CRYOSYSTEM XC SERIES

SET-UP AND TECHNICAL MANUAL



Custom BioGenic Systems

www.custombiogenics.com
74100 Van Dyke ◆ Bruce Twp., MI 48065 ◆ USA
1.800.523.0072 ◆ Tel: 1.586.331.2600 ◆ Fax: 1.586.331.2588

Leading the World with Innovative Cryopreservation Technology Solutions

- IMPORTANT INFORMATION -

We at Custom Biogenic Systems are proud of our work, and appreciate your purchase of this product. With proper care, this equipment will be trouble free for many years to come. Before setting up and using your new cryogenic system, first check to see that all parts are accounted for and that no damage has occurred during shipping. Also, read this manual completely before proceeding to set-up. If at any time you are unsure of the procedures for set-up and use of this product, please contact Custom Biogenic Systems or your Custom Biogenic Systems representative.

- TESTING UNIT PRIOR TO USE -

Although every unit is factory tested it is recommended that dewars be tested again to ensure the viability and safety of stored media. Simply follow these steps before putting unit into service:

1. Unpack, open lid and remove foam plug
2. Fill unit to approximately 1/3 full (see fill instruction on page 7)
3. Replace foam plug and allow unit to stand for 24 hours
4. Measure the depth of the Liquid Nitrogen and make a note of this depth
5. Let unit stand another 24 hours
6. Measure the depth a second time and make a note of this depth
7. The depth should go down no more than approximately 1/4" in 24 hours. During this initial testing watch for signs of excess frosting or sweating on the outside of the dewar. Also take note of excess liquid nitrogen boil off especially after the second weigh-in. Liquid Nitrogen should settle down (cease boiling) after an hour.

PRODUCT WARRANTY

Custom BioGenic Systems warrants all manufactured cryogenic equipment to be free from defects in workmanship and materials for a period of one year.

Custom BioGenic Systems' liabilities under the warranty shall be limited to correcting or replacing the defective workmanship or materials. A claimant under the warranty must notify Custom BioGenic Systems within ten (10) days after discovery of the defect and immediately discontinue use of the defective equipment.

Custom BioGenic Systems reserves the right, at their discretion, to correct the defect(s) in the field without return shipment to Bruce Twp., Michigan.

This warranty does not cover defects on cryogenic equipment resulting from abusive handling and subsequent failure.

Serial Number _____

Model number _____

For Technical Assistance Call: 1.800.523.0072 (U.S. Only)
Phone: 586.331.2600 Fax: 586.331.2588
www.custombiogenics.com

- TABLE OF CONTENTS -

SAFETY - PAGE 1

LA-2B CONTROLS AND CONNECTIONS - PAGE 3

LA-2B PLUG-IN CONNECTIONS - PAGE 4

BAT-1B CONTROLS & CONNECTIONS - PAGE 5

LA-2B PLUG-IN CONNECTION - PAGE 6

FILL INSTRUCTIONS - PAGE 7

UNIT PARAMETERS - PAGE 8

PARTS AND ACCESSORIES - PAGE 9

TROUBLESHOOTING - PAGE 10

NOTES - PAGE 12

- SAFETY -

IMPORTANT!

The following section on LIQUID NITROGEN SAFETY should be read carefully and followed completely, but is by no means a complete volume on the use of cryogenic liquids. All personnel should have a complete knowledge of the correct procedures, as well as the hazards of working with liquid nitrogen. Failure to do so could result in serious injury or death.

WARNING

LIQUEFIED GASES ARE EXTREMELY COLD LIQUIDS. LIQUID NITROGEN EXISTS AT -196°C. BECAUSE OF THESE TEMPERATURES, LIQUEFIED GASES WILL "BURN" IF THEY COME INTO CONTACT WITH SKIN. NEVER ALLOW DIRECT SKIN CONTACT WITH LIQUID NITROGEN OR SERIOUS BURNS WILL RESULT.

