EDITION 2

AIR-CONDITIONING & REFRIGERATION

AMTEC TECHNIQUIP
Engineering The Future

Suppliers Of Educational Engineering Equipment & Accessories

MADE IN SOUTH AFRICA

30 YEARS OF ENGINEERING EXCELLENCE

BEE LEVEL 2 company 125% recognition

+27 (0) 11 823 2678 SALES @AMQUIP.CO.ZA | WWW.AMTECTECHNIQUIP.CO.ZA

Amtec Techniquip applies 30 years of knowledge & experience in the design, manufacture and import of educational engineering equipment, accessories, instrumentation and consumables.

During this time, we have been a market leader in innovation, bringing many new concepts and products to the educational industry while expanding our comprehensive range of quality teaching equipment to a level unsurpassed by any other company in the industry.

This includes unique new methods of introducing and educating the learners in all facets of modern engineering. Our products are visual and demonstrational to best teach and explain concepts from basic engineering, all the way up to research and thesis levels in the most advanced forms of engineering.

Amtec Techniquip's commitment to the end user...

AMTEC offers a personal approach to each and every end user as we are always available to meet and discuss any requirements face-to-face basis to provide a tailor-made solution.

AMTEC have a large footprint throughout Southern Africa and regularly visit the countries and provinces we service while also keeping our customers up-to-date with any new products and innovations we bring to the market.

AMTEC supplies expert training on all our products. Our team of experts offer training at the end user or alternately at our head office in Jhb. All our products are supplied with their relevant manuals, course materials and exercise guides.

AMTEC offers unmatched after-sales service and customer support. All our equipment is supplied complete with ICT (Installation, Commissioning & Training). Our sales and support teams are at the end user's disposal should any assistance be needed during the life of a product.

AMTEC offers an extended Service and Maintenance plan to make sure that your equipment and apparatus are maintained to ensure a long lifespan with little or no downtime.

AMTEC makes use of only quality components to ensure reliability and longevity of all our manufactured equipment. This provides the end user with peace of mind and a product that will stand the test of time in an educational environment.

AMTEC has the manufacturing capability to R+D and manufacture "one-off" designs and customise any equipment within our range to meet the end users requirements. We have many accessories, add-ons and tooling that can work in conjunction with our equipment and trainers.

AMTEC offers a 24-month factory warranty on all our products supported by the backing of our local & international suppliers.

AMTEC HVAC TOOLS

AIRCONDITIONING LEAK DETECTION TOOLKIT

TESTO MANOMETER 870PSI

HVAC TECHNICIAN TOOLKIT

AIR CONDITIONER REFRIGERANT MANIFOLD GAUGE KIT

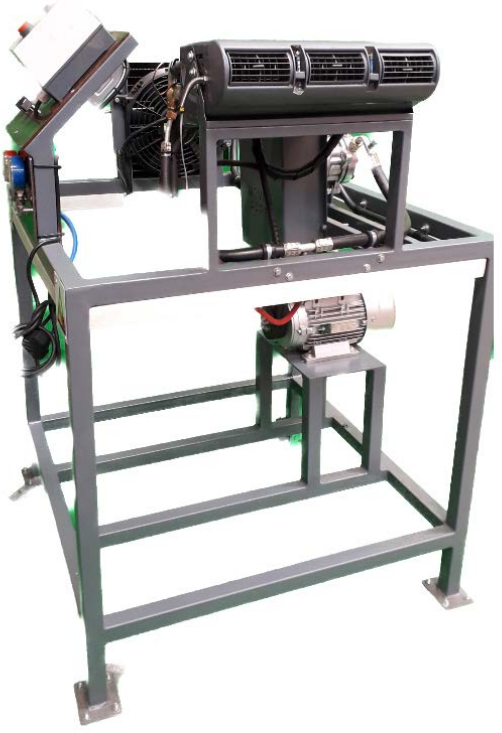
1" - 3" HYDRAULIC / ELECTRICAL PIPE BENDER

FLARING SWAGING TOOL SET TUBE CUTTER PIPE REPAIR REFRIGERATION EXPANDER WITH CASE

HAND OPERATED PIPE BENDER

12 TON HYDRAULIC PIPE BENDER

AMTEC AUTOMOTIVE AIRCON TRAINER



This trainer integrate the main components of a vehicle air conditioning system. The compressor is driven by an electric motor at mains voltage allowing the execution of the refrigeration cycle and the operation of the entire system. It is possible monitoring the compressor inlet pressures (low pressure, blue) and the compressor output pressure (high pressure, red) and the temperatures of the condenser and of the evaporator.

Main features:

- Max. power 2 kW
- Cooling liquid 400gt Freon R134a
- Piston compressor
- Condenser
- Dehydrating filter
- Pressure switch
- Expansion valve
- Evaporation unit
- Resistor
- Thermostat

**Also available: Sectioned Aircon Unit

The trainer corresponds to an aftermarket unit mounted on a chassis. Ideal for training in the operation and maintenance

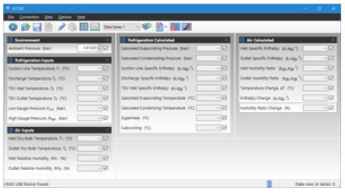
The system can simulate 4 electrical failures without disconnecting connectors and wires, but by acting on switches which interrupt the following circuits:

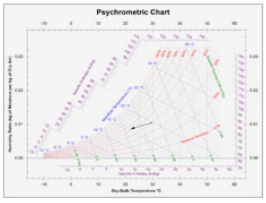
- Compressor enable signal from pressure switch
- Compressor clutch
- Cooling fan enable signal from pressure switch
- First speed evaporator fan

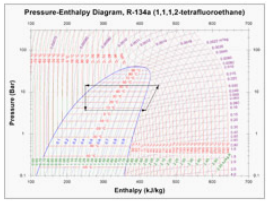
VDAS® EC1501

AIR-CONDITIONING TRAINER

Bench-top trainer, allows students to investigate the fundamental principles of air conditioning







SCREENSHOTS OF THE VDAS® SOFTWARE

KEY FEATURES

- Pressure and temperature measurements taken around the refrigeration circuit
- Relative humidity and temperature measured upstream and downstream of the evaporator
- LCD display of all measured parameters
- VDAS® connectivity included featuring data acquisition via USB
- VDAS® software allows students to visualise experimental parameters using Psychrometric and Pressure-Enthalpy charts
- Refrigeration circuit colour-coded to internatinal standards

LEARNING OUTCOMES

- Learn to use Psychrometric charts
- Determine enthalpy change in the air flow
- Learn to use a Pressure-Enthalpy chart
- Determine superheat and sub-cooling
- Determine Coefficient of Performance (COP)
- Determine isentropic and non-isentropic efficiencies of compression stage
- Investigate the effect of air flow rate on COP

VDAS® EC1501

AIR-CONDITIONING TRAINER

DESCRIPTION

This training unit allows students to investigate air conditioning at a basic level. Students can use Pressure-Enthalpy and Psychrometric charts for their calculations and discover the enthalpy change.

The unit features an air-cooled condenser unit connected to an evaporator located in an air duct. The air duct contains relative humidity and temperature sensors on both sides of the evaporator. A small fan provides air flow down the duct and air flow rate can be manually adjusted.

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 observation of temperatures, these can be used for the calculation of potential super heating and sub-cooling.

STANDARD FEATURES

- Supplied with 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 20cm of the fan 75 dB

40cm away from the fan, less than 70 dB(A)

ESSENTIAL SERVICES

BENCH SPACE NEEDED:

1020 mm (wide) x 600 mm (deep)

ELECTRICAL SUPPLY:

Single phase

220 to 240 VAC 50 Hz, 2 A

208 to 220 VAC 60 Hz, 2 A

110 to 120 VAC 60 Hz, 4 A

(Specified on order)

VDAS® SOFTWARE

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

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.

APPROX NETT DIMENSIONS AND WEIGHT:

1020 mm wide x 600 mm front to back x 860 mm high and mass approx 72 kg

INTRODUCTION TO THE AIR CONDITIONING SYSTEMS

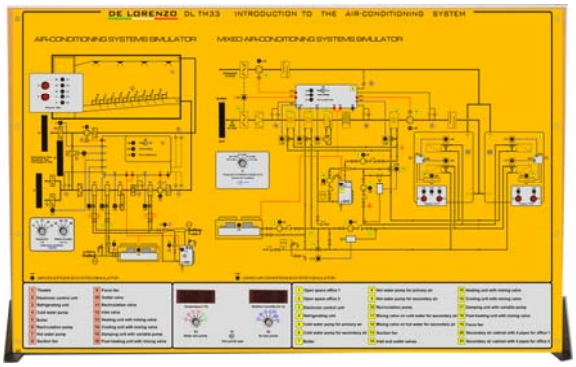
Two-side simulator for the study of different air-conditioning systems.

- SIDE A simulates two types of systems: the mixed (air-water) air-conditioning systems and the systems that are used for the air-conditioning of a show hall (theatres, cinemas, etc.) where the ambient parameters change due to the presence of many people.

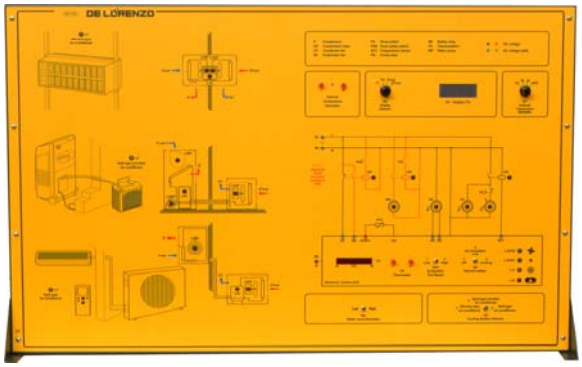
- SIDE B simulates the domestic air-conditioning systems: the window single block air-conditioner, the portable air-conditioner and the fixed, split type air-conditioner.

Through the study of the above systems it is possible to understand the operation of: compressors, condensers and evaporators, fan speed selectors, temperature probes for internal and external air, switches, thermostats, air-processing units with heating, cooling and humidifying devices, outlet and recirculation valves, temperature/humidity probes, boilers and refrigerating units for the production of hot and cold fluids, electronic units for data recording of temperature and humidity and for the adjustment of the actuators, pumps, etc.

The panel is complete with CAI software.



