

Software V6.10

*cryo*ICE BOX[®]

Quick Reference Guide

CE
2797

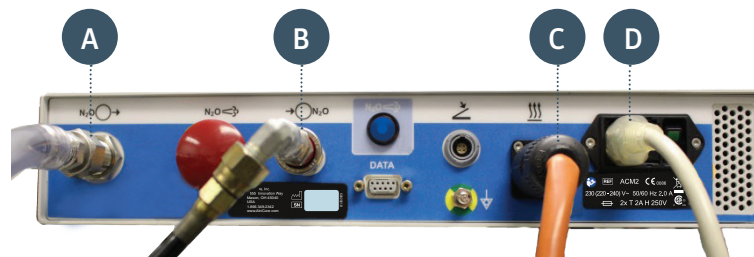
SOFTWARE UPGRADE V6.10 INCLUDES:

- Audible tone when probe is above 0°C (32°F)
- Gas gauge indicator based on new algorithm, measuring tank temperature and pressure
- Tank pressure reduced from 850psi(5.9MPa) to 800psi(5.5MPa)

SET UP

1. Check connections on back of cryoICE BOX

- A – Exhaust Hose: connect other side to vent
- B – Tank Hose
- C – Heater Band
- D – Power Cord



2. Open the N2O tank valve

- Be sure the tank valve is open in order to activate the heater.
- Closing the valve while the unit is on will lead to a heater band error.



3. Turn ON the cryoICE BOX



4. Plug in probe

The probe can be plugged in at any time.

CRYOICE BOX FRONT AND REAR PANELS — Illustrations and Nomenclature

Illustrations of the cryoICE BOX front panel (Figure 1) and rear panel (Figure 2) are shown below.

