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INTRODUCTION

An epicyclic gearing is a system or gear train used to transfer power from one element to another.

The main application of this type of gearing is in automatic transmissions, whose mission is to shift gears automatically without human intervention.

GENERAL DESCRIPTION

The main distinguishing element of automatic transmissions is its group of epicyclic gearing. The gear assembly of the MBW unit consists of:

- Two sun gears, one to transfer forward gear ratios and one reverse gear.
- Two sets of planet gears: long and short planet gears.
- Ring gear.

It is a gearing system in which power is transmitted to the assembly through the central sun gears. For forward gear ratios power will be introduced through the forward sun gear and for the reverse gear through the reverse sun gear. In both cases, the final motion is transferred to the output shaft through the ring gear.

A Borg-Warner automatic transmission has a torque converter and a three-speed automatic system. The transmission consists of three forward gear ratios and one reverse gear. They can be selected and their gear ratio studied through the coupling of the appropriate mechanical actuator in the different discs available to brake the elements of the planetary gearing, simulating brake bands and clutches.

Two graduated discs are included, one at the inlet and the other at the outlet, to measure angular displacement, allowing to observe the gear ratios of the assembly and to compare them with the values calculated theoretically.

Other special feature of the unit is that it has a freewheel mechanism that blocks the rotation of a shaft in one direction, allowing rotation in the opposite direction, and it allows to visualize the braking effect.



ISO 9000: Quality Management
(for Design, Manufacturing,
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European Union Certificate
(total safety)



Certificates ISO 14000 and
ECO-Management and Audit Scheme
(environmental management)



Worlddidac Quality Charter
Certificate and
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SPECIFICATIONS

The MBW unit is assembled in an anodized aluminum structure with painted steel panel, supported by four legs.

Also, four brackets are provided so the unit can be mounted on the wall, which allows the experiments with weights to be carried out more easily.

This unit is mainly composed of:

Epicyclic gear set is composed of:

2 sun gears, one to transfer forward gear ratios and one reverse gear.

2 set of planet gears: long and short planet gears.

A ring gear.

2 graduated discs, with angular indicator, placed in the input and output shaft.

2 input discs to simulate the clutch of gears.

Some mechanic actuators or pins that simulate the pilot valves used to brake the different components of the planetary gear.

The shafts of the unit is made of stainless steel. The discs and the gears are made of aluminum to facilitate the practice's carrying out.

In order to carry out some of the practices with MBW unit, are required 2 sets of weights "B type" (See "required accessories" section).

Manuals: This unit is supplied with the following manuals: Required services, Assembly and Installation, Starting-up, Security, Maintenance and Practices manual.

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Demonstration of the operation of an epicyclic gearing system.
- 2.- To check the gear ratio:
 - First gear.
 - Imposed first gear.
 - Second gear.
 - Reverse gear.
 - Third gear and neutral.
- 3.- To simulate breakdowns:
 - Forward gear clutch breakdown.
 - Reverse gear clutch breakdown.
 - Brakes breakdown.
- 4.- To check the relation between the input motor torque and the output motor torque.
- 5.- To check the relation between the input motor torque and the output motor torque having the transmission brake activated.

DIMENSIONS AND WEIGHT

-Dimensions: 450 x 320 x 300 approx. (17.72 x 12.60 x 11.81 inches approx.). -Weight: 15 Kg. approx. (33 pounds approx.).

REQUIRED ACCESSORIES

- 2 Sets of weights "B type" (set B).

Each "B type" set is composed of:

6 weights of 200 gr. (0.44 pounds approx.)

6 weights of 100 gr. (0.22 pounds approx.)

2 weights of 50 gr. (0.11 pounds approx.)

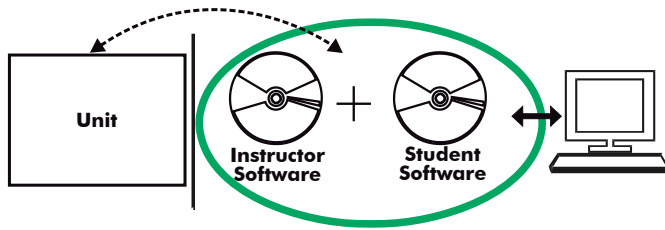
2 weights of 20 gr. (0.044 pounds approx.)

2 weights of 10 gr. (0.022 pounds approx.)

1 support hook of 100 gr. (0.22 pounds approx.)

Optional

MBW/CAI. Computer Aided Instruction Software System:



With no physical connection between unit and computer (PC), this complete software package consists of an Instructor Software (INS/SOF) totally integrated with the Student Software (MBW/SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

Example of software screens

Instructor Software

INS/SOF. Classroom Management Software (Instructor Software):

The Instructor can:

- Organize Students by Classes and Groups.
- Create easily new entries or delete them.
- Create data bases with student information.
- Analyze results and make statistical comparisons.
- Generate and print reports.
- Detect student's progress and difficulties.
- ...and many other facilities.



This software, working in network configuration, allows controlling all the students in the classroom.

Student Software

MBW/SOF. Computer Aided Instruction Software (Student Software).

It explains how to use the unit, run the experiments and what to do at any moment.

- This software contains:

Theory: gives the student the theoretical background for a total understanding of the studied subject.

Exercises: divided by thematic areas and chapters to check out that the theory has been understood.

Guided Practices: presents several practices to be done with the unit, showing how to perform the exercises and practices.

Exams: set of questions to test the obtained knowledge.



