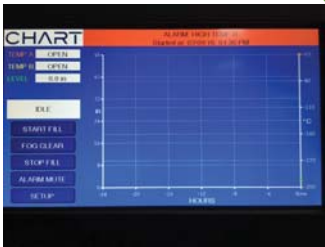
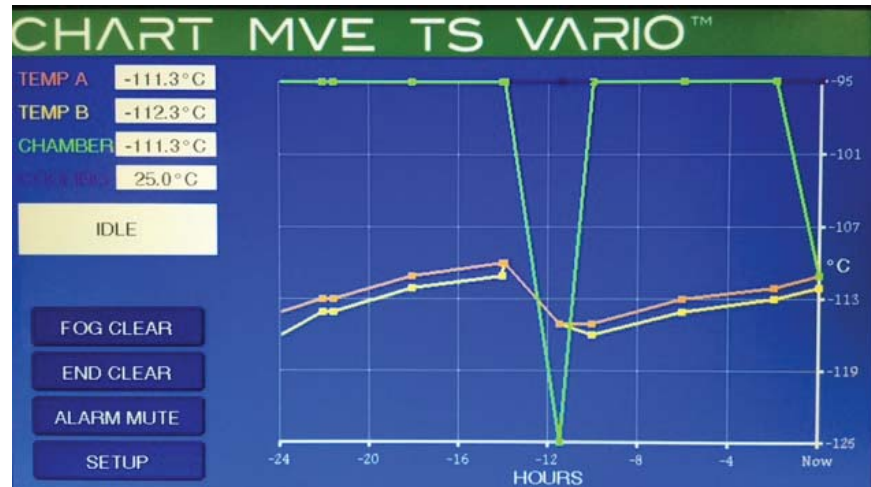


Chart MVE TS

(Touch Screen)

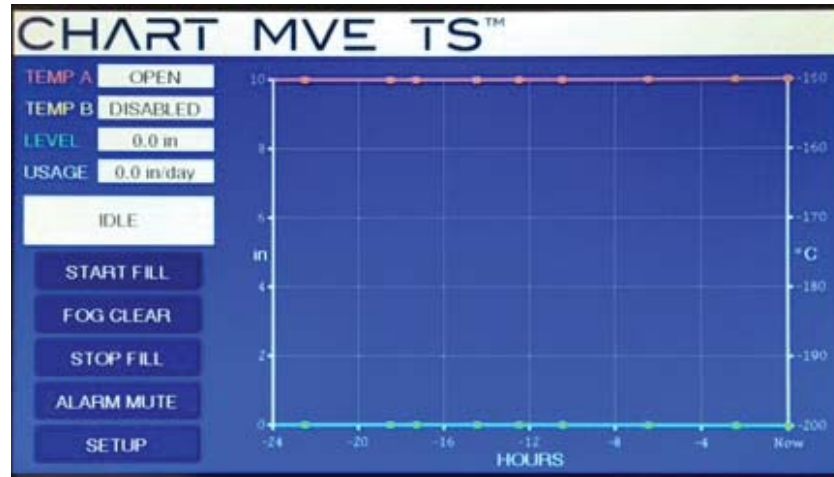


Liquid Version



Vario Version

Chart MVE TS (Touch Screen)



New Screen will feature X,Y Graph for quick view of Temperature and Liquid Nitrogen Level!

Chart MVE TS employs a variety of advanced features that enable the controller to monitor and control the environment inside a freezer with a high level of precision.

Liquid Nitrogen Level Measurement

Chart MVE TS uses a differential pressure system to determine the LN2 level to an accuracy of ± 0.5 in. (15 mm) and a resolution of 0.1 in. (5.0 mm). Unlike alternative level sensing systems, differential pressure allows the exact level to be measured and displayed. Using the simple single point calibration in a range of 3.0 in. to 48.0 in. (75 mm to 1220 mm), the patented, self-maintaining, closed-loop system displays in inches, millimeters, or a percentage full.

Automatic Liquid Nitrogen Level Control

The fully automated LN2 level control system is based on user-defined parameters that can be electronically adjusted over the entire level range. The parameters include Low Level Alarm, Low Level Fill Point, High Level Fill Point and High Level Alarm. The redundant Dual Solenoid Valves for overfill protection run on 24 VDC, 1.0 amp (max).

Liquid Usage

This exclusive feature provides an estimation of liquid usage to track LN2 consumption and can provide an early failure warning to allow sufficient time to implement corrective action and save irreplaceable samples.

