BioMedical

MVE Variō™ Pro

Quick Reference Guide
Multilingual

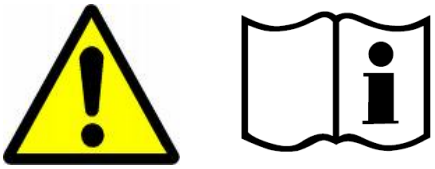


Table of Contents

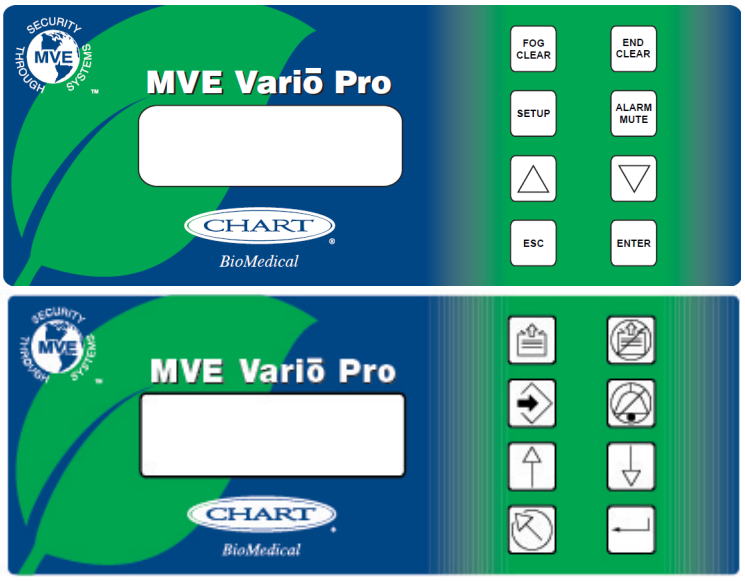
NOTE: All MVE models are a Class 1, externally powered, continuous operation medical device. They are not suitable for use with flammable anesthetics. This equipment has been tested and found to comply with the limits for medical devices to IEC 601-1-2: [or EN 60601-1-1-2:2001 or Medical Device Directive 93/42/EEC].

NOTE: MVE Varió liquid nitrogen freezers should be installed by an authorized MVE Distributor per the MVE Varió Pro Technical Manual, PN 14930250.

