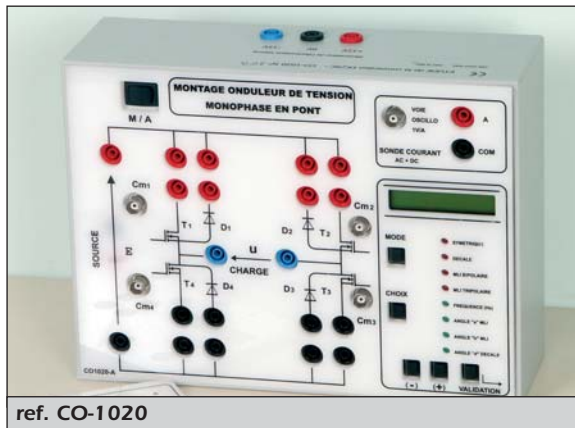




CONVERSION TEST BENCH

INVERTER

SINGLE-PHASE CONTINUOUS/ALTERNATING CURRENT CONVERSION TEST BENCH
CO-1000 IS SUPPLIED WITH 2 MOVEABLE FRONT PANELS, INSTRUCTION BOOK INCLUDED TUTORIALS



ref. CO-1020

ACCESSORIES FOR CO-1020

- | | |
|-----------------|----------------------------|
| Ref. ECO1/2 10Ω | Rheostat ECO1/2 10Ω (P.78) |
| Ref. ECO1/2 15Ω | Rheostat ECO1/2 15Ω (P.78) |
| Ref. ECO1/2 22Ω | Rheostat ECO1/2 22Ω (P.78) |
| Ref. ECO1/2 33Ω | Rheostat ECO1/2 33Ω (P.78) |
- for an optimal use, low resistance loads are better
- | | |
|-------------|--|
| Ref. PSYJR | Variable coil (P.85) |
| Ref. CO-106 | 12V/24V Battery |
| Ref. CO-107 | Single-phase transformer 12V - 230V with its lamp 230V - 40W |
| Ref. CO-109 | load made up of a 40W machine 12V/230V |
| Ref. CO-122 | Capacitor 22μF |

EDUCATIONAL OBJECTIVES

- Studying of a 24V single-phase inverter, in half bridge and in bridge

TEACHING RESSOURCES + PRACTICAL WORKS

This bench is suitable for all types of tests on independent, single-phase static voltage converters. It has 2 detachable front panels, with holes forming a mask that reveals the layout diagram for the specific type of test to be carried out.

The choice of layout (consisting of MOS power transistors) is thus determined by the front panel slotted into the casing:

PANEL A: "Single-phase, static, half-bridge voltage converter (two switches)"

PANEL B: "Single-phase, static, bridge voltage converter (four switches)"

The system includes a control panel offering the following options: (SYMMETRICAL, OFF-SET, BIPOLAR PWM, and THREE-POLE PWM), a display (frequency and offset angles), indicator lights (control mode selection and adjustment parameters), and an AC+DC current probe for measuring and displaying all the current in the layout. It runs both on batteries and the laboratory continuous power supply and has reinforced safety systems (for reversed polarity and shutdown of unused transistors). The output ($I_{MAX} = 3A$) is sufficient to run a motor of significant power and, in particular, to study the U/F control.

TRANSISTOR CONTROL PANEL

This flexible, easy-to-use control panel is entirely managed by micro-controller and is capable of all variable frequency controls.

CONTROL MODE

The control mode is selected by pressing the "MODE" key:

- Converter U/F constant
- SYMMETRICAL
- OFFSET
- BIPOLAR PWM - THREE-POLE PWM

A LED indicates which mode has been selected.

SELECTING ADJUSTMENT PARAMETERS:

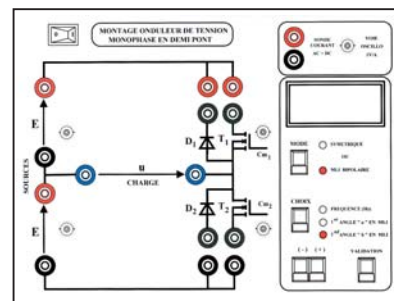
Adjustment parameters are selected by pressing the "SELECT" key:

- FREQUENCY (Hz)
- OFFSET ANGLE
- 1st ANGLE "a" IN PWM
- 2nd ANGLE "b" IN PWM

A LED indicates which parameter has been selected. In PWM mode, the signal pattern is determined by the size of the angle (a, b) selected (which amounts to setting the pulse width). Depending on the values of these angles, it is possible to eliminate the 3rd- and 5th-rank harmonics to obtain a spectrum with fewer harmonics, closer to the sinusoid curve.

CURRENT PROBE

This probe measures AC, DC, and AC + DC current and is connected in series, like an ammeter, in the circuit to be measured. A BNC terminal displays an image of the current intensity at a voltage of 1 V/A.

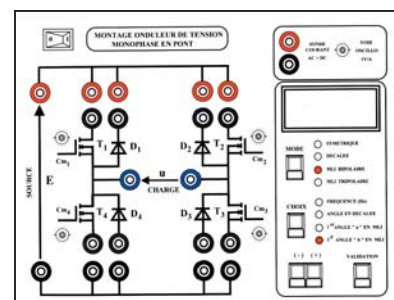


PANEL A "SINGLE-PHASE, STATIC, HALF-BRIDGE VOLTAGE CONVERTER (2 SWITCHES)"

The diode and power transistor operate by cross-barraging
Presentation of symmetrical control

Presentation of the Pulse-Width Modulation control: Bipolar PWM wave

- Experiment N°1: Throughput over resistive load (R)
- Experiment N°2: Throughput over inductive load (R, L)
- Experiment N°3: Throughput over resonant load (R, L, C)



PANEL B "SINGLE-PHASE, STATIC, BRIDGE VOLTAGE CONVERTER (4 SWITCHES)"

Presentation of offset control

Presentation of the Pulse-Width Modulation control: Three-pole PWM wave

- Experiment N°1: Throughput over resistive load (R)
- Experiment N°2: Throughput over inductive load (R, L)
- Experiment N°3: Throughput over resonant load (R, L, C)

Application to induction heating

Application to speed variations in an alternating current motor

Application to a backup power supply
Using the CO-1000 test bench as a charger.