User-Defined Alarms

A total of 18 audio/visual alarms are used to alert the user to any potential or developing problems. The alarms include: High Temperatures, Low Temperatures, High Level, Low Level, Liquid Usage, Maximum Fill Time, Gas Bypass, Stuck Open/Closed, Temperature Calibrations, Low Battery, Power Failure, Lid Open and Communication Loss.

Remote Alarm Monitoring

Alarm monitoring includes Global/Discrete Remote Alarm Relay.

Temperature Measurement

Two independent temperature measurement channels are employed to accurately measure the temperature across the entire storage space. The two platinum RTD sensors have an accuracy of $\pm 1.0^{\circ}\text{C}$ and a resolution of 0.1°C . The temperature can be displayed in $^{\circ}\text{C}$, $^{\circ}\text{F}$ or K. The single or two point calibration also has altitude compensation for the highest accuracy.

Temperature Inlet Settings (Hot Gas Bypass)

This unique feature is able to vent warm nitrogen gas from the supply line before initiating a fill. This prevents warm gas from entering the freezer space, which helps maintain a stable temperature gradient and increases the efficiency by reducing excess LN2 evaporation.

Event Log / Data Storage

Store vital, unalterable, time-stamped data in nonvolatile memory. This is a great tool for assessing freezer performance and troubleshooting any problems. The memory can store 30,000 events, an estimated 10 years of storage capacity. The data includes time-stamped temperatures, LN2 level, liquid usage, and any alarms or events.

Password Security

The multilevel security system comprised of up to ten user-specific programmable passwords and four security levels can be customized to grant or restrict personnel access to certain menus and settings.

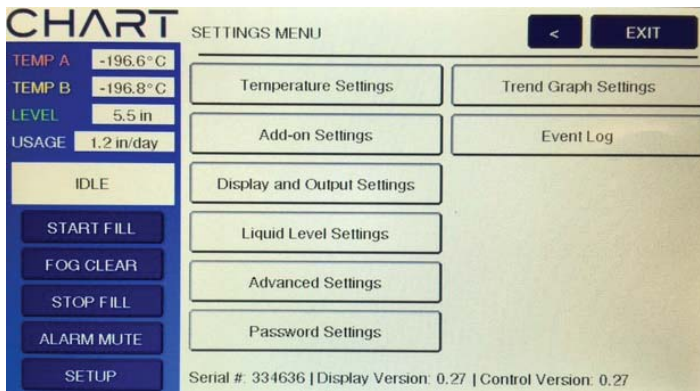
Communication Capabilities

One independent port can be used to communicate with other TEC 3000 controllers, a remote PC, serial printer, or other RS-485 networks and devices. Options include ASCII, MODBUS, Printer and One Fill All Fill (OFAF).

Ethernet Capabilities

One independent RJ45 port can be used for network connection.

Chart MVE TS (Menus)



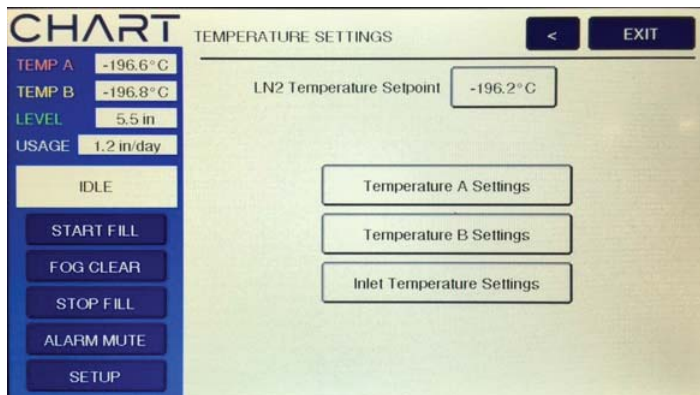
Settings MMenu

New Trend Graph Settings and Event Log Menus. Easy convenient access to all menus.

Main Menu Continual Display

New feature displays Temp A,B, Liquid Level, Usage, Idle status while providing convenient access to each menu.

The Start Fill, Fog Clear, Stop Fill, Alarm Mute Icons display on screen while providing convenient access to all menus.



Temperature Settings

Two independent temperature measurement channels are employed to accurately measure the temperature across the entire storage space.

Inlet Temperature Settings *(Hot Gas Bypass and Stuck Valve) This unique feature vents nitrogen gas from the supply line before initiating a fill.

*Note the Hotgas Bypass menu is renamed as the "Inlet Temperature Settings" and is found in the Temperature Menu.

