

*“Safeguarding  
 Your Precious  
 Biological  
 Materials”*



## CA5000-C Liquid CO<sub>2</sub> Freezer Backup System

### PRODUCT DESCRIPTION:

The CA5000-C Liquid CO<sub>2</sub> Freezer Backup System is a unique combination of field-proven, ultra-reliable alarm systems and a liquid CO<sub>2</sub> 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 liquid CO<sub>2</sub> is maintained at high 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 liquid CO<sub>2</sub> 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 CO<sub>2</sub> 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, 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, CO<sub>2</sub> injection initiation conditions, and CO<sub>2</sub> injection timing. For operational safety, the system includes a door interlock switch that disables CO<sub>2</sub> injection when the freezer door is open.

See Hampshire Controls' CA5000-N Liquid Nitrogen Backup System for backup ULT freezer target temperatures as low as -150 °C.

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



### FEATURES:

- Freezer cabinet maintained at temperatures as low as -70 °C
- More than 10 hours of -60 °C freezer backup with one 50-pound cylinder of CO<sub>2</sub>
- 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 liquid CO<sub>2</sub> injection times
- Visible and audible indicators for alarm conditions and system status
- Programmable delays to minimize unnecessary CO<sub>2</sub> injections and nuisance alarms
- Relay contact output for central alarm systems and automatic notification systems
- Door safety interlock switch preventing liquid CO<sub>2</sub> injection while freezer is being accessed
- EU Declaration of Conformity

### AVAILABLE OPTIONS:

- Our A84000-19 CA5000-C Liquid CO<sub>2</sub> Backup System Installation Kit allows for easy connection to standard CO<sub>2</sub> cylinders available in the USA
- Backup temperature setpoint range between -70 °C and 0 °C
- Universal UL listed power supply 120-240V/50-60 Hz with interchangeable international AC blades
- Programmable CO<sub>2</sub> 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 CO<sub>2</sub> purge command for verifying proper CO<sub>2</sub> injection into freezer cabinet

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# CA5000-C Liquid CO<sub>2</sub> Freezer Backup System

CA5000-C Liquid CO <sub>2</sub> Backup System	
<b>Backup Time (50-lb CO<sub>2</sub> cylinder)</b>	>10 hours at -60 °C setpoint
<b>CO<sub>2</sub> Supply Pressure</b>	<1,000 psi (<6,900 kPa)*
<b>Backup Temperature Setpoint Range</b>	-70 °C to 0 °C
<b>Audio Alarm</b>	3.6 kHz, 90 dB @ 10 cm
<b>Visual Alarm</b>	~1 Hz flashing red LED
<b>Output Relay (SPDT Contact)</b>	Normally open (NO) or normally closed (NC), 30 VDC/1 A max (non-inductive)

\*Maintain CO<sub>2</sub> cylinder temperature below 82 °F (28 °C) when connected to the **CA5000-C Liquid CO<sub>2</sub> Backup System**. Temperatures above 82 °F (28 °C) and associated pressures above 1,000 psi (6,900 kPa) can damage the injection valve and cause the **CA5000-C** to fail to function when liquid CO<sub>2</sub> injection is required.

Freezer Temperature Probe	
<b>Temperature Range</b>	-200 °C to +50 °C (factory calibration guaranteed for 1 year)
<b>Sensor &amp; Lead</b>	Type T thermocouple, 3" (76 mm) stainless steel sheath, 10' (3m) lead
<b>Accuracy</b>	±2 °C
<b>Display Resolution</b>	1 °C

Power Adapter	
<b>Input (Fluctuation)</b>	100 – 240 VAC (fluctuation not to exceed ±10% of nominal), 50-60 Hz, 1A max
<b>Output</b>	15 VDC, 2.4A, 36W

Battery Backup	
<b>Battery</b>	12 VDC, 12 Ah sealed, lead-acid rechargeable. Replace with Hampshire Controls' recommended battery only.
<b>Battery Life</b>	>48 hours backup, typ

CA5000 Controller	
<b>Mounting Options</b>	<b>Standard:</b> Adhesive VELCRO® mounting strips (included) <b>Optional:</b> Interlocking wall mounting bracket (order with P/N 68034)
<b>Dimensions, WxHxD</b>	5.00 x 4.25 x 1.75 in. (127 x 108 x 44 mm)
<b>Weight</b>	1 lb. (465 g)
<b>Case</b>	Black Bakelite

CA5000 Battery Valve Module	
<b>Placement</b>	Place in a secure, stable location close to the ULT freezer inlet port and with easy access to line power and the <b>CA5000 Controller</b> .
<b>Dimensions, WxHxD</b>	6.25 x 5.00 x 10.00 in (159 x 127 x 254 mm)
<b>Weight</b>	14 lbs. (6.35 kg)
<b>Case</b>	Painted steel

Environmental Conditions	
<b>Facilities</b>	Intended for indoor (laboratory) use
<b>Altitude</b>	Up to 6,600' (2,000 m)
<b>Ambient Temperature Range</b>	0 °C to +40 °C
<b>Maximum Relative Humidity</b>	60% (0 °C to +40 °C)
<b>Ventilation</b>	Compliance with ANSI/ASSP Z9.5-2022 recommended.
<b>Pollution Degree</b>	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 CO<sub>2</sub> and LN<sub>2</sub> **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-12 TEMPHECK Rapid Response Thermometers**
- **ADM-215 Remote Alarm Delay Modules**
- Customized monitoring, alarm notification, and logging

