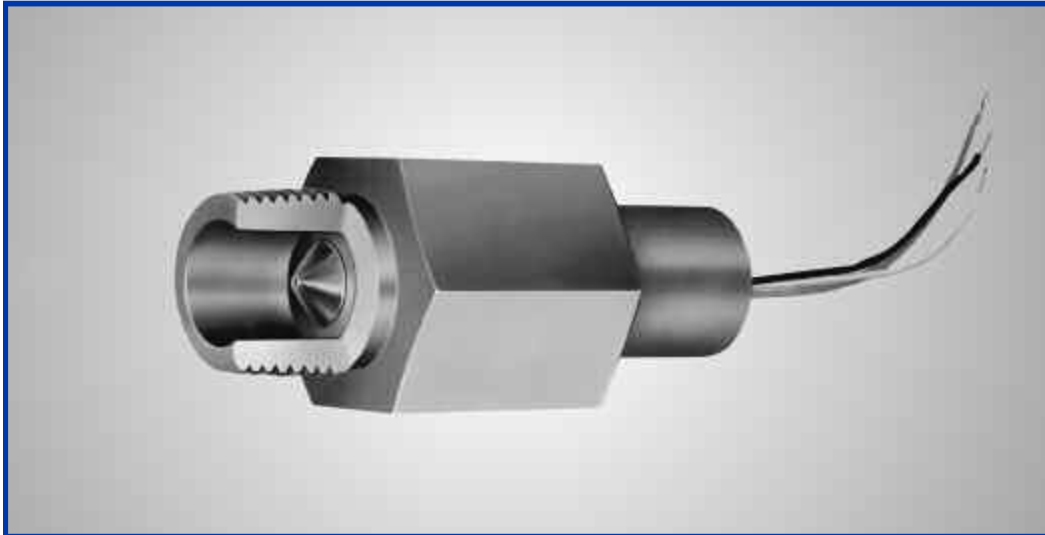


LIQUID LEVEL SWITCHES

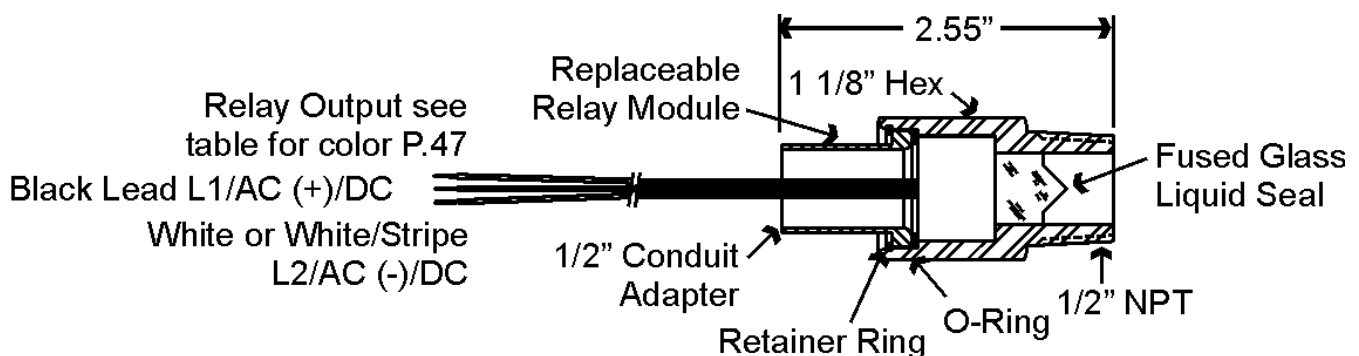


Features:

- **Solid-State Switch** for liquid sensing
- No contact level sensing
- **Serviceable** without loss of refrigerant
- **Works with oil, refrigerants**, or any non-hazardous non-corrosive fluid
- **Glass prism** in contact with fluid medium
- **Industry approved** for Nema 4 and 4X for Water tight
- **Meets UL Standard #873 & #207** File Numbers E141577 & SA6720*
- **Mounting:** Horizontal Only
- **Switch Inductive Ratings:** 36 VA Pilot Duty Rated
- **Contacts, Power Off:** Normally Open (N.O.)
- **Contact Life:** Over 1 Million Cycles at Rated Electrical Load
- **Pressure Rating:** 1200 PSI Working, 6000 Burst
- **Power for Operation:** 3.5 mA AC, 5.5 mA DC
- **Minimum Load:** 2 ma (without bleed resistor)