ALTHOUGH LIQUID NITROGEN ITSELF IS NON-TOXIC, WHEN RELEASED IN TO A CONFINED SPACE IT CAN DISPLACE OXYGEN CAUSING ASPHYXIATION. ENTERING AN OXYGEN DEFICIENT ROOM CAN CAUSE UNCONSCIOUSNESS WITHOUT WARNING. ALWAYS CHECK AIR QUALITY UPON ENTERING A ROOM WHERE CRYOGENIC LIQUIDS ARE BEING USED AND IF POSSIBLE, HAVE A RESPIRATOR AVAILABLE.

INTRODUCING EQUIPMENT WHICH IS AT ROOM TEMPERATURE INTO LIQUID NITROGEN IS ALWAYS SOMEWHAT HAZARDOUS. BEWARE OF SPLASHING AND "BOILING" WHICH MAY OCCUR. ALL PERSONNEL PERFORMING THESE OPERATIONS SHOULD BE FULLY INFORMED OF PROPER HANDLING PROCEDURES AND SHOULD ALWAYS WEAR A FACE SHIELD AND PROTECTIVE CLOTHING.

LIQUEFIED GASES SHOULD NEVER BE USED IN COMBINATION WITH OTHER SUBSTANCES WITHOUT KNOWING WHAT THE RESULT WILL BE. WHEN IN DOUBT, CONTACT A COMPETENT AUTHORITY.

- SAFETY -

HANDLING

Personnel handling liquefied gases should be thoroughly instructed as to the nature of these materials. Proper training is essential to safety and will ensure the accident-free use of this equipment.

Because of their low temperatures, liquefied gases will burn the skin much the same way as hot liquids can. For this reason, always wear the proper protective clothing when handling these materials. It is advised that during use, handlers of liquid nitrogen should protect themselves by wearing goggles or face shields, heavy rubber gloves large enough to allow quick removal and a heavy rubber apron. It is preferable that shoes worn at these times have high tops as to not permit accidently spilled liquid from entering as well as pant legs which come down over the tops of shoes for further protection.

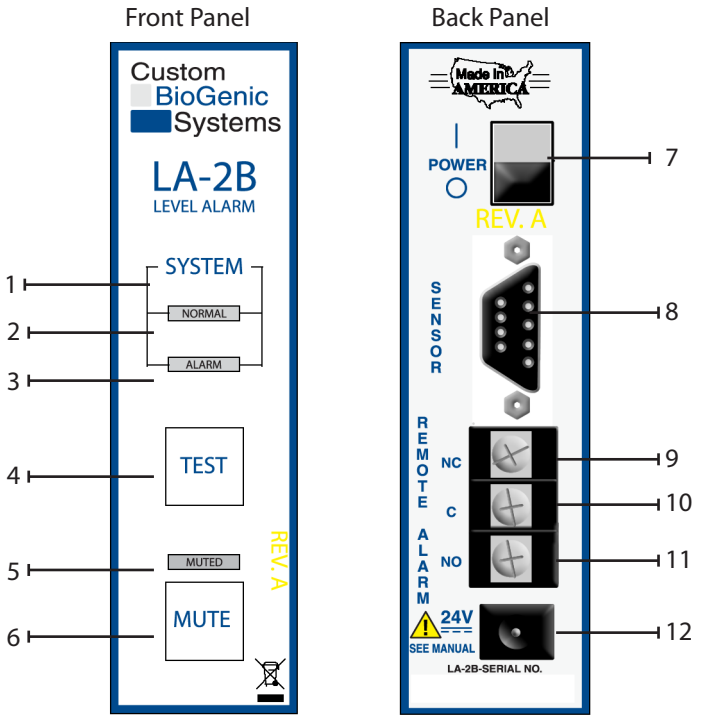
Also because of the extremely low temperatures, liquid nitrogen should only be handled and transported in approved containers. Many materials become brittle and may shatter when put into contact with liquid nitrogen and other cryogenic liquids.

FIRST AID

In the event a person is burned by liquefied gas, the following first aid treatment should be given while awaiting the arrival of medics or a doctor:

1. If the material has contacted skin or eyes, flood those areas with large quantities of unheated water and protect frozen areas with loose, bulky, dry and sterile dressings.
2. If the skin is blistered or there is a chance that the eyes have been affected, seek medical help immediately.

- LA-2B CONTROLS & CONNECTIONS -

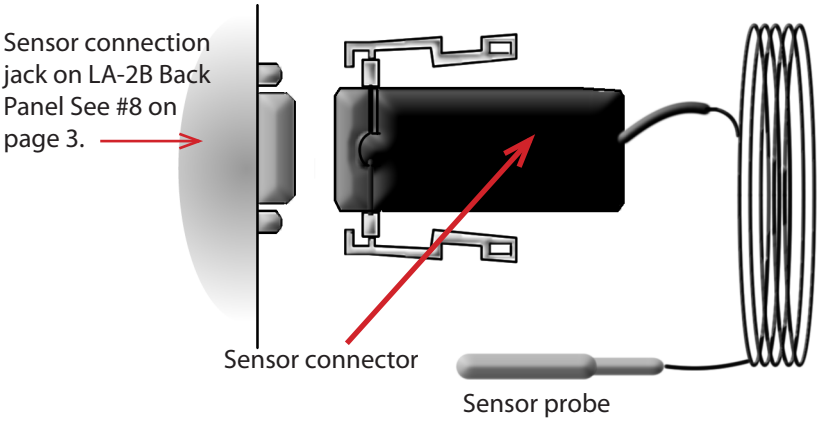


1. **SYSTEM STATUS Indicator Section**
2. **"NORMAL" Indicator Light** (Green indicator light indicates power is on and no alarm condition is occurring)
3. **"ALARM" Indicator Light** (Flashing red light indicates an alarm condition or a test)
4. **"TEST" Switch** ("Membrane" switch tests alarm functions)
5. **"MUTE" Indicator Light** ("YELLOW" light Indicates the audible alarm is muted)
6. **"MUTE" Switch** ("Membrane" switch activates and deactivates the audible alarm function)
7. **"POWER" Switch** (Main power switch for the unit, "I" is ON, "O" is OFF)
8. **Sensor Connection Port** (the sensor plugs in here, "see next page")
9. **Remote Alarm Jack 1 - "Normally Closed"** (Remote alarm wire connects here)
10. **Remote Alarm Jack 2 - "Common"** (Remote alarm wire connects here)
11. **Remote Alarm Jack 3 - "Normally Open"** (Remote alarm wire connects here)
12. **AC Power Adapter Jack** (AC Power adaptor plugs in here, "see next page")

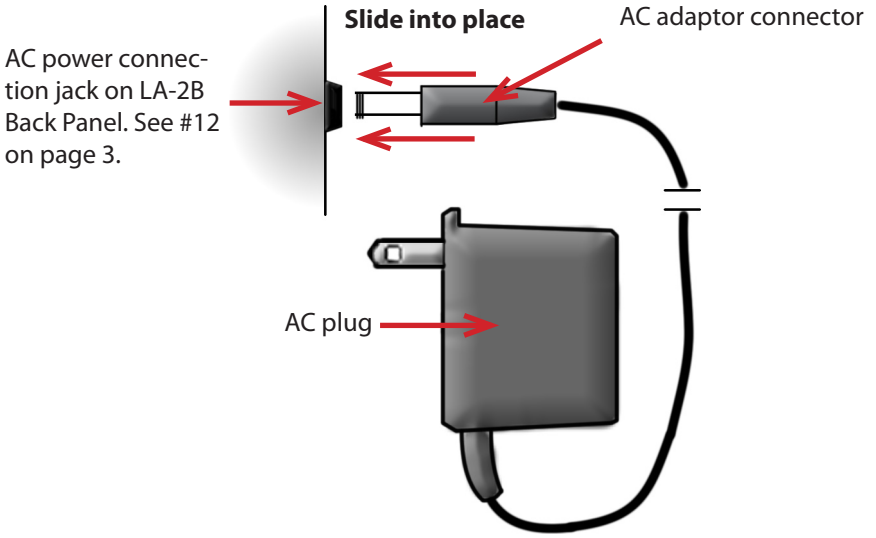
- LA-2B PLUG-IN CONNECTIONS -

Use the diagrams below to properly connect the power and sensor connectors. (Drawings not to scale.)

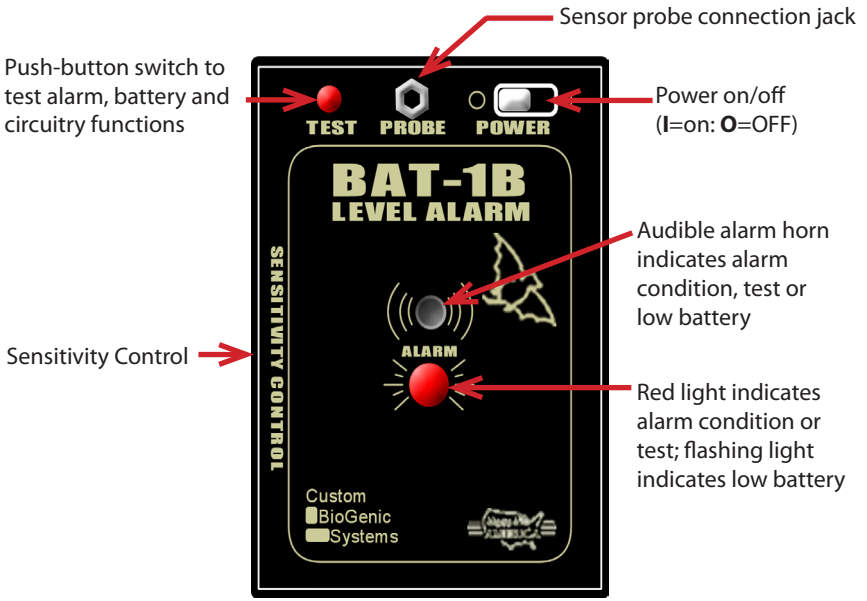
SENSOR CONNECTION PROCEDURE



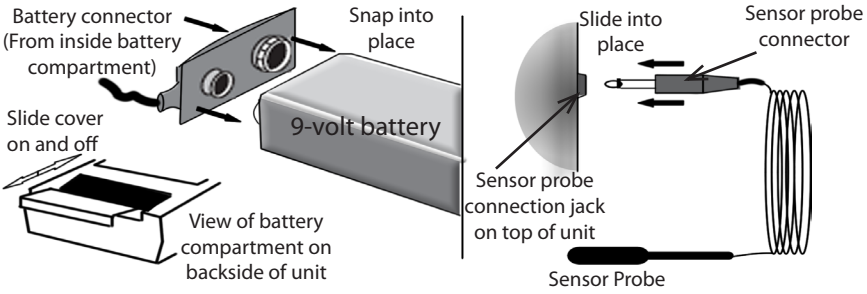
AC POWER ADAPTOR CONNECTION PROCEDURE



- BAT-1B CONTROLS & CONNECTIONS -



- POWER CONNECTIONS -



- SPECIFICATIONS -

Power requirements: One 9-volt battery
Dimensions (L x W x H): 3 1/4" x 1 1/2" x 4 3/8" or 8.3cm x 3.8cm x 11.1cm
Weight: 7 oz. or 0.196kg (including battery)

- LA-2B PLUG-IN CONNECTIONS -

This section describes how the sensor probe is adjusted to set-up for an alarm at a specified liquid level. The probe levels are pre-set at the factory to give a low level alarm at **one-third of the usable vessel height**. (see figure A. for usable height.) To change the pre-set level or if replacing a defective probe, the following diagrams will aid in accurate probe level settings.

To accurately change the probe level simply mark the probe wire at the neck opening and either add or subtract wire from the known pre-set figure (1/3 of usable vessel height) to achieve the new level location.

This formula will work for all models and will also work when replacing the sensor probe.