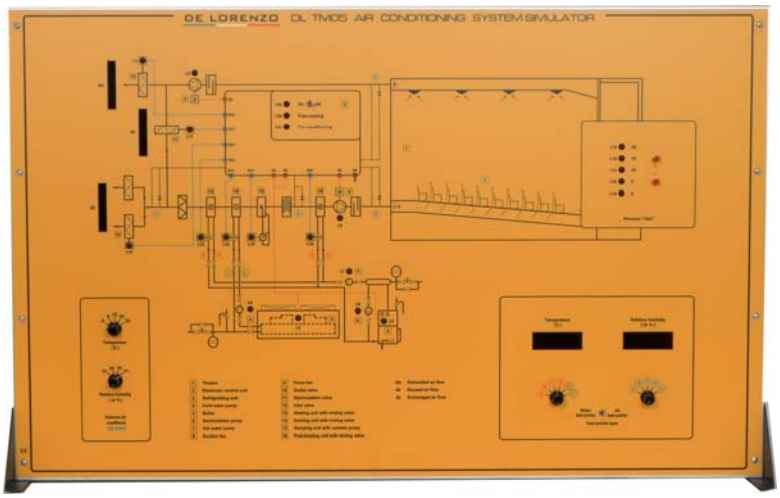
Side A



DL TM33

Side B

AIR-CONDITIONING SYSTEM



DL TM05

The simulator allows the study, the performing of experiments and the troubleshooting for the following system:

- Full air, single duct, constant capacity air-conditioning system, for single zone with regulation on the heating, cooling and post-heating batteries

This system is reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.

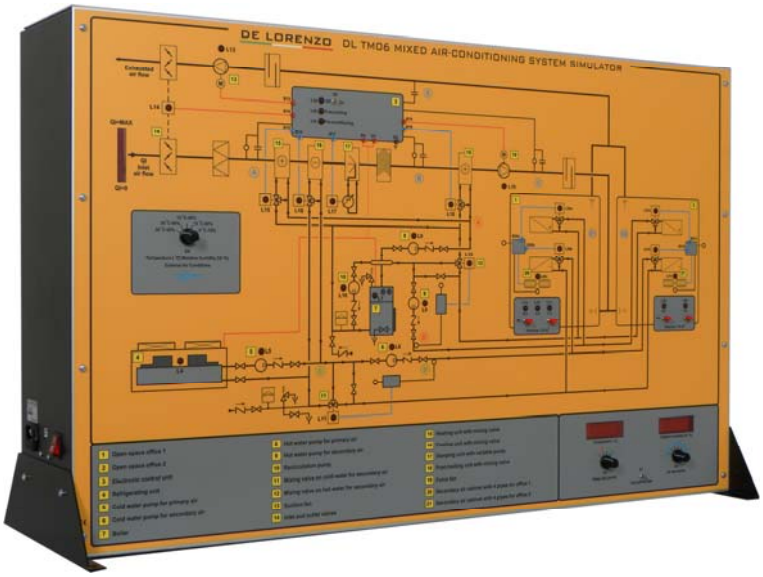
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The full air, single duct, constant capacity air-conditioning system, for single zone with regulation on the heating, cooling and post-heating batteries is composed of the following main elements:

- Air treatment unit (ATU) complete with heating, cooling, humidifying and post-heating batteries
- Air duct, complete with inlet fan, recovery fan, motorized shutter for ejecting, mixing and renewing the treated air
- Boiler and refrigerating unit for the production of the hot and of the cool fluid to be used in the ATU batteries
- Electronic station for data recording concerning temperature and humidity and for the subsequent adjustment and opening of the actuators and devices for the air-conditioning
- Ambient to be air-conditioned composed of a show hall (theatre, cinema), provided with system for air delivery from the bottom and its recovery from the top
- Possibility to simulate the external temperature and humidity conditions
- Possibility to simulate the crowding of the hall and, consequently, the relevant thermal and sensitive loads
- Possibility to display the percentages of the ejected, recycled and renewed air
- Possibility to display the temperature and the humidity of the treated air, in various points of the system
- Possibility to display the temperatures of the hot and cool fluid on the batteries of the ATU

MIXED AIR-CONDITIONING SYSTEM



DL TM06

The simulator allows the study, the performing of experiments and the troubleshooting for the following system:

- Mixed air-water conditioning system, with four-duct air convectors

This system is reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.

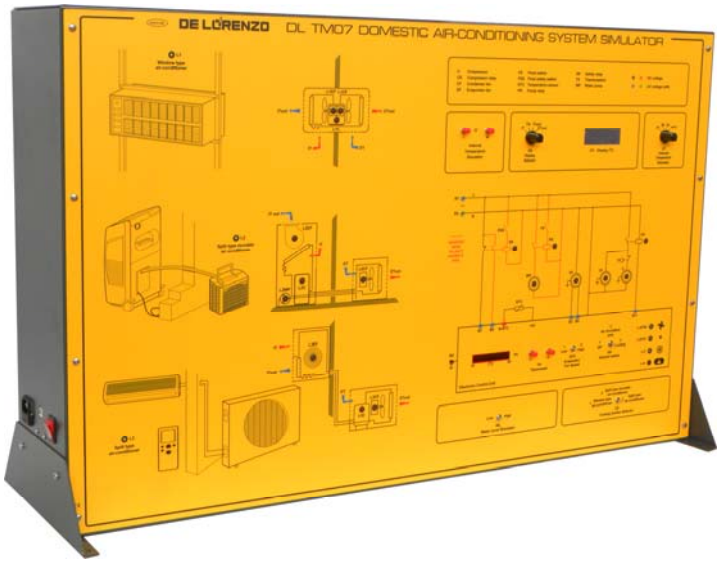
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The mixed air-water conditioning system, with four-duct air convectors is composed of the following main elements:

- Air treatment unit (ATU) complete with heating, cooling, humidifying and post-heating batteries;
- Air duct, with delivery fan, ejection fan, motorized shutter for treated air ejection and treated air renewal
- Boiler and refrigerating unit for the production of the hot and of the cool fluid to be used in the ATU batteries and in the four-duct air convectors;
- Electronic station for data recording concerning temperature and humidity and for the subsequent adjustment and opening of the actuators and air-conditioning devices;
- Environment to be air-conditioned composed of offices, provided with four-duct air convectors, system for air delivery and for its recovery;
- Possibility to simulate the external temperature and humidity conditions;
- Possibility to simulate the crowding of the offices and, consequently, the relevant thermal and sensitive loads;
- Possibility to display the percentages of the renewed air;
- Possibility to display the temperature and the humidity of the treated air, in various points of the system;
- Possibility to display the temperatures of the hot and cool fluid supplying the batteries

DOMESTIC AIR-CONDITIONING SYSTEMS



The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- window single block air-conditioner
- portable air-conditioner, split type
- fixed air-conditioner, split type

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

DL TM07

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.
The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

The window single block air-conditioner consists of the following main elements:

- single-phase motor compressor
- condenser and evaporator with ventilation through only one single-phase electric motor
- capillary pipe
- regulation thermostat
- fan speed selector
- main switch
- switch for compressor insertion
- possibility to simulate the internal and external temperature
- possibility to display the temperature values of the treated air

TECHNICAL DESCRIPTION

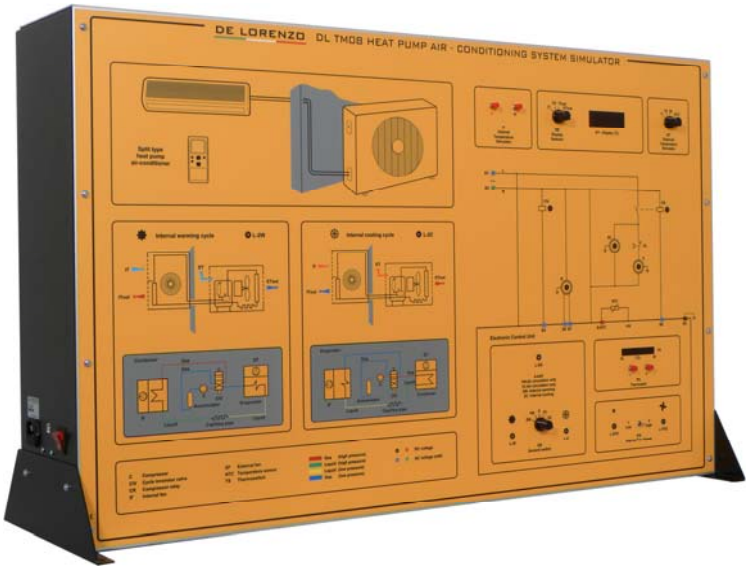
The portable air-conditioner, split type, consists of the following main elements:

- single-phase motor compressor
- condenser with ventilation through single-phase electric motor
- evaporator with ventilation through single-phase electric motor
- capillary pipe
- regulation thermostat
- fan speed internal selector
- main switch
- switch for compressor insertion
- single-phase motor-driven pump for condensate evacuation
- possibility to simulate the internal and external temperature
- possibility to display the temperature values of the treated air

The fixed air-conditioner, split type consists of the following main elements:

- single-phase motor compressor
- condenser with ventilation through single-phase electric motor
- evaporator with ventilation through single-phase electric motor
- capillary pipe
- regulation thermostat
- fan speed internal selector
- main switch
- switch for compressor insertion
- possibility to simulate the internal and external temperature
- possibility to display the temperature values of the treated air

HEAT PUMP AIR-CONDITIONING SYSTEM



DL TM08

The simulator allows the study, the performing of experiments and the troubleshooting for the following system:

- Fixed air-conditioner, split type, with air-air heating pump, for cooling and heating the ambient

This system is reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.

Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The fixed air-conditioner, split type, with air-air heating pump, for cooling and heating the ambient is composed of the following main elements:

- Single-phase motor compressor
- Condenser/evaporator with ventilation through single-phase electric motor
- Evaporator/condenser with ventilation through single-phase electric motor
- Two expansion thermostatic valves
- Two single-direction valves for by-pass circuits
- Monostable electro valve for inversion of the refrigerating cycle
- Liquid tank
- Regulation thermostat
- Internal fan speed selector
- Main switch
- Cooling/heating selector
- Possibility to simulate the internal and external temperatures
- Possibility to display the temperature values of the treated air

AIR CONDITIONING TRAINER

The trainer is a heat pump split air conditioning system, which gives students advanced instructions on the components and operation of an air conditioning and refrigerating system. The trainer includes refrigerating, electrical control, fault insertion, and fault elimination systems.