*U.S. Patent #5,278,426 & other U.S. and Foreign Patents pending

S-9400 Series
with 1/2" NPT Connection



LIQUID LEVEL SWITCHES

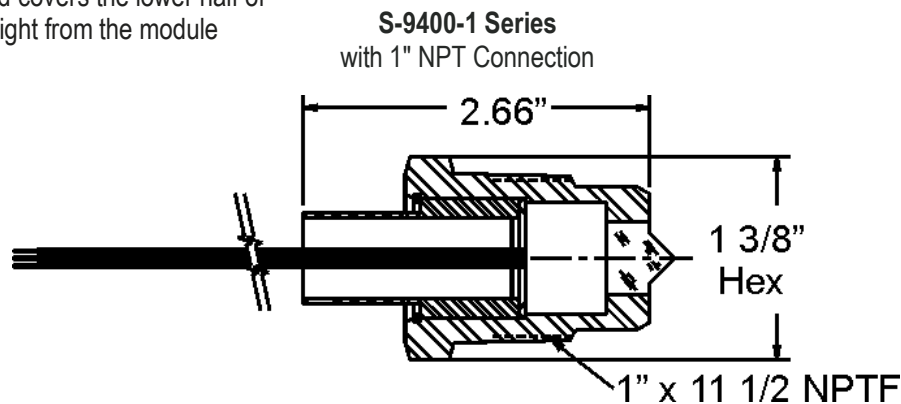
Construction: The switch consists of a sturdy nickel plated steel body with a built-in fused glass prism. This allows liquid to be optically detected by a solid state opto-electronic module. The solid state module is encapsulated in silicon. It can be easily replaced without disturbing the system. The fused glass prism provides chemical resistance to all refrigerants and high pressure ability to withstand typical burst pressure needs. The switch can be installed on any location in the refrigeration system where the temperatures do not exceed the rating in the table above. This includes Oil Separators, Oil Reservoirs, Refrigerant Receivers and compressor crankcase applications. The electrical connection end is suitable for 1/2" conduit.

Operation: The S-9400 Series Level Switch uses light reflecting from a conical glass prism as a means of detecting the absence of a fluid at the level of the glass cone. When no fluid covers the lower half of the cone infra-red light from the module

from the mirror-like inner surface of the cone back to a light detector signaling the electronic module to switch. When fluid covers the lower half of the glass cone, the light from the module passes into the fluid. This absence of light is detected by the module which switches into the opposite direction. The module provides a .06/.10 differential distance from the cone point down.

Optional 1" NPT Connection: A 1" connection is available for the S-9400 series by ordering with a "-1" suffix (i.e. S-9424A-1). The 1" pipe thread connection allows the module to be mounted closer to the inner wall of the tank. This prevents the fitting from creating a pool of liquid next to the glass prism which, in certain applications, can be detrimental to the operation. The 1" connection is also recommended for Ammonia applications where residue can build up on the sight glass.

Replacement Sight Glass Part #: 3-020-070



Catalog Numbers	Size M.P.T.	Voltage	Resistive Rating	Contacts with Liquid Present	Wire Color Code	Replacement Module No.	Min/Max Fluid Temp. *
S-9400	1/2"	120V 50/60 Hz	.5 Amp	Closed	Yellow & White	2-044-012	-40°F+210°F
S-9400-1	1"	120V 50/60 Hz	.5 Amp	Closed	Yellow & White	2-044-012	-40°F+210°F
S-9400A	1/2"	120V 50/60 Hz	.5 Amp	Open	Yellow & White/Stripe	2-044-017	-40°F+210°F
S-9400A-1	1"	120V 50/60 Hz	.5 Amp	Open	Yellow & White/Stripe	2-044-017	-40°F+210°F
S-9420	1/2"	208/240V 50/60 Hz	.25 Amp	Closed	Red & White	2-044-015	-40°F+200°F
S-9420-1	1"	208/240V 50/60 Hz	.25 Amp	Closed	Red & White	2-044-015	-40°F+200°F
S-9420A	1/2"	208/240V 50/60 Hz	.25 Amp	Open	Red & White/Stripe	2-044-018	-40°F+200°F
S-9420A-1	1"	208/240V 50/60 Hz	.25 Amp	Open	Red & White/Stripe	2-044-018	-40°F+200°F
S-9424	1/2"	24V AC/DC	.5 Amp	Closed	Orange & White	2-044-013	-40°F+210°F
S-9424-1	1"	24V AC/DC	.5 Amp	Closed	Orange & White	2-044-013	-40°F+210°F
S-9424A	1/2"	24V AC/DC	.5 Amp	Open	Orange & White/Stripe	2-044-020	-40°F+210°F
S-9424A-1	1"	24V AC/DC	.5 Amp	Open	Orange & White/Stripe	2-044-020	-40°F+210°F

