

Automotive Air Conditioning Trainer

39-305



Description

With over 50 years of experience in the design, manufacture and supply of high quality educational products, Feedback's range of refrigeration and air conditioning products provide an ideal platform for students to gain a thorough understanding of the subject by means of practical experimentation.

Have you ever wondered how the air-con system in your car actually works? Feedback Instruments' automotive air conditioning trainer enables students to find out how a typical system works whilst learning the principles of refrigeration. By using authentic components, students learn how to perform fault finding and servicing using a safe and accessible system. The product has been designed specifically with hands-on training in mind and it can also be used by students to perform the safe recovery and recharging of refrigerant.

Features

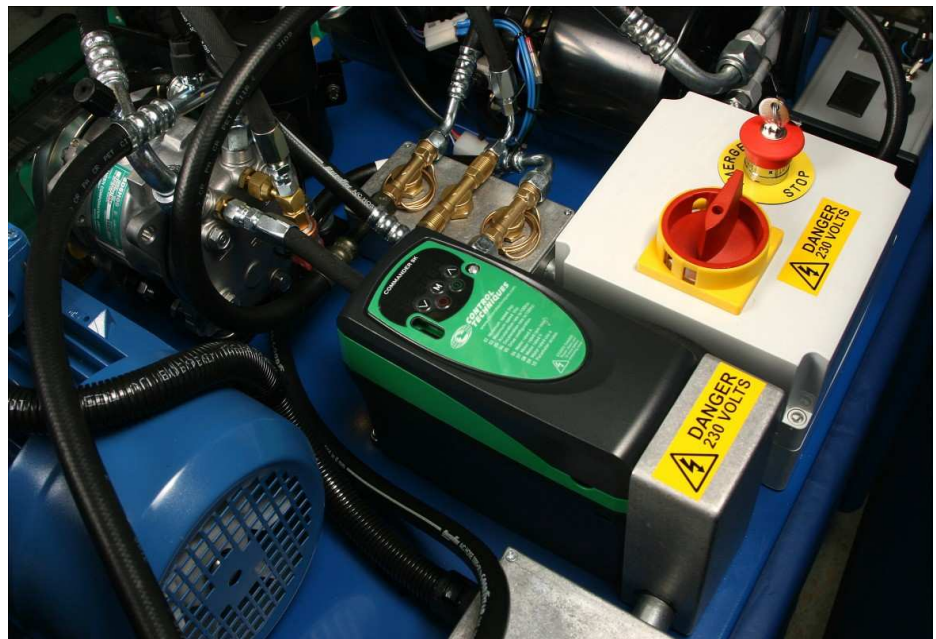
- Uses actual automotive components
- Suitable for both technician and vocational teaching
- Portable design
- Uses non-ozone depleting HFC refrigerant
- Enables hands-on access to all components
- Simulates four common faults
- Variable speed motor simulates car engine
- Available for either 110 V or 230 V mains connection

It is now uncommon to come across new vehicles which do not have any form of air conditioning and as a consequence the requirement for serving and repair of such systems has grown considerably. Feedback Instruments' automotive air conditioning trainer is a complete, authentic vehicle air conditioning system mounted on a convenient, portable frame. The unit incorporates all of the components that would typically be found on a modern vehicle air conditioning system, with particular attention having been made to making all parts visible and accessible to students. A digitally controlled electric motor simulates the vehicle engine, therefore making the unit ideal for the classroom training environment, without the need for ventilation or fume extraction equipment.

The system is an example of a refrigeration circuit from which the basic vapour-compression cycle can be studied. This process entails the circulation of a refrigerant medium that is forced to change state in the evaporator by expansion from a liquid through to a superheated gas. During this phase of change, large amounts of heat energy are absorbed into the refrigerant, which is then pumped round and rejected to atmosphere through the condenser.

Complete with compressor, condenser, receiver drier, expansion valve and evaporator, the unit is pre-installed with R134a type refrigerant which is an HFC non-ozone depleting gas and is in line with global emissions guidelines. The system is furnished with high and low-side pressure service ports that facilitate easy connection of a gauge set or for the recovery and re-charging of refrigerant. These ports are typical quick coupler type as would be found on modern vehicles.

The speed of the motor which simulates the vehicle engine is variable by means of an electronic, digitally controlled three-phase inverter drive. This enables the demonstration of the effect that compressor speed has on the system performance. The system is designed to be bench mounted and run from either a 230 V or 110 V a.c. supply. There is a 12 volt dc output socket which enables the connection of ancillary equipment, such as a UV leak detection lamp.



The provision of a sight glass enables students to observe the state of the refrigerant in the high pressure side of the system. This assists with the diagnosis of four simulated common faults which can be applied by the instructor. The following four simulated faults can be applied by setting the fault switch on the main control panel:

- Blocked TEV (Thermal Expansion Valve)
- Blocked receiver drier*
- Faulty valve plate
- Unit under condensing

The student will observe the effect of the faults by monitoring system pressures (using optional manifold gauges) changes in the cooling duty, observing changes on the digital thermometer and observing the state of the refrigerant in the sight glass. A high pressure cut-out switch shuts the compressor down if the high side pressure becomes abnormally high.

Ordering Information

The product is available with two ordering options, depending on the type of expansion device required and the supply voltage. The unit is available with either TEV (Thermal Expansion Valve) or with FOT (Fixed Orifice Tube). A further combined version allows configuration of either TEV or FOT with instructions provided to guide the user through the stages of conversion. All three variants are available for connection to either 110V ac or 230V ac supply.

*The FOT version is delivered with three possible fault modes, since the system does not utilise a receiver drier. The blocked TEV fault is replaced with a blocked FOT fault, which has a similar effect on the system.

Specification

Length:	910 mm
Height:	460 mm
Width:	565 mm
Weight:	80 kg
Electrical supply:	230 V a.c. 13 A
Power rating	2200W
Electrical protection	Motor overload and RCD
Refrigerant	R134a
Refrigerant charge	450 grams \pm 20 grams
Compressor oil	PAG ISO 100



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Feedback reserves the right to change these specifications without notice.