

Drive & Brake Training System

Overview

The universal drive and brake unit is mainly asynchronous motor with frequency converter and precise adjustment of the drive and brake torque. The unit is designed to enable experiments in the fluid field when connected to various driving machines.



Specifications

Main Kit

Code: (FR - 014.1)

- The universal drive and brake unit is considered the base module in the fluid energy machines, which allows performing various experiments on fluid machinery.
- The series associated with this unit covers five training courses on water, oil pumps, turbines, systems engineering and engine technologies.
- In order to execute the experiment, the

complete experimental setup should include the brake unit, the fluid machine to be investigated and a supply unit or a test stand.

- The main function of the universal drive and brake unit is to provide the drive or brake power necessary to study the selected driving or driven machine.
- This power is generated by an air-cooled asynchronous motor with a frequency converter which allows 4-quadrant

operation: generator or motor mode, as required.

- As a generator, it acts as a brake on the fluid energy machine, in this case motors or turbines, and diverts the energy, the energy that is created during the braking process in generator mode is converted into heat at a load resistor.
- As a motor, it powers the fluid energy machine under investigation, e.g. pumps or compressors.
- The drive and/or brake torque can be adjusted precisely and measured with a force sensor that is why the asynchronous motor is suspended as a pendulum.
- The universal drive and brake unit is connected with the driving or driven machine with a V-belt, the motor can be moved to tension the V-belt.
- The universal drive and brake unit is equipped with digital displays for speed and torque.
- Each of the individual accessories is delivered with specific evaluation software used for data acquisition and visualization which makes the experiments clear and enables fast execution of experiments with reliable results.

- Data between the base module and the accessories are exchanged through a data cable.
- The measured values can be transmitted simultaneously via USB directly to a PC.

Optional Kits

Code: (FR - 014.2)

Supply unit for water pumps (FR-014.2.1)

- The training system can be supplied optionally with water supply system which comprises of water tank, flow meter, flow control valve and all of the needed fittings for pump connections.
- The water supply system offers a closed water cycle enabling trainees to perform the experiments independently of water systems

Turbine supply unit (FR-014.2.2)

- The water storage tank of the supply system can be provided optionally with a submerged pump making it accessible for turbines connection.
- The flow meter mounted to the water supply system is used to measure water flow which can be controlled through the provided control valve as well.

Experiments

- This main unit works as a drive or a brake unit for the accompanied modules and can be used to experiment:

- Measuring and displaying speed for different modules
- Measuring and displaying Torque for different modules

Technical Data

Asynchronous motor with frequency converter

- » power: 2200W
- » max. speed: approx. 3000min-1
- » max. torque: approx. 12Nm

Resistive Load

- » 72Ω, 2400W

Measuring Ranges

- » torque: ±15Nm
- » speed: 0...5000min-1

Optional kits:

- Supply unit for water pumps:
 - » Storage tank: 100L
 - » Flow rate sensor: 25 - 250 liters/minute
 - » Measuring ranges
 - » pressure (inlet): ±1bar
 - » pressure (outlet): 0...6bar
- Turbine supply unit
 - » Flow rate: 360 L/M
 - » Head: 19 m
 - » power : 2hp

Scope of Delivery

- Drive & Brake Training System (FR - 014)
 - » Main Kit (FR - 014.1)
- Hard copy user manual
- Bedo software

Required for operation

- Laboratory PC

Options

- Digital Content (BI-01)
- Optional Kits (FR - 014.2)
 - » Supply unit for water pumps (FR - 014.2.1)
 - » Turbine supply unit (FR - 014.2.2)
- Single Stage Piston Compressor (FR - 016)