1.0 Product Identification

1.1 The Variō Pro Controller

1.1.1 Display Panel Identification



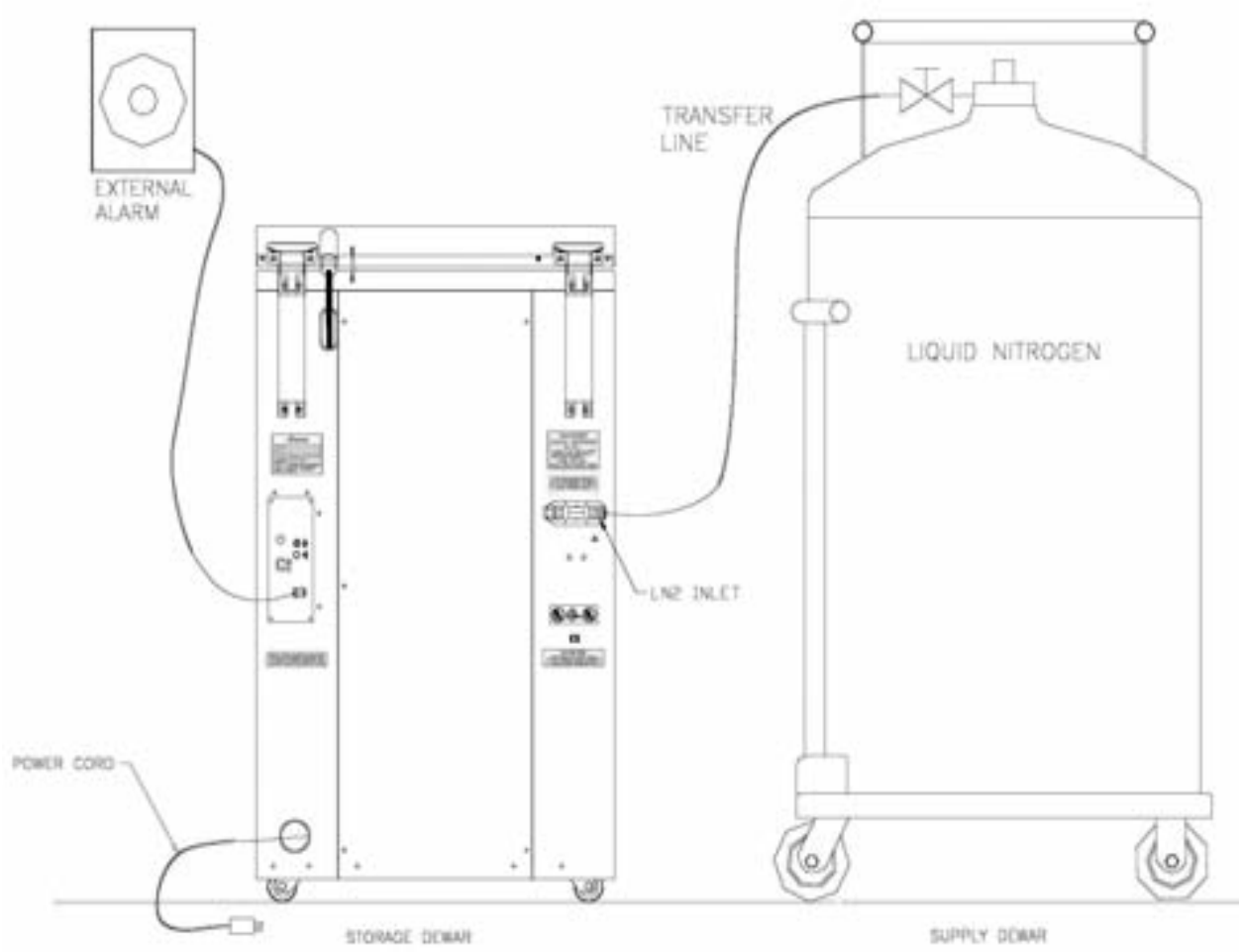
Display Panel Identification Key		
Front Panel		The front panel is the user interface for the Variō Pro. All displays and controls are located on the front panel.
Display		A 4 x 20 Liquid Crystal Display (LCD) provides the user with all of the pertinent information associated with the selected menu item. The display also shows any current alarm conditions that may exist.
FOG CLEAR		Used to manually clear the fog from the storage area to increase visibility.
END CLEAR		Used to manually end the fog clearing process.
SETUP		Used to enter and navigate the setup menus.
ALARM MUTE		Used to silence the audible alarm. Also used to reset the latching alarms after the alarm condition has been corrected.
△		Used to increase numeric values and toggle *YES/NO* or *ENABLED/DISABLED* settings in the setup menus. Press once to increase incrementally. Hold the button down to scroll quickly.
▽		Used to decrease numeric values and toggle *YES/NO* or *ENABLED/DISABLED* settings in the setup menus. Press once to decrease incrementally. Hold the button down to scroll quickly.
ESC		Used to exit any menu or cancel any menu operation.
ENTER		Used to select any menu for editing or save any user setting.

1.1.2 Connection Panel Identification

Connection Panel Identification Key	
Temp A	Platinum RTD connection for primary sensor
Temp B	Platinum RTD connection for auxiliary sensor
Serial I/O	RS-485 input/output connection
Manual Fill	Manual override button, forces cooling valves open
Sensor/Alarm Output	Output connection for the remote monitoring of Temp A & various alarm conditions.
Global Remote	Output connection for the remote monitoring of all alarm conditions. Any Varió Pro system alarm will cause the normally closed (NC) and normally open (NO) contacts to switch state. These connections may be wired to any remote monitoring system utilizing NC or NO contacts.
Main Wire Harness	Connection for main wire harness. All system components are wired through this connection, with the exception of Temp A, Temp B, and the main power supply.