It consists of: control panel, outdoor unit and indoor unit of an air-conditioning system, measuring instruments, AC power supply control unit, fault insertion unit and fault elimination unit, etc.

Features:

• It utilizes an actual refrigerating unit with the functions of refrigerating, heating, ventilating, dehumidifying, temperature and wind speed selection, timing, sleeping, etc.

• It integrates: refrigerating system, electrical control system, fault insertion system and fault elimination system, meeting the training requirements of an air conditioning and electrical control system.

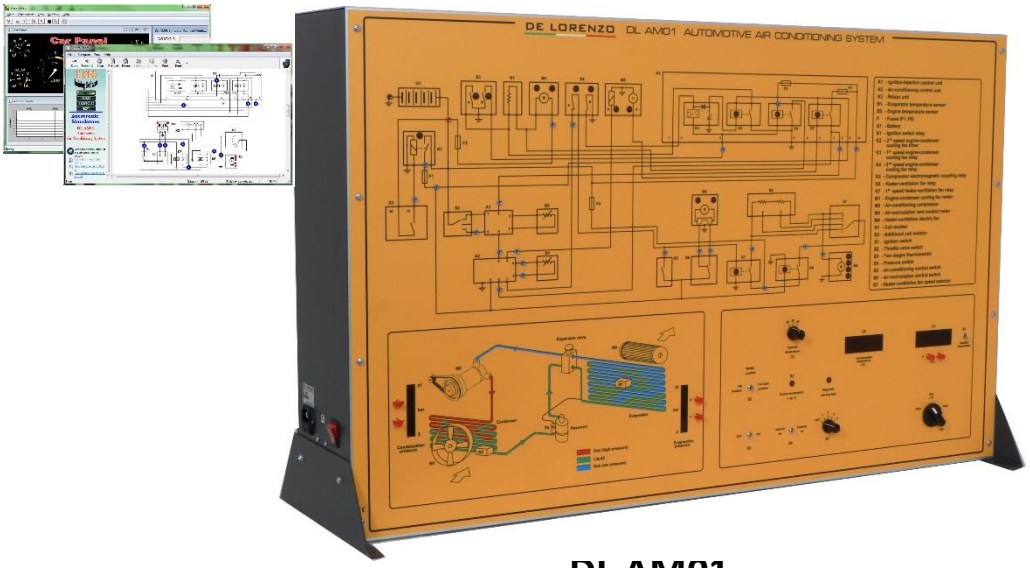
• It clearly shows the inner components layout and refrigerating cycle system structure; it demonstrates the operating principle of a heat pump type air conditioner; it comes with AC voltmeter, AC ammeter, thermometer, vacuum pressure gauge, pilot lamps, and LED to show the system real-time status; the main control board is covered with a transparent board to facilitate observation; schematic diagram of control system and relative test points are available; sight glass in the pipeline is used to observe refrigerant status; HV pipeline is marked with red, while LV pipeline with blue, relative components are all labeled.

• It includes a connection area for electrical control circuit of outdoor unit to train students' hands-on ability.

• Fault insertion and suppression.

DL TMAC10

AIR CONDITIONING FOR AUTOMOBILES



DL AM01

LEARNING EXPERIENCE

This simulation panel is properly designed and realized to allow an easy and complete learning of the techniques and of the electro-mechanical, and electronic devices that are used for the regulation and control of automotive air conditioning.

To cool the external air, refrigerating compressor based systems are exclusively used. The compressor activated by the engine compresses the refrigerant, which consequently warms up; in the condenser the working fluid is cooled until it reaches the liquid phase. The cooling is obtained by giving heat to the exterior in the zone around the compressor. The cooled fluid expands in the expansion valve and in the evaporator and is transformed in gas. The heat necessary for such transformation is subtracted from the entering cool air.

GENERAL CHARACTERISTICS

- Dim. mm approx (HxLxW) : 700x1000x150 - (470 with the base)
- Weight approx. kg 25
- Input power supply: AC 220V±10% 50 Hz
- Working temperature: -40°C ~ +50°C.

MAIN CHARACTERISTICS

The simulator analyses all the phases of the refrigeration cycle. In particular:

- Relations between temperature and pressure in the refrigerant
- Operation of the compressor
- Operation of the condenser
- Pressure switches
- Temperature regulation

This vertical frame bench-top trainer is specially designed to show to students how automotive systems work. The simulator consists of a panel operated by the support of a computer with a coloured silk-screen diagram that clearly shows the structure of the system and allows the location of the components on it.

The display of the information available on the computer screen allows the continuous control of the educational system. The operational conditions can be entered by the students and the insertion of faults can be carried out through the computer by the teacher.

The trainer is supplied with a CAI Software and the supported documentation guides the students to the study and the performance of the simulation exercises.

All components installed and given leads are made to protect the safety of the students.

CAR AIR CONDITIONING SYSTEM

DL DM31

LEARNING EXPERIENCE

The trainer corresponds to an aftermarket unit mounted on a chassis. Ideal for training in the operation, maintenance, repair and troubleshooting.

The system can simulate 4 electrical failures without disconnecting connectors and wires, but by acting on switches which interrupt the following circuits:

- Compressor enable signal from pressure switch
- Compressor clutch
- Cooling fan enable signal from pressure switch
- First speed evaporator fan

GENERAL CHARACTERISTICS

- Dim. mm approx (HxLxW) : 1300X1000X750
- Weight approx. kg 150
- Power supply: AC 220V±10% 50/60 Hz
- Working temperature: -40°C ~ +50°C.

MAIN CHARACTERISTICS

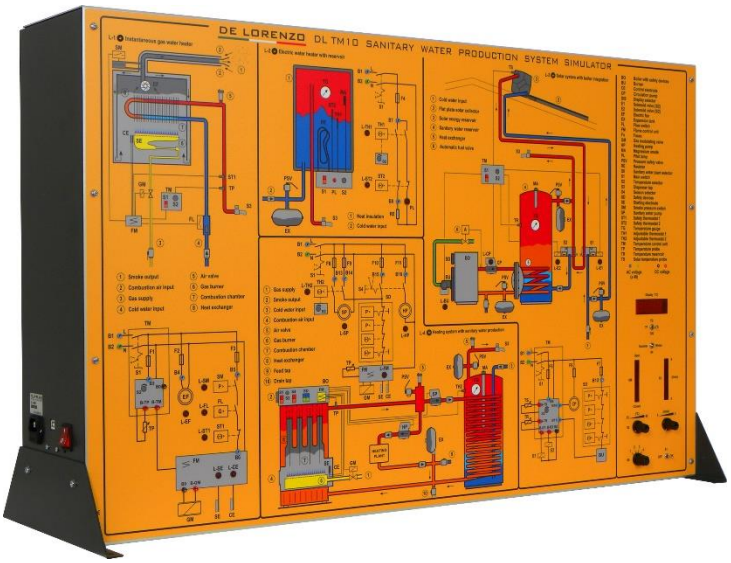
This trainer integrate the main components of a vehicle air conditioning system. The compressor is driven by an electric motor at mains voltage allowing the execution of the refrigeration cycle and the operation of the entire system. It is possible monitoring the compressor inlet pressures (low pressure, blue) and the compressor output pressure (high pressure, red) and the temperatures of the condenser and of the evaporator.

Main features:

- Max. power 2 kW
- Cooling liquid 400gt Freon R134a
- Piston compressor
- Condenser
- Dehydrating filter
- Pressure switch
- Expansion valve
- Evaporation unit
- Resistor
- Thermostat
- Troubleshooting device for simulation of 4 faults
- Nomenclature table

System supplied with manual.

SANITARY WATER PRODUCTION SYSTEMS



DL TM10

The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- Instantaneous geyser;
- Store electric water heater;
- Solar system for sanitary water production with boiler integration;
- Central system for heating and sanitary water production

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.
The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Average training hours: 10h (including 2h for fault finding).

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The solar system for sanitary water production with boiler integration is composed of the following main elements:

- Solar panel with natural circulation, with tank for sanitary water storage
- Boiler and relevant gas burner
- Safety and regulation devices for the boiler
- Boiler for sanitary water storage
- Boiler pump
- Sanitary water regulation thermostat
- Probe for boiler temperature and boiler sanitary water thermometer
- Probe for stored sanitary water temperature through solar panels
- Safety valve
- Electrovalve for control of the heating through solar panel or through solar panel with boiler integration
- Sanitary water with heating through boiler

The central system for heating and sanitary water production is composed of the following main elements:

- Gas boiler
- Safety and regulation devices for the boiler
- Flame control device
- Modulating valve for gas capacity
- Heating circulation pump

The instantaneous geyser is composed of the following main elements:

- Forced draught gas-fired wall boiler
- Flame control device
- Sanitary water regulation thermostat and safety thermostat
- Sanitary water flow meter
- Smoke pressure switch
- Modulating valve for gas capacity

The store electric water heater is composed of the following main elements:

- Steel boiler with insulation
- Electric resistance
- Sanitary water regulation thermostat and safety thermostat
- Safety valves
- Magnesium anode
- Sanitary water thermometer
- Pilot light for electric resistance insertion
- Expansion tank
- Air exhaust valve
- Boiler for sanitary water storage
- Boiler pump
- Sanitary water regulation thermostat
- Probe for boiler temperature and boiler sanitary water thermometer
- Safety valves
- Magnesium anode

Automotive Air Conditioning Training Unit – Mod. 810

- *Complete System Bench Mounted*
- *Fitted with 1_ Volt Control System*
- *Optional Student Tool Kit and Test and Service Equipment*
- *Instruction Manual Contains Course Notes, Instruction Notes and Student Example Worksheets*
- *Demonstrates Common Faults and Effects on the System*
- *T vo year Warranty*

Introduction

The 810 is designed to train students in the operation. fault finding. maintenance and repair of automotive air conditioning systems.

It comprises a complete automotive air conditioning system on an alloy frame suitable for bench mounting The unit operates on R134a refrigerant used in most current vehicle air conditioning systems and connections areprovided to allow the use of standard R134a manifold gauges.

