

# 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

- TecEquipment Ltd, Bonsall Street, Long Eaton, Nottingham NG10 2AN, UK
- **T** +44 115 972 2611 • **F** +44 115 973 1520 • **E** info@tecquipment.com • **W** www.tecquipment.com
- An ISO 9001 certified company

# 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.

Thyristor drive units independently control both motors. Electric 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 Maihak Indicator (GT103a).

### Standard Features

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

### Recommended Ancillary

- Maihak Indicator (GT103a)

### 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 Maihak 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:*

Single-phase 220–240 VAC, 50/60 Hz 50 A (other voltages available – specify on order)

**Note:** This equipment needs a high current electrical supply.

*Water supply (for the intercooler):*

3.0 litres a minute

### Operating Conditions

*Operating environment:*

Laboratory environment

*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<sup>-1</sup>

Maximum delivery pressure 10.3 bar