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PRODUCT DATA SHEET
Catalogue reference for product evaluation

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Automotive Air Conditioning Trainer | PolarX - 544

Category: Refrigeration and Air Conditioning · **Country of Origin:** India

Product Overview

The Automotive Air Conditioning Trainer PolarX - 544 replicates a vehicle's air conditioning system, using a compressor, condenser, filter/drier, expansion valve, and evaporator to produce cold air. This Automotive Air Conditioning Trainer runs on a standard automotive 12VDC supply, with compressor drive via V-belt, magnetic coupling, and a variable-speed motor controlled by a frequency converter. An axial piston compressor (greater than 3HP) delivers approx. 3kW refrigeration capacity at 3000RPM, with 4 Type-k temperature sensors and optional simulation of 8 system faults. Optional LABVIEW-based DAQ software supports automated data measurement.

View this product online: https://scienticoindia.com/product/automotive-air-conditioning-trainer-polarx-544/



Request a model-specific quotation
Include quantity and delivery country.

Technical Specifications

Automotive Air Conditioning Trainer PolarX - 544, Technical Specifications

Component	Type / Detail
Refrigeration System	Compression refrigeration system with compressor, condenser, filter/drier, expansion valve, evaporator
Compressor Drive	Electric motor with variable speed
Condenser	With fan
Evaporator	Air cooler with three-stage fan
Compressor Type	Axial piston compressor
Compressor Drive Mechanism	V-belt and magnetic coupling
Fault Simulation	8 faults simulated via buttons in connectable box (optional)
Power On Method	Ignition lock
Displayed Parameters	Temperatures, pressures (refrigerant), flow rate (refrigerant), pick-up current, speed
Refrigerant	R134a, CFC-free
Voltage Supply	12VDC

Technical Data

Electric Motor

Parameter	Value
Type	Rotary current motor
Speed Range	Variable speed, variable frequency drive, 500~3000RPM
Power	4kW at 3000RPM

Axial Piston Compressor

Parameter	Value
Refrigeration Capacity	approx. 3kW at 3000RPM
Compressor Capacity	greater than 3HP

Evaporator

Parameter	Value
Capacity	5.3kW

Condenser

Parameter	Value
Capacity	6.6kW

Temperature Sensor

Parameter	Value
Range	-40~400°C
Type	Type-k
Total	4

Measuring Ranges

Parameter	Value
Speed	0~9000RPM
Current	0~10A
Flow Rate (R134a)	10~95L/h
Pressure Gauge	-1~16bar

Key Features

Key Features

- **System Type:** Automotive Air Conditioning Trainer replicating vehicle AC operation
- **Refrigeration Circuit:** Compressor, condenser, filter/drier, expansion valve, evaporator
- **Compressor:** Axial piston, greater than 3HP, approx. 3kW refrigeration capacity at 3000RPM
- **Compressor Drive:** Electric motor via V-belt and magnetic coupling, variable speed 500~3000RPM
- **Evaporator:** Air cooler with three-stage fan, 5.3kW capacity
- **Condenser:** Fan cooled, 6.6kW capacity
- **Power Supply:** Standard automotive 12VDC, switched on via ignition lock
- **Fault Simulation:** 8 connectable faults via button box (optional)
- **Temperature Sensors:** 4 x Type-k, range -40~400°C
- **Measuring Ranges:** Speed 0~9000RPM, current 0~10A, flow rate 10~95L/h, pressure -1~16bar
- **Refrigerant:** R134a, CFC-free

Experiments

- Typical components of a refrigeration system
- Principle of operation, design and handling of a vehicle air conditioning system
- Refrigeration circuit as thermodynamic cycle: p-h diagram, determine the coefficient of performance and efficiency of the system, determine the compressor pressure ratio
- Detection of typical faults and repair of a faulty air conditioning system (optional): simulation of 8 system faults

Construction and Design

The Automotive Air Conditioning Trainer PolarX - 544 uses a compression refrigeration system consisting of a compressor, condenser, filter/drier, expansion valve, and evaporator. An electric motor with variable speed drives the compressor via V-belt and magnetic coupling. The condenser is fitted with a fan, and the evaporator functions as an air cooler with a three-stage fan. A frequency converter enables variable adjustment of motor and compressor speed to imitate drive via the vehicle engine. The system is switched on via an ignition lock and runs on a 12VDC supply. Eight faults can be simulated via buttons in an optional connectable box.

Software

PolarX - 544 (optional). A DAQ software package, specially designed in National Instruments LABVIEW environment, measures and calculates the results of the apparatus. The software is optional. When the software is used, a set of electronic sensors is included. The software can be run on any Windows environment.

Scope of Delivery

- 1 experimental module
- 1 instruction manual

Ordering & Delivery

- Send the product name, quantity, delivery country and destination with your enquiry.
- Production schedule, freight, payment terms and export documents are confirmed in the written quotation.

Frequently Asked Questions

Q: What power supply does the Automotive Air Conditioning Trainer PolarX - 544 use?
A: It uses a standard automotive 12VDC power supply and is switched on via an ignition lock.

Q: How is the compressor driven?
A: The compressor is driven by an electric motor using a magnetic contact and a V-belt, with a frequency converter enabling variable speed adjustment to imitate drive via the vehicle engine.

Q: Can the trainer simulate faults?
A: Yes. Eight connectable faults can be simulated via buttons in an optional connectable box.

Q: What parameters are displayed during operation?
A: Temperatures, pressures (refrigerant), flow rate (refrigerant), pick-up current, and speed.

Q: Is the DAQ software required to operate the trainer?
A: No. The PolarX - 544 software is optional, and a set of electronic sensors is included when the software is used.

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