

INTRODUCTION

The mechanical transmissions are mechanisms that transfer power between two or more elements in a machine.

A mechanical transmission is a means of exchanging mechanical energy. Its operation is different to the operation of pneumatic or hydraulic transmissions, since it is based on the motion of solid bodies. Gears and transmission belts follow that method.

In most cases, transmissions are made with rolling elements, since power transmission by rotation is more compact than power transmission by translation.

Rack and pinion mechanisms are mechanical devices with two gears, called "pinion" and "rack", that convert rotational motion into rectilinear motion or vice versa. This type of mechanical transmissions is often used as part of a simple linear actuator, where the rotation manually produced by wheel or with a motor is converted into linear motion.

Possible misalignment problems, speed and rotation intermittent changes or load concentrations must be considered to design a good rack and pinion transmission. They might result in vibrations, noise, overloads or a premature wear of the rack and pinion.



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



Certificate and Worlddidac Member

GENERAL DESCRIPTION

The Gear Generation Unit, "MGE", has been designed by EDIBON to study rack and pinion systems. With this unit the student can draw by an easy procedure the profile of a tooth, produced by the involute process of the rack when passing over the pinion. The user can adjust the rack radially (with respect to the central axis of the circular template) in such a way that the profiles of the corrected teeth can be made using the graphical method.

With this unit the student draw the outline of the tooth that corresponds to the pinion required to mesh in a specific standard rack. To that end, the unit consists of a circular support disc that can be laterally displaced and a standard rack for which the necessary pinion must be found. When the circular disc is linearly displaced, it will rotate together with the lower additional gear teeth to which it is linked, so that the rack performs the involute path on the template simulating the definite meshing state.

SPECIFICATIONS

Bench-top unit with adjustable legs.

Anodized aluminum frame and panels made of painted steel.

The "MGE" unit mainly consists of:

Rack:

Inverse of the module (P_d) = 0.091 mm.

Pressure angle (Ψ) = 20°.

Length = 450 mm.

Number of teeth (T) = 13.

Pinion:

Module (m) = 11 mm.

Primitive diameter (D_p) = 110 mm.

External diameter (D_e) = 132 mm.

Internal diameter (D_i) = 82 mm.

Tooth height (h) = 25 mm.

Number of teeth (T) = 10.

Support disc:

Primitive diameter (D_p) = 110 mm.

External diameter (D_e) = 200 mm.

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



MGE detail

EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Determining the influence of corrections in rack and pinion systems.
- 2.- Determining the influence of modifications of the rack tooth head size in rack and pinion systems.
- 3.- Determining the influence of modifications in the effective number of teeth of a pinion on rack and pinion systems.
- 4.- Experimental determination of the shape and construction of the involute curve.

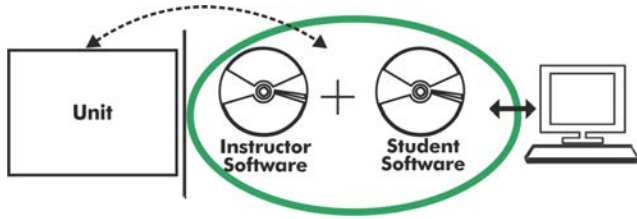
DIMENSIONS AND WEIGHTS

MGE:

- Dimensions: 600 x 450 x 150 mm approx. (23.62 x 17.71 x 5.90 inches approx.)

- Weight: 7 Kg approx. (15.43 pounds approx.)

MGE/ICAI. Interactive Computer Aided Instruction Software System:



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

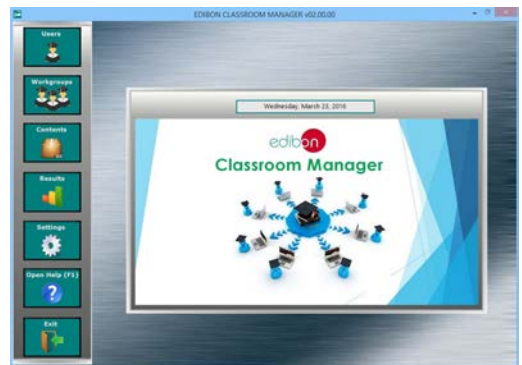
Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

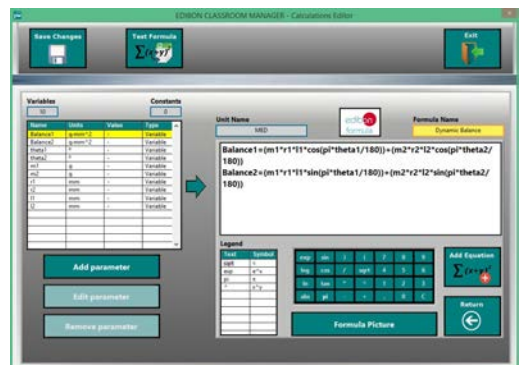
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional
Student Software

- **ESL-SOF. EDIBON Student Labsoft (Student Software).**

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

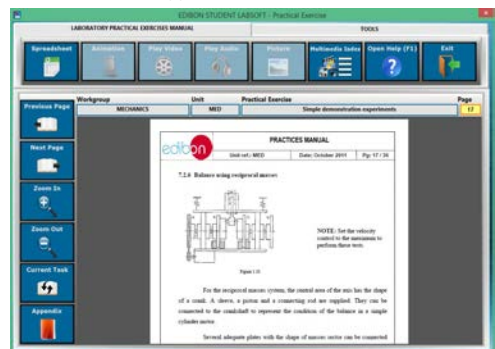
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- Test self-correction.
- Calculations computing and plotting.
- Equation System Solver Engine.
- User Monitoring Learning & Printable Reports.
- Multimedia-Supported auxiliary resources.

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

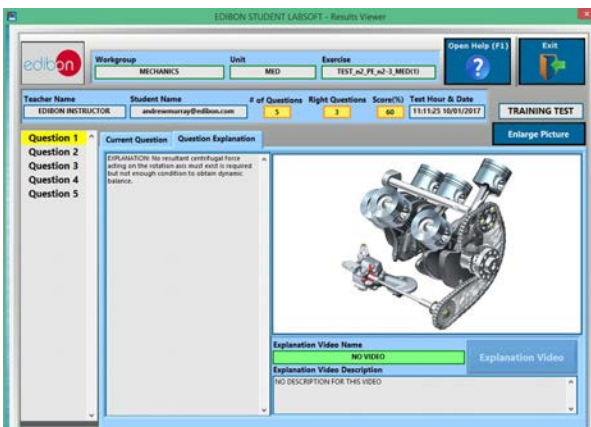
www.edibon.com/en/files/expansion/ICAI/catalog



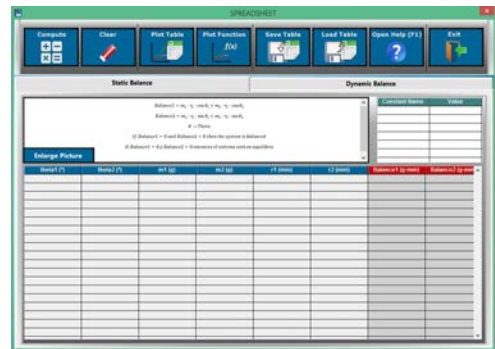
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

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



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REPRESENTATIVE:

