

## LLE Series

### Liquid level sensors



#### DESCRIPTION

The enhanced series of liquid level sensors incorporates a photo-transistor trigger which provides a digital output that denotes the presence or absence of liquid.

The mode of operation is derived from the principle of total internal reflection. An LED and photo-transistor are housed within a plastic dome at the head of the device. When no liquid is present, light from the LED is internally reflected from

the dome to the photo-transistor. When liquid covers the dome, the effective refractive index at the dome-liquid boundary changes, allowing some light from the LED to escape. Thus the amount of light received by the photo-transistor is reduced and the output switches, indicating the presence of liquid. This method of liquid level sensing is very fast, and almost instantaneous for water.

#### FEATURES

- Solid state technology
- Small size
- Digital output
- Pre-wired
- Electrically robust

#### BENEFITS

- Accurate, repeatable switching point
- Can be mounted in applications where space is limited
- Microprocessor compatible
- Easy to install, saving assembly time
- Reverse polarity, over voltage, short circuit and transient protection

#### TYPICAL APPLICATIONS

- Home appliances
- Spa baths
- Vending machines
- Food and beverage
- Medical
- Compressors
- Machine tools
- Automotive

#### ORDER GUIDE

| Catalogue Listing             |                     |                      |                  |
|-------------------------------|---------------------|----------------------|------------------|
| Description                   |                     | Standard temperature | High temperature |
| Screw In, M12 Thread, Plastic | (Type 1)            | LLE101000            | LLE101101        |
|                               | (Type 2)            | LLE102000            | LLE102101        |
|                               | (Type 3)            | LLE103000            | LLE103101        |
| Push In, Plastic              | (Type 5)            | LLE105000            | LLE105100        |
| Screw In, ½ in, Metal         | Nickel plated brass | LLE205000            | LLE205100        |
|                               | Stainless steel     | LLE305000            | LLE305100        |

# LLE Series

## TECHNICAL INFORMATION

| Specifications                             |  |                                                                                                                                |                                          |                               |  |
|--------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------|--|
| Operation mode                             |  | User defined single point on/off switch (Output is high in air)                                                                |                                          |                               |  |
| Repeatability (mm)                         |  | ± 1                                                                                                                            |                                          |                               |  |
| Hysteresis (mm)                            |  | 2 (dependent on liquid)                                                                                                        |                                          |                               |  |
| Response time                              |  | Rising liquid level - 50 µs<br>Falling liquid level - 1 s max (in ethanol)<br>Response in other liquids dependent on viscosity |                                          |                               |  |
| Mechanical                                 |  |                                                                                                                                |                                          |                               |  |
| Mounting                                   |  | Type 1 and 2 - mounted from outside; Type 3 and 5 - mounted from inside                                                        |                                          |                               |  |
| Termination                                |  | 250 mm flying leads (180 mm for metal versions)                                                                                |                                          |                               |  |
|                                            |  | Blue                                                                                                                           | 0 V                                      |                               |  |
|                                            |  | Red                                                                                                                            | +5 V to +12 V supply                     |                               |  |
|                                            |  | Green                                                                                                                          | Output                                   |                               |  |
| Material [Note 1]                          |  | Polysulphone                                                                                                                   |                                          |                               |  |
| Dimensions                                 |  | <b>Plastic</b><br><b>LLE101/102/103 Series</b>                                                                                 | <b>Metal</b><br><b>LLE205/305 Series</b> |                               |  |
|                                            |  | 3,5 mm radius (includes LLE105 Series)                                                                                         |                                          |                               |  |
|                                            |  | Dome                                                                                                                           |                                          |                               |  |
|                                            |  | Thread                                                                                                                         | 1/2 in BSPT                              |                               |  |
| Hex                                        |  | 19 mm                                                                                                                          | 24 mm (See mounting drawings on page 3)  |                               |  |
| Environmental                              |  | Standard temperature                                                                                                           |                                          | High temperature              |  |
| Operating temperature (°C)                 |  | -25 to 80 (-13 °F to 176 °F)                                                                                                   |                                          | -40 to 125 (-40 °F to 257 °F) |  |
| Storage temperature (°C)                   |  | -30 to 85 (-22 °F to 185 °F)                                                                                                   |                                          | -40 to 125 (-40 °F to 257 °F) |  |
| Thermal testing                            |  | As per BS EN60068-2-33                                                                                                         |                                          |                               |  |
| Humidity                                   |  | As per BS EN60068-2-30                                                                                                         |                                          |                               |  |
| Vibration                                  |  | As per BS EN60068-2-6 Part S3: 1996                                                                                            |                                          |                               |  |
| Mechanical shock                           |  | As per BS EN60068-2-27 Part 2 Ea: 1987                                                                                         |                                          |                               |  |
| Pressure range (bar)                       |  | 0 to 5 (plastic housing) [Note 2]<br>0 to 25 (metal housing)                                                                   |                                          |                               |  |
| Ambient IR light limit (@ 940 nm) [Note 3] |  | 10 mW/cm² in operation                                                                                                         |                                          |                               |  |
| Electrical                                 |  | Standard temperature                                                                                                           |                                          | High temperature              |  |
| Supply voltage (Vcc)                       |  | +5 Vdc to +12 Vdc ± 5 %                                                                                                        |                                          |                               |  |
| Supply current (mA)                        |  | 15 mA nominal @ +5 Vdc                                                                                                         |                                          | 5 mA nominal @ +5 Vdc         |  |
| Output sink current [Note 4]               |  | @ 25 °C 10 mA max.                                                                                                             |                                          | @ 25 °C 40 mA max.            |  |
| @ 5 Vdc supply                             |  | @ 80 °C 3 mA max.                                                                                                              |                                          | @ 125 °C 7 mA max.            |  |

### Notes:

[Note 1] Material compatibility information available on request.

