

# Vertiv™ Liebert® Liqui-Tect™ LP6000 Leak Detection Panel GUIDE SPECIFICATIONS

## 1.0 GENERAL

### 1.1 Summary

The leak detection panel shall detect leaks, provide an audible/visual event annunciation and provide a direct-readout of the location of the leak. The system shall also have the ability to communicate alarm and status information to the Vertiv™ Liebert® *Trellis™*, Vertiv™ Liebert® SiteScan™ Web enterprise monitoring system, Vertiv™ Liebert® Nform and to building management systems.

### 1.2 Standards

The leak detection panel shall be designed in accordance with applicable sections of the current revision of the following listings and approvals.

- CE; EMC – EN61326 1997 Class A
- ETL Listed; UL STD 61010A-1; EN STD 61010-1; CAN/CSA C22.2 STD NO. 61010-1
- CL2P/CMP per UL STD (for Vertiv™ Liebert® LT500Y Leak Detection Cable); ANSI/NFPA 262EN62040-2
- RoHS (2011/65/EU)
- REACH (Regulation (EC) No 1907/2006)
- WEEE (2012/19/EU)

### 1.3 System Description

The leak detection panel shall include an integrated display with indication of normal and alarm conditions, as well as leak location. Display and measurement modules are contained in a single compact package. The panel can monitor Liebert® LT500Y leak detection cable for conductive fluids. The system determines the location of the water on the detection cable and reports the distance from the leak detection module in feet or meters. To ensure proper protection, the system continuously monitors operation, signaling system normal, leak detected and cable fault.

The leak detection panel shall have the following functions:

- Audible and visual alarms
- Local touch screen display
- Adjustable sensitivity set points for leaks and contamination
- Historical log of leaks and faults
- Connection to a building management system
- Automatic detection of broken cables and contaminated cables
- Password protection
- The system shall be provided with retention of configuration after a power failure
- Web based (HTML) interface

- Vertiv™ Liebert® SiteScan™ Web integration
- Vertiv™ Liebert® Nform integration

The system shall consist of a leak detection panel, leak detection cable with cable hold down clips and accessories.

#### **1.4 User Documentation**

The leak detection panel shall be supplied with a quick start guide for ease of installation, configuration and start up. A full user manual shall be located on the manufacturer's web site for review and download. The user manual shall include installation instructions, a functional description of the equipment, safety precautions, illustrations, step-by-step operating procedures and general maintenance guidelines.

#### **1.5 Warranty**

The leak detection panel manufacturer shall warrant the module against defects in materials and workmanship for one (1) year.

#### **1.6 Quality Assurance**

##### **1.6.1 Factory Testing**

The manufacturer shall fully and completely test the system to ensure compliance with the specification.

## 2.0 PRODUCT

### 2.1 Fabrication

All materials and components making up the leak detection panel shall be new, of current manufacture and shall not have been in prior service except as required during factory testing.

#### 2.1.1 Panel

The leak detection panel shall be constructed as a standalone unit suitable for vertical surface wall mounting and shall be housed in a metal Type 1 enclosure. The module shall be cleaned, primed and painted black.

##### 1. Dimensions

The overall unit dimensions shall be 12.5"W x 10.0"H x 3.25"D (318mmW x 254mmH x 83mmD)

##### 2. Weight

The overall unit weights shall be less than or equal to 8.2 lb (3.7kg)

#### 2.1.2 Cooling

The leak detection panel shall be convection cooled.

### 2.2 Power Requirements

#### 1. Input Voltage

The leak detection panel shall be suitable for universal voltage input and shall operate on 100/120/230-240VAC @500mA max, 50/60 Hz, single-phase power supply.

#### 2. Power Supply

A universal power supply is integrated in the panel with screw terminal connections for a hard wired connection.

### 2.3 Environmental Conditions

#### 1. Operating Temperature

Ambient temperatures between 32°F and 122°F (0°C and 50°C)

#### 2. Storage Temperature

Storage at temperatures between -4°F and 158°F (-20°C and 85°C)

#### 3. Relative Humidity

Relative humidity between 5% and 95%, non-condensing

#### 4. Altitude

Maximum altitude of 15,000 feet (4572m)

### 2.4 Displays and controls

#### 1. Display

One 480 pixels W x 272 pixels H color LCD, LED backlit, resistive touch panel display, mounted on the front of the leak detection panel. The touch panel display shall announce alarm conditions, display the status of the leak detection system, and provide menus and softkeys for use in controlling and configuring the leak detection panel. Certain menus shall be password protected to prevent inadvertent changes to the leak detection panel's operation.