Description

Model 810 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The compressor is driven by a synchronous AC electric motor and the complete unit has an internal Residual Current Device for additional operator safety. Apart from the drive motor all other controls are 12V as used in automotive air conditioning systems.
Temperature control is by an adjustable electronic thermostat and the evaporator has three fan speeds to show the effect of air velocity and varying load on the system

Four common faults can be demonstrated –

- Blocked Thermostatic Expansion Valve
- Blocked Drier
- Compressor Fault
- Poor Condensing

A standard Student Tool Kit and Test and Service Equipment Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

Specification

Detailed

A complete vehicle air conditioning system mounted on an alloy frame and fitted with standard R134a manifold gauge connections

Incorporating:-

Electric Motor nominal 1500rpm with overload cut out.

Five cylinder open type compressor with duty of up to 7.5 Kw at maximum rated speed.

Air cooled condenser and fan with 12v dc motor.

Evaporator fitted with three speed 12 dc fan and Thermostatic Expansion Valve.

Electronic thermostat, adjustable for temperature control.

Transformer to provide 12v automotive control circuit

Electrical control box with key locked emergency of button, on – off switch, ignition key and residual current device.

Four switch controlled fault conditions:

- Blocked Thermostatic Expansion valve
- Blocked drier
- Compressor Fault
- Poor condensing

Refrigerant R134a

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Student test papers and sample answers
- Electrical wiring diagram.

Dimensions

Height 46 cm Depth 57 cm
Width 91 cm Weight 100kg

Services Required

Electrical

Either: A: 13Amp 220-230 Volts, Single Phase, 50Hz
(With earth/ground).
OR
B: 26Amp 110-120 Volts, Single Phase, 60Hz
(With earth/ground).

Optional Equipment

Student Tool Kit
Test And Service Equipment

Ordering Information

Order as Automotive Air Conditioning Training Unit 810

Electrical Specification

Either: A: 220-230 Volts, Three Phase, 50Hz
(With earth/ground).
OR
B: 110-120 Volts, Three Phase 60Hz
(With earth/ground).

Language

Either: English, Spanish or French

Shipping Specification (Approx)

Net Weight:	100 kg
Gross Weight:	150 kg.
Packing Case Dimensions:	100 x 60 x 75 cm
Packing Case Volume:	0.450m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

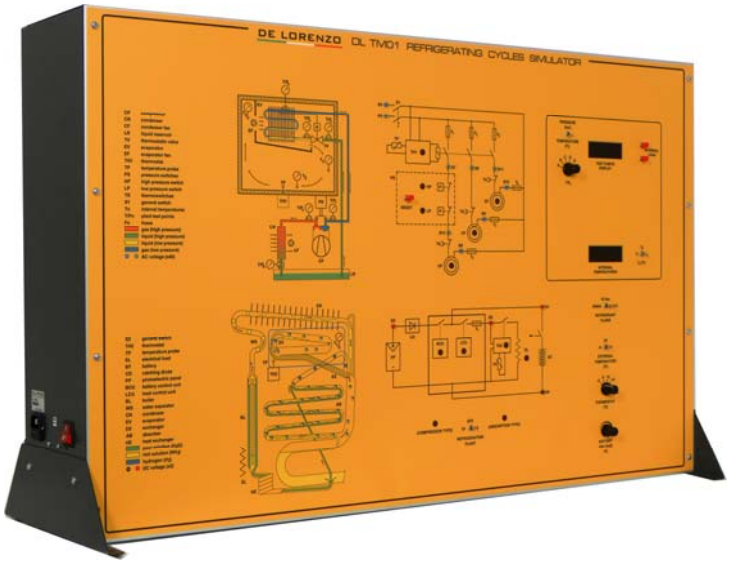
Horsebridge Mill, King's Somborne,
Stockbridge. Hampshire. SO20 6PX. England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

REFRIGERATING CYCLES



The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- Refrigerating cycle with liquefactible gas evaporation/ compression;
- Refrigerating cycle with absorption/ diffusion.

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

DL TM01

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.

Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The refrigerating cycle with liquefactible gas evaporation /compression is composed of the following main elements:

- Hermetic compressor
- Ventilated condenser
- Tank for the liquid
- Automatic thermostatic valve
- Ventilated evaporator
- Regulation thermostat
- Safety pressure switch
- Refrigerating fluid temperature/pressure test-points
- Possibility to test the main alternative refrigerating fluids, such as: R-125 alternative to R-502, R-134a alternative to R-11 and R-12, R-407C alternative to R-22

The temperature absorption/diffusion refrigerating cycle, based on a solution of water-ammonia with inert gas (hydrogen), is composed of the following main elements:

- Aggregate consisting of boiler, water separator, condenser, evaporator, exchanger, absorber
- Electrical resistance for the boiler heating
- Regulation thermostat for electrical resistance insertion
- Solar power system composed of photovoltaic panels, block diode, battery, for the conversion of solar energy into electrical power and subsequent storage in the battery
- Electronic device for insertion/disconnection of photo- voltaic panels, on the basis of the battery loading status
- Possibility to simulate the various operating situations on the basis of the battery loading status, the temperatures and the regulations

Basic Installation Training Package 803

Kit Form

Assembled Unit

- Complete Package containing all the Individual Component Parts clearly labelled and identified
- Enables Students Practical Skills to be assessed
- Constructed from the Components actually required to install a 2.50 Cubic meter (75 Cubic Feet) Chill room
- Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package
- Instruction Manual Contains Course Notes, Instruction Notes and Student Example worksheets
- Two year Warranty.

Introduction

The 803 is a complete package, in kit form, containing all the individual components needed to assemble and operate the unit 802 Commercial Refrigeration Training Unit.

This kit of parts, supported by a detailed instruction manual, will help the student to develop and practice the skills and techniques necessary to enable a successful commercial installation.

The 803 will give the student experience and practice in:

- Correct location of components
- Cutting, flaring, bending and brazing of copper pipe
- Electrical wiring
  Evacuation, charging and leak testing
- Operation, temperature control and switch adjustment

Description

Model 803 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame with stainless steel panels and comprises an hermetic type compressor with air cooled condenser and forced air evaporator inside an insulated cabinet.

The layout of the system components is exactly the same as fitted to a full size chill room and the unit is designed as an introduction to "real" refrigeration systems. The training objectives of the 803 link directly to the Commercial Refrigeration Training Unit 802.

A comparison between the student built 803 and 802 clearly establishes whether installation skill and competences are sufficiently developed or if further training and practice are required.
A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request

Student Tool Kit

Test & Service Equipment

803 Maintenance & Student Practice Package

Specification

General

Supplied in kit form clearly labelled and identified for mounting on a supplied steel frame with stainless steel base and back panel.

The components comprise:
Air cooled condensing unit with high back pressure, high starting torque hermetic compressor.
Complete with:
Suction and Discharge Service Valves
Gauge Manifold Connections
Built in Motor Protector

Forced air, blow through type evaporator, with 15-watt fan motor. Powder coated galvanised sheet steel casing with removable front panel.
Evaporator coil constructed from internally grooved copper tube, and fitted with aluminium fins at 5 FPI.

Detachable Insulated hood with variable heat load: 60, 100, 120, 160 or 200 watts.
Dial Thermometer.
Internally equalised Thermostatic Expansion Valve.
Liquid Line Filter Drier.
Heat Exchanger.
High Pressure Switch.
Low Pressure Switch.
High Pressure gauge.
Compound gauge.

An electrical control box is mounted on the back panel and includes indicators/warning lamps on/off and heat load contactors and overloads as well as residual current device for protection against earth leakage.

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Students test papers and sample answers
- Electrical wiring diagram

Dimensions

Height:	165 cm	Depth:	64 cm
Width:	134 cm		
Weight:	101 kg		

Services Required

Electrical:

Either A: 13 Amp 220-240 Volts, Single Phase, 50Hz (With earth/ground).

OR

B: 26Amp 110-120 Volts, Single Phase, 60Hz (With earth/ground)

Optional Equipment

- Student Tool Kit
- Test and Service Equipment
- Maintenance and Student Practice Package

Ordering Information

Order as: Commercial Refrigeration Training Unit 803

Electrical Specification

Either: A: 220-240 Volts, Single Phase, 50Hz (With earth/ground).

B: 110-120 Volts, Single Phase, 60Hz (With earth/ground).

Language

Either: English, Spanish or French.

Shipping Specifications

Net Weight:	101 kg
Approximate Gross Weight:	151 kg.
Packing Case Dimensions:	143 x 72 x 126 cm
Packing Case Volume:	1.297m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Somborne,
Stockbridge, Hampshire, SO20 6PX, England.

Telephone: National (01794) 388382
International +44 1794 388382

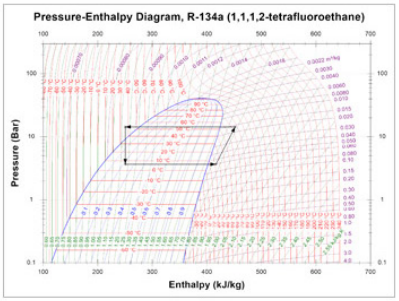
Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

VDAS® ECI500

REFRIGERATION CYCLE

Bench-top unit that allows students to investigate the stages of refrigeration.



SCREENSHOT OF THE VDAS® SOFTWARE

KEY FEATURES

- Pressure and temperature measurements taken around the refrigeration circuit
- LCD display of all measured parameters
- VDAS® connectivity included featuring data acquisition via USB
- VDAS® Software allows students to visualise experimental parameters using Pressure – Enthaply charts
- Temperature sensors in heat source and heat sink water tanks allows clear demostration 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 volumetri efficiencies of the compression stage
- Effect of heat source and heat sink temperatures on COP
- Compare performance between actual and reversed Carnot cycles.

VDAS® EC1500

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-cooloing.

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.

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 to 240 VAC 50 Hz, 2 A

208 to 220 VAC 60 Hz, 2 A

110 to 120 VAC 60 Hz, 4 A

(Specified on order)

VDAS® SOFTWARE

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

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.

APPROX NETT DIMENSIONS AND WEIGHT:

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

Visual Refrigeration Training Unit 801

- Shows Clearly the Basic Principles of the Vapour Compression Refrigeration Cycle
- Introduces the Concepts of Change of State, Saturated Liquid, Saturated Vapour and Superheated Vapour
- Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package.
- Instruction Manual Contains Course Notes, Instruction Notes and Student Example Worksheets
- Demonstrates Common Faults and Effects on the System
- Two year Warranty.

