

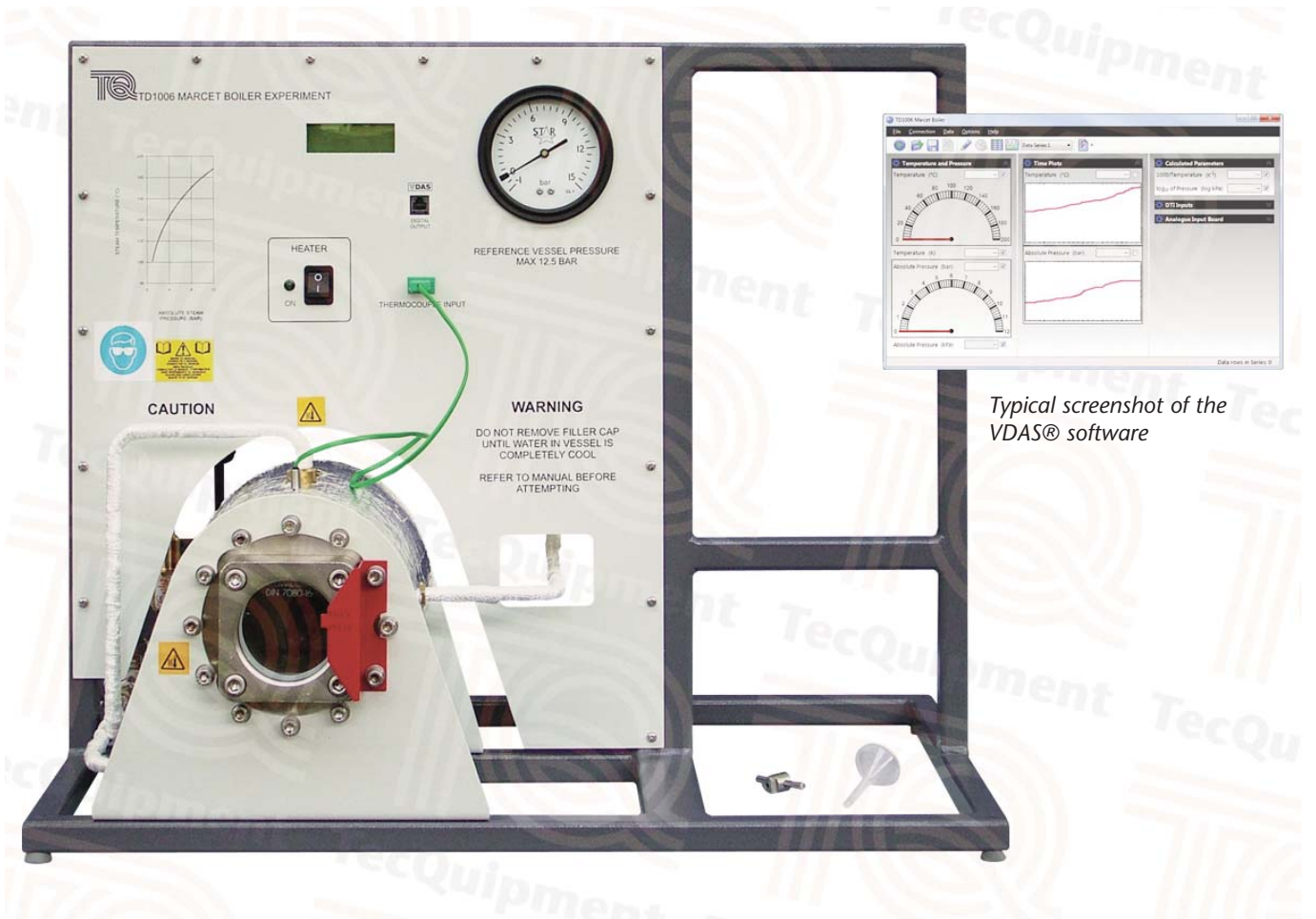


Thermodynamics

TD1006

Marcet Boiler

Shows the pressure and temperature relationship for saturated steam



Typical screenshot of the VDAS® software

- Compact, bench-top unit
- Based on the classic Marcet boiler experiment
- Stainless steel vessel (boiler) for long life and ease of maintenance
- Proves the Antoine Equation for saturated steam
- Vessel (boiler) has viewing window to see the boiling process and the water level
- Simple and safe to use – includes temperature cut-out switches and a pressure relief valve
- Electronic sensors measure boiler temperature and pressure – shown on a digital display in both SI and traditional units (including absolute values)
- Can connect to TecEquipment’s Versatile Data Acquisition System (VDAS®)

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- An ISO 9001 certified company
- VDAS is a registered trademark of TecEquipment Ltd



TD1006

Marcet Boiler

Description

The TD1006 Marcet Boiler is a simple experiment to show the relationship between pressure and temperature for saturated (wet) steam for comparison with published results.

The apparatus consists of a rigid frame containing an insulated pressure vessel (boiler) and an instrumentation and control unit. The frame also has extra space for the optional VDAS® interface.

The electrically-heated boiler holds water. As the water temperature increases, so does the pressure in the boiler. A transducer and a thermocouple measure the boiler pressure and temperature. A digital display shows the values in both SI and traditional units (including absolute values).

The boiler includes a special-purpose glass window. It allows students to see the internal construction of the vessel, to see the boiling process and to check the water level.

For sound engineering practice a mechanical Bourdon type gauge also displays the pressure. It works independent of the electrical supply so the user can always see the pressure in the vessel.

The electrical heater has a thermostat to limit the maximum heater temperature. A pressure relief valve limits the maximum boiler pressure. For safety, the equipment includes high temperature pipe to direct any vented steam away from the working area to a suitable drain.

The design includes all possible safety and low-maintenance features, specially for educational use. TecEquipment has checked the corrosion-resistant high-grade stainless steel boiler against the latest European safety standards.

You can do tests with or without a computer connected. However, for quicker tests with easier recording of results, TecEquipment can supply the optional Versatile Data Acquisition System (VDAS®). This gives accurate real-time data capture, monitoring and display, calculation and charting of all the important readings on a computer (computer not included).

Standard Features

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

Experiments

- Variation of saturated steam pressure with temperature
- Confirmation of the Antoine Equation

Recommended Ancillaries

- VDAS-F (frame-mounting version of the Versatile Data Acquisition System)

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

Sound Levels

Less than 70 dB(A)

Essential Services

Bench space needed:
Approximately 800 mm x 410 mm, plus space for a suitable computer if you need to use the optional VDAS

Electrical supply (determined by order):
220 to 240 VAC 50 Hz to 60 Hz at 5 A

or

110 to 120 VAC 50 Hz to 60 Hz at 10 A

Technical Details

Nett dimensions:
800 mm wide x 410 mm front to back x 640 mm high and 40 kg

Approximate packed volume:
0.5 m³ and 50 kg

Digital display:
Shows temperature in Kelvin (absolute) and Celsius
Shows pressure in Pascals (absolute) and bar (absolute)

Mechanical pressure gauge:
Pressure in bar (for reference only)

Nominal maximum experiment pressure:
10 bar (absolute)

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