



*Instruction Manual*

***PLS 960 Series***

***Multi-Point Liquid Level Systems***



**Sensaras**

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## General.

**The PLS960 Series** is a multipoint liquid level system that is designed primarily for the Semiconductor Industry to detect various purity liquid chemicals at specified levels in precursor bubblers and ampoules.

The system uses Ultrasonic Technology to sense the presence or absence of the chemical in a container. There are no moving parts in the system; it is not dependent on the dielectric constants, color, density and viscosity of the chemical to function correctly.

**The Probe** is constructed in 316LSS and is designed to stay with the container during use and transport for refill. The probes are Vacuum leak tested to within 5E-09 ATM-CC/Sec HE.

*The option for a K-type thermocouple is available.*

**The Electronic Module** is designed to function without calibration allowing the probe to be functional no matter the chemical, the chemical density, color or viscosity. Each sensing point has a 1A SPDT relay for the output, below are the p/n's with options of the 5<sup>th</sup> relay. A HD15 male connection for the output makes for easy connection to the tool.

For the 7 point electronics the 8<sup>th</sup> relay is the fault relay with a HD26 male connection for the output.

P/N 096-20014:- 4 X 1A SPDT with Fault Relay (no sensor, lower point dry while point above shows wet).

P/N 096-20034:- 4 X 1A SPDT with Fault Relay and Thermocouple K-type display.

P/N 096-20054:- 4 X 1A SPDT with Fault Relay in Fail-safe mode.

P/N 096-20094:- 4 X 1A SPDT with Fault Relay and Thermocouple K-type display in Fail-safe mode.

P/N 096-20017:- 7 X 1A SPDT with Fault Relay (no sensor, lower point dry while point above shows wet).

**A fail proof version is also available. This version has Two Independent Watch-Dog-Timer Circuits added to fail-safe version of the electronics to check the microprocessor. Should the processor fall into a loop this option will trip the Fault Relay Circuit.**

**P/N 096-21054:- 4 X 1A SPDT with Fault Relay in Fail-safe mode and WDTC function (up to 4 point).**

**P/N 096-20057:- 7 X 1A SPDT with Fault Relay in Fail-safe mode and WDTC function (up to 7 point).**

## Installation.

The probes are installed in the vessel as per requirements, be careful not to damage the VCR seal. Leak test the system before filling the vessel with chemical.

The electronic module has 4 mounting holes in the enclosure for installation (see dimensions). Be sure to install the enclosure with conductive (metal) fasteners to an electrically grounded surface.

The electronic module has one mounting hole intentionally stripped of the paint to insure a solid connection is made to the electrically grounded surface.

Adding a ground wire from the return (-) to the connection at mounting hole will insure that the return is at the same ground potential as the electrically grounded surface (see wiring)

The input power to the system is 24VDC +/- 10% consuming 250mA.

Remove the 2 pin terminal block from the electronic module to connect the power (see power wiring).

Connect power to the electronic module.

## **RELAY and LED FUNCTIONS**

### **Standard electronic module 096-20014, 096-20034, 096-20017**

- Power on – No sensor connected – Level Relays De-energized – Level LEDs Blink.
  - Fault relay energized- Fault LED is RED
- Sensor connected (dry) – Level Relays de-energized- Level LED's RED.
  - Fault relay de-energized- Fault LED is GREEN
- Sensor connected (wet)- Level Relays energized - LED's GREEN.
  - Fault relay de-energized- Fault LED is GREEN