2.0 MVE Variō Plumbing Connections

Connect a transfer line (included with freezer) from an LN2 supply tank to the fill connection at the rear of the freezer. Optimum supply tank pressure is 22 to 35 psi (1.5 to 2.4 bar). Although the plumbing assembly has a 50 psi (3.45 bar) pressure relief device, it is recommended that the supply tank be pressurized below 35 psi (2.4 bar) to reduce the LN2 "flash-off" rate during cooling cycles and to maximize the cryogenic valve life. The supply line can be insulated to minimize LN2 transfer losses. After the transfer hose is securely coupled to the freezer and supply tank, ensure all connections are leak free by opening the valve of the LN2 supply tank and applying a soap and water solution to each field joint. You should not see bubbles forming at any joint. Wipe away excess soap and water when finished. Before removing the transfer hose, ensure the LN2 supply tank valve is closed. Slowly and carefully loosen the transfer hose connection to vent any remaining pressure in the line before disconnecting the hose.



3.0 Adjusting Temperature Settings

The following section describes how to adjust the MVE Variō system temperature and alarm settings. At any time, the user may exit the current menu by pressing the *ESC* button repeatedly until the display returns to the main screen. After 30 seconds of inactivity, the controller will automatically exit the current menu and return to the main screen.

3.1 Adjusting Storage Chamber Temperature

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

   Note: The default user password is *3 4 5 6*.

   Higher User Level
   Required use ▲▼ to
   ENTER Password
   0000

2. After entering password, the first menu item is *Temperature Menus*. Press *ENTER*.

   Press ENTER for
   Temperature menus
   or press SETUP for
   next menu

3. Press *SETUP* to scroll to the *Cooling Menu* display and press *ENTER.*

   Press ENTER for
   Cooling menu
   or press SETUP for
   next menu

4. The first menu item will display the current temperature of the cooling temp sensor. Press *SETUP* to continue.

   Current Cooling Temp
   -60.0°C

5. To adjust the maximum (warmest) allowable chamber temperature, use the ▲/▼ keys to select the desired value and press *ENTER* to save. Press *SETUP* to advance to the next screen.

   Note: The Variō Pro controller will not allow the user to select a maximum chamber temp greater than or equal to the high temperature alarm setpoint. As a result, it may be necessary to adjust the high temperature alarm prior to changing the maximum chamber temp. See the following section for further instruction.

   Max Chamber Temp
   -80.0°C
   Use ▼▲ to adjust
   Press ENTER to save

6. To adjust the chamber temperature deadband, use the ▲/▼ keys to select the desired value and press *ENTER* to save. Note that the chamber deadband also defines the minimum (coldest) allowable chamber temperature.

   Note: The Variō Pro controller will not allow the user to select a maximum chamber temp / chamber deadband combination that results in a minimum chamber temp less than or equal to the low temperature setpoint. As a result, it may be necessary to adjust the low temp alarm prior to changing the chamber deadband.

   Chamber Deadband
   10.0°C
   Use ▼▲ to adjust
   Press ENTER to save

7. Press *SETUP* repeatedly to scroll to the *Cooling Time Alarm* display. For the initial cooling cycle, it will be necessary to disable the alarm. Use the ▲/▼ keys to select *DISABLED* and press *ENTER* to save. Press *ESC* repeatedly to return to the home screen.

   Note: It is recommended that the Cooling Time Alarm be re-enabled after the initial cooling cycle is complete. Follow the steps above to return to the *Cooling Menu* and set the Cooling Time Alarm to *ENABLED*.

   Cooling Time Alarm
   ENABLED
   Use ▼▲ to adjust
   Press ENTER to save

3.2 Adjusting Temp A & B High / Low Alarms

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

   Note: The default user password is *3 4 5 6*.

