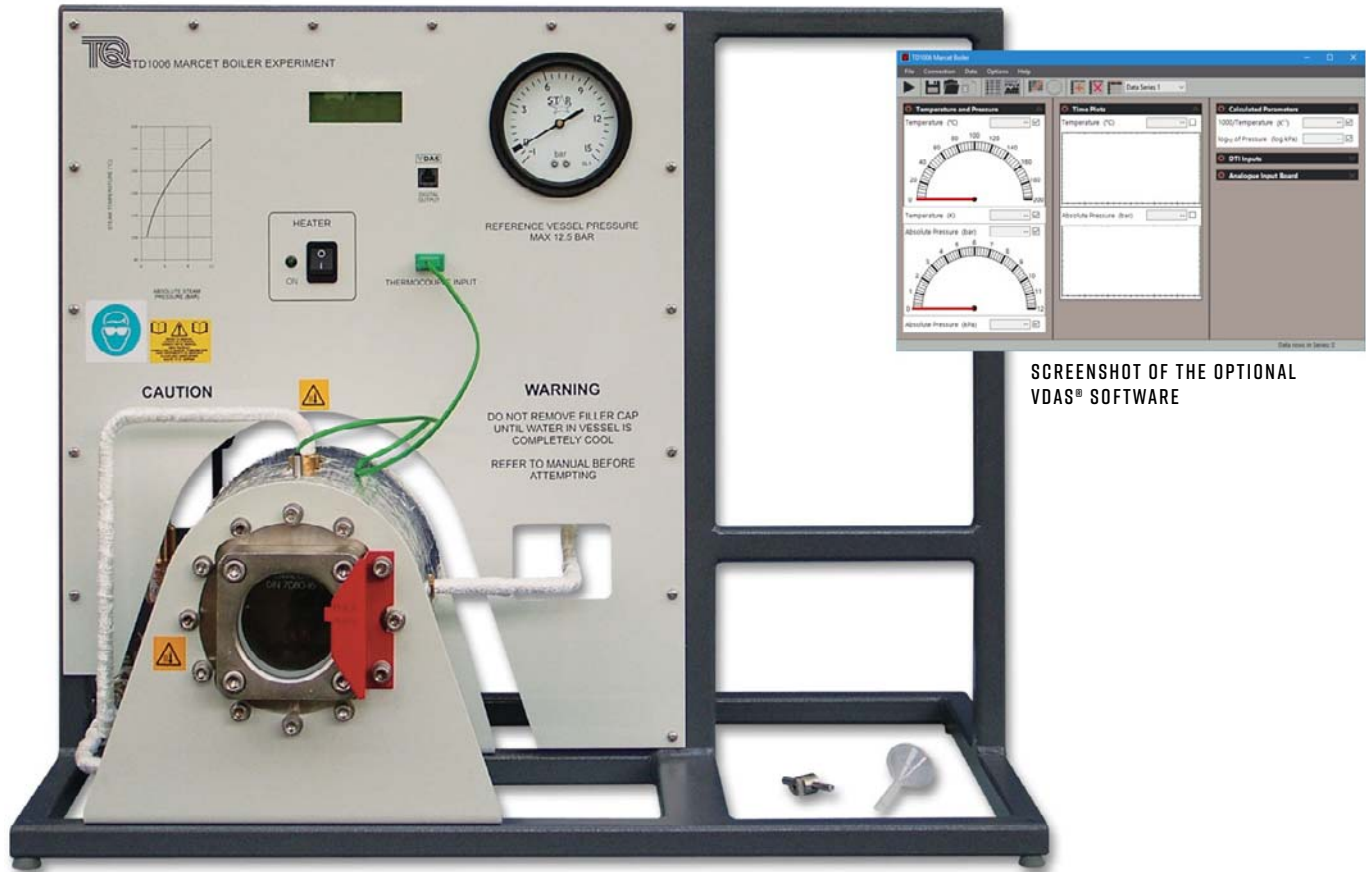




VDAS® TD1006

## 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 TecEquipment'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 m<sup>3</sup> 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)