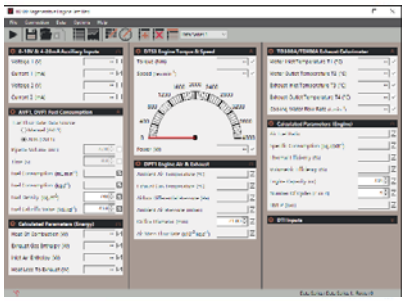
REGENERATIVE ENGINE TEST SET

VDAS® TD300

This floor-mounted engine test set, with bench and instrumentation frame, offers the most advanced student investigations into engine performance from TecQuipment. The four-quadrant drive absorbs more power, higher levels of accuracy, has improved speed stability and settles quicker, saving time in the laboratory. Includes extensive instrumentation for comprehensive investigations.



SCREENSHOT OF THE OPTIONAL VDAS® SOFTWARE

SHOWN FITTED WITH ONE OF THE OPTIONAL ENGINES

KEY FEATURES

- Enables a wide range of investigations into the characteristics of four-stroke single-cylinder petrol and diesel engines
- For use with engines up to 10 kW: four-stroke diesel and four-stroke petrol engines (available separately)
- Ideal for group demonstrations and student projects
- Includes comprehensive control console and instrumentation
- Optional ancillaries available to extend the range of study even further
- Quick, convenient and accurate engine mounting and changeover
- Test bed includes anti-vibration mounts
- Uses four-quadrant drive to start and load the engine, giving excellent stability
- Self-sealing couplings enable quick and efficient connection and disconnection of fuel lines with minimum loss or spillage of fuel
- Works with TecQuipment's Versatile Data Acquisition System (VDAS®)

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TECQUIPMENT

REGENERATIVE ENGINE TEST SET

VDAS® TD300

DESCRIPTION

A versatile regenerative engine test set with comprehensive controls and instrumentation. When used with one of TecQuipment's optional single-cylinder engines (rated up to 10 kW), it safely and effectively enables study and demonstrations of the features and characteristics of the engine. In addition, optional ancillaries are available to extend the range of study, demonstrations and investigations even further.

The equipment is fully compatible with TecQuipment's Versatile Data AcquisitionSystem (VDAS®, available separately). Using VDAS® enables accurate real-time data capture, monitoring and display, calculation and charting of all relevant parameters on a computer (not supplied) making tests quick and reliable.

The main components of the system are:

- a heavy fabricated floor-mounting bed
- an instrument console with instrument frame
- a fuel tank support frame that supports the fuel tank and optional fuel gauge

The bed is held on anti-vibration mounts. It includes a robust trunnion-mounted DC machine. An electronic load cell connected to the machine measures the driving torque of the test engine. The engines (available separately) are supplied pre-mounted on a sturdy precision base plate. When the engine is initially mounted onto the testbed or exchanged with an alternative engine, dowels and slots locate the engine quickly, accurately and reliably. Each engine includes a colour-coded fuel tank with self-sealing couplings. The couplings ensure the engines can be connected and disconnected quickly and efficiently with minimum loss or spillage of fuel. For convenience and safety, the fuel tank can be removed for filling or for storage in a fuel locker when not in use. Removing the fuel tank also prevents unauthorised use of the equipment.

The control console has an electrical cabinet which houses a four-quadrant drive to start and load the engine. The motor can also be used to drive the engine while the fuel and ignition are off, so students can establish frictional losses. The control console includes an air-box and orifice plate to enable students to measure air flow. The instrumentation and display units are mounted on a sturdy frame, which is part of the control console. The control console also includes a convenient work top for use as a writing desk, or for positioning other equipment such as a computer (computer not included).

The control console and test bed are separate in order to avoid vibration being transmitted from the engine to the measuring devices. In addition, it allows the instrumentation to be thermally and acoustically screened from the test bed, using suitable shielding or a wall.
The engines (available separately) include an exhaust thermocouple, dynamometer coupling, colour-coded fuel tank, hoses and fittings. They also have modified cylinder heads and cranks for connection to TecQuipment's Engine Cycle Analyser (ECA100 available separately). An Exhaust Gas Calorimeter (TDX00a) is also available to enable students to measure energy lost through exhaust gases and to determine the energy balance of the engine.

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

AVAILABLE EXPERIMENT MODULES

- Four-stoke petrol engine (TD301)
- Four-stroke diesel engine (TD302)

ESSENTIAL ANCILLARIES

- Manual Volumetric Fuel Gauge (AVF1)

OR

- Automatic Volumetric Fuel Gauge with Digital Read-out (DVF1)

RECOMMENDED ANCILLARIES

- Exhaust Gas Calorimeter (TDX00a)
- Versatile Data Acquisition System frame mounted version (VDAS-F)

NOTE:

- The engines supplied have very similar or equivalent specifications to that used by TecQuipmnent to generate the sample results. However, some performance variations will occur.
- The characteristics of some engines may vary as the latest emission regulations come into force
- For the latest performance information please refer to the engine manufacturer's website.

REGENERATIVE ENGINE TEST SET

VDAS® TD300

ESSENTIAL SERVICES

EXHAUST OUTLET:

One 2.5 m exhaust is supplied with the TD300 which can be connected to a suitable outlet. The local laboratory exhaust can be used (both need an outlet to atmosphere and to comply with local emission regulations)

NOTE: TecQuipment supplies a 1" BSP threaded stub adaptor with each test engine for connection to the TecQuipment exhaust.

ACOUSTIC SILENCER:

Specification dependent upon exhaust system

ELECTRICAL SUPPLY:

- Three-phase 415 VAC, 50/60 Hz, 20 A

OR

- Three-phase 220 VAC, 50/60 Hz, 32 A

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Well ventilated 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

DETAILED 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.

INSTRUMENT CONSOLE DIMENSIONS:

Width 1700 mm x depth 750 mm x height 1340 mm

TEST BED DIMENSIONS (WITHOUT ENGINE):

Width 1150 mm x depth 500 mm x height 800 mm

WEIGHT (PACKED TOTAL):

600 kg

VOLUME (PACKED TOTAL):

4.25 m^3

DYNAMOMETER:

D.C. machine with four-quadrant regenerative drive

MAXIMUM ABSORPTION:

10 kW

MAXIMUM SPEED:

3600 $rev.min^{-1}$

SPEED MEASUREMENT:

Optical encoder and digital display

TORQUE MEASUREMENT:

Strain gauged load cell and digital display

AIR CONSUMPTION MEASUREMENT:

Airbox and orifice plate, pressure transducer and digital display.

AMBIENT AIR TEMPERATURE AND BAROMETRIC PRESSURE MEASUREMENT:

Thermocouple, pressure transducer and digital display

EXHAUST TEMPERATURE MEASUREMENT:

Engine thermocouple and digital display

FUEL CONSUMPTION:

Precision volumetric fuel gauges (analogue or automatic digital versions available)

SAFETY FEATURES:

- Interlocks for mains power failure and engine overspeed
- Emergency stops on test bed and console

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