

# LIQUID LEVEL SWITCHES



**The function of a Liquid Level Switch is detect and monitor liquid levels.**

## Applications

The level switch can be installed in a number of locations in the refrigeration system such as liquid receivers, suction line accumulators and compressor crankcases.

The range is designed for use with HCFC, HFC and ammonia refrigerants, along with their associated oils. A 1" NPT level switch is recommended for ammonia applications. For other refrigerant/oil combinations, please contact Henry Technologies.

## How it works

The S-94 series electronic level switches use infrared light reflecting from a conical glass prism as a means of detecting the absence of fluid at the level of the glass cone. An integral part of the switch is an infrared module, containing a light emitter and receiver.

When no fluid covers the lower half of the cone, infrared light from the emitter reflects from the inner surface of the cone back to the receiver. This signals the module to switch. When fluid covers the lower half of the cone, the light from the emitter disperses into the fluid. The resulting absence of reflected light is detected by the receiver and the module switches in the opposite direction.

## Main Features

- Patented optical sensor technology<sup>#</sup>
- Robust design
- Serviceable without refrigerant loss
- No moving parts
- Fused glass hermetic seal
- Flying leads and DIN connector options

<sup>#</sup> US patent 5278426

## Technical Specification

Allowable operating pressure:	0 to 46 barg*
Allowable operating temperature:	-40°C to +99°C
Mounting:	Horizontal only
Supply voltage:	Refer to table
Switch inductive rating:	36VA pilot duty rated
Contact life:	Over 1 million cycles at rated electrical load
Power for operation:	3.5mA AC, 5.5mA DC
Minimum load:	2mA (without bleed resistor)
Resistive rating:	Refer to table
Contacts, power off:	Normally Open (NO)
Contacts, power on: (liquid present)	Refer to table
Customer interface:	Refer to table
Protection class:	IP 65 DIN models only

\*Higher pressures of up to 130 barg available on request.

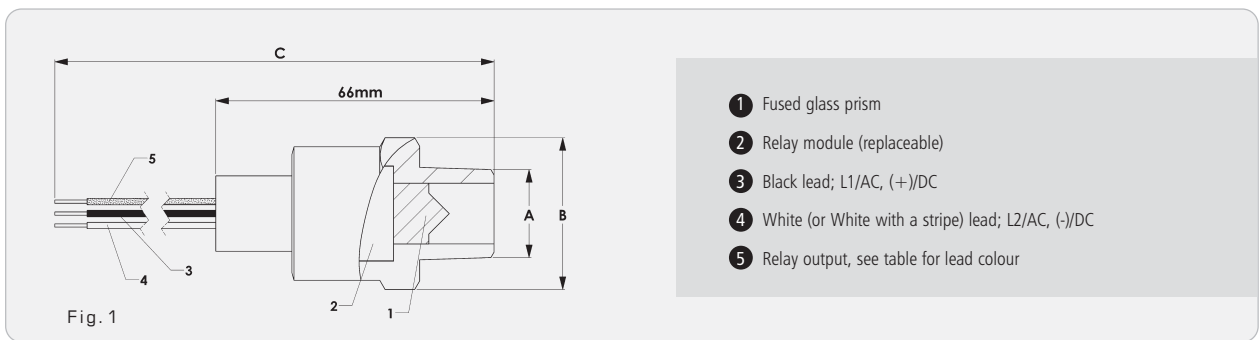
## Materials of Construction

The switch consists of a plated steel body with a built-in fused glass prism.