FIGURE A
FACTORY LOW LEVEL ALARM
PRE-SET IS 1/3 OF THE USABLE HEIGHT

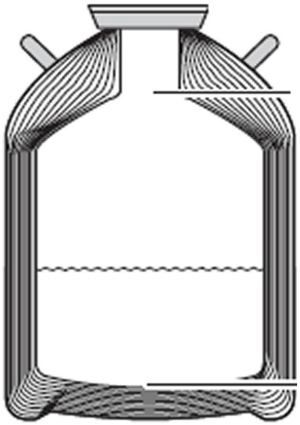
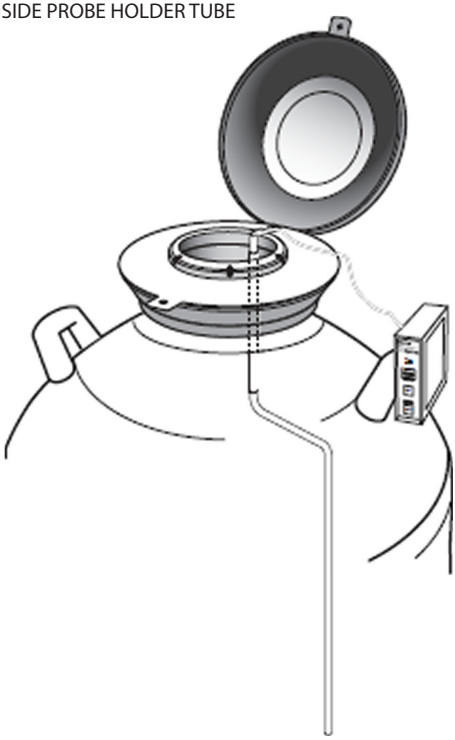


FIGURE B
PROBE WIRE IS ADJUSTED
INSIDE PROBE HOLDER TUBE



BAT-1B USERS ONLY: The probe sensitivity is pre-set at the factory.
To change or adjust the sensitivity follow these steps:
1) Submerge the probe in liquid nitrogen for five minutes;
2) Turn the adjustment screw counter-clockwise until the alarm sounds;
3) Finally, turn the screw slowly clockwise just until the alarm stops.
The probe is now properly adjusted for use.

- FILL INSTRUCTIONS -

Follow these steps for filling your Vapor Shipper with liquid nitrogen:

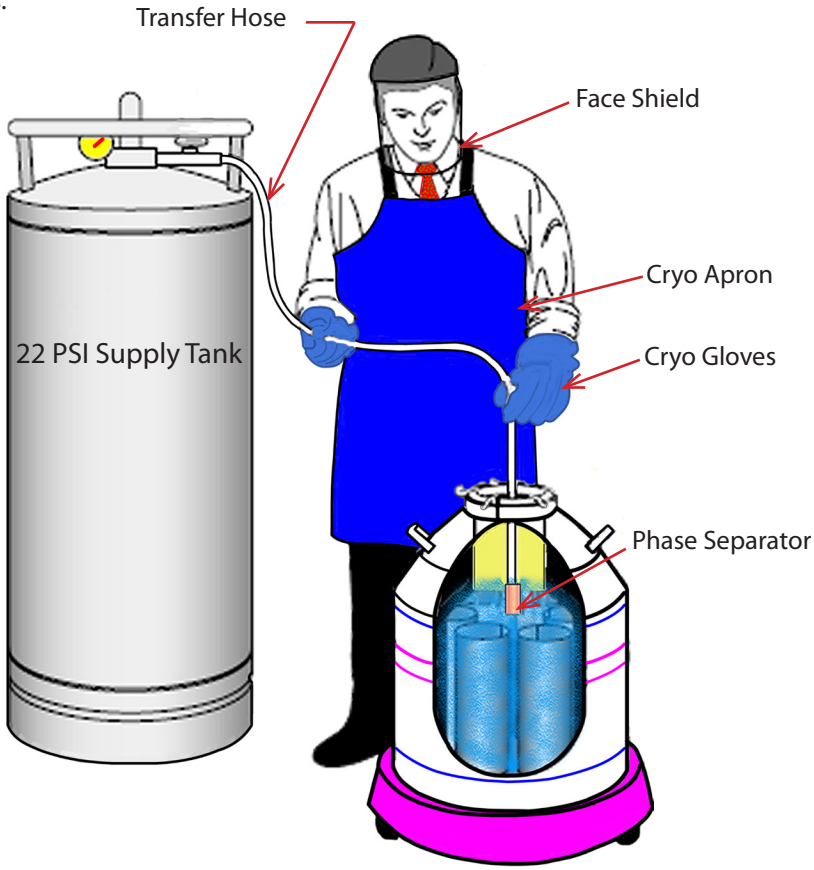
1. Using the proper equipment as shown in the diagram, connect all the fill hardware to the supply tank.

2. User should dress in the appropriate safety gear

3. Place Phase Separator into neck opening and hold in place while opening supply valve with free hand.

CAUTION:

Always closely follow the instructions on the containers and accessories when transferring liquid nitrogen. See the safety section of this manual on page 4 for important information on the dangers of proper first aid for liquid nitrogen accidents.



- UNIT PARAMETERS BY MODEL -

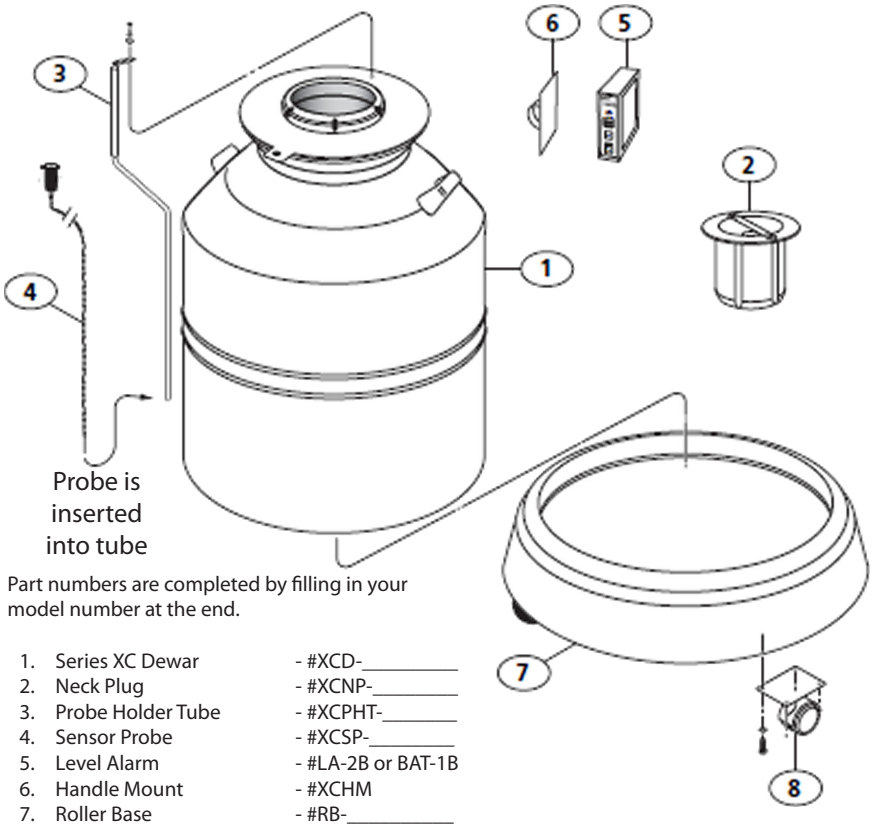
Use this section to become familiar with capacities, dimensions and normal liquid nitrogen use of your specific model. Units listed are the most common but do not represent all available models. Consult our factory for further information on models not listed.