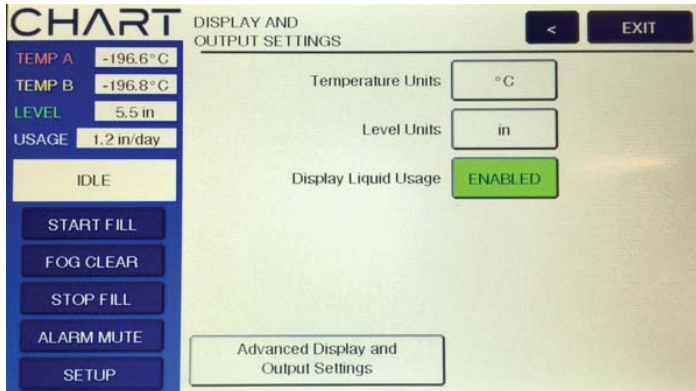


Add-On-Menus

Menu displays Battery Status or AC power. Can also Enable or Disable Power Failure Alarm. Lid switch settings can be accessed.

* Refer to the Technical Manual

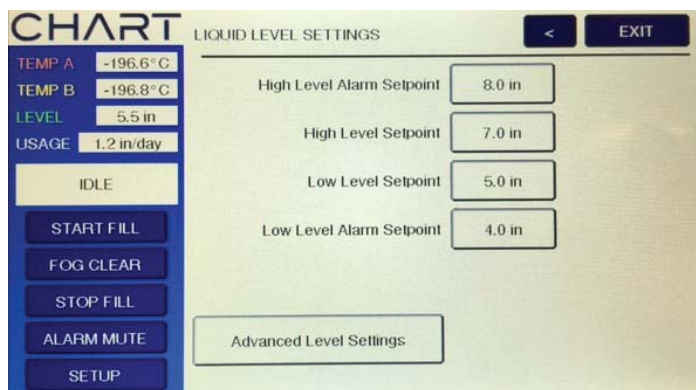
Chart MVE TS (Menus)



Display and Output Settings

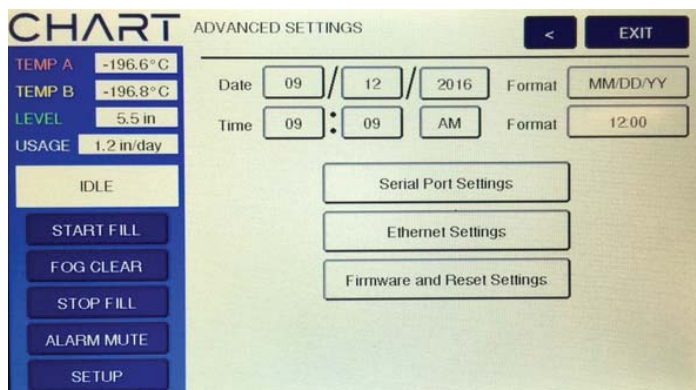
Change unit of measure for Temperature and Liquid Nitrogen Level.

Advanced Display and Output accesses the Buzzer and Printer settings



Liquid Level Settings -(Automatic Liquid Nitrogen Level Control)

The fully automated LN2 level control system is based on user-defined parameters that can be electronically adjusted over the entire level range. The parameters include Low Level Alarm, Low Level Fill Point, High Level Fill Point and High Level Alarm. Advanced Level Settings Menu can access Level Calibration.



Advanced Settings *(Communication Capabilities)

One independent port can be used to communicate with other TEC 3000 controllers, a remote PC, serial printer, or other RS485 networks and devices. Options include ASCII, MODBUS, Printer and One Fill All Fill (OFAF).

New Ethernet Capabilities Feature*

One independent RJ45 port can be used for network connection.

Chart MVE TS (Menus)



CHART PASSWORD SETTINGS

TEMP A -196.6°C
TEMP B -196.8°C
LEVEL 5.5 in
USAGE 1.2 in/day

IDLE

START FILL
FOG CLEAR
STOP FILL
ALARM MUTE
SETUP

Password Entry Mode: DISABLED

Set Password 1 Set Password 6
Set Password 2 Set Password 7
Set Password 3 Set Password 8
Set Password 4 Set Password 9
Set Password 5 Set Password 10

Set Global Password

Password Security

The multilevel security system comprised of up to ten user-specific programmable passwords and four security levels can be customized to grant or restrict personnel access to certain menus and settings.

