



FL 03.1 - SERIES AND PARALLEL PUMPS (pag. B - 1)



FL 03.1i - COMPUTERIZED SERIES AND PARALLEL PUMPS (pag. B - 1)



FL 03.2 - CENTRIFUGAL PUMPS CHARACTERISTICS (pag. B - 1)



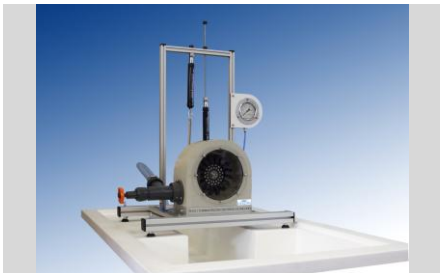
FL 07.1 - AXIAL FAN (pag. B - 2)



FL 07.2 - CENTRIFUGAL FAN (pag. B - 2)



MH 01.1 - CENTRIFUGAL PUMP DEMONSTRATION UNIT (pag. B - 2)



TH 01.1 - FRICTION BRAKE PELTON TURBINE (pag. B - 3)



TH 01.2 - FRICTION BRAKE FRANCIS TURBINE (pag. B - 3)



TH 01.4 - FRICTION BRAKE KAPLAN TURBINE (pag. B - 3)



TH 03.1 - ELECTRIC BRAKE PELTON TURBINE (pag. B - 4)



TH 03.2 - ELECTRIC BRAKE FRANCIS TURBINE (pag. B - 4)



TH 03.4 - ELECTRIC BRAKE KAPLAN TURBINE (pag. B - 4)



TH 04.1 - AUTONOMOUS ELECTRIC BRAKE PELTON TURBINE (pag. B - 5)



TH 04.2 - AUTONOMOUS ELECTRIC BRAKE FRANCIS TURBINE (pag. B - 5)



TH 04.4 - AUTONOMOUS ELECTRIC BRAKE KAPLAN TURBINE (pag. B - 5)

FL 03.1 - SERIES AND PARALLEL PUMPS



With this equipment you can practice much of the operations, start-up, operation and necessary regulations in a pump installation.

One of the pumps is controlled by a frequency variable, which allows varying the speed of rotation. Likewise, this pump has a measurement system of mechanical torque.

The flow rate is measured by an electronic flow meter.

In addition, you can make an study of the characteristics of a pump, working individually and in groups, in series or in parallel, performing a wide range of practices and experiences.

FL 03.1i - COMPUTERIZED SERIES AND PARALLEL PUMPS



FL 03.2 - CENTRIFUGAL PUMPS CHARACTERISTICS



The equipment is designed to operate on hydraulic bench. The installation is mounted on a frame constructed of aluminum, with a system of pipes and valves that allow it to be coupled hydraulic pump and bank equipment in series or in parallel.

The equipment has a frequency converter for controlling the speed of rotation of the pump. Also has two wattmeter for obtaining the power consumed by both pumps.

Through the study of the characteristics of centrifugal pumps is demonstrated the operation and functioning and factors affecting their efficiency.

FL 07.1 - AXIAL FAN



This equipment has been developed for the study of the characteristics of an axial fan, performing a range of practices and experiences.

The unit has a digital display of revolutions that lets us know the working speed of the fan at all times in a simple manner. This speed is regulated by the control.

Similarly pressure transducers measure the working pressure in each tapping under study through its digital displays and boosting practical experience.

Pressure taps are sealed to prevent leaks that distort the readings taken.

Besides using the speed regulation for modifying the flow of work equipment also it has an IRIS type valve that can vary the airflow through the conduit.

FL 07.2 - CENTRIFUGAL FAN



This equipment has been developed for the study of the characteristics of a centrifugal fan, through the realization of a wide range of practices and experiences.

A pitot tube allows the measurement of air velocity at any diametral point of the tube, measuring the position of the tube through a digital display.

The vertical and inclined manometers allow a correct reading of the pressures.

The equipment is supplied with 2 different impellers (blades tilted forward and backward), which can be exchanged in a very simple way. Through a control of 3 positions we control the direction of rotation of the motor.

The frequency shifter allows the variation of the speed of rotation, while we observe the consumed electrical power in a wattmeter.

Through a conical cap in the air outlet we can cause an adjustable pressure drop, and study the operating points of the fan.

MH 01.1 - CENTRIFUGAL PUMP DEMONSTRATION UNIT



TH 01.1 - FRICTION BRAKE PELTON TURBINE



The TH.01.1 equipment simulates an installation in a small scale with a Pelton turbine. It has been designed with special emphasis on the didactic aspect of the same, being able to observe at all times the operation of the system and the different components that constitute it.

The turbine housing is transparent so that you can see how the turbine uses the inertia that transfers a jet of water, which drives it by the principle of recoil.

The equipment is endowed with different variable components, which allows to vary the facings that affect the mechanism and thanks to it to be able to realize different tests for a better understanding of the student.

It has a regulating valve for water inner, which allows to work with different flow rates as required.

Regarding to the braking system, it is made up of dynamometers that allow the braking force to be operated at different speeds.

TH 01.2 - FRICTION BRAKE FRANCIS TURBINE



The TH 01.2 equipment simulates a small-scale installation with a Francis turbine. It is designed with an emphasis on teaching aspect of it, being able to observe at all time the operation of the system and the different components that constitute it.

Among its most notable features we might mention that the turbine housing is transparent so the aid you can see how the water flow turns the wheel. In this case, besides the rotation of the wheel, the movement of the fins guide the distributor with which the flow regulation turbine inlet is achieved is also observed. Additionally, the student can visualize the impact of the fluid on the blades, besides being able to make the necessary data gathering to perform the practices successfully.