   Higher User Level
   Required use ▲▼ to
   ENTER Password
   0000

2. After entering password, the first menu item is *Temperature Menus*. Press *ENTER*.

   Press ENTER for
   Temperature menus
   or press SETUP for
   next menu

3. The first menu item is *Temp A Menu*. For Temp B, press *SETUP* to scroll to *Temp B Menu.* Press *ENTER.*

   Press ENTER for
   Temp A/B menu
   or press SETUP for
   next menu

4. Press SETUP repeatedly to scroll to the Temp A/B High Alarm setpoint screen and use the ▲/▼ to select the desire value and press *ENTER* to save. Press *SETUP* to continue.

   Temp A/B High Alarm
   -75.0°C
   Use ▼▲ to adjust
   Press ENTER to save

5. To adjust the Low Temperature Alarm setpoint, use the ▲/▼ to select the desire value and press *ENTER* to save. Press *ESC* repeatedly to return to the home screen.

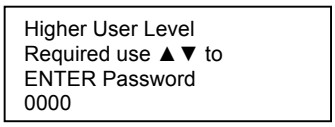
   Temp A/B Low Alarm
   -95.0°C
   Use ▼▲ to adjust
   Press ENTER to save

4.0 Adjusting Display & Output Settings

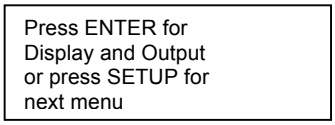
4.1 Adjusting Temperature Units

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

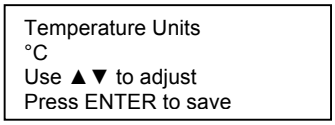
   Note: The default user password is *3 4 5 6*.



2. After entering password, press *SETUP* to scroll through the menu items. When the *Display and Output* screen appears, press *ENTER*.



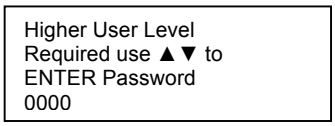
3. The first menu item is the *Temperature Units* screen. Use the ▲/▼ keys to select either °C, °F, or K. Press *ENTER* to save.



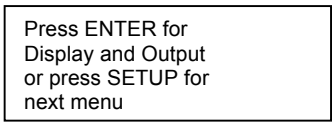
4.2 Alarm Buzzer

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

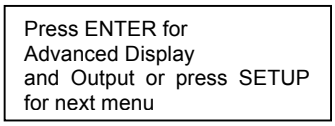
   Note: The default user password is *3 4 5 6*.



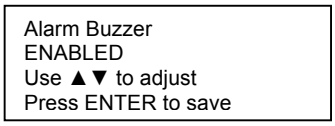
2. After entering password, press *SETUP* to scroll through the menu items. When the *Display and Output* screen appears, press *ENTER*.



3. Press *SETUP* to scroll to the *Advanced Display and Output* menu and press *ENTER*.



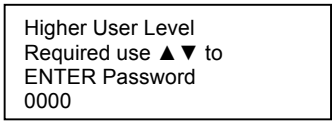
4. The first menu item is the *Alarm Buzzer* menu. Use the ▲/▼ keys to enable/disable the audible alarm buzzer. Press *ENTER* to save.



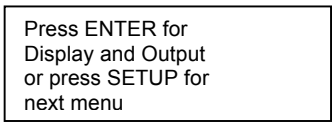
4.3 Language Settings

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

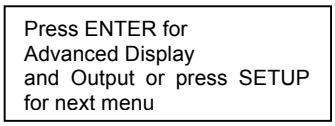
   Note: The default user password is *3 4 5 6*.



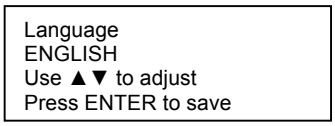
2. After entering password, press *SETUP* to scroll through the menu items. When the *Display and Output* screen appears, press *ENTER*.



3. Press *SETUP* to scroll to the *Advanced Display and Output* menu and press *ENTER*.



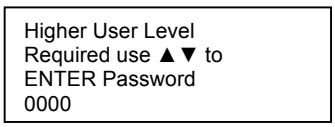
4. Press *SETUP* scroll to the *Language* menu. Use the ▲/▼ keys to select either English, French, Italian, German, or Spanish. Press *ENTER* to save.



