



FLUID MECHANICS

MODULE FOR CENTRIFUGAL PUMP CHARACTERISTICS



DL DKL032

The equipment is designed to run on a hydraulic bench DL DKL014. The installation is mounted on a frame built with aluminium elements. The system has several pipes and valves allowing the pump of the module to be coupled to the pump of the hydraulic bench in-series or in-parallel.

The machine has a frequency converter for controlling the speed of rotation of the pump. It also has two power meters for obtaining the consumed power by both pumps.

Through the study of the characteristics of centrifugal pumps, you can learn the operation and function of the main factors affecting their efficiency.

TRAINING OBJECTIVES

- Commissioning of a pump.
- Analysis and study of the following subjects:
- Pump priming.
- Checking the direction of rotation
- Over current produced in the pump motor.
- Study and obtaining the characteristic curves of a pump
 - Height – flow (H-Q)
 - Power – flow (P-Q)
 - Performance – flow (η -Q)
- Study of cavitation and obtaining the characteristic curves of NPSH required flow.
- Study of different ways to regulate a turbo pump.
- Varying pump rotational speed and obtaining new curves.
- Changing the operating point by varying the pumping installation
- Adjusting the discharge valve
- Analysis of similar pumps running in group
 - Characteristic curves in-series operation.
 - Height - flow (H- Q)
 - Power - Flow (P- Q)
 - Performance - Flow (η - Q)
 - Characteristic curves parallel operation.
 - Height - flow (H- Q)
 - Power - Flow (P- Q)
 - Performance - Flow (η - Q)

TECHNICAL DESCRIPTION

Diameters

- Suction piping
 - Inner $\varnothing = 27.2\text{mm}$
 - Outer $\varnothing = 32\text{mm}$
- Discharge piping
 - Inner $\varnothing = 34\text{mm}$
 - Outer $\varnothing = 40\text{mm}$

Manometres:

- Bourdon type with glycerin from -10.33m to +35m T.M.H. (x3).
- Bourdon type with glycerin from -10m to +70m T.M.H.

Pump features:

- Maximum manometric head: 23m T.M.H
- Maximum flow rate: 20/160 l/min
- H21 / 10m THM
- H max 23m THM
- H min 10m THM
- Power consumption: 750W (1hp)
- Motor speed: 2,900rpm

Power meter:

- Power meter with range: 0-1,200W

Requirements:

- Hydraulic bench DL DKL 014
- Power supply: 230/50Hz



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- Analysis of different pumps running in group
 - Characteristic curves in-series operation.
 - Height - flow ($H - Q$)
 - Power - Flow ($P - Q$)
 - Performance - Flow ($\eta - Q$)
 - Characteristic curves parallel operation.
 - Height - flow ($H - Q$)
 - Power - Flow ($P - Q$)
 - Performance - Flow ($\eta - Q$)