Honeywell

# 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 | **Plastic**<br>**LLE101/102/103 Series** | **Metal**<br>**LLE205/305 Series** |
| Dome | 3,5 mm radius (includes LLE105 Series) | |
| Thread | M12x1 | ½ 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/cm$^2$ 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.

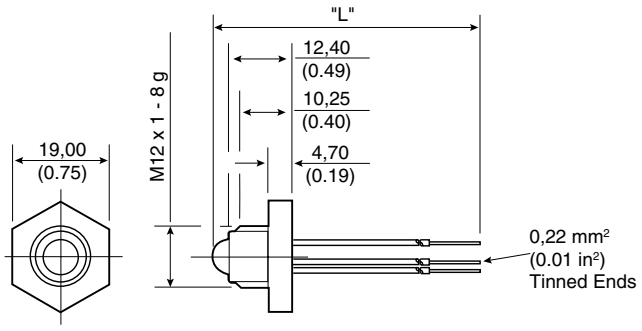
[Note 2] Threaded sensors only.

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

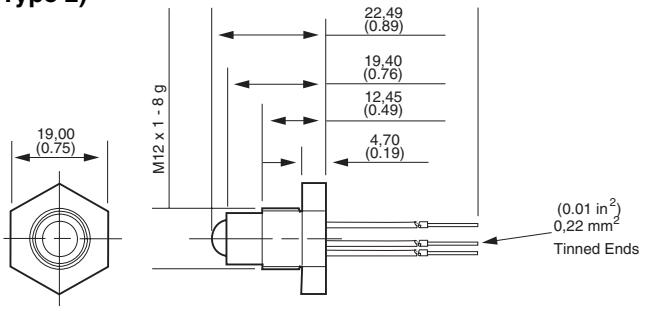
[Note 4] The output is intended as a TTL compatible output signal, for interfacing to logic systems. For interfacing with other types of circuitry an appropriate buffer circuit must be used.

## MOUNTING DRAWING (IN MM AND INCHES)

### LLE101000/LLE101101 (Type 1)



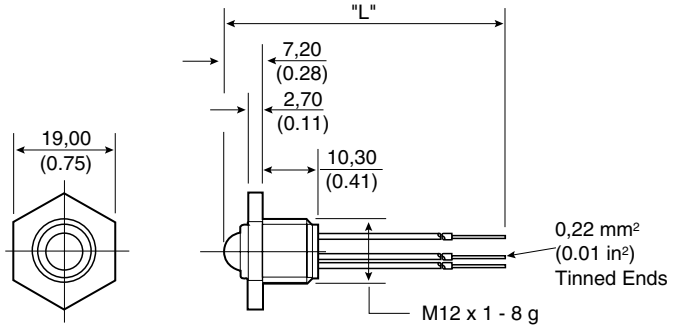

### LLE102000/LLE102101 (Type 2)



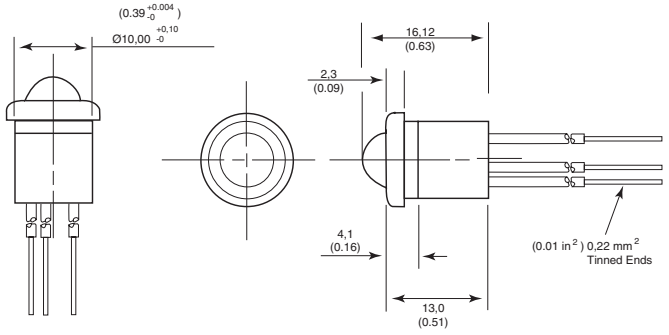

#### Notes

1 Recommended panel hole size Ø 12,5 ±0.3 mm (0.49 ±0.01 in)
2 'O' ring seal supplied Unassembled

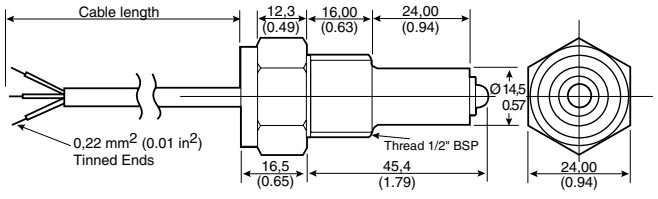
### LLE103000/LLE103101 (Type 3)



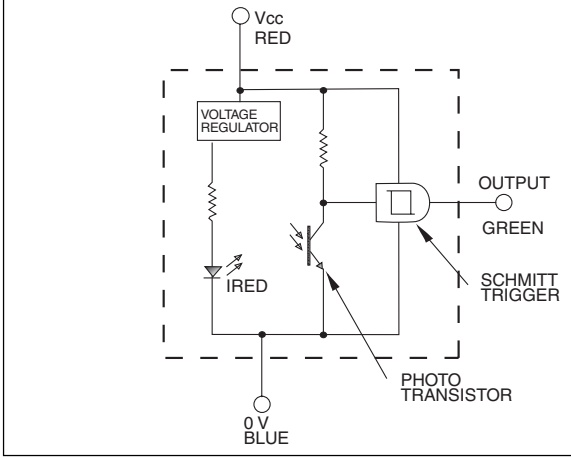

### LLE105000/LLE105100 (Type 5)




### 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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