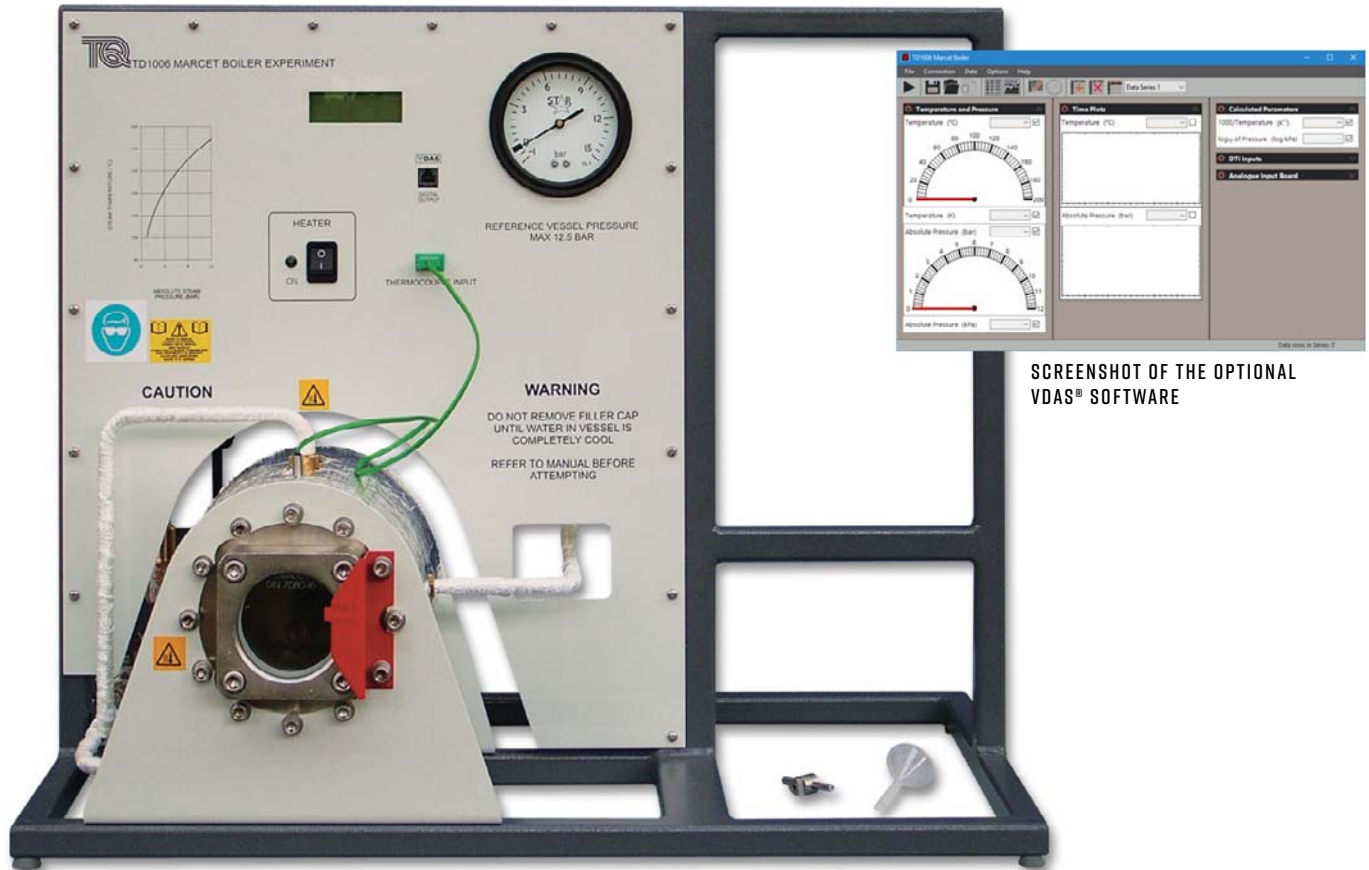




VDAS® TD1006

SATURATED STEAM – THE MARCET BOILER

Illustrates the pressure and temperature relationship for saturated steam.



SCREENSHOT OF THE OPTIONAL
VDAS® SOFTWARE

KEY FEATURES

- 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 TecQuipment's Versatile Data Acquisition System (VDAS®)

SATURATED STEAM – THE 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. TecQuipment 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, TecQuipment 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
- ISO9001 certified manufacturer

RECOMMENDED ANCILLARIES

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

LEARNING OUTCOMES

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

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

SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

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

VESSEL CAPACITY:

Approximately 1.75 litres

HEATER CAPACITY:

1 kw nominal

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)