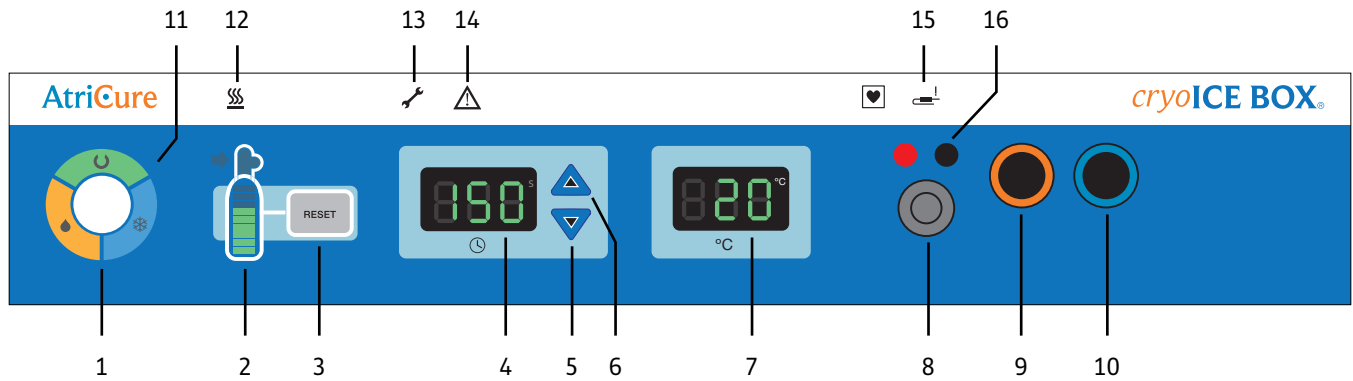


Figure 1: cryoICE BOX Front Panel

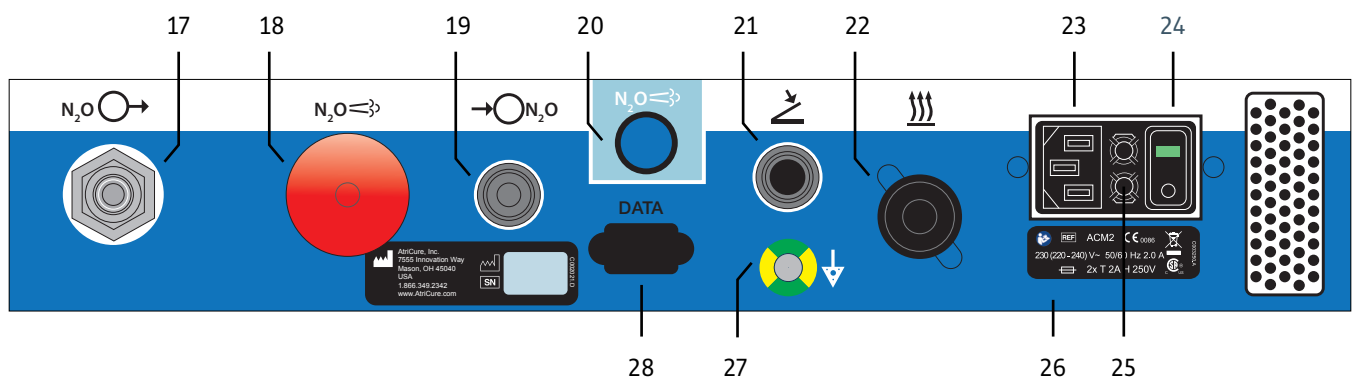


Figure 2: cryoICE BOX Rear Panel

- | | | | | | |
|----|--|----|--------------------------------------|----|---------------------------------------|
| 1 | Activation Button | 11 | Ablation Status Indicator | 21 | Activation Footswitch Connection Port |
| 2 | N ₂ O Gas Gauge Indicator Display | 12 | Cylinder Heater Band Indicator | 22 | Heater Band Cord Receptacle |
| 3 | N ₂ O Gas Gauge Indicator Display Reset | 13 | Maintenance Needed Indicator | 23 | Power Plug Receptacle |
| 4 | Ablation Timer Display | 14 | System Fault Indicator | 24 | Power Switch |
| 5 | Ablation Timer Decrement | 15 | Thermocouple Open Indicator | 25 | Mains Fuse Location |
| 6 | Ablation Timer Increment | 16 | cryoICE Probe Thermocouple Ports | 26 | cryoICE BOX Voltage Rating Label |
| 7 | cryoICE Probe Temperature | 17 | N ₂ O Exhaust Port | 27 | Equipotential Terminal |
| 8 | Future Probe Connection | 18 | N ₂ O Manual Exhaust Knob | 28 | RS232 Data Connection |
| 9 | cryoICE Probe Gas Outlet Port | 19 | N ₂ O Inlet Port | | |
| 10 | cryoICE Probe Gas Inlet Port | 20 | N ₂ O Exhaust Switch | | |

N₂O = Nitrous Oxide

OPERATING MODES

The cryoICE BOX operates in one of three modes: READY, FREEZE, DEFROST. These modes are identified by the system status indicator LEDs and the ablation status indicator LEDs located on the front of the cryoICE BOX unit.



READY Mode

This mode is entered automatically upon successful execution of power-on-self-test when the unit is first turned on, or following DEFROST mode upon the cryoICE probe reaching approximately 10°C(50°F) and automatically venting. This indicates that the system is ready for the next cryoablation run.



FREEZE Mode

This mode is entered from the READY mode when the user initiates the cryoablation cycle by pressing and releasing the Activation Button or the Footswitch. In this mode, the N₂O gas is allowed to cycle through the cryoICE probe causing a temperature drop to take place at the cryoICE probe.



DEFROST Mode

This mode is entered automatically from FREEZE mode upon expiration of the ablation timer, or manually by the operator when the Activation Button or the Footswitch is actuated while in the FREEZE mode. In this mode, the cryoICE probe temperature is actively forced towards the ambient temperature. Once the cryoICE probe temperature is approximately 10°C(50°F), the cryoICE BOX unit will transition back to the READY mode.

Note: cryoICE BOX does allow early transition out from the DEFROST mode into either the READY mode or the FREEZE mode by pressing the Activation Button.

Note: cryoICE probe temperature may drop temporarily upon transition from DEFROST to READY state.