### **Fail-Safe electronic module 096-20054, 096-20094, 096-21054 096-20057**

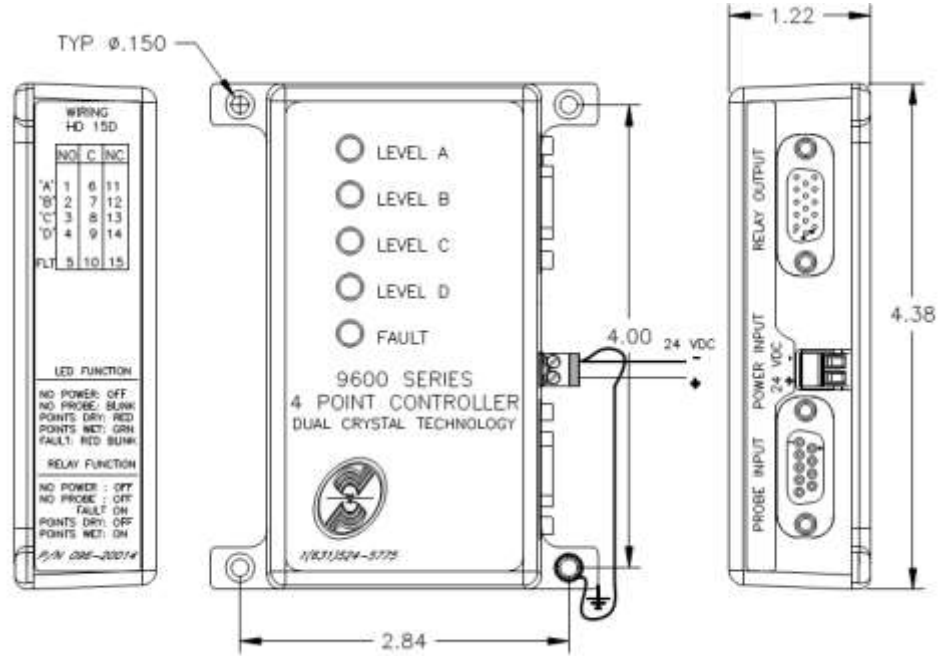
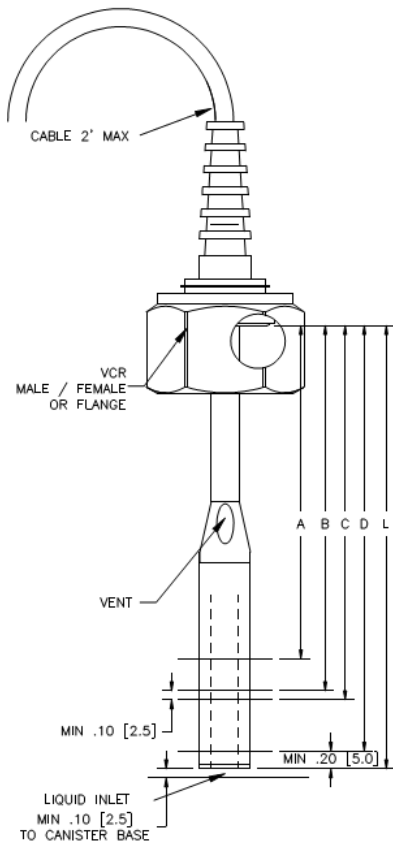
- Power on – No sensor connected – Level Relays Energized – Level LEDs Blink.
  - Fault relay de-energized- Fault LED is RED
- Sensor connected (dry) – Level Relays energized- Level LED's RED.
  - Fault relay energized- Fault LED is GREEN
- Sensor connected (wet)- Level Relays de-energized - LED's GREEN.
  - Fault relay energized- Fault LED is GREEN

❖ **Fault condition Fault Relay changes state, LED blinks RED.**

## DIMENSIONS AND POWER / GROUND WIRING.

### 4 Point Remote

The Probe is custom made per drawing with Customer approval.  
 Dimensions of sensing points (A,B,C,D (E) and L) Taken from VCR gland.  
 Up to 5 point are available with a ½" VCR fitting.



### PIN LAYOUT

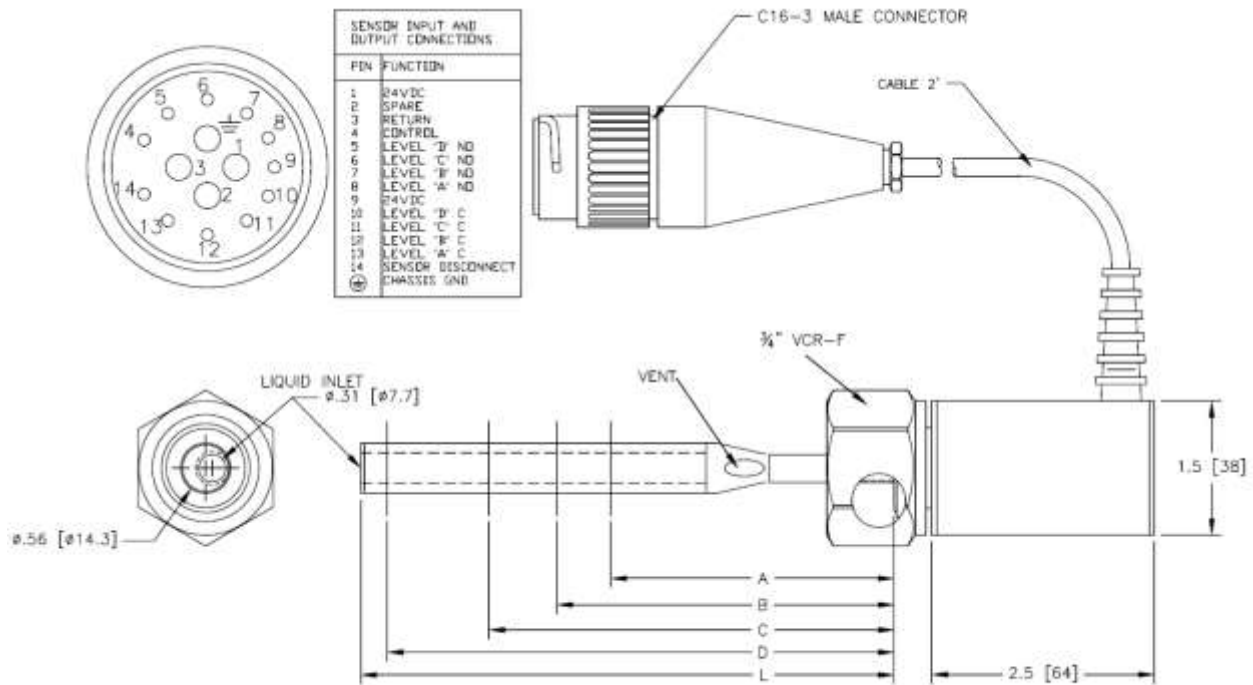
Sensor Input (9 Pin)	
1	Signal 'A'
2	Signal 'B'
3	Signal 'C'
4	Signal 'D'
5	Signal 'T'
6	Sensor Verify
7	Ground
8	Ground
9	Sensor Connect