** Part No	Voltage	Resistive rating	Contacts - power on & liquid present	Customer interface	Wire colour codes	Drawing reference	Dimensions			Replacement Module/kit number	Weight (kg)	CE Cat
							A (mounting thread)	B across flats (mm)	C (mm)			
S-9400	120V 50/60 HZ	0.5 A	closed	flying leads	Yellow & White	fig.1	1/2" NPT	28.6	192	2-044-012	0.22	SEP
S-9420	208/240V 50/60 HZ	0.25A	closed	flying leads	Red & White	fig.1	1/2" NPT	31.8	192	A4416	0.22	SEP
S-9420A	208/240V 50/60 HZ	0.25A	open	flying leads	Red & White/Stripe	fig.1	1/2" NPT	31.8	192	A4415	0.22	SEP
S-9424	24V AC/DC	0.5A	closed	flying leads	Orange & White	fig.1	1/2" NPT	31.8	192	A4414	0.22	SEP
S-9424A	24V AC/DC	0.5A	open	flying leads	Orange & White/Stripe	fig.1	1/2" NPT	31.8	192	2-044-020	0.22	SEP

\*\*A 1" NPT connection is available for the S-9400 series by ordering with a "-1" suffix (i.e. S-9424-1)  
 Note: load is to be wired between black and coloured leads.

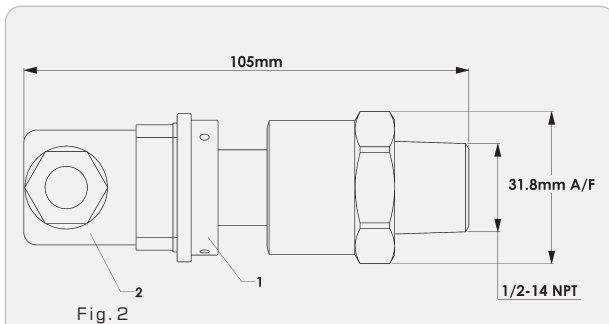
Note: The optional 1" NPT level switches allow the unit to be mounted closer to the inner wall of the vessel. This eliminates the potential for a pool of liquid next to the glass prism, which can be detrimental to performance. A 1" NPT level switch is recommended for ammonia applications where residue can build up on the glass prism.



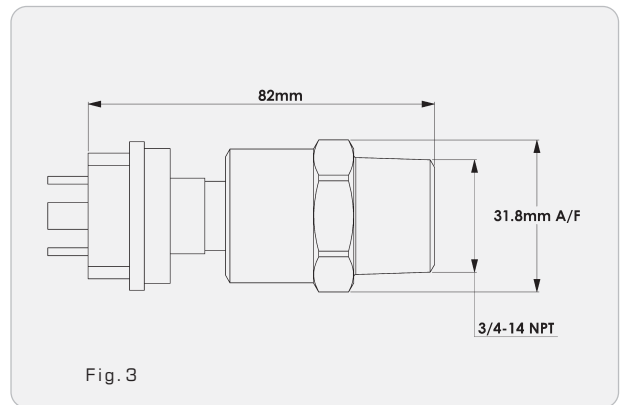
- 1 Fused glass prism
- 2 Relay module (replaceable)
- 3 Black lead; L1/AC, (+)/DC
- 4 White (or White with a stripe) lead; L2/AC, (-)/DC
- 5 Relay output, see table for lead colour

Part No	Voltage	Resistive rating	Contacts - power on & liquid present	Customer interface	Wire colour codes	Drawing reference	Replacement Module number	Weight (kg)	CE Cat
S-9420DN	208/240V 50/60 HZ	0.25 A	closed	DIN socket	Red & White	fig.2	A4416	0.23	SEP
S-9424DN	24V AC/DC	0.5 A	closed	DIN socket	Orange & White	fig.2	A4414	0.23	SEP
S-9424-3/4UK	24V AC/DC	0.5A	closed	DIN plug	Orange & White	fig.3	A4414	0.23	SEP

NOTE: load is to be wired between black and coloured leads.



- 1 Adaptor
- 2 Socket connector



**Installation – Main issues**

1. Install a level switch horizontally. If the unit is mounted at an angle or vertically, liquid can be trapped which will cause switching problems.
2. Ensure that no object is within 50 mm of the glass prism.
3. Wiring diagrams are included in the Product Instruction sheets.
4. The switches should not be used with very dirty liquids.
5. Full instructions are given in the Product Instruction sheet, provided with each unit.