FAULT Condition

This is entered upon detection of any unrecoverable error condition during any mode. The system is inoperable in this mode until the unit is first power cycled, and only if the FAULT Condition no longer exists or has been remedied.

GAS GAUGE LEVEL INDICATOR



FULL

20 to 40 minutes remaining¹



Two Segments Remaining

15 to 20 minutes remaining¹



One Segment Remaining

5 to 10 minutes remaining¹



EMPTY (Flashing)

0 to 5 minutes remaining¹

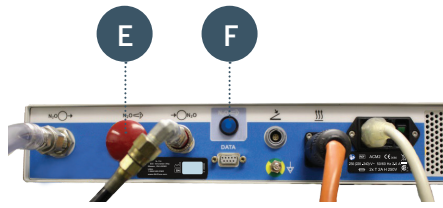
¹ Minutes remaining are based on 20lb(9.1kg) steel tanks with 8"(20cm) diameter. Time may vary with different style tanks.



SHUT DOWN



1. Close the N2O tank valve



2. Vent the N2O from the gas line by:

- E – Pulling the red N2O Manual Exhaust Knob – or –
- F – Pressing the blue N2O Exhaust Switch

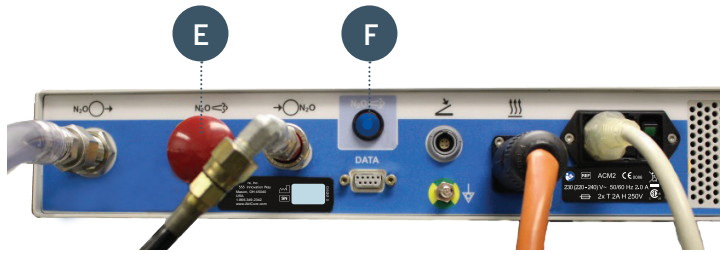


3. Turn OFF the cryoICE BOX

CYLINDER EXCHANGE



1. Close the N2O cylinder valve

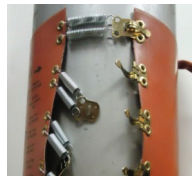


2. Vent the N2O from the gas line by:

- E – Pulling the red N2O Manual Exhaust Knob – or –
- F – Pressing the blue N2O Exhaust Switch



3. Turn OFF the cryoICE BOX power



4. Remove the heater band from N2O cylinder



5. Replace with a full cylinder and re-connect the heater band

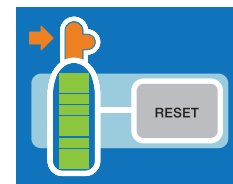
- The band should be located as close to the bottom of the tank as possible
- Fasten the outermost buckles first and work toward the center



6. Open the N2O tank valve



7. Power ON the cryoICE BOX

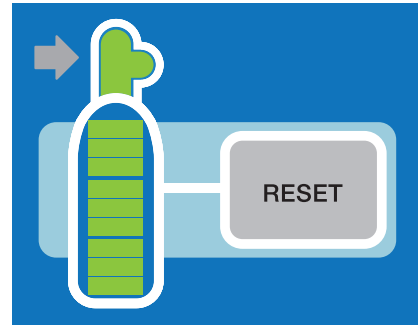


8. Press the RESET button on the front of the cryoICE BOX

Valve icon will be amber and icon will flash if tank valve is closed.

TANK CHANGE TIPS

1. The gas gauge indicator can only be RESET once per Power Cycle or if a tank change has been detected.
 - It is recommended to start with a full N₂O tank.
 - The gas gauge indicator will need to be RESET when a full tank is installed and will not automatically adjust to full without pressing RESET.
2. The cryoICE BOX needs time for the system to warm up in order to estimate the N₂O remaining in the tank.
 - This takes 2 to 5 minutes on average, depending on the initial pressure of the N₂O tank. If the starting pressure is below 725psi(5MPa) due to a cold environment, it could take additional time to estimate the N₂O remaining.
 - The gas gauge indicator requires the heater band to be installed on the N₂O tank for proper functionality.
 - If the gas gauge indicator is RESET prior to the system warming up, it may indicate full until the tank pressure is about 800psi (5.5MPa).