MODEL	XC 20/20	XC 33/22	XC 34/18	XC 47/11	XC 32/8
Storage Capacities					
Number of Racks	N/A	N/A	N/A	6	N/A
Number of Canisters	6	6	6	6	9
No. of 1.2 & 2 mL vials (6 racks)	N/A	N/A	N/A	750	N/A
No. of 1.2 & 2 mL vials (5 /cane)	210	360	630	1,320	855
No. of 1/2cc straws (10/cane)	780	1,260	2,100	4,500	2,520
No. of 1/2cc straws (1 level bulk)	1,222	1,764	3,000	6,216	3,960
Liquid Nitrogen Usage & Capacities					
Liquid Nitrogen capacity (liters)	20.5	33.4	34.8	47.4	32
Static evaporation rate (liters/day)	0.09	0.14	0.18	0.39	0.35
Normal working days	140	154	123	76	57
Dimensions					
Neck Opening (in/mm)	2.18 (55.4)	2.75 (70)	3.5 (89)	5 (127)	3.81 (97)
Overall Height (in/mm)	25.7 (652)	26 (660)	26.6 (675)	26.5 (673)	21.5 (546)
Outside Diameter (in/mm)	14.5 (368)	18.2 (464)	18.2 (464)	20 (508)	18.2 (464)
Canister Height (in/mm)	11 (279)	11 (279)	11 (279)	11 (279)	11 (279)
Canister Diameter(in/mm)	1.65 (41.9)	2.22 (56)	2.81 (71)	4 (102)	2.62 (67)
Weight Empty (lbs/kg)	26 (11.8)	34 (15.4)	34 (15.4)	36 (16.4)	30 (13.6)
Weight Full (lbs/kg)	62.5 (28.3)	94 (42.5)	96 (43.5)	120 (54.6)	87 (39.5)

Use this section to become familiar with the electronic specifications of your low level alarm.

LA-2B	BAT-1B
Power requirements: 120/220 Volts AC / 24 Volts DC internal **Remote contact type:** Normally Open / Normally Closed **Remote contact rating:** 10 amp - 120 Volts AC / 6 amp - 220 Volts AC	**Power requirements:** One 9-Volt transistor radio battery

- CRYOSYSTEM XC ASSEMBLY AND PARTS LIST -



Part numbers are completed by filling in your model number at the end.

1.	Series XC Dewar	- #XCD-_____
2.	Neck Plug	- #XCNP-_____
3.	Probe Holder Tube	- #XCPHT-_____
4.	Sensor Probe	- #XCSP-_____
5.	Level Alarm	- #LA-2B or BAT-1B
6.	Handle Mount	- #XCHM
7.	Roller Base	- #RB-_____
8.	Castor Wheel	- #CW-RB