* Actual fluid temperature, not tank temperature

NOTE: Load is to be wired between black and colored leads

LIQUID LEVEL SWITCHES

Suitable for Ammonia

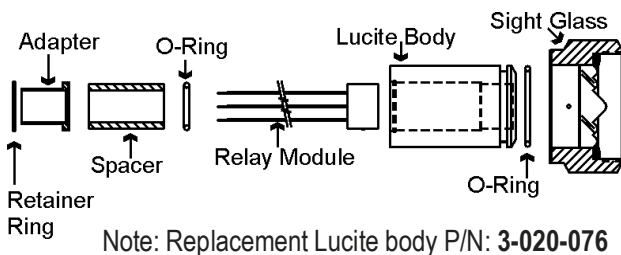
Installation:

The E-9400 series liquid level switch is intended to be mounted horizontally on the side of a liquid level column in the sight glass cap. The switch can be installed on any location on the liquid level column when the temperatures do not exceed the rating in the table on page 25. This includes oil separators, oil reservoirs and refrigerant receivers. The electrical connection end is suitable for 1/2" conduit. For electrical safety, liquid level switch types which use an AC power supply must be used on grounded equipment.

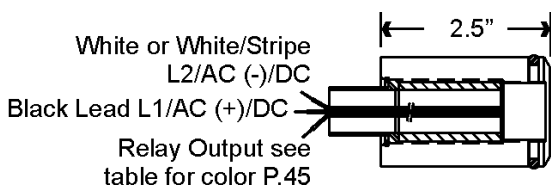
Specifications:

- **Mounting:** Horizontal only
- **Switch inductive ratings:** 35 va pilot duty rated
- **Contact, power off:** Normally Open (N.O.)
- **Contact life:** More than one million cycles at rated electrical load
- **Power for operation:** 3.5 ma AC, 5.5 ma DC
- **Minimum load:** 2 ma (without bleed resistor)

Liquid Level Switch Details Disassembled View



Liquid Level Switch Assembled View (no sight glass)

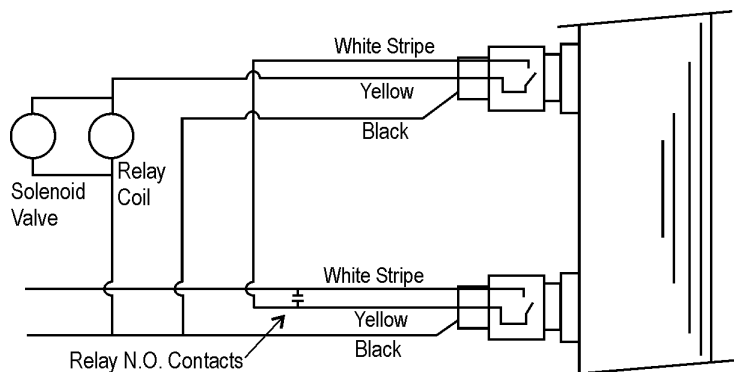
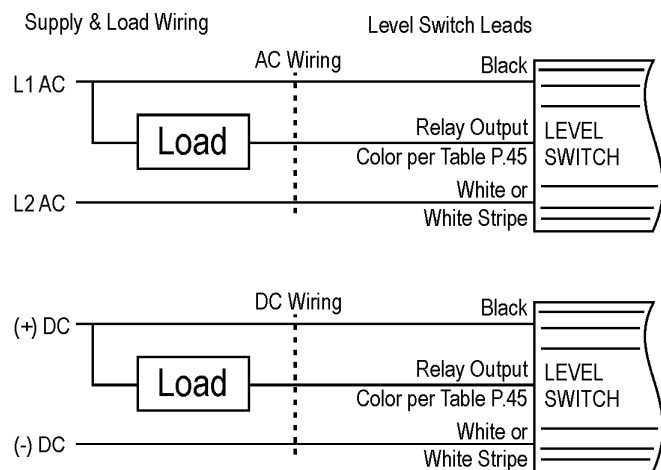