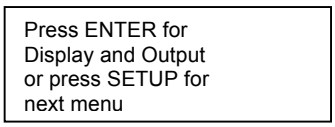
4.4 Printer Settings

1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

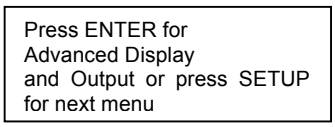
   Note: The default user password is *3 4 5 6*.



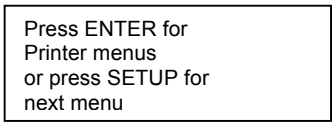
2. After entering password, press *SETUP* to scroll through the menu items. When the *Display and Output* screen appears, press *ENTER*.



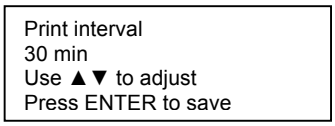
3. Press *SETUP* to scroll to the *Advanced Display and Output* menu and press *ENTER.*



4. Press *SETUP* to scroll to the *Printer* menus and press *ENTER.*



5. The first menu item is the *Print Interval* menu. Use the ▲/▼ keys to adjust setting to the desire value and press *ENTER* to save.



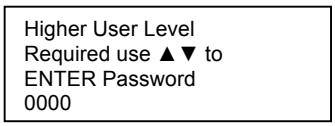
5.0 Calibration of Temperature Probes

Each of the temperature sensor probes used with the Variō Pro have been calibrated at the factory using the Low Temperature Range method. This calibration method provides a level of accuracy of +/-1.8°F or +/-1°C when operated at an altitude range of 1000ft – 1500ft (305m - 457m). Further calibration should not be required unless desired by the user. Refer to the Variō Pro Technical Manual (PN 14930250) for information on calibration methods and procedures.

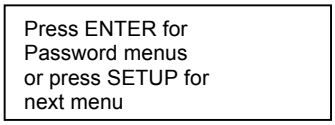
6.0 Password & Security Setup

6.1 Password Entry Mode

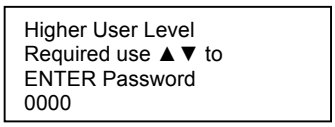
1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.



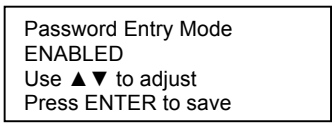
2. After entering password, press *SETUP* to scroll through the menu items. When the *Password Menus* screen appears, press *ENTER*.



3. The controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.

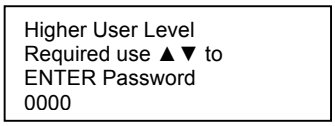


4. The first menu item is the *Password Entry Mode* display. Use the ▲/▼ keys to enable/disable password entry mode and press *ENTER* to save.

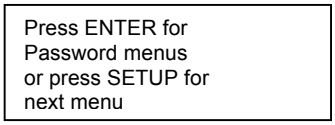


6.2 Global Password

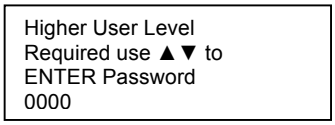
1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.



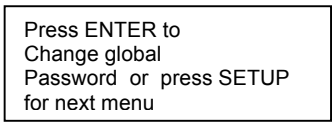
2. After entering password, press *SETUP* to scroll through the menu items. When the *Password Menus* screen appears, press *ENTER*.



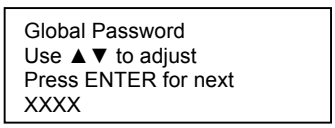
3. The controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.



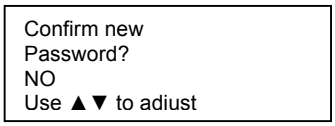
4. Press *SETUP* to scroll to the *Change Global Password* display and press *ENTER*.



5. Use the ▲/▼ keys to scroll to the desired number and press *ENTER* to advance the cursor to the next position. When complete, press *ENTER* to save.

