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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

Refrigeration Components for Advanced Experiments | PolarX-1015

Category: Refrigeration and Air Conditioning · **Order Code:** POLARX-1015 · **Country of Origin:** India

Product Overview

The Refrigeration Components for Advanced Experiments PolarX-1015 supports complex circuit design and operation using sophisticated industrial components. Features capacity controller, intake pressure controller, defrost timer, four-way reversing valve, refrigeration controller, power and auxiliary contactors, time relay, solenoid valve, manual and post-injection expansion valves, high- and low-pressure manometers, and measurement instruments. Enables hot gas defrosting, advanced control strategies, and comprehensive fault-finding in refrigeration components systems.

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

Technical Specifications

Refrigeration Components for Advanced Experiments PolarX-1015 — Technical Specifications

Specification	Details
Capacity Controller	For compressor output regulation
Intake Pressure Controller	For suction pressure maintenance
Defrost Timer	For automatic defrosting cycle control
Four-Way Reversing Valve	Enables circuit reversal for hot gas defrosting
Refrigeration Controller	Manages overall system operation
High-Pressure Manometer	Indicates discharge side pressure ratios
Low-Pressure Manometer	Indicates suction side pressure ratios
Pressure Measuring Instruments	For refrigerant state monitoring
Temperature Measuring Instruments	Laboratory thermometers for log p-h plotting
Electric Thermostat	For temperature-based control
Manual Expansion Valve	For manual refrigerant flow control
Post-Injection Valve	For advanced expansion control
Solenoid Valve	With coil for electrical refrigerant control
Power Contactor	For main circuit electrical control

Specification	Details
Auxiliary Contactor	For auxiliary circuit control
Time Relay	For time-based electrical control sequences
Hot Gas Defrosting System	Reverses circuit for evaporator defrosting
Documentation	Technical drawings and operating instructions

Technical Data

Advanced Control Components

- Capacity controller: Regulates compressor displacement or speed to match system load
- Intake pressure controller: Maintains constant suction pressure by controlling expansion element
- Defrost timer: Initiates automatic defrosting cycles at predetermined intervals
- Refrigeration controller: Coordinates operation of all refrigeration components in circuit

Four-Way Reversing Valve Assembly

- Function: Reverses refrigerant flow direction in refrigeration components circuit
- Application: Converts evaporator to condenser for hot gas defrosting
- Control: Electric solenoid activation for valve switching
- Benefit: Enables defrosting of iced-up evaporators without external heat source

Measurement and Control Instrumentation

- High-pressure manometer: Monitors discharge pressure in refrigeration components
- Low-pressure manometer: Monitors suction pressure in refrigeration components
- Pressure instruments: Enable refrigerant state determination at circuit points
- Temperature instruments: Laboratory thermometers for accurate log p-h diagram plotting

Electrical Control Components

- Power contactor: Controls main compressor and motor circuits
- Auxiliary contactor: Controls secondary electrical circuits in refrigeration components
- Time relay: Provides time-delayed switching for defrost cycles
- Solenoid valve: Electrically controlled valve for refrigerant direction control
- Electric thermostat: Temperature-based switch for on/off control

Refrigerant Flow Control

- Manual expansion valve: Provides manual refrigerant flow adjustment
- Post-injection valve: Advanced expansion control for capacity modulation
- Solenoid valve: Electrical control of refrigerant flow direction
- Capacity controller: Modulates compressor output to match load

Key Features

Key Features

- Complex refrigeration components: Enables hands-on learning with sophisticated industrial equipment for advanced refrigeration components systems
- Capacity controller: Regulates compressor output in refrigeration components circuits for load matching and efficiency
- Intake pressure controller: Maintains stable suction pressure in refrigeration components during varying operating conditions
- Four-way reversing valve: Enables circuit reversal for hot gas defrosting of iced-up evaporators in refrigeration components systems
- Defrost timer: Automatically initiates defrosting cycles at programmed intervals for refrigeration components maintenance
- Refrigeration controller: Coordinates overall operation of all components in advanced refrigeration components circuits
- High- and low-pressure manometers: Display pressure ratios for analysis of refrigeration components performance
- Electric thermostat: Temperature-based control for refrigeration components circuit operation

- Manual expansion valve: Provides manual refrigerant flow adjustment in refrigeration components
- Post-injection valve: Advanced expansion control strategy for refrigeration components capacity modulation
- Solenoid valve with coil: Electrically controlled refrigerant direction switching in refrigeration components circuits
- Power and auxiliary contactors: Electrical control of main and secondary circuits in refrigeration components
- Time relay: Provides time-delayed switching for defrost cycles in refrigeration components systems
- Hot gas defrosting capability: Reverses refrigerant flow to defrost evaporators using system-generated heat in refrigeration components
- Temperature and pressure measurement: Enables refrigerant state tracking and log p-h diagram plotting using laboratory thermometers
- Technical documentation: Includes drawings and operating instructions for complex refrigeration components circuits

