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MVE Tech Tips

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MVE XLC Freezers: Liquid Usage Calculation

Here is an explanation of how the liquid nitrogen consumption in your MVE XLC Freezer is calculated by the TEC 2000 controller.

The liquid usage value is calculated in the following manner.

1. Measurement of usage data after the unit has been powered up and the first fill cycle. If power is lost to a unit without battery backup, measurement will not begin again until after power has been restored and completion of the first fill cycle.
2. To minimize the effects of liquid slosh from the filling, measurement does not start until at least 15 minutes after termination of the fill cycle.
3. Once the above criteria are met, the level is recorded and a timer is started.
4. The controller then waits for a change in level of at least 0.5”(12.7mm). It uses level data without offset compensation so that changing the offset value will not affect the usage calculation.
5. Once the 0.5” change in level has occurred; the recorded level change and the elapsed time for the change are used to calculate the usage rate.
6. The calculated value is converted to the chosen display units and this value is stored for display on demand as well as for data logging and printer output.
7. After this is done, the controller re-zeroes the level sensor and starts the next set of measurements for liquid usage calculation.

Fill activity will terminate the usage measurements. Measurement will restart 15 minutes after fill activity stops. No averaging is done. The displayed value is the result of the latest usage calculation. If the 0.5” change does not occur within 5 days, measurement is restarted. This means that a usage value of less than 0.1”/day cannot be calculated. Liquid usage will not be calculated if the differential between high and low fills settings are set at the 0.5” minimum.

Operation Instructions For The Tec-2000 Event Log Download Program

Installation: Follow the instruction on the diskette
Additional hardware required:

- Interface kit CHART P/N 10740221, contains all necessary hardware to connect a single TEC-2000 equipped unit to a DB25 or DB9 Comm port connection on a host computer up to 14 feet away.
- Daisy Chain kit CHART P/N 10856321, contains an RJ45 jack splitter/tee, to allow two cables to plug into one RJ45 port, and a 14 ft. cable. One daisy chain kit is required for each additional TEC-2000 unit to be connected to the host computer. Using the daisy chain kit, multiple units can be connected to a single host computer via a single interface kit.
- If the distance to the computer or from the unit exceeds 14ft., you will to purchase or assemble a custom length computer network cable with RJ45 end connections. Most computer supply stores can provide this requirement. To avoid purchasing unneeded items, the jack splitter/tee can be ordered individually from CHART (P/N 10856312) if not available locally. This will allow daisy chaining with locally purchased or assembled custom length cables.
- If desired, it is possible to “Close the loop” on the daisy chain. By adding two additional tees and one additional cable, the last unit in the chain can be connected back to the interface kit at the computer. With this configuration, in the event of a cable or connection failure, it is unlikely that more than one unit would be unable to communicate with the computer.
- The user manual supplied with the TEC-2000 equipped unit provides additional information on hardware and connections.

TEC-2000 unit preparation:
To allow proper communication with individual TEC-2000 control units, each must have a unique Unit ID. This is done via the TEC-2000 display/keypad. To assign each unit a unique ID, perform the following:

- Press the “interface” key on the keypad. The display will indicate via an arrow that the printer driver is On or Off.
- The printer driver must be activated (On) to access the Unit ID display. If ON is not indicated, toggle the arrow to the on position by pressing the up arrow key, then press enter.
- “Enter Unit ID” will appear in the top line, with the current ID displayed in the bottom line. Enter a numeric ID and press *ENTER* to accept the value. The next two displayed values are date and time. Adjust the date and time values, if necessary, and press *ENTER* to accept the value and move to the next display. The net two displays are printer related only. Press *ENTER* to continue until the normal display appears again.
- The printer driver must be de-activated for PC communications. Press the Interface key and toggle the arrow to indicate Printer (Off). Make sure the “Baud” rate is set at 96(9600) by pressing the down arrow until the arrow in the display indicates 96. Then press *ENTER*.
- Repeat the above steps for each unit that will be connected to the host computer for communication, using a unique ID for each unit.

NOTE: Alpha character can be used in the ID when using a PC to change it. This program does not have provisions for changing the ID, however, The Terminal (Windows 3.x) or HyperTerminal (Windows 95+) programs provided with Windows operating software can be used for this purpose if so desired. Refer to Chapters 5 and 11 of the TEC-2000 user manual (10753946 rev C) for information on using the “Terminal” programs.

