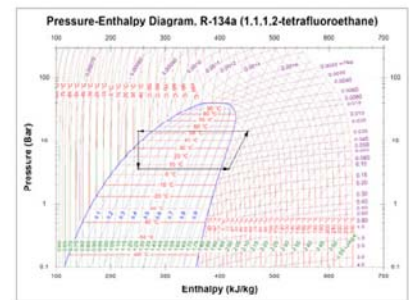
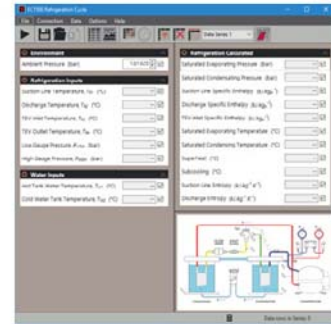




**VDAS<sup>®</sup>**  
ON BOARD **EC1500V**

## REFRIGERATION CYCLE

Bench-top apparatus that allows students to investigate and observe the stages of refrigeration, such as, the coefficient of performance, superheat and subcooling.



SCREENSHOTS OF THE VDAS<sup>®</sup> SOFTWARE

### KEY FEATURES

- Includes TecQuipment's Versatile Data Acquisition System VDAS<sup>®</sup> Onboard, featuring data acquisition via USB
- VDAS<sup>®</sup> software allows students to visualise experimental parameters using pressure-enthalpy charts
- Pressure and temperature measurements taken around the refrigeration circuit
- LCD display of all measured parameters
- Temperature sensors in heat source and heat sink water tanks allows clear demonstration of a refrigeration or heat pump cycle
- Water pump allows circulation of water for steady-state experiment
- Refrigerant circuit colour-coded to international standard

### LEARNING OUTCOMES

- Learn to use a pressure-enthalpy chart
- Determine superheat and sub-cooling
- Basic refrigeration cycle energy balance
- Determine coefficient of performance (CoP)
- Determine non-isentropic, isentropic and volumetric efficiencies of the compression stage
- Effect of heat source and heat sink temperatures on CoP
- Compare performance between actual and reversed Carnot cycles



# REFRIGERATION CYCLE

## DESCRIPTION

This simple refrigeration cycle unit assists students to learn the stages of refrigeration at an entry level. Students learn about pressure-enthalpy charts and use the chart for R-134a to determine the coefficient of performance (CoP), superheat and sub-cooling from the enthalpy changes.

The refrigeration circuit features high and low pressure gauges, a pressure switch, sight glass, filter dryer and TEV valve. The circuit also includes pressure transducers that connect to the instrumentation. Four thermocouples placed around the refrigeration circuit allow the observation of temperatures, these can be used for the calculation of potential super-heating and sub-cooling.

The evaporator and condenser coils are submerged in heat source and heat sink water tanks for the clear demonstration of a practical heat pump. A small pump provides a circulation of the water between the heat source and sink for steady state experiments.

EC1500V features VDAS® Onboard for data acquisition via USB cable (supplied) to a computer (not supplied).

## STANDARD FEATURES

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

## OPERATING CONDITIONS

### OPERATING ENVIRONMENT:

Laboratory

### STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

### OPERATING TEMPERATURE RANGE:

+5°C to +30°C

### OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 30°C

## SOUND LEVELS

Within 20 cm of the water pump: 80 dB

40 cm away from the water pump: less than 70 dB(A)

## ESSENTIAL SERVICES

### BENCH SPACE NEEDED:

825 mm (wide) x 494 mm (deep)

### ELECTRICAL SUPPLY:

Single phase, 220 - 240 VAC, 50 Hz, 2 A **OR**

Single phase, 110 - 120 VAC, 60 Hz, 4 A **OR**

Single phase, 208 - 220 VAC, 60 Hz, 2 A

(Specified on order)

## VDAS® SOFTWARE

PC running Windows 7 or newer, required for optional VDAS® software

## SPECIFICATIONS

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

### APPROX NETT DIMENSIONS AND WEIGHT:

825 mm wide x 494 mm front to back x 845 mm high and mass approx 58 kg