



## PED 020 420

(Previous ref. EL – 2042)

### 4 Quadrants chopper & 2 Amps inverter

#### MAIN CHARACTERISTICS

The **PED 020 420** module is dedicated to the study of DC electrical machines speed. It can be linked to a rotating machine bench for showing that a motor load must sometimes be driven and braked in both rotation directions. It also enables the study of offset-control autonomous inverters or Pulse Width Modulation inverters.

- 1- Study in four quadrants,
- 2- Study of the control circuit,
- 3- Influence of the load: R, RL, ERL & DC motor.

#### AREAS OF APPLICATIONS

##### Basic training :

Introduction in low power, to the principles of motor-generator benches control :

- . Technical colleges ,
- . Higher Education, Universities,
- . Professional training.

#### TECHNICAL SPECIFICATIONS

##### Four quadrants chopper

Nominal supply voltage : 30 V  
Output nominal current: 2 Amp.  
Chopper max. frequency : 2 kHz  
Cyclic ratio linear control by DC voltage from -10V to +10V.

#### Inverter

Nominal supply voltage : 30 V  
Modulation max. frequency : 2 kHz  
Nominal current : 2Amp. peak: 1.5Amp. effective.  
Max. frequency : 100 Hz.  
In modifying the transistors control logic of the four quadrants chopper, it is possible to carry out, either an offset-controlled autonomous inverter, or a Pulse Width Modulation inverter.

Simple control: Frequency variation from 0 to 100 Hz by DC voltage varying from 0 to 10V.

Offset control: Frequency variation from 0 to 100 Hz by DC voltage varying from 0 to 10V and cyclic ratio variation from 0 to 0.5 by DC voltage adjustable from -10V to +10V.

Constant U/f control: Frequency control from 0 to 100Hz, and effective voltage control from 0V to a max. value (depending on the supply voltage) by DC voltage adjustable from 0 to 10V.

Pulse Width Modulation: Sine voltage supply control. Max. amplitude of 10V and max. frequency of 100Hz.

##### Mechanical Characteristics :

- Net weight : 0.9 Kg
- Gross weight : 1.6 Kg
- Dimensions : 30 x 20 x 10 cm

#### MANUALS

The PED 020 420 module is provided with one Practical Works manual.

#### ENVIRONMENT

Recommended Power Supply:  
EMD030340

- Control part: DC Power Supply:  $\pm 15V$
- Power part: DC Power Supply: 30V-2Amp
- Rheostat : 100 $\Omega$
- PMM064300 adjustable self
- Self : 0.1 to 1.1 H
- PED037580 DC motor Bench
- For Practicals on chopper
- PED037820
- For Practicals on inverter

#### PRACTICAL WORKS

##### Operation as a CHOPPER

- 1 – Study in the four quadrants,
- 2 – Study of the control circuit
- 3 - Influence of R, RL, RC, RLC, ERL loads, and AC motor.

##### INVERTER

If the four quadrants transistors chopper control logic is modified, it is possible to carry out, either one offset-controlled autonomous inverter, or one Pulse Width Modulation inverter.

Studying either V constant, F constant or V/F constant is proposed.

- 1 – Study of the control circuit
- 2 – Operation of full wave inverter
- 3 – Operation of offset-controlled inverter
- 4 – Operation in Pulse Width Modulation
- 5 - Influence of R, RL, RC, RLC, ERL loads, and AC motor.