SCIENTICO INDIA
Manufacturer & Exporter · Ambala, Haryana, India

PRODUCT DATA SHEET
Catalogue reference for product evaluation

Phone: +91 7015865225 **Email:** info@scienticoindia.com **Web:** scienticoindia.com **Address:** #71, Industrial Area, Ambala Cantt, Haryana, India

Absorption Refrigeration Trainer | PolarX - 504

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

Product Overview

The Absorption Refrigeration Trainer PolarX - 504 is a laboratory unit demonstrating the operation of an absorption refrigeration system using an ammonia-water working medium and hydrogen as an auxiliary gas. Its primary components are an evaporator, absorber, boiler with bubble pump, and condenser. This absorption refrigeration trainer is heated by an adjustable electric heater (60 to 180 W) at the boiler, with an optional gas burner (propane, LPG, or natural gas) as an alternative, and an adjustable 50 W evaporator heater as the cooling load. Four K-type temperature sensors (-40 to 400°C) and two digital multifunctional power meters (0 to 500 V, 0 to 40 A each) monitor all circuit parameters digitally, with power measurement from 0 to 200 W. Optional LabVIEW-based DAQ software is available for Windows-based data acquisition.1

View this product online: https://scienticoindia.com/product/absorption-refrigeration-trainer-polarx-504/



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

Technical Specifications

Absorption Refrigeration Trainer PolarX - 504, Technical Specifications

Parameter	Value
Working Medium	Ammonia-water solution
Auxiliary Gas	Hydrogen
Primary Components	Evaporator, absorber, boiler with bubble pump, condenser
Electric Heater Power (Boiler)	60 to 180 W, adjustable
Evaporator Heater Power	50 W, adjustable
Gas Burner Fuel (Optional)	Propane, LPG, or natural gas
Gas Burner Ignition (Optional)	Piezoelectric igniter
Power Measuring Range	0 to 200 W
Digital Power Meters	2
AC Volt Range (per meter)	0 to 500 V
AC Ampere Range (per meter)	0 to 40 A
Temperature Sensor Type	K-type
Temperature Sensor Range	-40 to 400°C
Number of Temperature Sensors	4

Technical Data

Working Medium and Auxiliary Gas

Parameter	Value
Working Medium	Ammonia-water solution
Auxiliary Gas	Hydrogen

Electric Heater (Boiler)

Parameter	Value
Power	60 to 180 W, adjustable

Gas Burner (Optional)

Parameter	Value
Fuel	Propane, LPG, or natural gas
Ignition	Piezoelectric igniter

Evaporator Heater

Parameter	Value
Power	50 W, adjustable

Digital Multifunctional Power Meter

Parameter	Value
Number of Units	2
AC Volt Range	0 to 500 V
AC Ampere Range	0 to 40 A

Temperature Sensors

Parameter	Value
Type	K-type
Range	-40 to 400°C
Total Number	4

Power Measurement

Parameter	Value
Power Range	0 to 200 W

Key Features

Key Features

- **Absorption Refrigeration Trainer Configuration:** Evaporator, absorber, boiler with bubble pump, and condenser
- **Working Medium:** Ammonia-water solution
- **Auxiliary Gas:** Hydrogen, used to maintain pressure differential
- **Boiler Heater:** Adjustable electric heater, 60 to 180 W
- **Alternative Boiler Heating:** Optional gas burner (propane, LPG, or natural gas) with piezoelectric igniter
- **Evaporator Heater:** Adjustable, 50 W, serves as cooling load
- **Bubble Pump:** Transports solution within the circuit

- **Power Measurement Range:** 0 to 200 W
- **Digital Power Meters:** 2 units, each measuring AC voltage (0 to 500 V) and AC current (0 to 40 A)
- **Temperature Sensors:** 4 x K-type, range -40 to 400°C, digital display
- **Digital Displays:** Temperature and power values displayed digitally
- **Waste Heat Utilisation:** Generated waste heat can be used for process cooling applications
- **Quiet Operation:** No mechanical compressor, silent running
- **Software:** Optional LabVIEW-based DAQ software, Windows compatible

---

Experiments

- Demonstrating the fundamental workings of an absorption refrigeration system
- Study of the essential parts of the absorption refrigeration system
- Operational behaviour under load

Construction and Design

The Absorption Refrigeration Trainer PolarX - 504 is built around four primary components: an evaporator, an absorber, a boiler acting as a generator with a bubble pump, and a condenser. The working medium is an ammonia-water solution. Hydrogen serves as an auxiliary gas to maintain the pressure differential across the circuit. Ammonia liquid evaporates in the evaporator, absorbing heat from the surrounding air. The ammonia steam is absorbed by water in the absorber to reduce evaporation pressure. The high-concentration ammonia solution is continuously circulated to prevent the absorption process from stopping. The boiler heats the solution until ammonia evaporates again, and a bubble pump transports the solution through the circuit. The ammonia steam condenses in the condenser and returns to the evaporator. The low-concentration ammonia solution flows back to the absorber.

The boiler is heated by an adjustable electric heater rated at 60 to 180 W. An optional gas burner using propane, LPG, or natural gas with a piezoelectric igniter provides an alternative heating source. An adjustable 50 W electric heater at the evaporator serves as the cooling load. Two digital multifunctional power meters, each covering 0 to 500 V AC and 0 to 40 A AC, monitor electrical power input. Four K-type temperature sensors with a range of -40 to 400°C measure temperatures at all relevant points in this absorption refrigeration trainer circuit, with all values shown on digital displays. Power measurement covers 0 to 200 W.

Software

PolarX - 504 Software (Optional)

- Developed in the National Instruments LabVIEW environment
- Designed specifically for data acquisition with this apparatus
- Measures, processes, and stores experimental results on a PC
- A set of electronic sensors is included when the software option is selected
- Compatible with any Windows operating system

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

Q1: What working medium and auxiliary gas are used in the Absorption Refrigeration Trainer PolarX - 504?
The unit uses an ammonia-water solution as the working medium. Hydrogen is used as an auxiliary gas to maintain the pressure differential throughout the system without a mechanical compressor.

Q2: How is the boiler heated in this absorption refrigeration trainer?
The boiler is heated by an adjustable electric heater rated at 60 to 180 W as standard. An optional gas burner using propane, LPG, or natural gas with a piezoelectric igniter is available as an alternative heating source.

Q3: What is the purpose of the evaporator heater in this unit?
The adjustable 50 W electric heater at the evaporator simulates the cooling load. It produces the heat input that the evaporating

ammonia must remove, replicating the load that would be applied in a real refrigeration application.

Q4: What temperature and power parameters are measured and displayed?

Four K-type temperature sensors (range -40 to 400°C) measure temperatures across the refrigeration circuit. Two digital multifunctional power meters each measure AC voltage (0 to 500 V) and AC current (0 to 40 A). Power measurement covers a range of 0 to 200 W. All values are shown on digital displays.

Q5: What is the operating advantage of an absorption refrigeration system over a compression refrigeration system?

An absorption refrigeration system operates without a mechanical compressor, running on thermal energy instead of mechanical energy. This results in quiet operation. The generated waste heat can also be used for cooling in process technology applications, improving overall system efficiency.