



Data Sheet

Solid state liquid level switches – standard, high temperature and industrial

RS stock numbers Standard: 317-803, 317-819

High temperature: 183-543, 183-559

Industrial: 183-565

Introduction

Three ranges of optical liquid level switches giving front and rear mounting options in standard temperature range (1), high temperature range (2) and an industrial housed unit range (3) incorporating a 4-pin miniature connector (enabling rapid replacement should the unit sustain any damage during service). Several compatible connection cables, each 2 metres in length, are available in the sensors/transducers (proximity switch accessories) section of the **RS** Catalogue. All units exploit the principle of total internal reflection. An integral LED and photosensor are so arranged that when a liquid does not cover the sensor, a light path is established between them.

Ranges 1 and 2 are housed in a polysulphone body that is compatible with most industrial liquids including oils, petrols and detergents. However, check for liquid compatibility with polysulphone before use. Mounting is by a single 12mm diameter hole. Fluoro-silicon rubber gasket and plated steel nut are supplied.

Range 3 is housed in a stainless steel body with polysulphone dome. This rugged housing enables ease of cleaning, sealing to IP65, high resistance to vibration or shock and the use of this product in areas where the pressure can be up to 50 bar. The total absence of moving parts ensures high reliability even in fast cycling applications.

Specifications

	Standard range (1)	High temp. range (2)	Industrial range (3)
Device to device consistency	Better than $\pm 1\text{mm}$		
Hysteresis	1mm (dependant on liquid)		
Mounting thread	M12 x 1		Exterior mounting by $\frac{3}{16}\text{in}$ BSP
Connections	Flying lead, 0.2m		Connector: Pin 1 = V_{CC} Pin 3 = Ov Pin 4 = o/p
Body material	Polysulphone		Stainless steel
LED current	30-50mA	30-40mA	35mA
Operating voltage (output switch)	5-16Vdc 5V at 85°C	-40 to +85°C = 5-16Vdc +85 to +125°C = 5Vdc	10-40Vdc
Sink current	40mA max	@ 25°C = 40mA max @ 125°C = 20mA max	200mA max
Operating temp. range	-20°C to +85°C	-40°C to +125°C	-40°C to +125°C (sensing end only)
Storage temp. range	-40°C to +100°C	-50°C to +150°C	-50°C to +90°C
Ambient light (Lux)	20,000 @ 0.6m		

Features

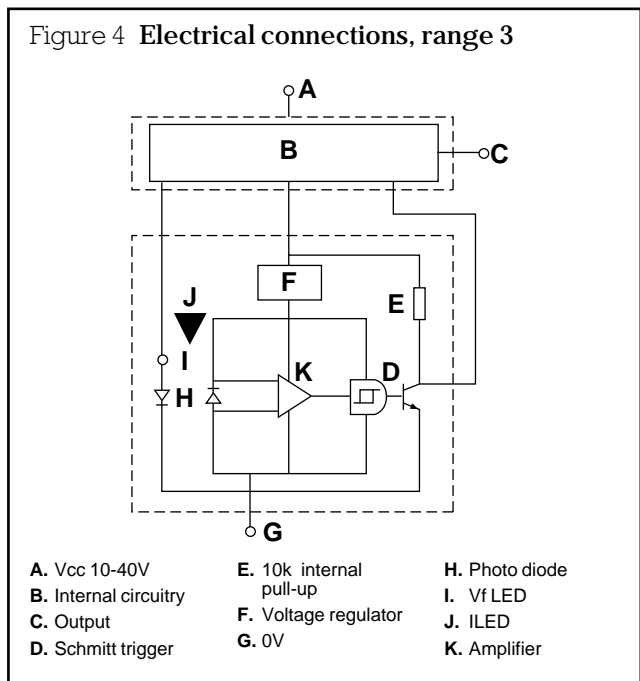
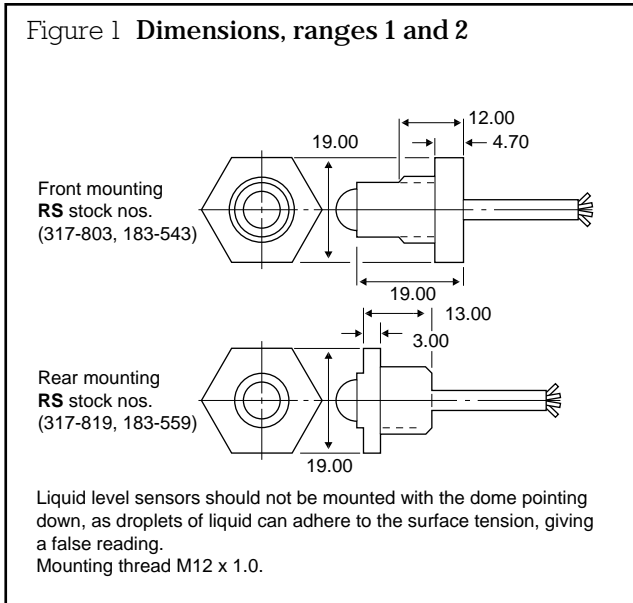
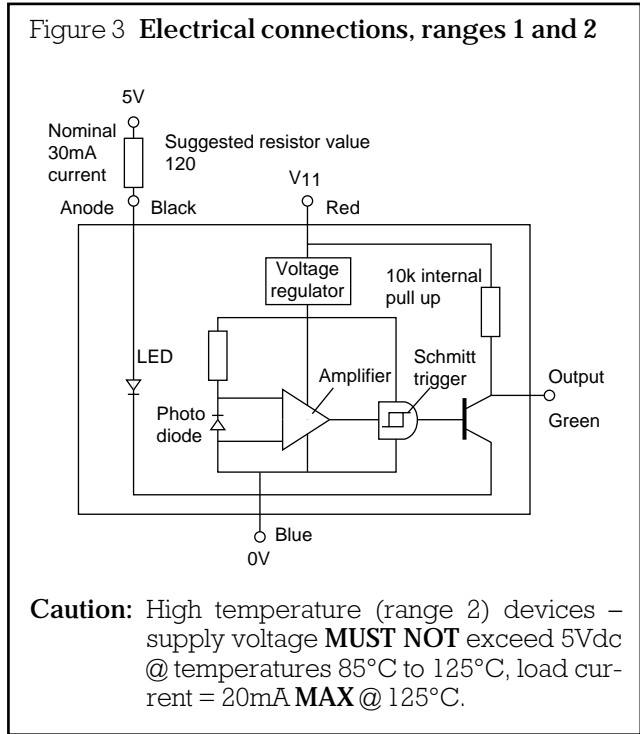
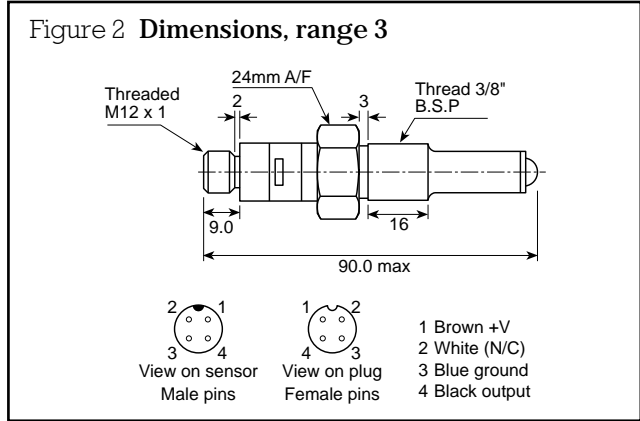
- Accurate liquid level sensing
- No mechanical moving parts – fully solid state
- Compact dimensions
- Wide range of compatible liquids
- Excellent repeatability
- High temperature performance (range 2)
- Rugged housing industrial version available (range 3).