Operation

- To run the application
  - Click on the Window “Start” button
  - Select “programs”
  - Select “TEC-2000 download” from the menu.
- Select the appropriate Comm. port and click on the “Connect” button.
- Enter the ID number for the unit you wish to communicate with. This field must be filled in and must include 5 characters (exceptions noted below). Example; If you assigned the ID for the unit as 00001 via the display/keypad, the Unit ID field used to query the unit must read 00001. The TEC-2000 will not assume leading or trailing zeroes.
- To query the unit for the current interval between log recordings;
  - Click on the “log period query” button. The current interval for the unit indicated in the Unit ID field will be displayed in the text box to the right of the button.
- To change the interval between records;
  - Click on the text box to the right of the “change log period to” button.
  - Enter a new value (current maximum is 255 minutes).
  - Click on the “change log period to” button. The text box to the right of the “Log Period Query” bottom will update to show the new interval.

NOTE: Attempting to enter values in excess of 255 will result in erroneous values. The TEC-200 will not default back to the previous setting.

- To download the event log from the unit to a text files.
  - Click the “Select File” button.
  - This will open a Dialog box for selecting an existing file or enter a new file name to create a new text file. After selecting or entering the desired file name click “Open” or press *ENTER* to accept the file name.
  - Click the “Download Event log” button. The status will be displayed below the button (current record # as it is downloaded) while in process. When all records have been extracted and written to the text file, “DONE” will be displayed to the right of the button. When the download is complete the text file is closed to allow access via notepad or WordPad while this program is still open.

- You can review the record by selecting the filename from the “Documents” list accessible from the Windows 95+ start menu. Window should default to open the file with notepad.
- Repeat steps to download from each individual unit, changing the unit ID and text filename as desired.

NOTE: This program appends the text file so any existing text in the file is not overwritten, but added to.

- To convert the text file to Excel spread sheet format;
  - From Excel, use the file open command to open the text file. Excel will launch the Import Wizard, which will allow you to determine how the data is imported into Excel.
- To query the unit for the current number of records in the event log;
  - Click on the “Event Count Query” button. The current number of event log records for the unit indicated in the unit ID field will be displayed in the text box to the right of the button.
- To Clear the event log for the current unit;
  - Click on the “Clear Event Log” button. The text box to the right of the “Event Count Query” button will update to show no records.

“Exception to Unit ID Rule”
If your desire to change the Log Period or Clear the Event Log for all units connected to the host computer, you can do so by clearing the Unit ID field (no characters), then click on the button for the change you wish to make.
NOTE: As indicated above, the displayed values for the Log Period query or Event count query are updated whenever the corresponding change button is clicked to make a change. When making a blanket change with the unit ID field cleared, a blanket query is also made. All connected units will respond simultaneously. It is not possible to differentiate the responses therefore; gibberish will be displayed in the corresponding query text boxes.

If verification of the change is subsequently required, queries of individual units using the unique ID’s will be required. Likewise any query command (included download) execute with the ID field cleared will receive a group response which could possibly create multiple lines of unreadable text in a file.

- To close this application;
  - Click on the Close (X) button at the top right corner of the form.

If you have any questions on the above procedures, you can contact Jim Bachman, Technical Service.

Recalibrating and Certifying Data Logger Temperature Probe

Chart Ind. Bio-Medical Division now has the capability to calibrate and certify the data logger temperature probe. Using a Contronics PT100 Test & Calibration unit we can now perform this service in house rather than shipping unit to the UK for calibration. Contact our customer service department @ 888 683-2796 for a return authorization number and send entire cover assembly to:

Chart Ind.
Bio-Medical Div.
3505 County Rd. 42 West
Burnsville, MN. 55306

Cost of this service is $200 plus shipping and handling. Turnaround time is 3 workdays from receipt at our dock.

If you have any questions regarding pricing or availability please contact customer service. For technical service contact Jim Bachman at one of the numbers listed below:

Toll free direct number to technical service….1-866-819-5897
Direct Burnsville number…… 952-641-6115
Cell phone number…….. 612-889-7810
Fax……..…1-800-232-9683
E-mail……..……jim.bachman@chart-ind.com