Introduction

Students who are new to refrigeration may find some important concepts difficult to understand. for example,

- Latent heat
- Pressure/temperature relationship
- A liquid can boil at sub-zero temperatures
- Saturation temperature
- Superheat
- Sub-cooling

With its transparent evaporator, the Model 801 is designed to promote a clear understanding of these concepts. and to support the teaching of:

- The basic principles of heat transfer
- The Vapour compression refrigeration cycle
- Function and application of different flow controls

Description

Model 801 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame with stainless steel panels and comprises an open type compressor with air cooled condenser and clear plastic evaporator.

A variety of different flow controls can be selected and the operation with each type of control studied. including liquid return to the compressor.

All the flow controls and the high and low pressure switches are adjustable by the student to enable basic studies in the control of vapour compression refrigeration.

A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

Specification

DETAILED

The unit is mounted on a steel framework with stainless steel base and back panels.

Air-cooled condensing unit with open type twin cylinder reciprocating compressor.
Transparent plastic evaporator, clearly showing change of state of refrigerant from liquid to vapour phase
Refrigerant flow control options, selected by use of hand wheel valves as follows:

1. Automatic Expansion Valve
2. Thermostatic Expansion Valve, Internally equalised.
3. Capillary with Separate Filter Drier

Liquid/suction heat exchanger
Liquid line filter drier and sight glass
HP/LP switches
Compound and pressure gauges
Suction and discharge service valves fitted
Liquid line hand wheel valve fitted for easy manual pump down of system
Refrigerant R134a

An electrical control box is mounted on the back panel and includes indicators/warning lamp, on/off contactor and overload, as well as residual current device for protection against earth leakage.

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Student test papers and sample answers
- Electrical wiring diagram.

Dimensions

Height 163 cm Depth 64 cm
Width 134 cm Weight 89 kg

Services Required

Electrical

Either: A 2.5Amp.220-240 Volts, Single Phase, 50Hz (With earth/ground).
OR
B: 5Amp.110-120 Volts, Single Phase, 60Hz (With earth/ground).

Optional Equipment

- Student Tool Kit
- Test And Service Equipment
- Maintenance And Student Package

Ordering Information

Order as: Visual Refrigeration Training Unit 801

Electrical Specification

Either: A: 220-240 Volts, Single Phase 50Hz (With earth/ground).
OR
B: 110-120 Volts, Single Phase 60Hz (With earth/ground).

Language

Either: English, Spanish or French

Shipping Specification *(Approx.)*

Net Weight:	89 kg
Gross Weight:	138 kg.
Packing Case Dimensions:	143 x 72 x 126 cm
Packing Case Volume:	1.297m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

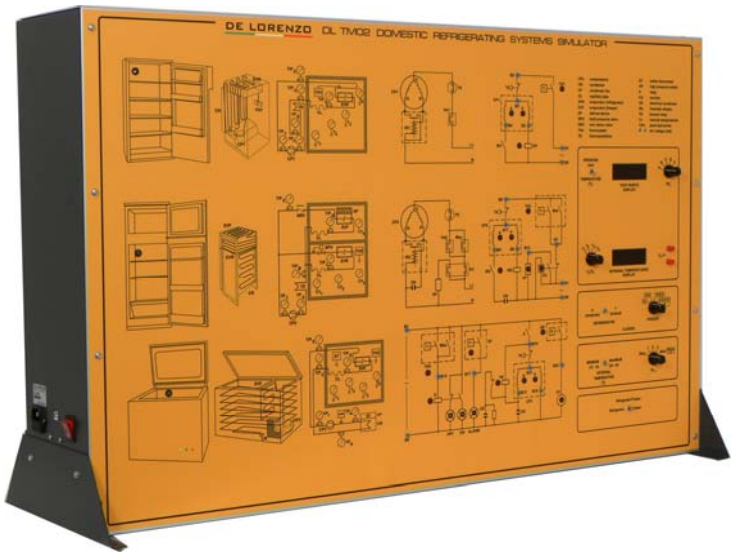
Horsebridge Mill, King's Somborne,
Stockbridge, Hampshire, SO20 6PX, England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

DOMESTIC REFRIGERATING SYSTEMS



The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- Single temperature domestic refrigerator
- Two temperatures domestic refrigerator
- Domestic freezer

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

DL TM02

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.
The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

The domestic freezer is composed of the following main elements:

- Hermetic compressor with thermal protection and power relay with starting condenser
- Forced air cooled condenser
- Capillary pipe for refrigerating fluid expansion
- Static evaporator
- Regulation thermostat
- Refrigerating fluid temperature/pressure test-points
- Warning light for normal operating conditions and alarm conditions

TECHNICAL DESCRIPTION

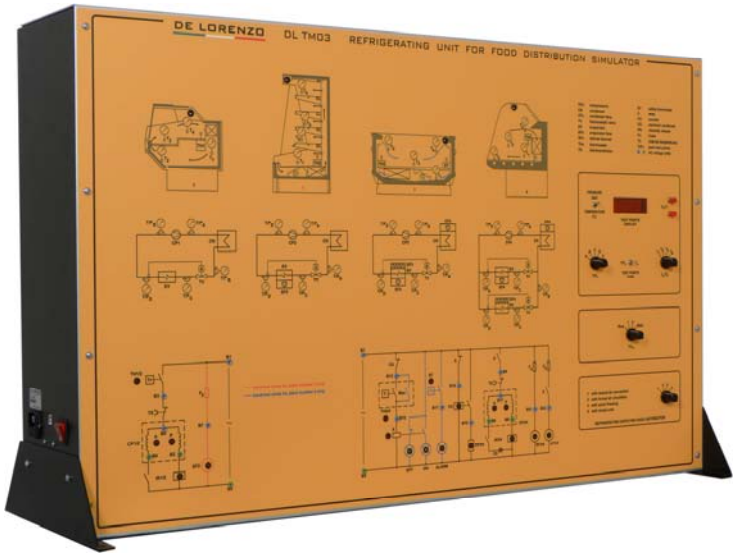
The single temperature domestic refrigerator is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay without starting condenser
- Static condenser
- Capillary pipe for refrigerating fluid expansion
- Natural air circulation static evaporator
- Regulation thermostat
- Refrigerating fluid temperature/pressure test-points
- Possibility to simulate and test both the version for temperate climate and the version for tropical climate

The two temperatures domestic refrigerator is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay with starting condenser
- Static condenser
- Capillary pipe for refrigerating fluid expansion
- Natural air circulation static evaporator for refrigerator
- Constant pressure valve
- Natural air circulation static evaporator and electrical defrosting resistance, for freezer
- Double regulation thermostat for refrigerator/freezer
- Refrigerating fluid temperature/pressure test-points
- Possibility to simulate and test both the 1, 2 and 3 star freezer and the 4 star freezer
- Possibility to simulate and test both the version for temperate climate and the version for tropical climate

REFRIGERATING UNIT FOR FOOD DISTRIBUTION



The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- Natural air circulation cabinet
- Forced circulation 5-level refrigerated cabinet
- Island for frozen food
- Mixed cold cabinet

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

DL TM03

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.
The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.
Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

The mixed cold cabinet is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay with starting condenser
- Forced air cooling condenser
- Two automatic thermostatic valves
- Forced air circulation evaporator and coil evaporator for the top
- Regulation thermostat
- Defrosting resistance, for the coil evaporator, controlled by a counting device
- Refrigerating fluid temperature/pressure test-points
- Possibility to check the level of the temperature inside the cabinet

TECHNICAL DESCRIPTION

The natural air circulation cabinet is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay
- Static condenser
- Automatic thermostatic valve
- Natural air circulation static evaporator
- Regulation thermostat
- Refrigerating fluid temperature/pressure test-points
- Possibility to check the level of the temperature inside the cabinet

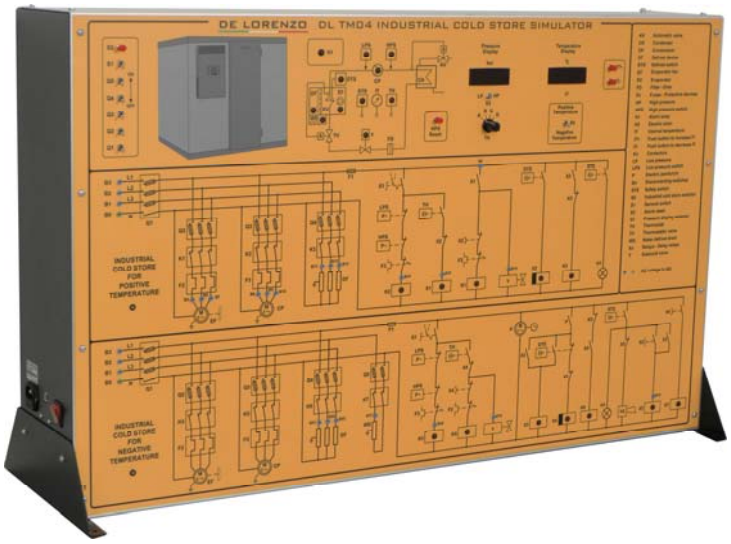
The 5-level refrigerated cabinet is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay
- Static condenser
- Automatic thermostatic valve
- Forced air circulation static evaporator
- Regulation thermostat
- Refrigerating fluid temperature/pressure test-points
- Possibility to check the level of the temperature inside the cabinet

The island for frozen food is composed of the following main elements:

- Hermetic compressor with thermal protection and intensity relay with starting condenser
- Forced air cooling condenser
- Automatic thermostatic valve
- Forced air circulation static evaporator
- Regulation thermostat
- Defrosting resistor controlled by a counting device
- Refrigerating fluid temperature/pressure test-points
- Possibility to check the level of the temperature inside the cabinet

INDUSTRIAL COLD STORE



DL TM04

The simulator allows the study, the performing of experiments and the troubleshooting for the following systems:

- Positive temperature store for food refrigeration and preservation
- Cold store for the preservation of frozen food

These systems are reproduced on the panel, through a colour representation which allows a complete analysis of the fluid circuit, of its components and of the electrical/electronic circuit for control and regulation.

TRAINING OBJECTIVES

It is possible to simulate the behaviour of components and systems, on the basis of the operating conditions which can be monitored directly on the panel or through Personal Computer by teacher and students.