## 2. Audible Alarm

One audible alarm with an 85 db sound output at 2 feet (0.61m) which shall sound for cable fault and leak detected conditions and shall be silenced by pressing a softkey on the front panel display, or via the Web interface. The audible alarm shall be programmable to re-sound after a time period of 0 to 999 minutes.

## 2.5 Interface Options

### 2.5.1 Ports

The leak detection panel shall be configured either via a web-based (HTML) configuration and setup menu accessible from an Ethernet connection, via the touch panel display or via a terminal-based menu accessible via EIA-232. All configuration menus shall be password protected.

### 2.5.2 Relays

#### 1. Leak

The leak detection panel shall include two (2) Form C Leak Relays with contacts rated at 1A at 24VDC, 0.5A resistive at 120VAC. The relays shall be configurable as latched or non-latched and supervised or non-supervised.

#### 2. Cable Break

The leak detection panel shall include two (2) Form C Cable Break Relays with contacts rated at 1A at 24VDC, 0.5A resistive at 120VAC. The relays shall be configurable as latched or non-latched and supervised or non-supervised.

#### 3. Maintenance

The leak detection panel shall include one (1) Form C Maintenance Relay, which may be used to send a signal to a remote Building Management System (BMS) when periodic maintenance is due. The maintenance interval shall be programmable via the touch panel display or the Web interface

### 2.5.3 Analog Output

The leak detection panel shall provide a 4-20mA loop powered analog output, which shall provide a signal proportional to the distance to the detected leak

### 2.5.4 Ethernet Communications

The leak detection panel shall be capable of Ethernet communications over a 10/100BASE-T network via the RJ45 network port. Communications protocols supported over the Ethernet connection shall include SNMP, SMTP (email), Modbus TCP/IP, BACnet IP, and web-based (HTML) access.

### 2.5.5 Serial Communications

#### 1. 232

The leak detection panel shall include an EIA-232 serial port to interface with a PC allowing access to all functions and diagnostics within the system. The EIA-232 serial port shall be 9600 baud, no parity, 8 data bits, 1 stop bit.

#### 2. 485

The leak detection panel shall provide three independent EIA-485 serial ports and shall be capable of Modbus/RTU Master and Slave communications, BACnet MS/TP Slave communications, and N2 Slave communications via the EIA-485 serial ports. Baud rates shall be user selectable between 9600, 19,200, and 38,400 baud.

### 2.5.6 Alarms

The leak detection module shall be capable of sending alarms via SNMP traps, SMTP (email; up to four designated recipients), and BACnet.

## 2.6 Features and Functionality

### 2.6.1 Leak Cable Monitoring

The leak detection panel shall be capable of monitoring up to 10,000 feet (3,048m) of LT500Y Leak Detection Cable and shall have a leak response time of less than 30 seconds, a typical sensing repeatability of  $\pm 2$  feet (.61m)  $\pm 0.25\%$  of total cable length, and a detection accuracy of  $\pm 2$  feet (0.61m)  $\pm 0.5\%$  of the cable length

### 2.6.2 System Monitoring

The leak detection panel shall continuously supervise the electrical and mechanical integrity of the Leak Detection Cable.

### 2.6.3 Interactive Maps

The leak detection panel shall be capable of holding up to 10 images of floor plans and overlaying maps of cable layouts on the images. In the event of a leak or cable fault alarm, the leak detection panel shall be capable of displaying the location of the leak on the floor plan image on the Web interface.

### 2.6.4 Calibration

The leak detection panel shall allow leak detection sensitivity and cable contamination setting adjustments. It shall be possible to manually and automatically calibrate the module without the manufacturer's intervention. An optional password shall safeguard any unauthorized system calibration.

### 2.6.5 Virtual Zones

The leak detection panel shall monitor up to 32 user configurable virtual zones defined by the cable length at the beginning of the virtual zone. A unique description of each virtual zone will be user configurable.