Ranges 1 and 2



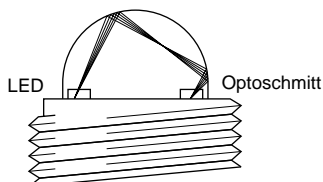
Range 3



Operation

LED and optoschmitt chips are sealed into the base of a clear plastic dome, in such a position that light is normally totally internally reflected from the dome boundary to the optoschmitt. Thus the output is normally high. When liquid covers the dome, the change in refractive index at the boundary means light escapes into the liquid, less light reaches the optoschmitt which thus turns off.

Figure 5 Operation



Suitable liquids

Acetic Acid – Glacial

Acetic Acid – 10%

Ammonia – 880

Ammonium Hydroxide – 10%

Ammonium Chloride – 10%

Aviation Spirit

Benzene

Benzoic Acid

Bleach

Brine

Butane

Butanol

Calcium Nitrate

Calcium Hypochlorite

Carbon Tetrachloride

Chromic Acid

Citric Acid

Copper Sulphate

Creosote

Cyclohexane

Cyclohexanol

Detergent Solutions

Diesel oil

Diethylamine

Diethyl Ether

Diethyl Phthalate

Edible Fats and Oils

Ethanol – 50%

Ethyl Alcohol

Ethylene Glycol

Ferric Chloride

Formaldehyde

Formic Acid

Glycerol

Heptane

Hexane

Hydrochloric Acid – 10%

Hydrochloric Acid – Concentrated

Hydrogen Peroxide

Isopropanol

Iso-Octane

Kerosene

Linseed Oil

Magnesium Sulphate

Methanol

Milk

Motor Oil

Nitric Acid – 10%

Oils – Vegetable

Oxalic Acid

Petrol

Petroleum Ether

Potassium Hydroxide – 10%

Potassium Hydroxide – 50%

Silicone Fluids

Silver Nitrate

Soap Solution

Sodium Chloride

Sodium Hydroxide – 10%

Sodium Hydroxide – 50%

Sulphuric Acid – 10%

Transformer Oil

Turpentine

Varnish

Water

White Spirit

The information provided in **RS** technical literature is believed to be accurate and reliable; however, RS Components assumes no responsibility for inaccuracies or omissions, or for the use of this information, and all use of such information shall be entirely at the user's own risk.
No responsibility is assumed by RS Components for any infringements of patents or other rights of third parties which may result from its use.
Specifications shown in RS Components technical literature are subject to change without notice.