The Personal Computer constantly keeps under control the simulation in progress and displays its behaviour through analog and digital signals and meters; in this way the student, through measurements and tests, can go on with the troubleshooting.

Dimensions: 0.66 x 1.04 x 0.35 m.
Net weight: 16 kg.
Average training hours: 10 h.

The system is supplied with a Student Navigator software that allows students to perform their learning activities through a Personal Computer, without the need for any other documentation.

Moreover, the Student Navigator is provided with an interface to the Laboratory Management software.

TECHNICAL DESCRIPTION

The positive temperature store for food refrigeration and preservation is composed of the following main elements:

- Three-phase motor compressor group
- Waste water condenser
- Automatic thermostatic valve
- Forced convection evaporator operated by a three-phase motor
- Electro valve for the liquid
- Defrosting resistance battery
- Regulation thermostat
- Defrosting thermostat
- Safety thermostat
- Low pressure switch
- High pressure switch

The cold store for the preservation of frozen food is composed of the following main elements:

- Three-phase motor compressor group
- Water condenser, supplied by a water thermostatic valve
- Automatic thermostatic valve
- Forced convection air refrigerator evaporator (three-phase fan)
- Electro valve for the liquid
- Defrosting resistance battery
- Discharge and dripping resistance
- Motorized pendulum for defrosting control
- Visual and sound alarm device
- Regulation thermostat
- Defrosting thermostat
- Safety thermostat
- Low pressure switch
- High pressure switch

Advanced Training Unit
805

The policy of P A Hilton Ltd is one of continual improvement The visual appearance of this unit may be changed without notice.

- *Fully Operational small scale cold room*
- *Multiple circuit, incorporating secondary controls*
- *Push button selection of built in faults*
- *Push button selection of Refrigeration circuit*
- *Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package*
- *Two year Warranty.*

Introduction

The Advanced Training Unit 805 is a fully operational, small scale coldroom, which enables the student to relate all test results, system faults and adjustments directly to situations encountered in service and maintenance.

It is a multiple circuit unit, incorporating important secondary controls, and is constructed entirely from standard commercial components that will give the student invaluable experience in fault diagnosis, system adjustment and replacement of faulty components.

Components include:

- Electric Defrost System
- Evaporator Pressure Regulation
- Crankcase Protection
- Capacity Regulation
- Variable Coldroom Heat Load

The push-button Switches Enable:

1. Selection of simple or more complex refrigeration circuit.
2. Comparison of controls.
3. A clear demonstration of the correct use of internal and externally equalised thermostatic expansion valves.
4. Selection of built in faults.

Description

Model 805 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame with stainless steel panels and comprises a hermetic type compressor with air cooled condenser and forced air evaporator with electric defrost inside an insulated cabinet with hinged lid.

A variety of different refrigerant controls can be selected and the operation with each type of control studied.

All the controls and the high and low pressure switches are adjustable by the student to enable advanced studies in the control of vapour compression refrigeration equipment.

A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

805 Maintenance & Student Practice Package

Specification

DETAILED

The unit is mounted on a steel framework, with stainless steel base and back panels and incorporates:-

- Hermetic condensing unit, with fan cooled condenser and receiver.
- Forced-air evaporator, with electric defrost, mounted in insulated box with hinged lid.
- Evaporator heat load – variable
- Pressure gauge.
- 2 Compound gauges.
- High-pressure control and low pressure control
- Thermostat.
- Oil separator.
- Liquid-vapour heat exchanger
- 2 Liquid line driers
- 3 Thermostatic expansion valves.
- Evaporator pressure regulator.
- Crankcase pressure regulator.
- Capacity Regulator.
- 7 Solenoid valves.
- 3 Hand wheel valves.
- Refrigerant R134a.
- 6 Sight glasses

Electrical

ON/OFF switch with indicator light.
7 Push button switches to control refrigerant flow path and to select in-built faults.

Separate push-button to switch:

- Condenser Fan Motor
- Evaporator fan motor
- Coldroom heat load

Overload protector
Contactor
Earth leakage protector
De-frost timer

Operating Manual

A comprehensive Installation Operating and Maintenance manual and data sheets includes:

- Notes on theory and principles
- Instructor/student guide notes
- Electrical wiring diagram

Dimensions

Height: 163 cm Depth: 64 cm
Width: 134 cm Weight: 164kg

Services Required

Electrical

Either: A: 15Amp 220-240 Volts, Single Phase, 50Hz (With earth/ground).
OR
B: 30Amp.110-120 Volts. Single Phase, 60Hz (With earth/ground)

Optional Equipment

- Student Tool Kit
- Test And Service Equipment
- Maintenance And Student Package

Ordering Information

Order as: Advanced Training Unit 805

Electrical Specification

Either: A:220-240 Volts, Single Phase, 50Hz (With earth/ground).
OR
B: 110-120 Volts, Single Phase, 60Hz (With earth/ground)

Language

Either: English, Spanish or French

Shipping Specification *(Approx)*

Net Weight:	164 kg
Gross Weight:	218 kg.
Packing Case Dimensions:	143 x 72 x 126 cm
Packing Case Volume:	1.297m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Sombome,
Stockbridge, Hampshire, SO20 6PX. England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

INDUSTRIAL REFRIGERATING SYSTEMS

Two-side simulator for the study of several industrial refrigerators and cold stores for food cooling and freezing.

- SIDE A simulates four types of industrial refrigerators: island for frozen food, natural air circulation cabinets, mixed cooling cabinets and 5 levels forced circulation cabinets.
  The components that are studied in the above systems include: hermetic compressor, evaporator, thermostat, temperature/ pressure measurement test-points, etc.

- SIDE B simulates two types of industrial cold stores: positive temperature store for food refrigeration and preservation and cold store for the preservation of frozen food.
  The components that are studied in the above systems include: three-phase compressor, evaporator, thermostats, defrosting resistance, pressure switches, measurement test-points, etc.

The panel is complete with CAI software.

Side A **DL TM32** **Side B**

REFRIGERATION TRAINER

It consists of an air conditioning system, a refrigeration system, a control panel, a unit for detecting the pressure, a connection area, etc.

The air conditioning system is composed of:
Internal and external heat exchanger, compressor, 4-way valves, control valves, etc.

The refrigeration system is composed of:
Refrigerator compressor, condenser, evaporator, regulator, thermostat, 2-way 3-position filter valve, etc.

The control panel is composed of:
Single-phase ac power supply. AC voltmeter, range: 0 ~ 250V. AC ammeter, range: 0 ~ 10A. Two digit thermometer. Switch to control the main supply current. Block diagram of the air conditioning system and of the refrigeration system. Test points. Protection against overheating or overload of the compressor.

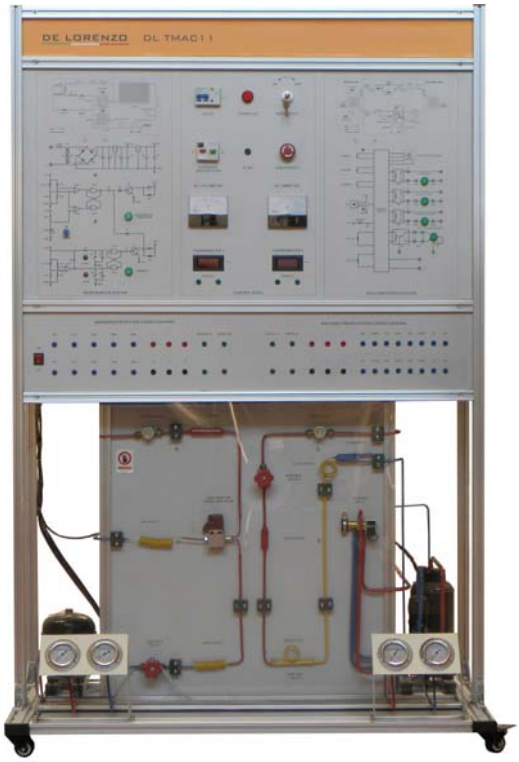
The detection of the pressure consists of:
Four vacuum manometers used to supervise the pressures in the air conditioning and refrigeration systems.
Range: -0.1 ~ 1.8MPa and - 0.1 ~ 3.8MPa.

Connection area:
For the control of the electric circuit of the air conditioning and refrigeration systems, for the training of the students.

SPECIFICATIONS

- Power supply: single-phase from mains.
- Ambient temperature: -10 °C ～ 40 °C, relative humidity <85%, altitude < 4000 m.
- Power: <1.5kVA.

Protection against overvoltage



DL TMAC11

COLD ROOM

DL DKF011

This system has been designed for the analysis of the phenomena of the industrial refrigeration. It integrates all the main components that can be found in a cold room facility. The trainer is composed of modular components and it can reach freezing temperatures as low as -30°C.

It consists of:
- a refrigeration chamber with a forced flow evaporator fed by a thermostatic expansion valve
- a 250W condenser unit
- a transparent heated access panel.

TRAINING OBJECTIVES

It is possible to perform several experiments in the following knowledge areas:

- Heat transfer and thermal insulation
- Refrigeration cycles of vapor compression
- Refrigerant fluids
- Calculation of thermal loads
- Psychrometric processes (low temperature)
- Cold rooms and industrial refrigeration
- Automatic control and instrumentation

Approximate dimensions and weight:
- Length: 1000 mm
- Maximum height: 1000 mm
- Width: 1300 mm
- Weight: 87kg

The control panel includes:
- Selectors to set all operation modes
- Cooling temperature control with LCD display
- Control unit of the electronic valve

TECHNICAL DESCRIPTION

The refrigerator circuit is equipped with:
- Flow display.
- Heat exchanger with solenoid valve.
- Electric defrost system.
- Control system via PLC and programmable timing functions.
- Drier filter and liquid storage tank.

The use of separate controls allows the simulation of different malfunctions.

The anti slugging water hammer system in the compressor ensures reliable operation under extreme conditions. The overheated steam can be set by a thermostat valve.

Requirements:

- Power supply: single phase 230V/50Hz.
- Drain for defrosting (if necessary).

TECHNICAL DATA

Cold room

- Polyurethane insulation: thickness 50 mm.
- Dimensions: 570x580x760mm

Evaporator

- Cold room evaporator with fan.

Condenser

- Hermetic reciprocating compressor for low temperature.
- Rated power: 3/8 HP.

Defrost system

The equipment includes two defrosting systems:

- Electric: in the evaporator, by electric resistances positioned inside the chamber.
- Gas : by refrigerating gas regulated by a solenoid valve.