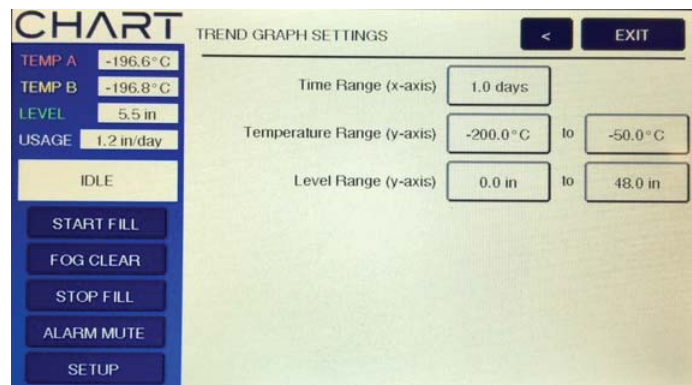


CHART TREND GRAPH SETTINGS

TEMP A -196.6°C
TEMP B -196.8°C
LEVEL 5.5 in
USAGE 1.2 in/day

IDLE

START FILL
FOG CLEAR
STOP FILL
ALARM MUTE
SETUP

Time Range (x-axis) 1.0 days
Temperature Range (y-axis) -200.0°C to -50.0°C
Level Range (y-axis) 0.0 in to 48.0 in

New Trend Graph Settings*

Screen Enables changing the X,Y Graph parameters. Time Range options are one day, seven days, and 30 days. The Temperature Range can be set from -200C to 0C. The Level Range can be set from 0 to 48 inches.

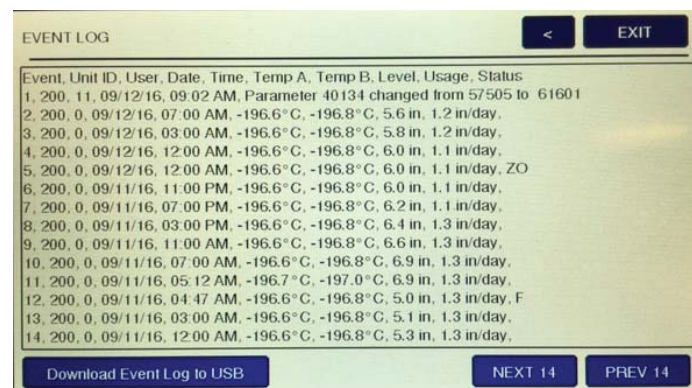


CHART EVENT LOG

Event, Unit ID, User, Date, Time, Temp A, Temp B, Level, Usage, Status

1, 200, 11, 09/12/16, 09:02 AM, Parameter 40134 changed from 57505 to 61601
2, 200, 0, 09/12/16, 07:00 AM, -196.6°C, -196.8°C, 5.6 in, 1.2 in/day,
3, 200, 0, 09/12/16, 03:00 AM, -196.6°C, -196.8°C, 5.8 in, 1.2 in/day,
4, 200, 0, 09/12/16, 12:00 AM, -196.6°C, -196.8°C, 6.0 in, 1.1 in/day,
5, 200, 0, 09/12/16, 12:00 AM, -196.6°C, -196.8°C, 6.0 in, 1.1 in/day, ZO
6, 200, 0, 09/11/16, 11:00 PM, -196.6°C, -196.8°C, 6.0 in, 1.1 in/day,
7, 200, 0, 09/11/16, 07:00 PM, -196.6°C, -196.8°C, 6.2 in, 1.1 in/day,
8, 200, 0, 09/11/16, 03:00 PM, -196.6°C, -196.8°C, 6.4 in, 1.3 in/day,
9, 200, 0, 09/11/16, 11:00 AM, -196.6°C, -196.8°C, 6.6 in, 1.3 in/day,
10, 200, 0, 09/11/16, 07:00 AM, -196.6°C, -196.8°C, 6.9 in, 1.3 in/day,
11, 200, 0, 09/11/16, 05:12 AM, -196.7°C, -197.0°C, 6.9 in, 1.3 in/day, F
12, 200, 0, 09/11/16, 04:47 AM, -196.6°C, -196.8°C, 5.0 in, 1.3 in/day, F
13, 200, 0, 09/11/16, 03:00 AM, -196.6°C, -196.8°C, 5.1 in, 1.3 in/day,
14, 200, 0, 09/11/16, 12:00 AM, -196.6°C, -196.8°C, 5.3 in, 1.3 in/day,

Download Event Log to USB NEXT 14 PREV 14

New Viewable Event Log / Data Storage*

Screen can instantly view events on the Touch Screen that stores vital, unalterable, time-stamped data in nonvolatile memory. The Next and Prev enable viewing history data.

New USB Data Transfer and Storage*

USB can download event logs to view events on a computer. The data includes time stamped temperatures, LN2 level, liquid usage, and any alarms or events.