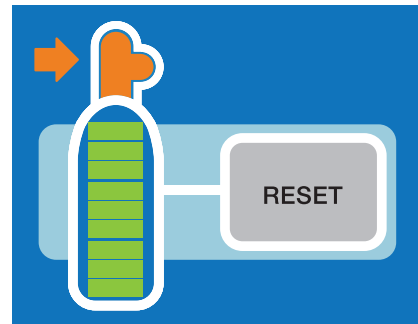
GAS GAUGE INDICATOR FEATURES

1. Tank Closed Indicator

- The gas gauge indicator arrow and valve portion will flash amber when the cryoICE BOX does not detect any pressure.
- Check the N₂O tank valve to see if it is closed. If so, open it to turn off the Tank Closed Indicator.

2. Low Pressure Indicator

- The gas gauge indicator will flash regardless of the gas gauge level indicator if the tank pressure is below 650psi(4.5MPa).
- This may be due to tanks being stored in a cold environment, and it may take longer than normal for the heater to bring the system up to pressure.



Tank Closed Indicator



CRYOICE BOX TROUBLESHOOTING

The cryoICE BOX User Manual has been updated to include additional information in the Troubleshooting sections to assist with maintaining Cryo system performance.

TOPIC #1: Cryo Probe Slow to Defrost; No Defrost

Possible Cause	Action to Take
Liquid Nitrous Oxide (N ₂ O) flooding system	<ul style="list-style-type: none"> Power-On cryoICE BOX no earlier than 10-minutes before use

TOPIC #2: Cryo Probe Not Getting Cold Enough

Possible Cause	Action to Take
Pressure gauge less than 700psi(4.8MPa) and cylinder warm	<ul style="list-style-type: none"> Replace the cylinder with a full one
Pressure gauge less than 700psi (4.8MPa) and cylinder cold	<ul style="list-style-type: none"> Verify heater band is working (warm to touch) Heater band icon is off, verify heater band connection
Pressure gauge is above 700psi (4.8MPa) in freeze mode	<ul style="list-style-type: none"> Unplug cryoICE BOX Orange tube, if temperature drops to -65°C(-85°F) the exhaust filter is clogged – return cryoICE BOX Unplug Orange tube at cryoICE BOX, if temperature doesn't drop to -65°C(-85°F) the Cryo Probe is clogged – replace Probe

TOPIC #3: Difficulty Connecting a Cryo Probe to the ACM

Possible Cause	Action to Take
Trapped N ₂ O within the system	<ul style="list-style-type: none"> Power-Off, Power-On cryoICE BOX – vents Probe side N₂O
ACM Blue connector sleeve out of sequence	<ul style="list-style-type: none"> Push the Blue connector sleeve toward cryoICE BOX
Connector O-ring dried out or swelling	<ul style="list-style-type: none"> Lubricate the O-ring with AtriCure P/N# C002502

TOPIC #4: Flashing Wrench Iron (possible error code 002)

Possible Cause	Action to Take
Heater band over temperature due to empty cylinder	<ul style="list-style-type: none"> Replace the cylinder with a full one
Heater band over temperature due to fit being loose	<ul style="list-style-type: none"> Verify heater band is at bottom of cylinder and snug
At Power-On, error code 002 displayed	<ul style="list-style-type: none"> Replace N₂O cylinder with a known full one
At Power-On, error code different than 002 displayed	<ul style="list-style-type: none"> If no, call AtriCure Technical Support +31 20 700 55 60

TOPIC #5: Cryo Probe Colder Than -70°C(-94°F), Not Defrosting

Possible Cause	Action to Take
Liquid Nitrous Oxide (N ₂ O) flooding system	<ul style="list-style-type: none"> Power-On cryoICE BOX no earlier than 10-minutes before use
N ₂ O quality not sufficient to us as a refrigerant	<ul style="list-style-type: none"> N₂O Supplier to manage water content to 3 ppm max
N ₂ O cylinder contains a siphon tube or dip tube	<ul style="list-style-type: none"> Do not use cylinders containing a siphon or dip tube



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