

LLN Series Industrial liquid level sensors



Features

- TTL-compatible - 200 mA sinking output
- High degree of sealing - IP67
- Stainless steel housings for long life and ease of cleaning
- Quick-connect, industry-standard cable assembly for easy installation
- Wide operating temperature range (-40 to +125°C)
- Compact optoelectronic design gives accurate, reliable results
- Polysulphone sensor dome suitable for hygiene applications (FDA, UL, CSA and Sanitary Spec 3-A)
- Integrated power regulation

Description

LLN Series industrial liquid level sensors are designed for industrial environments exposed to extremes of temperature, pressure, vibration and shock. Standard devices feature rugged, stainless steel housings and polysulphone domes. Nickel-plated brass housings and polyamide domes are available to special order.

The mode of operation is derived from the principle of total internal reflection (see figure 1). An LED and optoschmitt are housed within a plastic dome at the head of the device. When no liquid is present, all light from the LED is totally internally reflected from the boundary to the optoschmitt. 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 optoschmitt is reduced and the output switches, denoting the presence of liquid. This method of liquid level sensing is very fast.

Typical applications

- Industrial compressors
- Machine tools
- Material handling
- Processing and packaging equipment
- Heavy-duty automotive

Technical information

Specifications	
Operation mode	User defined single on/off switch
Repeatability (mm)	± 1
Hysteresis (mm)	1 (Dependent on liquid)
Response time	Rising liquid level - instantaneous Falling liquid level - 1s max. (in ethanol). Response in other liquids dependent on viscosity
Mechanical	
Mounting	Exterior mounting by 3/8" B.S.P. thread
Installation	Wall or base mounting
Connector	3-pin integral Lumberg/Brad Harrison type connector Pin 1 supply (V_{cc}) Pin 3 0 V Pin 4 output A range of cable/connector assemblies is available
Material	Polysulphone or polyamide dome, stainless steel housing (other materials available on request)
Dimensions	Dome 3,5 mm radius Thread 3/8" B.S.P. Hex 24 mm
Environmental	
Operating temperature ($^{\circ}\text{C}$)	-40 to +125 (Sensing end only)
Storage temperature ($^{\circ}\text{C}$)	-50 to +90
Humidity	No effect on operation, dependent upon catalogue listing
Vibration/shock	Qualification tested 100 to 5000 Hz at 30g to B.S.2011 part 2.1
Pressure range (bar)	0 - 25
Ambient light limit (Lux)	20000 at 0,6 m
Electrical	
Supply voltage (V_{cc})	10 to 40 Vdc Reverse voltage protection to 40 Vdc Short circuit protection to 40 Vdc
Supply current	Optoschmitt (I_o) : 8 mA typical LED (I_{LED}) : 15 to 50 mA, dependent upon catalogue listing
Output sink current (I_o)	200 mA max

Ordering information

Catalogue listing	Description
LLN865172-1	Stainless steel housed Polysulphone dome 35 mA LED drive current NPN output, high in air
LLN865172-2	Stainless steel housed Polysulphone dome 35 mA LED drive current NPN output, low in air
LLN865172-4	Stainless steel housed Polysulphone dome 15 mA LED drive current NPN output, high in air
LLN865172-5	Stainless steel housed Polysulphone dome 15 mA LED drive current NPN output, low in air
LLN865172-6	Stainless steel housed Polysulphone dome 50 mA LED drive current NPN output, high in air
LLN865172-7	Stainless steel housed Polysulphone dome 50 mA LED drive current NPN output, low in air
HLC131-020	2 m of cable 3-pin female connector assembly Straight head
HLC231-020	2 m of cable 3-pin female connector assembly Angled head

Note:

In normal operating conditions a sensor with LED drive current of 35 mA should be selected. In situations where extreme bubbling may occur, then the sensors with drive current 15 mA should be selected (i.e. LLN865172-4 and LLN865172-5). Where extreme condensation may be present, then the sensors with drive current 50 mA should be selected. (For assistance on these points see Application Note LL3 or contact local sales office).

Principle - LLN in air

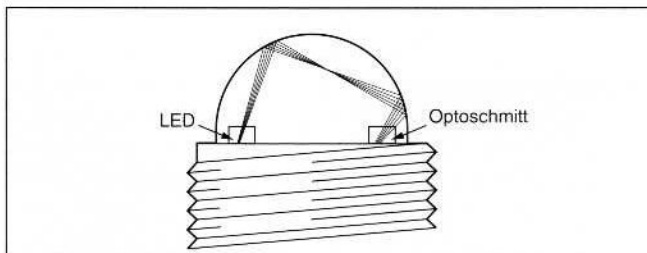


Figure 1

Electrical connections

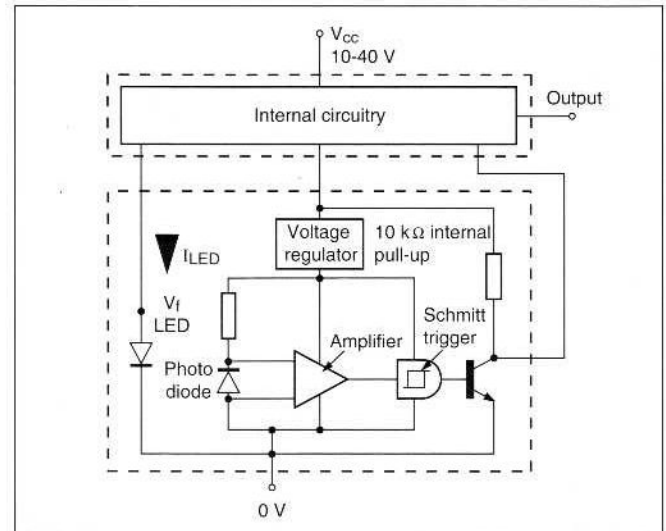


Figure 2

Mounting dimensions (for reference only)

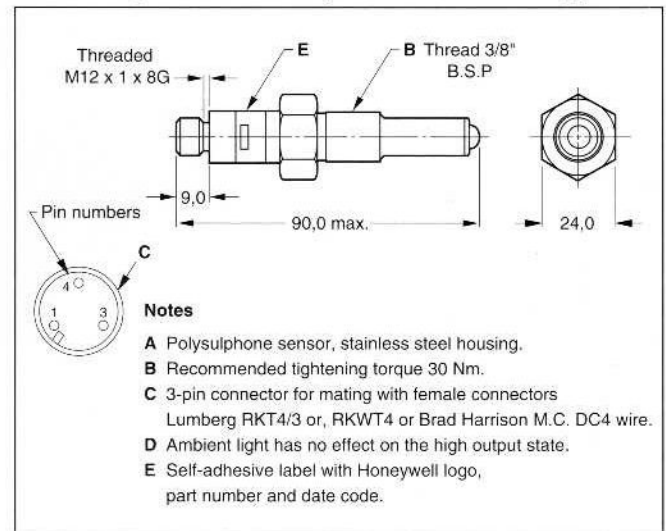


Figure 3

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