

- Microprocessor controlled
- Protection against possible failure due to power outage
- Wide selection of restarting time intervals
- LED indicators show system status at a glance
- Battery backup



When germanium detectors are cooled with an electromechanical cooler, such as the ICS-P4 Integrated Cryocooling System for PopTop detectors from ORTEC, there is a small possibility of an AC power failure causing detector damage. The supposed mechanism is that following the power failure, the system starts warming toward room temperature, and during the warmup, residual gases are released by the molecular sieve. If, before the system is completely warmed up, the AC power is restored, some of the gas is gettered by the detector element, which is then the coldest object in the vacuum assembly. The condensed gases may short circuit the reverse-biased detector junction and thereby cause voltage breakdown. For this reason, many users of electromechanical coolers prefer the detector to warm completely to room temperature after a power failure. CryoSecure ensures that this occurs, thus avoiding possible detector failure.

The CryoSecure Compressor Power Controller allows the operator to control the following time intervals:

- The “holding time” (4 selectable values) after an AC failure before allowing the Controller to go in the warming mode
- The “warmup time” (4 selectable values), which is the time the compressor is unpowered as the detector warms to room temperature
- The “cooling time with bias off” (16 selectable values), the Controller waits after restarting the compressor, before allowing reapplication of the detector bias voltage.

Once the desired time intervals are set, CryoSecure operates automatically under microprocessor control. Designed for worldwide use, CryoSecure operates with input from 100 V AC to 240 V AC, 47 to 63 Hz.

A rear-panel connector block incorporates a fuse holder and the input power connector. An international standard IEC power connector permits the use of power cords and plugs that meet local electrical standards. Output to the compressor, controlled by a solid-state relay, is provided via a mating rear-panel connector. The internal microprocessor-controlled circuit detects AC failure, measures its duration, and determines an appropriate response based on user settings. During the power failure, an internal battery supplies power to CryoSecure for continued operation (nominally 24 hours). Front-panel LED indicators allow monitoring of the controller status:

- **AC Power** AC on, the battery is being charged, the cooler is operating normally.
- **Holding** System is maintained on hold after a power failure.
- **Warming** System is in a warmup mode.
- **Bias OFF** Detector bias voltage is shut down.
- **Mains Fail** AC power has been interrupted.

A front-panel, two-position rocker switch turns the power on or off and a push-button Initialize switch allows the user to select the sequence of operation.

## Specifications

### PERFORMANCE

**INPUT AC VOLTAGE** The CryoSecure can accommodate input voltages of 100 V AC to 240 V AC at 47 to 63 Hz.

**INPUT CURRENT** Typically 7.5 A rms when connected to a 600-watt compressor.

**CIRCUIT PROTECTION** The input ac power line is protected with a 10-A fuse incorporated into the AC POWER input connector.

### INPUTS

**AC POWER** Rear-panel, international standard IEC power connector, type CEE-22, accepts power cables wired according to local electrical standards. A power cable is shipped with the CryoSecure.

**BIAS SHUTDOWN** Rear-panel BNC connector accepts Bias Shutdown signal from detector. During normal operation, this signal is passed through a relay contact to allow bias voltage to be applied to the detector. During a Holding State, Warming State, or Cooling State, the Bias Shutdown signal is interrupted preventing bias from being applied to the detector.

### OUTPUTS

**COMPRESSOR** Rear-panel, type NEMA 5-15R AC, provides AC mains voltage to the compressor. A solid-state switch in series controls on/off operation of the compressor.

**BIAS SHUTDOWN** Rear-panel BNC connector provides Bias Shutdown signal to the detector.

### CONTROLS

**POWER** Front-panel rocker switch turns power on or off.

**INITIALIZE** Front-panel push-button switch begins system operation, and allows the customer to manually cycle through the operating sequences.

**HOLD TIME** Internal printed wiring board (PWB)-mounted rotary switches (qty. 2) allow user to set the amount of time the CryoSecure waits after a mains power failure, before entering the Warming State.

**WARMING TIME** Internal PWB-mounted rotary switches (qty. 2) allow the user to set the amount of time the CryoSecure waits after a mains power failure before restarting the compressor.

**BIAS OFF** Internal PWB-mounted rotary switch allows the user to set the amount of time the CryoSecure waits after restarting the compressor, before allowing the detector bias voltage to be applied.

**DEEP DISCHARGE PROTECTION** In the event of a long-term power failure, or if the AC mains are turned off for an extended period of time, an internal relay will disconnect the internal circuitry from the internal backup battery before the battery discharges. When AC power is restored, the system will resume normal operation and the battery will be recharged.

### INDICATORS

**AC POWER** Front-panel LED indicates presence of AC mains voltage.

**BIAS OFF** Front-panel LED indicates the bias supply has been shut down.

**WARMING** Front-panel LED indicates CryoSecure is in the warming phase.

**HOLDING** Front-panel LED indicates CryoSecure is in the holding phase.

**MAINS FAIL** Front-panel LED indicates AC mains has failed. CryoSecure is operating from the internal battery.

### ELECTRICAL AND MECHANICAL

#### WEIGHT

**Net** 2.6 kg (5.8 lb).

**Shipping** 3.2 kg (7.0 lb).

**DIMENSIONS** 21.5 cm W x 26 cm D x 10.2 cm H.  
Aluminum enclosure.(8.4 x 10.2 x 4.0 inches)

## Ordering Information

To order, specify:

Model	Description
CRYOSECURE	Compressor Power Controller

Specifications subject to change  
092120