

THERMODYNAMICS Training Course

TR1605/102/001

APPLICATION FIELD - TARGET GROUP

Study of the basic knowledge of the physical principles governing the thermodynamics phenomena, thermodynamic processes of energy converters with efficiencies and performances knowledge. Understand the characteristics and different aspects of systems, machines and components and integrate practice and visual learning in laboratory experiences.

This training module is devoted to improve the basic knowledge of field technical persons with refreshing of the know-how and verification of learning results.

TOPICS

Developing deeper knowledge of the fundamental laws of thermodynamics, apply the laws to the thermodynamic processes of energy converters used in the industrial systems, evaluate first-law and second-law conversion efficiencies and their performances. Applied thermodynamics. Energy and entropy. Order probability information. Forms of energy: renewable and non-renewable. Electricity. Correlation demand / supply. Rational and efficient use of energy. Thermal machines. Heat pumps and refrigerators. Thermal efficiency. Yields of I and II order: Mechanical and thermal irreversibility. Cycles T.D. Adiabatic and isothermal. Cogeneration and district heating in industrial and civil. Energy cascading. Combined cycles.

Definition of: Heat engines, Turbines, Steam turbine, Gas turbine, Compressor; Thermodynamic cycle, Working fluid, Ideal gas, System Definition of processes: Isobaric, Isothermal, Isentropic, Isometric, Adiabatic mixing, Throttling, Free expansion, Polytropic

Heat transfer: Heat transfer; Heat exchangers, Heat flow through a pipe, Heat flow through a wall

Air Conditioning: Air conditioning, Humidifiers, Direct Steam Injection, Contact factor of a nozzle, Contact factor of a coil, Hygrometer.

Included practical sessions on laboratory.

SKILLS

Professional basic knowledge of Thermodynamics technology principles, circuits, machines and applications. Management of fluid machines systems and capability for first intervention maintenance of systems and devices.

DURATION

60 hours

SESSION OF COURSE

Classroom: 10 session of 4 hours each
Laboratory: 5 session of 4 hours each

ENTRY REQUIREMENTS FOR PARTICIPANTS

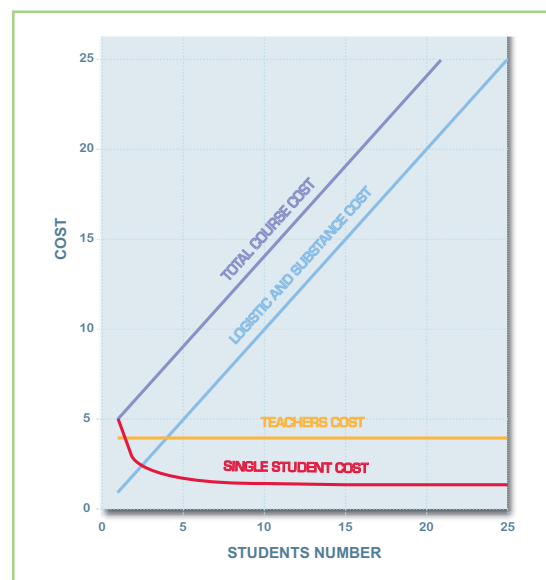
Vocational schools or high schools diploma of electrical or mechanical science. At least short employment experience.

MAXIMUM NUMBER OF STUDENTS PARTICIPATION

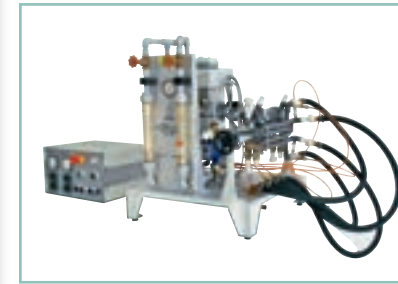
As you may see from the diagram, the costs of the course have their best efficiency with a number of participants ranging from 10 up to 25 units.

It is consequently suggestible to perform a teaching course with a minimum of 8 students up to a maximum of 25.

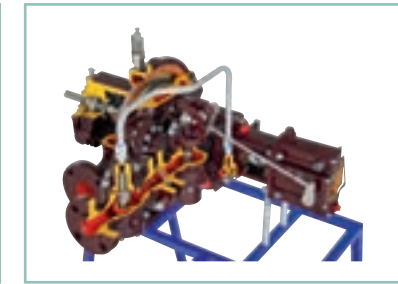
The diagram on the side is only indicative



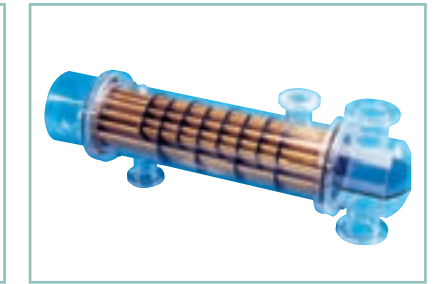
LABORATORIES / TOOLINGS / INDIVIDUAL EQUIPMENTS



Educational and training equipment for fluid machines thermodynamics



Full-scale cutaways for training purposes for fluid machines thermodynamics



Training models for fluid machines thermodynamics



TEACHING & LEARNING MATERIALS / ASSESTMENTS METHODS / CERTIFICATES



- Theory manuals,
- Workbooks,
- Users manuals.
- Schematics presentations and tables.



Evaluation questionnaire at the end of the course



Certificate of attendance at the end of course



RECEPTION PACKAGE

WELCOMING SERVICES FEES:

- Visa issuing, consular expenses for entrance to Italy and residence permit (issued by Ministry of Interior Affairs) for study purposes
- Flight ticket to Italy and return

BOARDING AND ACCOMMODATION SERVICES

- Reception at the organized lodging facilities hotel
- Board including: breakfast, lunch and dinner, drinks included

TRAINING COURSE ANCILLARIES SERVICES:

- Laundry service
- Daytime service of fixed telephone through operator at Prodit premises
- Mobile prepaid telephone service - 50 Euro/ month for each student
- Shuttle service from hotel to Prodit Engineering training center and return;
- Service of initial care for illness or injuries, available during the course time;
- Individual ordinary life and accident insurance, and national health service

TRAINING COURSE PACKAGE

DIDACTIC ACTIVITIES for 5 (five) days per week, as follows:

- Theoretical activities performed in classroom
- Practical activities performed in workshops and laboratories, equipped with didactic equipment
- Individual endowment for the student made up of text books, stationery and backpack
- Periodical tests for assessing student's learning
- Final examination
- Attendance Certificate (issued on the basic requirement of a minimum percentage of participation hours, equal to the 95% of the whole duration of the course)



COURSE LOCATION

These courses will be held at PRODIT ENGINEERING training center in Italy.