Expansion valve

Two in-line expansion valves for studying and comparing the difference in the operation of both types:

- Mechanical expansion valve.
- Electronic expansion valve.

Pressure switches:

- 2 independent pressure switches for high and low pressure.

Sight glass:

- To easily and quickly control the conditions of the refrigerant in the liquid phase,
- to check the regularity of the flow and the absence of moisture in the circuit.
- To allow the inspection of the oil when it returns to the compressor crankcase.

HEAT PUMP

DL DKC031

The system can easily demonstrate the operation of an air/water heat pump.
It is possible to study the utilization of environmental energy used to heat water. The refrigerant absorbs the heat environment while passing through the evaporator fan, and subsequently, it is transferred to the water in the condenser.
The hot-water storage tank includes an internal heat exchanger, which can be connected also to the network, in order to exchange energy with the flow of tap water.
The heat, absorbed by the water in the condenser, goes to the hot-water storage tank, where this heat energy it is stored and it can be exchanged with tap water flow.
The system is also ready to operate in an open circuit: the mains water can enter directly to the condenser providing instantaneous heating.

TRAINING OBJECTIVES

- Study of the operation of a heat pump.
- Study of the main components of the heat pump.
- Representation of reversible thermodynamic processes.
- Monitoring temperatures and pressures in the process.
- Use of stored heat.
- Energy balances:
    - in an open circuit.
    - in a closed circuit.

Requirements:
- Power supply: 230V/50 Hz.
- Tap water inlet
- Drain

TECHNICAL DESCRIPTION

The trainer is composed of :

- compressor
- circulation pump
- flow control valve
- accumulator tank
- condenser
- filter/drier
- expansion valve and evaporator fan, water flow meters
- temperature and pressure sensors with display in strategic points of the circuit

TECHNICAL DATA

- Refrigerant: R 134

Compressor:
- Power: 533 W
- Cylinder capacity: 6,1 cm^3
- Rated current: 1.58A
- Maximum current: 2.23 A
- Rated voltage: 220-240V

Evaporator
- fins evaporator with fan
- Power: 380W

Fan
- Rated voltage: 230V
- Rated speed: 1500rpm
- Airflow: 250m^3/h

Flowmeter
- Scale: 35-350l/h

Condenser:
- Concentric tube exchanger.

Accumulator
- Hot water accumulator with exchanger internal
- Capacity:5.5l

- Circulation of hot water by means of a circulating pump

Temperature sensors:
- Coolant inlet and outlet in condenser
- Water inlet and outlet in condenser.
- Water inlet and outlet in accumulator's coil.

Pressures:
- Compressor coolant inlet and outlet.

Flow rates:
- Water flow over condenser.
- Water flow on accumulator's coil.

Commercial Refrigeration Training Unit 802

- Constructed from the Components actually required to install a 2.50 Cubic meter (75 Cubic Feet) Chill room

- Shows how the Basic Principles of the Vapour Compression Cycle are applied in Practical Refrigeration

- Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package

- Complete with Comprehensive Installation, Operation and Maintenance Manual

- Demonstrates Common Faults and Effects on the System

- Two year Warranty.

Introduction

The 802 unit is constructed from components that are required to install a 2.54 cubic metre (75 cubic feet) chill room operating at -1/+2°C (30/25°F.) (actual size 0.166m^3).

This unit quickly enables the student engineer to learn how the basic principles of the Vapour-Compression Cycle, are applied in practical refrigeration, and provides valuable 'Hands-On' experience in:

- Fault diagnosis and correction
- Refrigerant recovery and recycling
- Changing components
- Evacuation and Charging^3

All exercises with the 802 relate directly to installations that students will encounter later in their work as a service and installation engineers.

Description

Model 802 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame made up of stainless steel panels and comprises a hermetic type compressor, air cooled condenser and a forced air evaporator inside an insulated cabinet.

The layout of the system components is exactly the same as fitted to a full size chill room and the unit is designed as an introduction to "real" refrigeration systems. The training objectives of the 802 unit link directly to the Basic Installation Training Package 803 for a comprehensive range of practical skills training. The instructor can introduce "faults" such as removing part of the system charge, setting high or low pressure switches to unusual levels or overcharging the unit. This assumes suitable charging and recovery equipment is available locally.

A comparison between the student built 803 and 802 clearly establishes whether installation skill and competences are sufficiently developed or if further training and practice are required.
A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request

Student Tool Kit

Test & Service Equipment

802 Maintenance & Student Practice Package

Specification

DETAILED

The unit is mounted on a steel frame and with a stainless steel base and back panel.
The unit comprises
Air cooled condensing unit with high back pressure, high starting torque hermetic compressor
Complete with:
Suction and Discharge Service Valves
Gauge Manifold Connection points.
Built in Motor Protector

Forced air, blow through type evaporator, with 15-watt fan motor. Powder coated galvanised sheet steel casing with removable front panel. Evaporator coil constructed from internally grooved copper tube, and fitted with aluminium fins at 5 FPI.

Open-able, Insulated hood with on/off heat load
Internally equalised Thermostatic Expansion Valve.
Liquid Line Filter Drier.
Heat Exchanger.
High Pressure Switch,
Low Pressure Switch.
High Pressure gauge.
Compound gauge

An electrical control box is mounted on the panel and includes indicators/warning lamps on/off and heat load contactors and overload as well as residual current device for protection against earth leakage.

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Guide notes.
- Suggested student test procedures

Experimental Procedures

1. Examination of the system cycle and components.
2. Heat leakage demonstration No 1
3. Heat Leakage Demonstration No 2
4. Product heat load
5. The use of service gauges
6. Method of adjusting Low Pressure Switch.
7. Excessive Discharge Pressure
8. Transfer of Refrigerant to the Liquid Receiver
9. Charging

Dimensions

Height: 165 cm
Depth: 64 cm
Width: 134 cm
Weight: 101 kg

Services Required

Electrical either:
A: 13 Amp 220-240 Volts, Single Phase, 50Hz (With earth/ground).
OR
B: 26Amp 110-120 Volts, Single Phase, 60Hz (With earth/ground).

Optional Equipment

- Student Tool Kit
- Test and Service Equipment
- Maintenance and Student Practice Package

Ordering Information

Order as: Commercial Refrigeration Training Unit 802

Electrical Specification

Either	A:	220-240 Volts, Single Phase 50Hz (With earth/ground).
	B:	110-120 Volts, Single Phase, 60Hz (With earth/ground).

Language

Either: English, Spanish or French.

Shipping Specifications

Net Weight:	101 kg.
Approximate Gross Weight:	151 kg.
Packing Case Dimensions:	143 x 72 x 126 cm
Packing Case Volume:	1.297m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Somborne.
Stockbridge, Hampshire, SO20 6PX. England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129
E-mail sales@p-a-hilton.co.uk
Website www.p-a-hilton.co.uk

Hermetic Refrigeration System Training Unit

804

- Designed for the Training of Domestic Refrigeration and Air Conditioning Service Engineers
- Promotes clear understanding of hermetic systems using a capillary tube as flow control
- Built in System Faults
- Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package.
- Instruction Manual Contains Course Notes, Instruction Notes and Student Example Worksheets.
- Two year Warranty

Introduction

Hermetic refrigeration systems using a capillary tube as the flow control are very extensively used in domestic and small commercial refrigeration appliances such as:
Freezers
Air Conditioners
Water Chillers etc.
Effective, economically acceptable and lasting repairs are only possible when the Service Engineer has a thorough understanding of the Hermetic System.

The comprehensive 804 Hermetic Refrigeration System Training Unit manual supplied, leads the student from a fundamentals understanding to a full understanding of the hermetic system.

Description

The 804 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame with stainless steel panels and comprises an hermetic type compressor with air cooled condenser and evaporator with capillary tube flow control.

Using the push button switches, five system faults can be introduced into the system:

i. Excess discharge pressure
ii. Faulty compressor valve
iii. Choked capillary
iv. Overcharged system
v. Undercharged system

A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

804 Maintenance & Student Practice Package

Specification

DETAILED

Unit is bench mounted on a steel framework with stainless steel back and base panels incorporating a drip tray for condensate.

The unit includes:
Fan cooled hermetic condensing unit with high starting torque compressor
Front mounted evaporator with suction accumulator
Liquid line dryer
Compound and Pressure gauges
Suction and discharge service valves fitted
High pressure safety switch
Digital readout of condenser outlet temperature
On/off switches for compressor and condenser fan
Fault selection control switches

Operating Manual
A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Student test papers and sample answers
- Electrical wiring diagram

Dimensions(Approx).

Height 73cm Depth 73 cm
Width 103cm Weight 66 kg

Services Required

Electrical

Either: A: 4Amp.220-240 Volts, Single Phase, 50Hz(With earth/ground).
OR
B: 8Amp.110-120 Volts, Single Phase, 60Hz(With earth/ground).

Optional Equipment

- Student Tool Kit
- Test And Service Equipment
- Maintenance And Student Package

Ordering Information

Order as: Hermetic Refrigeration System
Training Unit 804

Electrical Specification

Either: A: 220-240 Volts, Single Phase 50Hz (With earth/ground).

OR

B: 110-120 Volts, Single Phase 60Hz (With earth/ground)

Language

Either: English, Spanish or French

Shipping Specification

(Approx)

Net Weight:	66 kg
Gross Weight:	140 kg.
Packing Case Dimensions:	117x 84 x 94 cm
Packing Case Volume:	0.924m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Somborne,
Stockbridge, Hampshire, SO20 6PX, England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

Advanced Training Unit

For Fault Location

811

- Demonstrates multi-evaporator system operating at different temperatures
- Incorporates 25 typical system faults, each activated by a push-button switch.
- Allows practical fault detection and location.
- Introduces students to 3 phase systems.
- Two year Warranty.

Introduction

The Advanced Training Unit for Fault Location 811 is a fully operational refrigeration unit with two visible evaporators simulating freezing and cooling rooms, operating from a single semi-hermetic condensing unit.

The unit is constructed entirely from standard commercial components, including all of the necessary primary and safety controls and will give students valuable experience of system adjustment and fault finding on a multi-evaporator three phase refrigeration system.