It provides a regulating valve of water inlet, which allows working with different flows as required, making it possible to perform many tests as they are needed. The pressure at the inlet of the turbine is also known as measured by Bourdon gauge included in the team and whose management is specified in the manual itself not to lead to errors in the readings.

Furthermore, the braking system by dynamometers allows working at different speeds according to the braking force, which can be easily known through dynamometers that are incorporated in the teaching equipment.

TH 01.4 - FRICTION BRAKE KAPLAN TURBINE



The TH 01.4 equipment simulates a small-scale installation with a Kaplan turbine.

The equipment comes with 3 propellers with different input and output angles, which can be exchanged quickly and easily.

The equipment is designed for the study and display both the behavior and the characteristics of a Kaplan turbine.

TH 03.1 - ELECTRIC BRAKE PELTON TURBINE



The TH 03.1 equipment simulates a small-scale installation with a Pelton turbine.

The turbine housing is transparent so that can be viewed as the turbine uses the inertia that transfers a water jet which propels the recoil principle.

Through various system indicators, you can view all the variables that come into play in transforming energy.

The braking system by electric brake allows working at different speeds in a simple and effective way.

The equipment is designed for the study and display both the behavior and the characteristics of a Pelton turbine.

TH 03.2 - ELECTRIC BRAKE FRANCIS TURBINE



The TH 03.2 equipment simulates a small-scale installation with a Francis turbine or reaction.

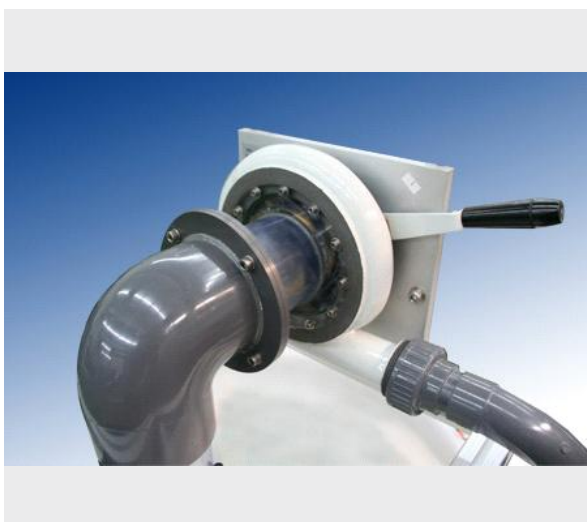
The equipment is designed for the study and display both the behavior and the characteristics of a Francis turbine.

Among its most notable features include the turbine housing is transparent so you can see how the water flow turns the wheel. In this case, besides the rotation of the wheel, the movement of the vanes guide the distributor with which the flow regulation turbine inlet is achieved is also observed.

The braking system with electric brake allows to work at different speeds in a convenient and simple way. The rotational speed of the engine control by a rheostat included in the top control module, where, in addition, through the various indicators of the system, you can display all variables that come into play in transforming energy.

Regulating valve has water inlet, which allows working with different flows as required. Pressure turbine inlet is read in a vacuum gauge arranged on the structure.

TH 03.4 - ELECTRIC BRAKE KAPLAN TURBINE



The TH 03.4 equipment simulates a small-scale installation with a Kaplan turbine.

The wheel blades of the turbine allow variation of the pitch angle manually.

Through various system indicators, you can view all the variables that come into play in transforming energy.

The equipment is designed for the study and display both the behavior and the characteristics of a Kaplan turbine.

TH 04.1 - AUTONOMOUS ELECTRIC BRAKE PELTON TURBINE


The TH 04.1 equipment simulates a small-scale installation with a Pelton turbine.

The turbine housing is transparent so that can be viewed as the turbine uses the inertia that transfers a water jet which propels the recoil principle.

Regulating valve has water inlet, which allows working with different flows as required.

The braking system by electric brake allows working at different speeds.

The equipment is computerized which means that the inlet pressure to the turbine, the flow, the braking torque, ultimately, all variables are displayed in the integrated team structure computer.

TH 04.2 - AUTONOMOUS ELECTRIC BRAKE FRANCIS TURBINE


The TH 04.2 equipment simulates a small-scale installation with a Francis turbine or reaction. It is designed for the study and display both the behavior and the characteristics of a Francis turbine.

Among its most notable features include the turbine housing is transparent so you can see how the water flow turns the impeller. In this case, besides the rotation of the impeller, the movement of the fins guide the distributor with which the flow regulation turbine inlet is achieved is also observed.

Regulating valve has water inlet, which allows working with different flows as required.

The braking system by electric brake allows working at different speeds.

The equipment is computerized which means that the inlet pressure to the turbine, the flow, the braking torque, ultimately, all variables are displayed in the integrated team structure computer.

The turbine can be operated completely autonomously, thanks to the team is composed of water tank, pump and all the necessary instruments on a laboratory trolley.

TH 04.4 - AUTONOMOUS ELECTRIC BRAKE KAPLAN TURBINE


The TH 04.4 simulates a small scale installation with a Kaplan turbine.

Turbine impeller blades allow for varying the pitch angle manually.

The equipment is designed for the study and visualization of both the behavior and the characteristics of a Kaplan turbine.

The turbine can be operated in a totally autonomous way, thanks to the equipment is composed of water tank, pump and all the necessary instruments, on a mobile laboratory car.

The equipment is designed for the study and visualization of both the behavior and the characteristics of a Kaplan turbine.

Through the different indicators of the system, you can see all the variables that come into play in the transformation of energy.