Module Replacement:

- Disconnect the power
- Remove wiring box from the retainer
- Remove the R. Ring with an IRR P-101 or equivalent retaining ring pliers
- Remove the adapter
- Pull out the module by the leads
- Install new module
- Verify the voltage rating
- Re-assemble

Application Wiring:

Wiring diagrams for both AC and DC applications are shown below. The 3 wire switching circuits shown can be used in a number of applications.



Example:

Differential control of liquid level using E-9400A liquid level switch
Operation:

1. Turn on solenoid valve when level goes below lower E-9400A
2. Turn off solenoid valve when level goes above upper E-9400A

LIQUID LEVEL SWITCHES

Suitable for Ammonia



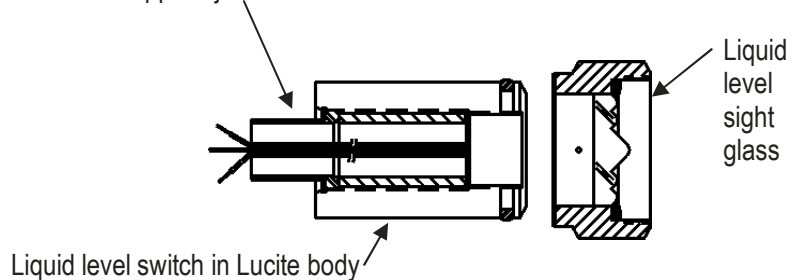
Features:

- Eliminates expensive mechanical floats
- Reduces number of connections required on liquid level columns by mechanical floats
- Provides automatic control of pumps, valves, high and low alarms, and cutouts
- Can be interfaced with a computer to track and record refrigerant levels
- To change level requirements, simply move the liquid level switch assembly on the liquid level column
- Maximum working pressure: 500 PSI (35 Kg/cm²)
- Temperature rating: see table below
- Solid State Switching for liquid sensing
- No contact level sensing
- Serviceable without loss of refrigerant
- Works with oil, refrigerants, water, or any non-hazardous, non-corrosive fluid
- Only glass prism in contact with fluid medium
- Meets UL standard #873 and #207 file numbers E141577 and SA6720.
- U.S. Patent 5,278,426

Operation:

The E-9400 series liquid level switches use infrared light reflecting from a conical glass prism molded in the sight glass as a means of detecting the absence of a fluid at the level of the glass cone. When no fluid covers the lower half of the cone, infra-red light from the module reflects from the mirror-like inner surface of the cone back to a light detector signaling the electronic module to switch. When fluid covers the lower half of the glass cone, the light from the module passes into the fluid. This absence of light is detected by the module, which switches into the opposite direction. The module provides a .06/.10 differential distance from the cone point down.

Same dia. as 1/2" conduit for coupling to customer supplied junction box.



Catalog Number	Voltage	Resistive Rating	Contacts Liquid Present	Wire Color Code	Replacement Module No.	Min/Max Fluid Temp.
E-9400	120V 50/60 Hz	.5 Amp	N.C.	Yellow & White	2-044-012	-40°F+210°F
E-9400A	120V 50/60 Hz	.5 Amp	N.O.	Yellow & White/Stripe	2-044-017	-40°F+210°F
E-9420	208/240V 50/60 Hz	.25 Amp	N.C.	Red & White	2-044-015	-40°F+200°F
E-9420A	208/240V 50/60 Hz	.25 Amp	N.O.	Red & White/Stripe	2-044-018	-40°F+200°F
E-9424	24V AC/DC	.5 Amp	N.C.	Orange & White	2-044-013	-40°F+210°F
E-9424A	24V AC/DC	.5 Amp	N.O.	Orange & White/Stripe	2-044-020	-40°F+210°F