[Note 2] Threaded sensors only.

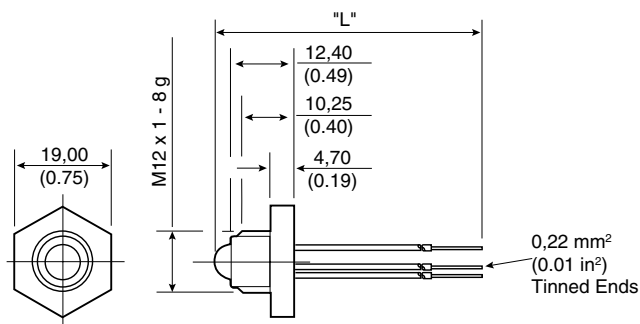
[Note 3] For other ambient light environments the user should test the sensor under application conditions to verify compatibility.

[Note 4] The output is intended as a TTL compatible output signal, for interfacing to logic systems. For interfacing with other types of circuitry an appropriate buffer circuit must be used.

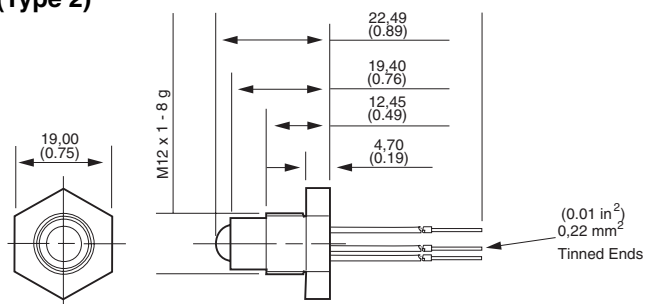
# Liquid level sensors

## MOUNTING DRAWING (IN MM AND INCHES)

### LLE101000/LLE101101 (Type 1)



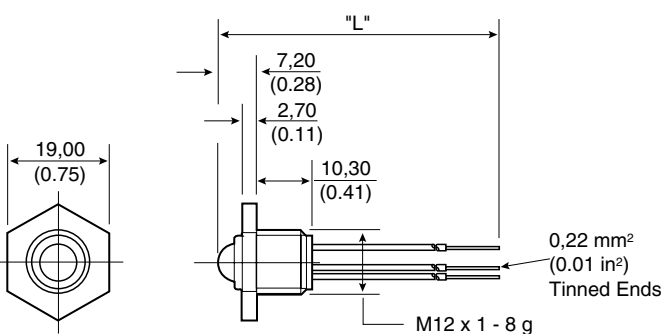
### LLE102000/LLE102101 (Type 2)



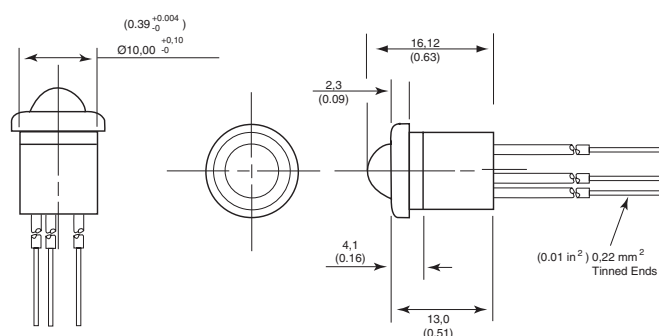
### Notes

- 1 Recommended panel hole size  $\varnothing$  12,5  
 $\pm 0.3$  mm (0.49  $\pm$  0.01 in)
- 2 'O' ring seal supplied Unassembled

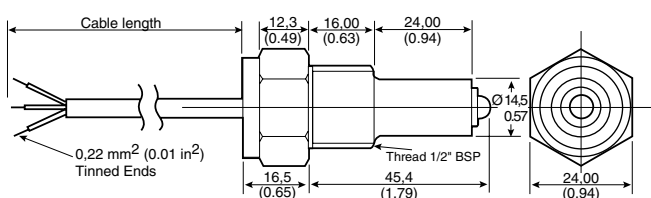
### LLE103000/LLE103101 (Type 3)



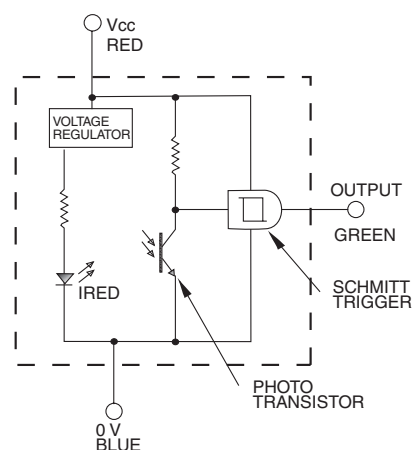
### LLE105000/LLE105100 (Type 5)



### LLE205000/LLE205100 LLE305000/LLE305100



## ELECTRICAL DIAGRAM



## **WARNING**

### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## **WARNING**

### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

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**E-mail:** [info.sc@honeywell.com](mailto:info.sc@honeywell.com)

**Internet:** [www.honeywell.com/sensing](http://www.honeywell.com/sensing)

### **Phone and Fax:**

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| Latin America | +1-305-805-8188<br>+1-305-883-8257 Fax                    |
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