### 2.6.6 Physical Zones

The leak detection module shall be capable to simultaneously monitor up to 127 slave devices (leak detection modules and panels) that are integrated via Modbus RTU (EIA-485) and Modbus TCP/IP (RJ-45).

### 2.6.7 Logging

#### 1. Trend

The leak detection panel shall maintain a trend log listing the cable current level every day recorded at configurable intervals (1 minute to 1440 minutes (1 day)), for the last 365 intervals.

#### 2. Event

An event log shall also provide a record of the last 1024 events. Logged events shall include, but not be limited to, Alarms, Cable Faults, and System Restarts.

#### 3. Time and Date

The leak detection panel shall use a real-time clock for time and date stamping of trend and event log entries. The date and time shall be set through the front panel display or the Web interface.

### 2.6.8 Logging Retention

The leak detection panel shall maintain the trend log and event log in nonvolatile memory, the logs shall survive events such as power failures and hard resets. The module shall keep the logs in first-in-first-out (FIFO) order.

## 2.6.9 NTP

The leak detection panel shall utilize Network Time Protocol (NTP) to synchronize its internal clock to an external time source.

## 2.6.10 File transfer

The leak detection panel shall be capable of downloading and uploading configuration files, uploading log files, and downloading images and firmware upgrades, via the Web interface.

## 2.7 Vertiv™ Liebert® LT500Y Leak Detection Cable

### 2.7.1 Summary

The leak detection cable shall detect the presence of water and other conductive liquids and shall be constructed of two sensing wires and two insulated wires with an abrasion resistant, non-conductive polymer core. Each individual sensing wire shall be covered with a non-conductive polymer mesh to help prevent false alarms from contaminants. The leak detection cable shall be fast drying and highly flexible allowing for small bend radii.

### 2.7.2 Standards

The leak detection cable shall be plenum rated to CL2P per UL (ANSI/NFPA262).

### 2.7.3 Fabrication

#### 1. Physical

The leak detection cable shall be available in 10 feet (3.05m), 35 feet (10.67m) and 50 feet (15.24m) lengths with mating connectors (male/female) pre-installed. The cable shall be yellow in color with the sense cables being black in color. The diameter of the cable shall not exceed 1/4". The end of the cable shall be terminated in matching male and female connectors for easy connection of cables from end to end.

#### 2. Characteristics

The leak detection cable shall have a Sheer Strength of > 180 lbs. (81.65kg) and a Cut Through Resistance of > 40 lbs. (18.14kg) with a .005in (0.127mm) blade.

### 2.7.4 Environmental Conditions

#### 1. Operating Temperature

Ambient temperatures between 32°F and 167°F (0°C and 75°C)

#### 2. Storage Temperature

Storage at temperatures between -22°F and 185°F (-30°C and 85°C)

#### 3. Relative Humidity

Relative humidity between 5% and 95%, non-condensing

#### 4. Altitude

Maximum altitude of 15,000 feet (4572m)

## 2.8 Accessories

### 2.8.1 Jumper Cables

Non-Sensing jumper cable shall be used to bridge between sections of leak detection cable where water leak detection is not needed. The jumper cable shall be plenum rated to CL3P per UL. NSC shall be

available in 3 feet (0.91m), 10 feet (3.05m), 25 feet (7.62m), 50 feet (15.24m) and 100 feet (30.48m) lengths with mating connectors (male/female) pre-installed.

### **2.8.2 Branching Connector**

A branching connector shall be used to branch the Leak Detection Cable in multiple directions. The branching connector shall be constructed with a single cable input, a single cable output and two additional branch lines. Multiple branching connectors can be used within a single system and the accuracy of the system shall not be affected. The cable output and both branch lines will add the equivalent of 35 feet (10.67m) to the system to add distinct separation of the outputs. The overall size of the branching connector shall be 2.0"W x 0.9"H x 3.0"D (50.8mm x 22.86mm x 76.2mm).

### **2.8.3 Weighted Length Connector**

A weighted length connector shall be used to simulate 35 feet (10.67m) of Leak Detection Cable and provide distinct separation between areas of coverage. The overall size of the weighted length connector shall be 2.5" x 1.0" (63.5mm x 25.4mm).