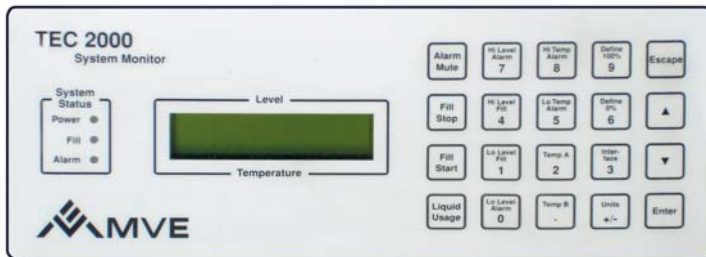




# MVE TEC 2000 automatic filling unit



## PRODUCT SPECIFICATIONS

### Level Control

- Level Display- Inches, mm or percent full
- Sensor Type- Dual Port Pressure Transducer
- Measurement accuracy +/- .5 in.
- Level Compensation
- Liquid Usage Monitoring
- Multi-Point Calibration

### Temperature Control

- Sensor Type - Two Platinum RTD's
- Accuracy +/-2.0C
- Altitude Compensation
- Dual Point Calibration
- Temperature Probe Heater

### Integrated Features

- Keyless Security System
- Maintenance Menu
- RS 485 Communications
- 7000 Event Retention
- Computer Interface
- Printer Interface

### Options

- Battery Back-Up
- Warm gas By-Pass

### Level Sensor Operation

- A low (differential) pressure transducer measures the pressure created by the weight of the LN<sub>2</sub> column
- The TEC2000 Controller converts the pressure reading to LN<sub>2</sub> level in inches or millimeters
- The level offset programmed in the maintenance menu is added (or subtracted) to provide a displayed level that agrees with actual level

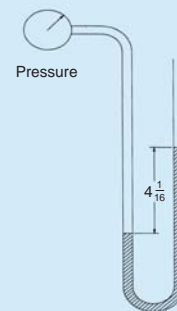
### One Fill All System (OFAF)

- One unit is Designated as Master for the OFAF network
- Custom Configuration Master Cable connects Master unit to the first slave unit
- Standard RJ45 network cable and Jack tee/splitter connects additional slave units to first slave unit in daisy chain fashion
- Master Polls all units and sends a fill command when a unit is found to be filling

### Available Alarms

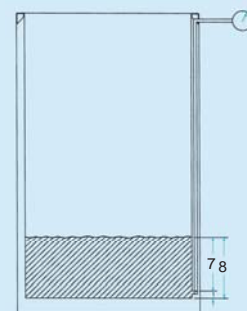
- Low Temp A & B
- High Temp A & B
- High Level
- Low Level
- LN<sub>2</sub> Supply (Fill Time)
- No Power (Hardware default)
- Fill Valve
- Bypass Valve (w/GB only)
- Bypass Sensor (w/GB only)
- Power Failure (w/BB only)
- Low Battery (w/BB only)

### Level Sensor Operation



#### Example: water manometer

Pressure = fluid density x height of fluid column  
 Pressure = .0361 lb/cubic in. x 4.063 in. = .147psi



Pressure created by LN<sub>2</sub> column  
 Pressure = fluid density x height of fluid column  
 Pressure = .0291 lb/cubic in. x 7 in. = .2psi



# MVE TEC 3000 automatic filling unit



The TEC 3000 employs a variety of high level features that enable the controller to monitor and control the environment inside a freezer with a high level of precision.

## FEATURES/OPTIONS:

- Liquid Nitrogen Level Measurement
- Automatic Liquid Nitrogen Level Control
- Two Channel Temperature Measurement
- Multi-Function User Defined Alarms
- Battery Backup (Optional)
- Adjustable Security / Password System
- Gas Bypass (Optional)
- One Fill All Fill Capability (Sequential or Simultaneous)
- Timed Filling

## PRODUCT SPECIFICATIONS

### Level Measurement

- Sensor Type - Dual Port Pressure Transducer Measurement, Accuracy +/- .5 in; +/- 13 mm (typical)
- Liquid Usage Feature
- Two Point Calibration Feature

### Level Control

- Control Type - On/Off
- Control Output - (Fill Solenoid Valve)
- 24 VDC, 1.0 amp (max)

### Temperature Measurement

#### Two Sensors, Platinum RTD - Two wire element

- Accuracy +/-2.0°C Full Scale
- Altitude Compensation For Accuracy
- Full Range Calibration Feature
- Probe Heater For High Temp Alarm Testing

### Front Panel Display

- LCD Readout, 4 row x 20 character
- Level Display - Inches,mm
- Temperature Display - °C, °F, or °K

### Standard Alarms

- Alarm Conditions
  - Low Level Alarm
  - High Level Alarm
  - Low Temperature (Probe A & B)
  - High Temperature (Probe A & B)
  - Fill Time Alarm
  - Power Failure (remote only)
  - Lid Open Alarm
  - Usage Warning
  - Temperature Calibration Alarm (Probe A & B)
  - Usage Alarm

### Optional Alarms

- Bypass Sensor Failure
- Bypass Time
- Bypass Sensor Calibration
- Power Failure (audible and visual in addition to remote)
- Low Battery Voltage

### Alarm Output

- Both Visual and Audible Alarms
- One Global Remote Alarm Relay
- Four Discrete Remote Contacts
  - Temp A High
  - Low Level
  - High Level
  - Low Battery (Optional When Equipped With Battery Backup)

### Controller Features

- Communication Interface - Serial Communication RS485/ASCII/MODBUS
- Memory - Stores time and date stamped information on the controllers 30,000 most recent events