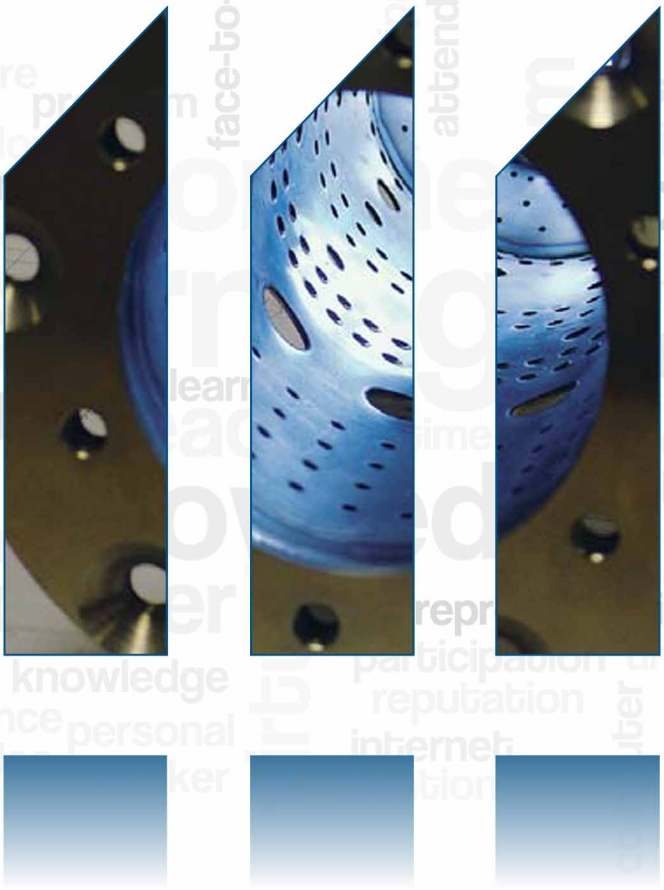

Thermodynamics

infoWERK
medien & technik

GT103 Two-Stage Compressor Test Set

Shows how single and two-stage compressors work, and their thermodynamic properties

- Compact, mobile unit
- Works as single-stage, two-stage or two-stage intercooled compressor
- Independently controlled compressor units, both with variable-speed dynamometer drives
- Clear, fully-instrumented control panel with mimic diagram
- Low-noise footprint
- Completely fail-safe operation – interlocks and pressure-relief valves prevent misuse

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An ISO 9001 certified company

TecQuipment

GT103 Two-Stage Compressor Test Set

Description

This test set has two independently-controlled, motor-driven compressors, intercooler and air receiver. It works as a single-stage, two-stage or two-stage compressor with intercooler. All controls and instrumentation are on an easy-to-operate mimic panel.

Electric motors and low-maintenance toothed belts drive two twin-cylinder, air-cooled reciprocating compressors.

Electronic drive units independently control both motors. Meters show motor electrical power consumption of each motor. A close-coupled load cell on each motor measures torque. A sensor on each motor measures speed, shown by a digital indicator. The product of the torque and speed gives true shaft power.

To allow students to study different types of air-compressor systems, diverter valves allow air to move in different directions. These include:

- From the first stage to the receiver
- Directly to the second stage
- To the second stage, by means of the integral water-cooled intercooler

Independent control of the two compressor speeds allows flexibility to match the two compressors under different conditions. Interlocks allow safe changes from one method of operation to another while the equipment works, and prevent misuse. For safety, all pressurised lines have relief valves.

To help produce pressure and volume diagrams, TecQuipment offers the optional Pressure Indicator (GT103a). It fits to an adaptor on each of the two compressors to measure the pressure changes during a compression cycle. One Pressure Indicator is enough to test each compressor, one at a time. However, you may choose to use two for convenience.

Standard Features

- Supplied with a comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

Recommended Ancillary

- Pressure Indicator (GT103a)

Note: You need a modern computer with a spare USB 2.0 socket to setup and analyse the Pressure Indicator results.

Experiments

A range of experiments and tests based on:

- Volumetric, mechanical and Isothermal efficiency
- Indicated work done
- Motor output power (compressor shaft power)
- Pressure ratio
- Temperature ratio
- Inlet dryness calculations
- P-V indicator diagram (needs optional Pressure Indicator)
- Effect of inter-stage cooling on compressor total power requirements and effect on cycle temperatures
- Effect of two-stage compression and inter-stage pressure on power requirements

Essential Services

Electrical supply:
220–240 VAC, 50/60 Hz 32 A phase to neutral or phase to phase

Note: This equipment needs a high current electrical supply.

Water supply (for the intercooler):
3.0 litres a minute

Operating Conditions

Operating environment:
Laboratory

Storage temperature range:
–25°C to +55°C (when packed for transport)

Operating temperature range:
+5°C to +40°C

Operating relative humidity range:
80% at temperatures < 31°C decreasing linearly to 50% at 40°C

Specifications

Nett dimensions and weight:
1200 mm x 660 mm x 1600 mm and 440 kg

Compressors:
Twin cylinders

Speed range 200-1000 rev.min^{-1}

Maximum delivery pressure 10.3 bar

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