For more information see CAI catalogue. Click on the following link:

www.edibon.com/products/catalogues/en/CAI.pdf

MBW/CAL. Computer Aided Learning Software (Results Calculation and Analysis):

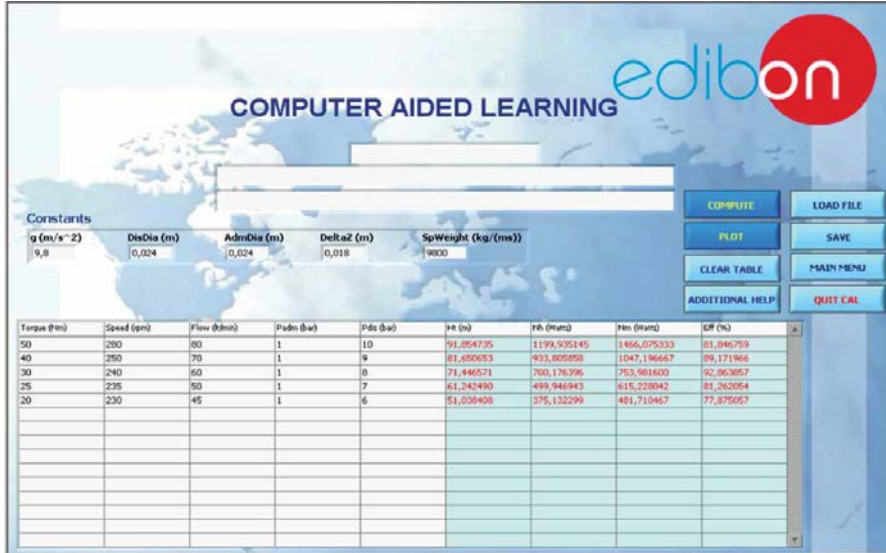
This Computer Aided Learning Software (Results Calculation and Analysis) "CAL" is a Windows based software, simple and very easy to use, specifically developed by EDIBON.

CAL is a class assistant that helps in doing the necessary calculations to extract the right conclusions from data obtained during the experimental practices. With a single click, CAL computes the value of all the variables involved and performs the calculations.

Also, CAL allows to plot and print the results. Within the plotting options, any variable can be represented against any other.

Available different plotting displays.

It has a wide range of information, such as constant values, unit conversion factors and integral and derivative tables.



On a table, we introduce data obtained during the development of the exercise.

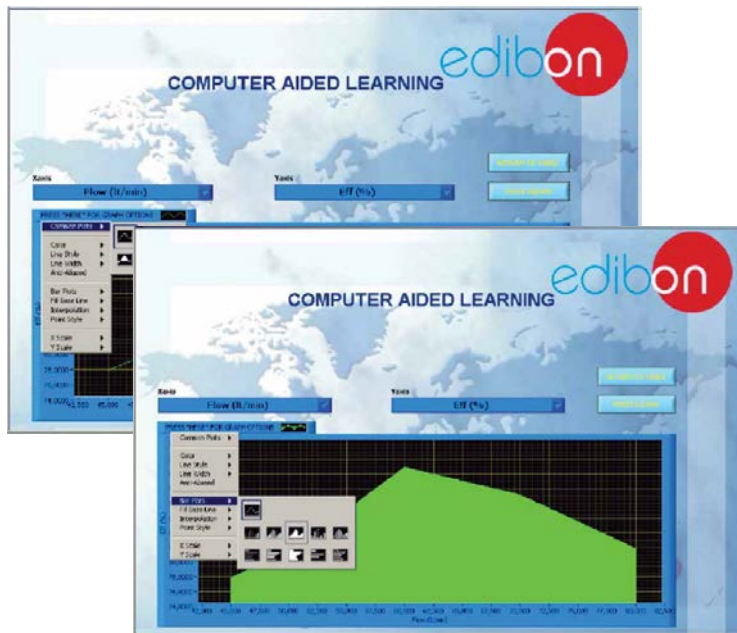
Above this table, it is shown "Constants" theoretically involved with the field of study. The values of these "Constants" may be modified to our convenience, assigning the appropriate values.

Simply, by clicking on "COMPUTE", CAL performs the calculations of the desired variables.

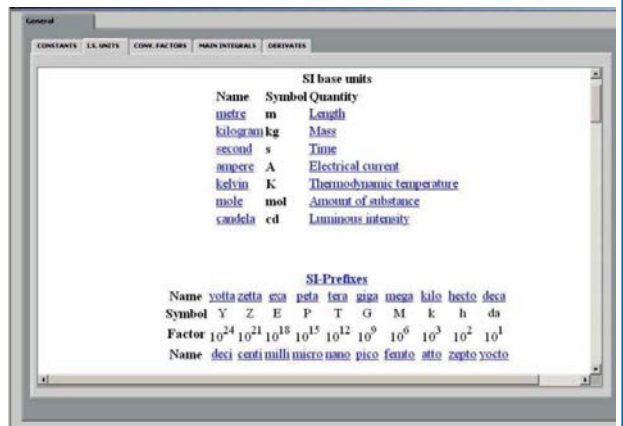
We can save and print the data of the experiment or calculations.

Also we can load any data file saved previously.

With the calculated variables, CAL gives the option of plotting the results. It is possible to represent any variable against any other. It has the option of representing the graph with different layouts. Screens below give an example of the multiple choices.



CAL has a wide range of help information. By clicking the button "ADDITIONAL HELP" opens a window where we have information about typical Constants, International System Units, Conversion Factors, and Table of Main Integrals and Derivatives (General), and there is other specific help for the particular unit.



For more information see CAL catalogue. Click on the following link: www.edibon.com/products/catalogues/en/CAL.pdf

*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



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