Learning Objectives and Experiments

- Setup of different complex refrigeration circuits using advanced refrigeration components
- Design, operation, and adjustment of sophisticated refrigeration components
- Evaporation pressure controller function and operation in refrigeration components circuits
- Intake pressure controller adjustment for stable suction pressure in refrigeration components
- Capacity controller tuning for load matching in advanced refrigeration components systems
- Refrigeration controller coordination of multiple refrigeration components
- Electric thermostat operation for temperature-based control in refrigeration components
- Manual expansion valve adjustment in refrigeration components circuits
- Post-injection valve operation for advanced refrigeration components flow control
- Solenoid valve and coil function in electrically controlled refrigeration components systems
- Four-way reversing valve operation and hot gas defrosting procedures in refrigeration components
- Power contactor and auxiliary contactor function in refrigeration components electrical circuits
- Time relay operation for automatic defrost cycle initiation in refrigeration components
- Hot gas defrosting method for removing ice from evaporators in refrigeration components systems
- Pressure and temperature measurement for log p-h diagram plotting in refrigeration components
- Technical drawing interpretation for complex refrigeration components circuits
- Operating instruction comprehension for advanced refrigeration components systems
- Fault diagnosis and troubleshooting in sophisticated refrigeration components circuits

Construction and Design

The Refrigeration Components for Advanced Experiments PolarX-1015 integrates sophisticated industrial components into a modular system for complex circuit design and operation. A capacity controller is positioned to regulate compressor output based on system load. An intake pressure controller maintains stable suction pressure by controlling the expansion element. A defrost timer initiates automatic defrosting cycles at programmed intervals. A four-way reversing valve enables circuit reversal to convert the evaporator into a condenser for hot gas defrosting of iced-up surfaces. A refrigeration controller coordinates operation of all advanced refrigeration components. High- and low-pressure manometers are mounted for clear visibility of pressure ratios throughout the circuit. Electric thermostats provide temperature-based control. Manual expansion valves and post-injection valves offer different refrigerant flow control strategies for refrigeration components. Solenoid valves with coils enable electrical refrigerant direction control. Power and auxiliary contactors manage electrical circuits in the refrigeration components system. Time relays provide time-delayed switching for defrost cycle automation. Laboratory thermometers and pressure instruments enable accurate refrigerant state measurement and log p-h diagram plotting. All components are integrated to support complex circuit configurations demonstrating advanced refrigeration components operation, hot gas defrosting procedures, and troubleshooting methodologies.

Scope of Delivery

- Capacity controller assembly
- Intake pressure controller assembly
- Defrost timer mechanism
- Four-way reversing valve assembly
- Refrigeration controller unit
- High-pressure manometer
- Low-pressure manometer

- Power contactor
- Auxiliary contactor
- Time relay
- Electric thermostat
- Manual expansion valve
- Post-injection valve
- Solenoid valve with coil
- Pressure measuring instruments
- Temperature measuring instruments (laboratory thermometers)
- Connecting tubes and fittings
- Electrical wiring and connectors
- Mounting hardware and supports
- Technical drawings
- Operating instructions manual
- Component identification labels
- Assembly aids

Required for Operation

- Refrigerant (type specified by manufacturer)
- Refrigeration oil compatible with refrigerant
- Electrical power supply as specified
- Adequate bench or table space for complex circuit assembly
- Well-ventilated workspace for refrigeration component handling
- Access to technical documentation for advanced circuit design
- Understanding of refrigeration principles and electrical controls

Optional Accessories

- Advanced capacity control modules
- Additional solenoid valve configurations
- Supplementary defrost timer options
- Extended measurement instruments for enhanced data logging
- Digital pressure and temperature monitoring equipment
- Advanced technical documentation for specialized applications
- Training modules on system optimization and diagnostics

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: How does the four-way reversing valve enable hot gas defrosting in the Refrigeration Components for Advanced Experiments PolarX-1015?
A: The four-way reversing valve reverses the refrigeration circuit direction, temporarily converting the evaporator into a condenser. Hot refrigerant gas from the compressor flows through the reversed circuit to melt ice on the evaporator surface without requiring external heat, enabling efficient defrosting in refrigeration components systems.

Q: What is the function of the capacity controller in advanced refrigeration components circuits?
A: The capacity controller regulates compressor output by modulating displacement or speed to match system load. This maintains stable operation and improves energy efficiency in advanced refrigeration components systems by reducing compressor cycling.

Q: How does the intake pressure controller maintain stable suction pressure in refrigeration components?
A: The intake pressure controller monitors suction pressure and adjusts the expansion element to maintain a preset pressure set-point.

This prevents evaporator pressure from dropping too low in refrigeration components circuits, protecting the compressor and maintaining system stability.

Q: What is the purpose of the post-injection valve in advanced refrigeration components?
A: The post-injection valve enables advanced expansion control by injecting liquid refrigerant at intermediate points in the cycle. This improves refrigeration components efficiency and cooling capacity compared to simple expansion valve control in certain operating conditions.

Q: Can students plot the complete refrigeration cycle using the PolarX-1015 refrigeration components?
A: Yes, pressure and temperature measuring instruments enable students to monitor refrigerant state at multiple circuit points and accurately plot the complete refrigeration cycle on a log p-h diagram using laboratory thermometer measurements in advanced refrigeration components experiments.

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