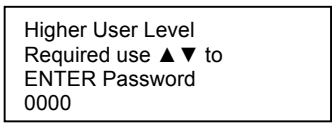


6. At the *Confirm New Password?* display, use the ▲/▼ keys to select either *YES* to confirm, or *NO* to cancel. Press *ENTER* to save.

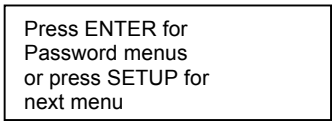


6.3 Multilevel Passwords

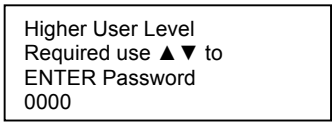
1. From the home screen, press *SETUP* to enter setup menus. If Password Entry Mode is enable, the controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.



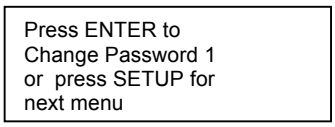
2. After entering password, press *SETUP* to scroll through the menu items. When the *Password Menus* screen appears, press *ENTER*.



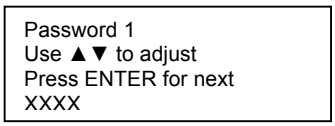
3. The controller will prompt for a password. Use the ▲/▼ keys to scroll to the appropriate number and press *ENTER* to advance the cursor to the next position.



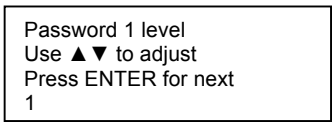
4. Press *SETUP* to scroll to the *Change Password 1* display and press *ENTER*.



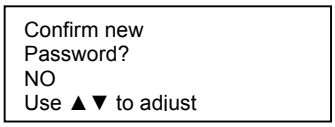
5. Use the ▲/▼ keys to scroll to the desired number and press *ENTER* to advance the cursor to the next position. When complete, press *ENTER* to save.



6. At the *Password 1 Level* display, use the ▲/▼ keys to select the desired access level for password 1.



7. At the *Confirm New Password?* display, use the ▲/▼ keys to select either *YES* to confirm, or *NO* to cancel. Press *ENTER* to save.



Security Access Levels			
LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**
▪ Fog Clear ▪ End Clear ▪ Alarm Mute ▪ Change Display Units	Level 1 + : ▪ Temp Settings ▪ Time & Date Settings ▪ Calibration Menus ▪ Language Selection ▪ Hot Gas Bypass Menus	Level 2 + : ▪ Communications Settings ▪ Programming	Level 3 + : ▪ Password Settings

7.0 Varīō Pro Alarms & Alarm Descriptions

The MVE Varīō Pro controller is equipped with a total of 15 system status alarms, all of which may be customized by the user to suit the needs of the application. The various alarm indication screens and the corresponding descriptions are shown below:

Alarm Display	Description
ALARM High Temp A Started at: 01/01/2011 12:00 PM	The Temp A sensor is reading above the user defined high temperature alarm setting.
ALARM High Temp B Started at: 01/01/2011 12:00 PM	The Temp B sensor is reading above the user defined high temperature alarm setting.
ALARM Low Temp A Started at: 01/01/2011 12:00 PM	The Temp A sensor is reading below the user defined low temperature alarm setting.
ALARM Low Temp B Started at: 01/01/2011 12:00 PM	The Temp B sensor is reading below the user defined low temperature alarm setting.
ALARM Temp A Sensor Fail Started at: 01/01/2011 12:00 PM	The Varīō Pro has lost communication with the Temp A sensor. The sensor has either been disconnected from the controller or has been damaged.
ALARM Temp B Sensor Fail Started at: 01/01/2011 12:00 PM	The Varīō Pro has lost communication with the Temp B sensor. The sensor has either been disconnected from the controller or has been damaged.
ALARM Inlet Sensor Fail Started at: 01/01/2011 12:00 PM	The Varīō Pro has lost communication with the inlet sensor. The sensor has either been disconnected from the controller or has been damaged.
ALARM Cooling Sensor Fail Started at: 01/01/2011 12:00 PM	The Varīō Pro has lost communication with the cooling sensor. The sensor has either been disconnected from the controller or has been damaged.
ALARM Supply Time *X* min Started at: 01/01/2011 12:00 PM	The Supply Time alarm is triggered when the temperature of the incoming nitrogen fails to reach the Inlet Temp Setpoint within the time specified by the Supply Alarm Delay. Once activated, the Varīō Pro will terminate the Hot Gas Bypass cycle and begin supplying the freezer with N_2.
ALARM Valve Stuck Open Started at: 01/01/2011 12:00 PM	The Valve Stuck Open alarm is triggered when the Cooling Cycle has terminated and the Inlet Temp Sensor fails to warm above the Inlet Temp Setpoint within the time specified by the Stuck Open Delay time setting.
ALARM Valve Stuck Closed Started at: 01/01/2011 12:00 PM	The Valve Stuck Closed alarm is triggered when the Varīō Pro has begun feeding N_2 to the freezer, and the Inlet Temp Sensor fails to cool to the Inlet Temp Setpoint in the time specified by the Stuck Closed Delay time setting. Note that although this alarm is similar to the Supply Time Alarm, it will remain active regardless of the *ENABLED/DISABLED* status of the Inlet Temp Sensor.

