

HAMPSHIRE



CONTROLS

*"Safeguarding
Your Precious
Biological
Materials"*



CA5000-N Liquid Nitrogen Freezer Backup System

PRODUCT DESCRIPTION:

The CA5000-N Liquid Nitrogen Freezer Backup System is a unique combination of field-proven, ultra-reliable alarm systems and a liquid nitrogen (LN2) injection system, safeguarding your precious biological materials and other products stored at ultra-low temperatures (ULT). The system offers user-programmable alarm and control setpoints and alarm delay times, all stored in non-volatile memory.

The customer supplied LN2 is maintained at 22 psi (152 kPa) nominal pressure, ready to be injected into a failing ULT freezer cabinet. When a power outage or freezer malfunction occurs and the freezer warms above the user-defined setpoint, an alarm sounds along with a flashing red LED. If the freezer continues to warm, then a user-defined quantity of LN2 is injected into the freezer, quickly restoring the temperature below the setpoint. In addition to providing insurance against power outages and freezer malfunctions, a manual LN2 injection from the CA5000 system will bring a freezer at room temperature to ultra-low temperature without having to wait for the typical ULT freezer cooldown period.

The peace of mind and rapid cooling efficiency of our CA5000 backup systems is crucial for vaccine and mRNA vaccine storage, virus and genetic samples, in vitro fertilization (IVF) samples, biopharmaceuticals, and other materials that must be stored at ultra-low temperatures.

Our CA5000 systems are easy to program, including ULT freezer chamber target temperature, alarm delay periods, LN2 injection initiation conditions, and LN2 injection timing. For operational safety, the system includes a door interlock switch that disables LN2 injection when the freezer door is open.

See Hampshire Controls' CA5000-C Liquid CO₂ Backup System for controllable liquid CO₂ backup injection for your ULT freezer.

**Custom programming and
packaging can be provided to
satisfy any ULT freezer backup
application.**



FEATURES:

- Freezer cabinet maintained at temperatures as low as -150 °C
- More than 48 hours of -60 °C freezer backup with one 180-liter cylinder of LN2
- Internal maintenance-free battery with integrated charger and low battery indicator providing at least 48 hours of freezer backup after a power outage
- Digital display of interior ULT freezer temperature
- Independent user-programmable setpoints for system alarms and LN2 injection times
- Visible and audible indicators for alarm conditions and system status
- Programmable delays to minimize unnecessary LN2 injections and nuisance alarms
- Relay contact output for central alarm systems and automatic notification systems
- Door safety interlock switch preventing LN2 injection while freezer is being accessed
- EU Declaration of Conformity

AVAILABLE OPTIONS:

- Backup temperature setpoint range between -150 °C and -40 °C
- Universal UL listed power supply 120-240V/50-60 Hz with interchangeable international AC blades
- Programmable LN2 injection temperature setpoint and injection valve on-time and off-time
- Programmable temperature alarm setpoint, alarm and relay delay periods, and alarm mute periods
- On-demand purge command for verifying proper LN2 injection into freezer cabinet

PO Box 516, Dover, NH 03821
U.S. Toll Free (866) 496-9424
Tel: (603) 749-9424
Fax (603) 749-9433
E-mail: sales@hampshirecontrols.com
www.hampshirecontrols.com



CA5000-N Liquid Nitrogen Freezer Backup System

CA5000-N LN2 Backup System	
Backup Time (180-L LN2 cylinder)	>48 hours at -60 °C setpoint
LN2 Supply Pressure	18 – 24 psi (124 – 165 kPa) at 20 °C
Backup Temperature Setpoint Range	-150 °C to -40 °C
Audio Alarm	3.6 kHz, 90 dB @ 10 cm
Visual Alarm	~1 Hz flashing red LED
Output Relay (SPDT Contact)	Normally open (NO) or normally closed (NC), 30 VDC/1 A max (non-inductive)
Freezer Temperature Probe	
Temperature Range	-200 °C to +50 °C (factory calibration guaranteed for 1 year)
Sensor & Lead	Type T thermocouple, 3" (76 mm) stainless steel sheath, 10' (3m) lead
Accuracy	±2 °C
Display Resolution	1 °C
Power Adapter	
Input (Fluctuation)	100 – 240 VAC (fluctuation not to exceed ±10% of nominal), 50-60 Hz, 1A max
Output	15 VDC, 2.4A, 36W
Battery Backup	
Battery	12 VDC, 12 Ah sealed, lead-acid rechargeable. Replace with Hampshire Controls' recommended battery only.
Battery Life	>48 hours backup, typ
CA5000 Controller	
Mounting Options	Standard: Adhesive VELCRO® mounting strips (included) Optional: Interlocking wall mounting bracket (order with P/N 68034)
Dimensions, WxHxD	5.00 x 4.25 x 1.75 in. (127 x 108 x 44 mm)
Weight	1 lb. (465 g)
Case	Black Bakelite
CA5000 Battery Valve Module (BVM)	
Placement	Place in a secure, stable location close to the ULT freezer inlet port and with easy access to line power and the CA5000 Controller .
LN2 Supply	Hampshire Controls supplies the LN2 injection tubing from the CA5000 BVM to the ULT freezer. Tubing between the LN2 supply and the CA5000 BVM must be provide by the user.
Dimensions, WxHxD	6.25 x 5.00 x 15.60 in (159 x 127 x 396 mm)
Weight	18 lbs. (8.16 kg)
Case	Painted steel
Environmental Conditions	
Facilities	Intended for indoor (laboratory) use
Altitude	Up to 6,600' (2,000 m)
Ambient Temperature Range	0 °C to +40 °C
Maximum Relative Humidity	60% (0 °C to +40 °C)
Ventilation	Compliance with ANSI/ASSP Z9.5-2022 recommended.
Pollution Degree	POLLUTION DEGREE 2: only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is expected.

One-year warranty on all Hampshire Controls products.

About Us: Established in 1975, Hampshire Controls provides standard and custom-designed electronics to the biomedical and industrial markets. In addition to the **CO₂** and **LN2 CA5000 Freezer Backup Systems**, our product portfolio includes:

- **MPS Multi-Probe Monitor/Alarms**
- **TT-150/200** temperature & humidity Wi-Fi transmitters
- **LD-215 Liquid Nitrogen Level Detector/Alarms**
- **Air Flow Monitors** (50 to 2500 FPM)
- **STEDIVOLT SV2005 Line Voltage Controls**
- Customized OEM electronics design and manufacturing
- **T° Sentry ALERT Monitoring System** data logging
- **T° Sentry Model 140** single probe temperature monitor/alarms
- **TC-25 & TC-25+ TEMPHECK Rapid Response Thermometers**
- **ADM-215 Remote Alarm Delay Modules**
- Customized monitoring, alarm notification, and logging

