |
| ELS310100                                               | Basic program, creation of loads and acquisition of mechanical variables (speed, torque, power)                                     | 1   |
|                                                         | <b>Motors :</b>                                                                                                                     |     |
| ELS301 000                                              | 300-W DC motor, 48 Vdc with separate excitation                                                                                     |     |
| ELS302 000                                              | 300-W DC motor, 48 Vdc with permanent excitation                                                                                    |     |
| ELS303 000                                              | 300-W 3-phase asynchronous motor, 24/42 Vac                                                                                         |     |
| ELS306 000                                              | 300-W Brushless motor, 23 Vdc                                                                                                       |     |
| ELS30X 000                                              | Special motors, ask us                                                                                                              |     |

## Example of configuration :

**ELS313B, BICMAC-S 310**, with: magnetic brake system with measurements of mechanical variables (**A=1**) and asynchronous squirrel cage motor, 24/42 VAC (**B=3**) .

## Packing:

**Net** : 16 kg, Dimensions (Lx l x h) 67 x 28 x 25 cm  
**Gross** : 20 kg, Dimensions (Lx l x h) 78 x 40 x 40 cm.