Alarm Display	Description
ALARM Lid Open *X* min Started at: 01/01/2011 12:00 PM	This alarm is triggered when the *Lid Switch Installed* setting is set to *YES* and the freezer lid remains open for the duration of the time specified by the Lid Open Alarm Delay. Note that by default, the *Lid Switch Installed* setting is set to *NO*.
ALARM Cooling Time *X* min Started at: 01/01/2011 12:00 PM	The Cooling Time Alarm is triggered when the Variō Pro has initiated a Cooling Cycle and the Chamber Temp fails to reach the minimum chamber temp setpoint in the amount of time specified by the Cooling Time Alarm Delay.
ALARM Power Failure Started at: 01/01/2011 12:00 PM	The Power Failure Alarm is triggered when the Variō Pro is equipped with battery backup and has been running on battery power for 30 minutes. With typical use, a battery backup equipped Variō Pro will retain functionality for 48 hours after the loss of its primary power source.
ALARM Low Battery Started at: 01/01/2011 12:00 PM	The Low Battery Alarm is triggered when the voltage of the battery backup powering the Variō Pro drops below 21VDC.
Communications Loss Unit 1 Started/Ended at: 01/1/11 12:00	The Communications Loss screen is displayed in the event that the Display Screen has been disconnected from the Variō Pro control board. This screen does not necessarily indicate a loss of system functionality, but it does impair the user's ability to monitor the system status.

If any alarms occur, contact your authorized MVE Distributor or customer/technical service.

North & South America
Toll Free: 1-800-482-2473
Fax: 1-888-932-2473

Asia, Australia, & Pacific Rim
Phone: +61 (2) 974 94333
Fax: +61 (2) 974 94666

Europe
Phone: +44 (0) 1344 403100
Fax: +44 (0) 1189 799245

8.0 Contact Information

Customer / Technical Service:

North & South America
Chart BioMedical
2200 Airport Industrial Drive, Suite 500
Ball Ground, GA 30107
Phone: 770-721-7759 ● Toll Free 1-800-482-2473
Fax: 770-721-7758 or 1-888-932-2473
Email: customerservice.usa@chartindustries.com
techservice.usa@chartindustries.com

Japan
Chart Japan Co., Ltd.
Phone: +(03) 5776 2670
Fax: +(03) 5776 2676
Email: customerservice.japan@chartindustries.com

Asia, Australia, & Pacific Rim
Chart Australia Pty Ltd.
Phone: +61 (2) 974 94333
Fax: +61 (2) 974 94666
Email: customerservice.australia@chartindustries.com

Europe
Chart BioMedical Ltd.
Phone: +44 (0) 1344 403100
Fax: +44 (0) 1189 799245
Email: customerservice.europe@chartindustries.com
technicalservice.europe@chartindustries.com