Chart MVE TS Main Screen Details)

Temp A, B, and Level is displayed when navigating the Menus

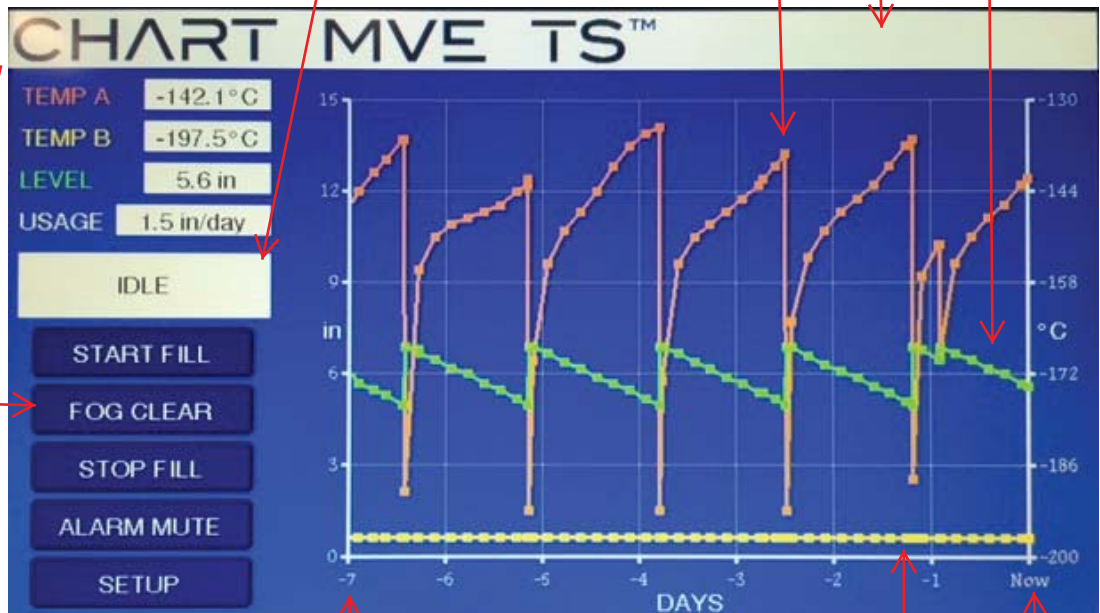
Idle Status indicates freezer on standby. Changes to Bypassing or Filling

Alarm Status Indicator (Changes to Red)

Temp A

Level

Fog Clear Icon! replaced Manual Fill Button)



Trend Data adjustable from one day, 7 days, or 30 days

Temp B Now Data (Present data)

Temperature A & B and Chamber Temp Display on Graph

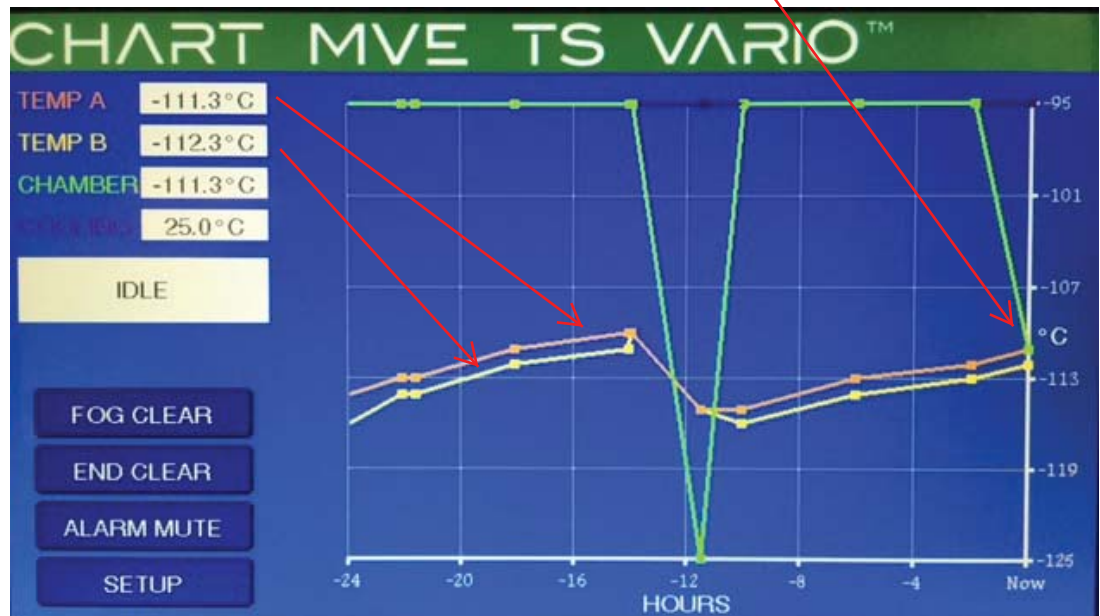


Chart: Total Cryogenic Solutions

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