A combination of 25 refrigerant circuit and electrical circuit faults can be activated by the instructor allowing both normal and fault condition operation to be investigated. The faults include:-

- Compressor valve fault
- Oil separator fault
- Overcharge
- Undercharge
- Check valve leak
- Evaporator pressure controller fault
- Thermostatic expansion valve not operating – freezer evaporator
- Thermostatic expansion valve fault – freezer evaporator
- Thermostatic expansion valve not operating – cold room e vaporator
- Thermostatic expansion valve fault – cold room evaporator
- Suction line freezer evaporator – frosted
- Suction line cooler evaporator – frosted
- Filter dryer restriction
- Discharge pressure fault
- Hot gas defrosting fault
- Suction pressure too low - decreasing evaporator capacity
- Suctions pressure too high
- One phase fault
- Two phase fault
- One contact set (motor overload protection) disconnected
- Two contact sets (motor overload protection) disconnected
- Thermal overload protection of motor switch box
- Coil fault – motor protection – starter box
- Thermostatic fault – freezing room – not working
- Thermostat fault – cooling room – not working

Description

The 811 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

On the model 811 all standard components are visible, mounted on a steel frame with stainless steel panels. Instrumentation includes condensing, evaporating and suction pressures, mechanical and digital temperature measurement, digital multi-meter and optional refrigerant flow meters. The system includes reverse gas defrost, suction accumulator, oil separation and variable speed evaporator and condenser fans. Instructor controlled faults are induced by internal components which are hidden from student view.
A standard Student Tool Kit, and Test and Service Equipment Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

Specification

Detailed

The unit is mounted on a wheeled steel frame with stainless steel base and back panels and incorporates -

- Compressor: Semi-Hermetic, 0.37 kW. 1450 rpm
- Condenser Air-cooled, aluminium finned copper coil
- Evaporators: Display-case evaporators. Aluminium finned, copper coils with hot gas defrosting
- Injection controls: 2 thermostatic expansion valves
- Liquid receiver
- Control equipment: Low and high-pressure control, thermostatic control, evaporator pressure control, capacity control, condensing pressure control and crankcase pressure control, low pressure switch, high pressure switch
- Measuring equipment: Digital temperature indicator with 10 ways elector switch
- 4 pressure gauges (3 compound,1 high pressure)
- 2 dial thermometers.
- Hand-held digital multi-meter

Refrigerant: R134a.

25 switches located on the side panel under a hinged cover allow combinations of faults to be activated by the instructor.

An electrical control box is mounted on the panel and includes accessible three phase relays, fuses and an overload protector. An internal three phase residual current device protects against earth leakage. Fan speed controls and defrost switch with indicator are also panel mounted.

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Student test papers and sample answers
- Electrical wiring diagram

Dimensions

Height: 1700mm Depth: 700mm
Width: 2160mm
Shipping Weight: 425kg

Services Required

Electrical

Either: A: 7Amp 380-440 Volts, Three Phase, 50Hz (With earth/ground).

OR

B: 13Amp 210-220 Volts. Three Phase, 60Hz (With earth/ground).

Optional Equipment

- Student Tool Kit
- Test And Service Equipment
- Maintenance And Student Package

Ordering Information

Order as: Advanced Training Unit For Fault Location 811

Electrical Specification

Either: A: 380-440 Volts, Three Phase 50Hz (With earth/ground).
OR
B: 210-220 Volts. Three Phase 60Hz (With earth/ground)

Language

Either: English. Spanish or French

Shipping Specification *(Approx)*

Net Weight:	263 kg
Gross Weight:	425 kg.
Packing Case Dimensions:	232 x 85 x 190 cm
Packing Case Volume:	3.7648m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
- Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Somborne,
Stockbridge, Hampshire, SO20 6PX, England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website: www.p-a-hilton.co.uk

Refrigeration and Air Conditioning Control and Fault Simulator

814a

- *Demonstrates both Cooling and Heating Modes in Normal Operation*
- *Demonstrates 21 Common Faults and Effects on the System*
- *17 Functions and System Components*
- *Room Temperature and Humidity Potentiometers*
- *Compact Case - Easy to Store and Carry*
- *Instruction Manual Contains Course Notes, Instruction Notes and Student Example Worksheets*
- *Two year Warranty*

Introduction

The Refrigeration and Air Conditioning Control and Fault Simulator, Model 814a, enables the study and operation of various components as applied to the refrigeration plant used in air conditioning systems. Both cooling and heating modes (Reverse cycle operation can be studied).

Description

Designed for single phase operation the demonstration case is divided into two main boards:

a) Mimic Diagram with room temperature and humidity potentiometers
b) Control board with programmable controller and normal Run/Fault switches

The Mimic diagram is split into two sections;-

1) Cooling Mode
2) Heating Mode

The following main functions and components are simulated:-

- Refrigeration/Cooling
- Heating/Heat Pump
- Compressor
- Crankcase Heater
- High Pressure Switch
- Reversing Valve
- Condensing Unit
- Non return Valve (outdoor use)
- Expansion Device (outdoor use)
- Reversible Filter drier
- Sight Glass (Heating)
- Non Return Valve (indoor use)
- Expansion Device (indoor use)
- Evaporator
- Low pressure Switch
- Suction Line Accumulator
- Defrost Facility

The following Normal operation and Fault conditions can be simulated:

Cooling Mode	Heating Mode
Normal operation	Normal operation
High Pressure Switch – high pressure fault	
Low Pressure Switch – low pressure fault	Low Pressure Switch – low pressure fault
Compressor - failed	Compressor - failed
Indoor fan - failed	Indoor fan - failed
Outdoor fan - failed	Outdoor fan - failed
Crankcase Heater - failed	Crankcase Heater - failed
Reversing Valve - failed	Reversing Valve - failed
Drier - blocked	Drier - blocked
Expansion device - failed	Expansion device - failed
Air flow – low	Air flow – low
Non return Valve – blocked/seized	Non return Valve – blocked/seized

Specification

Detailed

Refrigeration and Air Conditioning Control and Fault Simulator in compact case. Both cooling and heating modes (Reverse cycle operation can be studied).

Designed for single phase operation the demonstration case is divided into two main boards:-

a) Mimic Diagram with Cooling and Heating sections and room temperature and humidity potentiometers.

b) Control board with programmable controller and normal Run/Fault switches and indicator lamps.

The following main functions and components are simulated:-
Refrigeration/Cooling
Heating/Heat Pump
Compressor
Crankcase Heater
High Pressure Switch
Reversing Valve
Condensing Unit
Non return Valve (outdoor use)
Expansion Device (outdoor use)
Reversible Filter drier
Sight Glass (Heating)
Non Return Valve (indoor use)
Expansion Device (indoor use)
Evaporator
Low pressure Switch
Suction Line Accumulator
Defrost Facility

Up to 21 faults in cooling and heating modes can be simulated

Operating Manual

A comprehensive operating manual includes:

- Notes on theory and principles
- Instructor's guide notes
- Student test papers and sample answers
- Electrical wiring diagram.

Dimensions

Height 16 cm Depth 33 cm
Width 47 cm Weight 8kg

Services Required

Electrical

Either A: 2.5 Amp. 220-240 Volts, Single Phase, 50Hz (With earth/ground).

OR

B: 5Amp.110 -120 Volts, Single Phase, 60Hz (With earth/ground).

Ordering Information

Order as: Refrigeration and Air Conditioning Control and Fault Simulator 814a

Electrical Specification

Either: A: 220-240 Volts, Single Phase 50Hz (With earth/ground).

OR

B: 110 -120 Volts, Single Phase 60Hz (With earth/ground).

Language

Either English, Spanish or French

Shipping Specification

Net Weight: 8kg
Gross Weight: 20kg.
Packing Case Dimensions: 57 x 43 x 36 cm
Packing Case Volume: 0.088m³

Also Available on Request

- Further detailed specification
- Additional copies of instruction manual
  Recommended list of spares for 5 years operation

P.A.HILTON Ltd.

Horsebridge Mill, King's Somborne,
Stockbridge, Hampshire, SO20 6PX, England.

Telephone: National (01794) 388382
International +44 1794 388382

Fax: National (01794) 388129
International +44 1794 388129

E-mail: sales@p-a-hilton.co.uk
Website www.p-a-hilton.co.uk

Reverse Cycle Refrigeration and Air Conditioning Training Unit 808

- Air Cooled and Water Cooled Condenser
- Forced Air and Static Evaporator with dual temperature operation
- Optional Student Tool Kit, Test and Service Equipment and Maintenance and Student Practice Package.
- Comprehensive Instruction Manual Contains Course Notes, Instruction Notes and Student Example Worksheets
- Demonstrates Common Faults and Effects on the System
- Two year Warranty

Introduction

The 808 is designed to augment the student engineer`s existing knowledge of the theory and practice of refrigeration and lead him to an understanding of a more complex system.

Some features of the 808:

- Reverse Cycle Operation
- Air Cooled and Water Cooled Condensers
- Forced Air and Static Evaporators
- Dual Temperature Operation
- Compact and self contained. the 808 needs only a water supply, drain and a single phase electrical supply.

Description

Model 808 is one of a range of trainers designed to provide practical training in the fields of Refrigeration and Air Conditioning.

Each trainer has been carefully designed to provide instruction in specific topic areas that trainees are required to study as part of most Refrigeration and Air Conditioning courses.

The unit is mounted on a steel frame with stainless steel panels and comprises of a hermetic compressor with air and water cooled condensers.

The static and forced air evaporator are fitted with the necessary controls to allow dual temperature operation.

Reverse cycle operation allows the study of the application of the vapour compression to air conditioning and heat pump systems.

A standard Student Tool Kit, Test and Service Equipment Package and Maintenance and Student Practice Package are available as optional items.

Further details available on request.

Student Tool Kit

Test & Service Equipment

808 Maintenance & Student Practice Package

Street Address: Unit 20 Hughes Industrial Park
Cnr. Oscar and Romeo Street
Hughes, Boksburg
South Africa
1460

Phone: +27 11 823-2678
Fax: +27 11 823-1919

Email: sales@amquip.co.za (International/ General Sales)
marco@amquip.co.za (Sales Manager)
nick@amquip.co.za (Sales Manager)

Website: www.amtectechniquip.co.za

Postal Address: Postnet Suite #71,
Private Bag X01
Farrarmere
Benoni, 1518

GPS coordinates: -26.183503 28.229474

"Please feel free to contact us should you require a Quotation or Technical information & datasheets"