

## 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<br>Thread                                                                                                                 | M12x1<br>½ in BSPT                               |
|                                            | Hex                                                                                                                            | 19 mm<br>24 mm (See mounting drawings on page 3) |
| Environmental                              |                                                                                                                                |                                                  |
| <b>Standard temperature</b>                |                                                                                                                                | <b>High temperature</b>                          |
| 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                                 |                                                                                                                                |                                                  |
| <b>Standard temperature</b>                |                                                                                                                                | <b>High temperature</b>                          |
| 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.

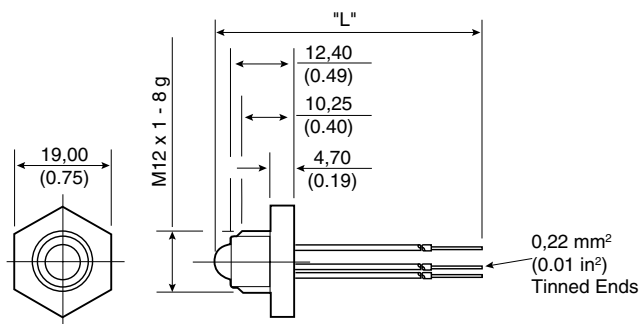
[Note 3] For other ambient light environments the user should test the sensor under application conditions to verify compatibility.

[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.

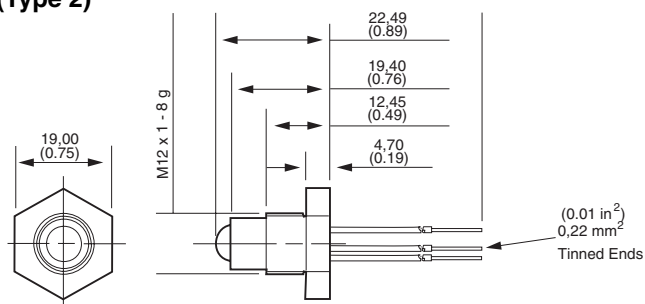
# Liquid level sensors

## MOUNTING DRAWING (IN MM AND INCHES)

### LLE101000/LLE101101 (Type 1)



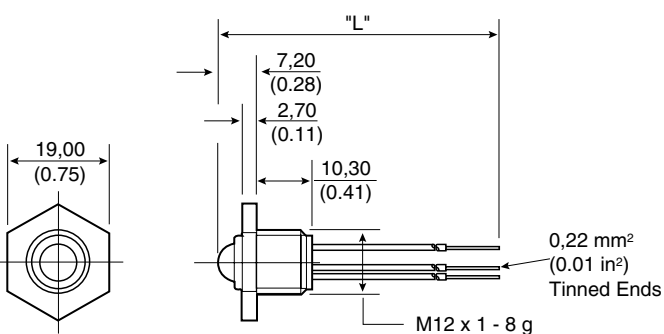
### LLE102000/LLE102101 (Type 2)



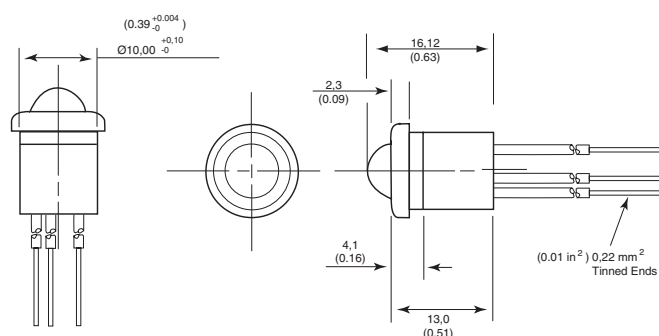
#### Notes

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

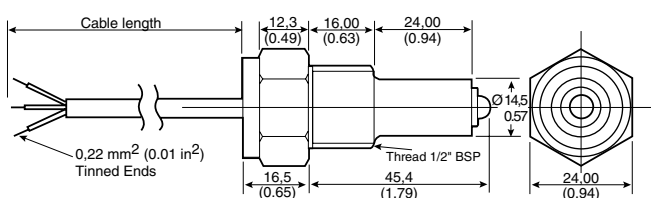
### LLE103000/LLE103101 (Type 3)



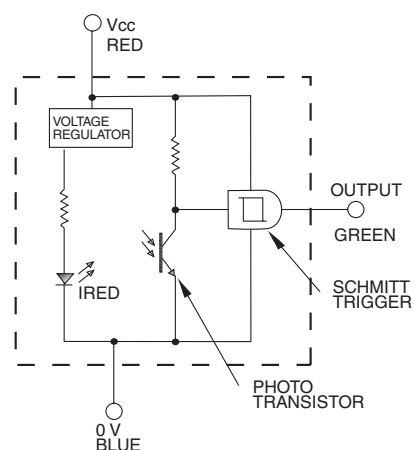
### LLE105000/LLE105100 (Type 5)



### 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.**

## **WARRANTY/REMEDY**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

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Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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