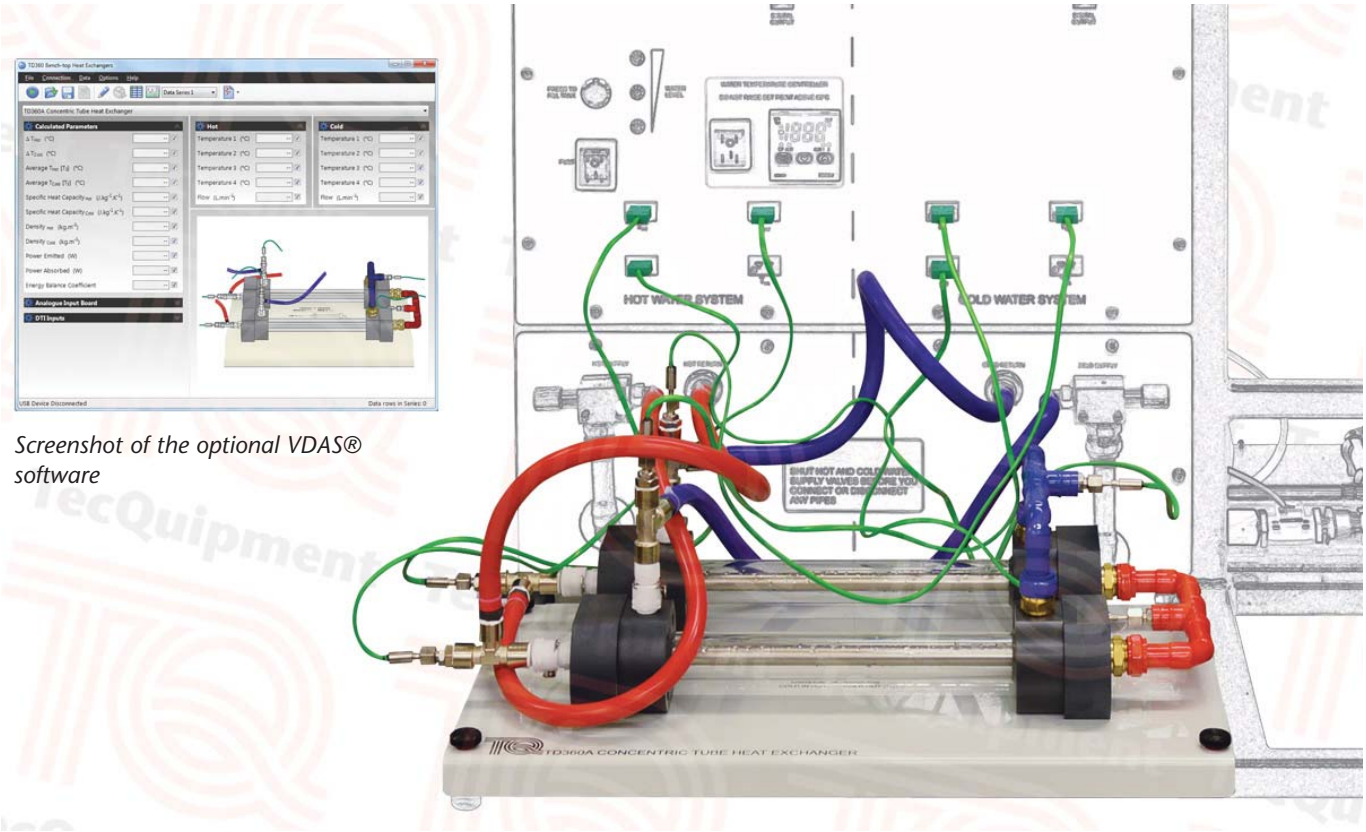
TD360a

Concentric Tube Heat Exchanger

Shows how a simple concentric shell and tube heat exchanger works



Screenshot of the optional VDAS® software

- One of a set of optional heat exchangers for use with TecQuipment's TD360 Service Module
- Popular type heat exchanger, used in industry but designed for teaching
- Simple and safe to use – foolproof fittings allow students to change and connect the heat exchanger quickly and easily – needs no tools
- Clear outside casing, so students can see its construction
- Bedplate with a clear schematic diagram to help students understand how to connect the heat exchanger
- Corrosion-resistant materials for use with ordinary clean water at safe temperatures

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An ISO 9001 certified company

TecQuipment

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Description

This is the simplest of the optional heat exchangers. It has two tubes, one inside the other. One tube carries hot fluid, the other carries cold fluid. Heat transfers between them. TecQuipment's heat exchanger is in two equal parts joined by intermediate pipes. This allows two extra measurement points at the midpoint (plus the standard four points at the connectors). This gives more useful experiment results, to show more clearly how the fluid temperatures change during heat transfer.

The Service Module (TD360) provides hot and cold water to the heat exchanger and all the instruments needed to measure its performance. All fluid connections to the heat exchanger are self-sealing quick connectors - for safety and simplicity. The hot and cold fluid streams have different connectors to reduce errors. Connecting the heat exchanger takes less than one minute.

The heat exchanger is on a bedplate that has a clear schematic diagram showing the connections. The bedplate fixes to the Service Module with thumbscrews (students need no tools).

Standard Features

- Five-year warranty
- Made in accordance with the latest European Union directives

The Service Module (TD360) shown with the Concentric Tube Heat Exchanger module and the optional VDAS® unit (VDAS-F)

Experiments

- Demonstration of heat transfer from one fluid to another through a solid wall.
- Energy balance and efficiency calculations.
- Demonstration of parallel-flow and counter-flow operation of heat exchangers.
- Measurement of the heat transfer coefficient, and the effect of fluid flow rates and the driving force (temperature differential) upon it.
- Introduction to the logarithmic mean temperature difference in heat exchangers.
- Comparison of different types of heat exchanger in terms of performance, size and relative cost (only if you have two or more optional heat exchangers).

Essential Base Unit

- Service Module (TD360)

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

Sound Levels

Less than 70 dB(A)

Specifications

Nett dimensions and weight:
500 mm x 260 mm x 160 mm and 3.5 kg

Other details:

- Outer tube – transparent, 30 mm outside diameter and 20 mm inside diameter
- Inner tube – stainless steel, 12 mm outside diameter and 10 mm inside diameter (1 mm wall)
- Mean heat transfer area 0.02 m^2
- Additional thermocouple in midpoint of hot and cold streams
- Connection to Service Module with quick connectors

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