- AVAILABLE ACCESSORIES 1-800-523-0072 1-586-331-2600 -


Low Level Alarm Multiplex

LN_2 Level Stick




Cryo Gloves


Roller Base


"Y" Connector


Phase Separator


LN_2 Transfer Hose


Canes and Straws


"T" Valve

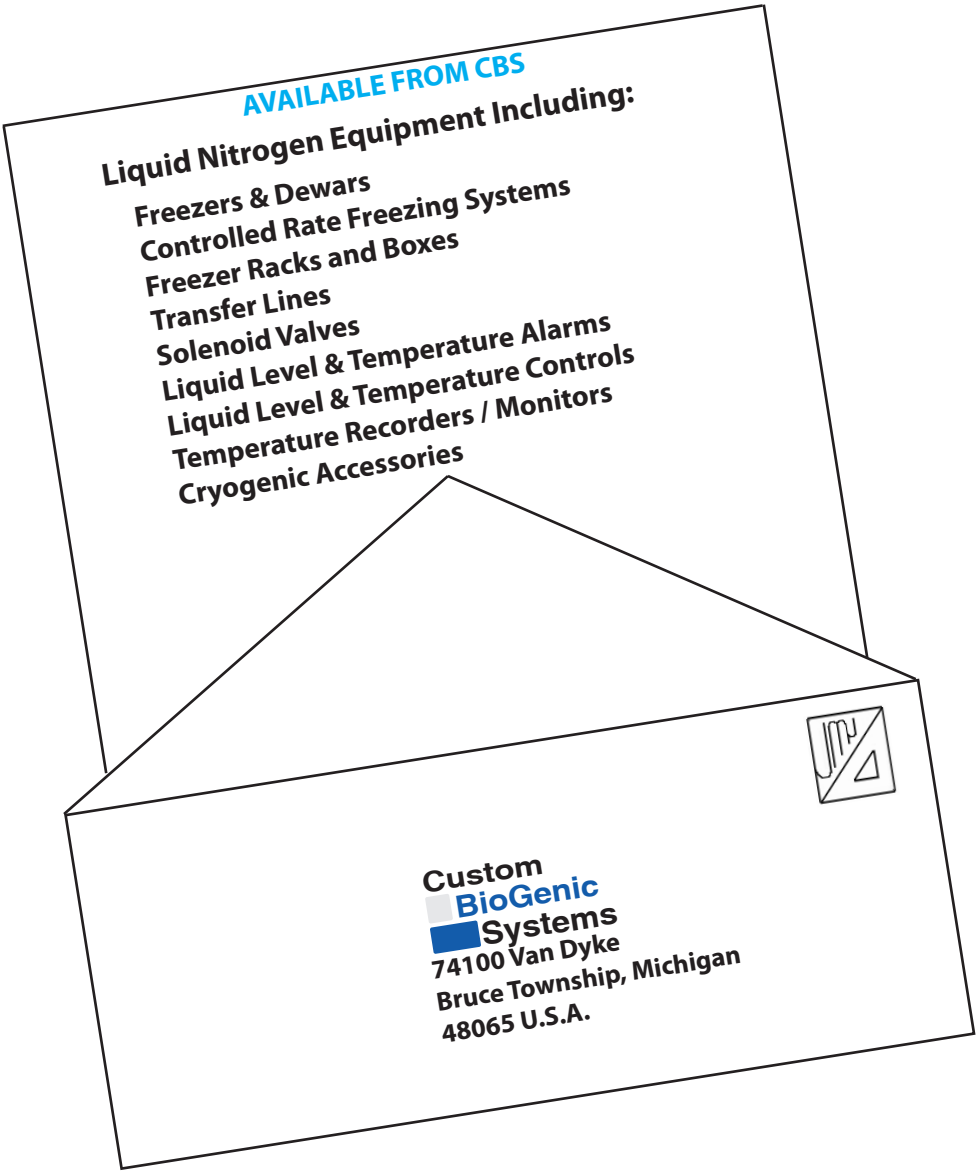
- TROUBLESHOOTING -

LA-2B		
CONDITION	**CAUSE**	**SOLUTION**
◆ Alarm light flashes	◆ Alarm condition is present ◆ Sensor plug is disconnected ◆ Sensor is shorted	◆ Correct the low liquid level, or adjust the sensor to the proper level (see page 7) ◆ Connect sensor plug properly ◆ Locate and correct short
◆ Alarm light flashes but no audible alarm heard	◆ Audible alarm is muted	◆ Push MUTE switch
◆ Remote alarm working improperly	◆ Remote alarm isn't wired correctly	◆ Carefully wire remote alarm using the diagram on page 3
◆ No lights	◆ No power to controller ◆ AC power supply is not plugged in ◆ Power adaptor plug not plugged into "24V DC" socket on unit back panel	◆ Check for live power source ◆ Plug AC adaptor into a wall socket ◆ Plug power source properly into back panel using the diagram on page 4

- TROUBLESHOOTING -

BAT-1B		
CONDITION	**CAUSE**	**SOLUTION**
◆ Red alarm light and audible alarm are present	◆ Alarm condition is present	◆ Correct the low liquid level, or adjust the sensor to the proper level (see page 7)
	◆ Sensor plug is disconnected	◆ Connect sensor plug properly using the diagram on page 6
	◆ Sensor is shorted	◆ Locate and correct short
	◆ Sensitivity control needs to be adjusted	◆ If liquid level does not warrant an alarm, turn sensitivity adjustment screw clockwise just until alarm stops (see page 7)
◆ Alarm light flashes and audible alarm sounds intermittently	◆ Battery is losing power	◆ Replace with fresh battery using the diagrams on page 6
◆ No lights	◆ ON/OFF switch in OFF position	◆ Move POWER switch into the on position
	◆ Defective or old battery	◆ Replace with fresh battery using the diagrams on page 6

Notes



CRYOXC.TM0609

Revision: B

© 2005 Custom BioGenic Systems

All designs and materials contained herein are protected under Federal copy right law.
Unauthorized distribution or use will be subject to prosecution to the fullest extent of the law.