Relay Output (15 Pin HD)			
Level 'A'	(1) N.O.	(6) C	(11) N.C.
Level 'B'	(2) N.O.	(7) C	(12) N.C.
Level 'C'	(3) N.O.	(8) C	(13) N.C.
Level 'D'	(4) N.O.	(9) C	(14) N.C.
Fault			
Or	(5) N.O.	(10) C	(15) N.C.
Auto Fill			
Empty			

**Integral systems:**

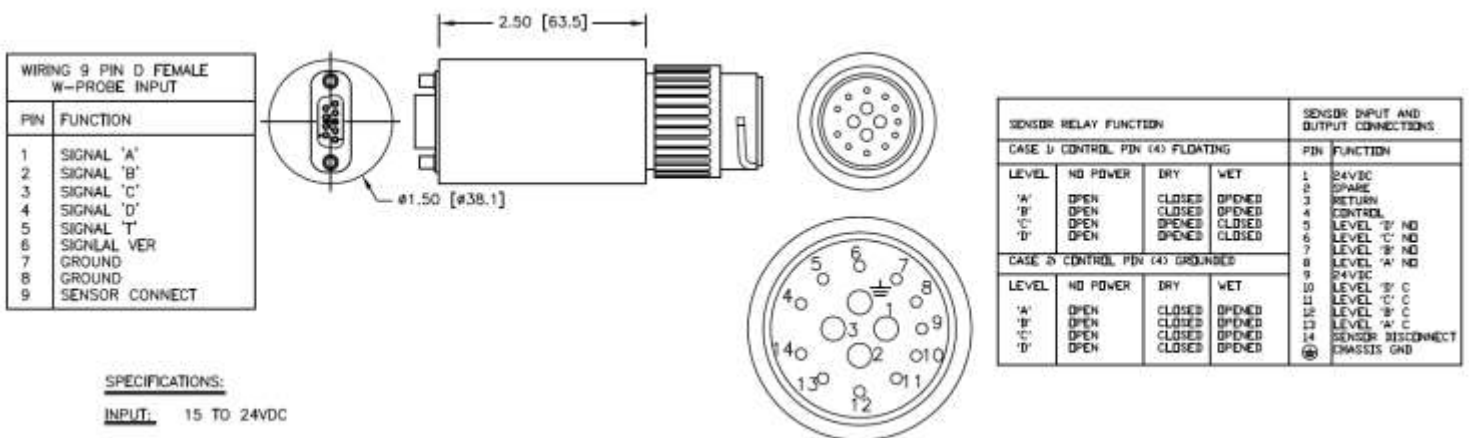
**Wiring and Dimensions**

**The Probe is custom made per drawing with Customer approval.  
Dimensions of sensing points (A,B,C,D and L) Taken from VCR gland.**



SENSOR INPUT AND OUTPUT CONNECTIONS	
PIN	FUNCTION
1	24VDC
2	SPARE
3	RETURN
4	CONTROL
5	LEVEL 'B' NO
6	LEVEL 'C' NO
7	LEVEL 'B' NO
8	LEVEL 'A' NO
9	24VDC
10	LEVEL 'B' C
11	LEVEL 'C' C
12	LEVEL 'B' C
13	LEVEL 'A' C
14	SENSOR DISCONNECT
⊕	CHASSIS GND

**P/N 096-20024:- Integral electronics with C-16 connector. (NO LED Display).**



**SPECIFICATIONS:**

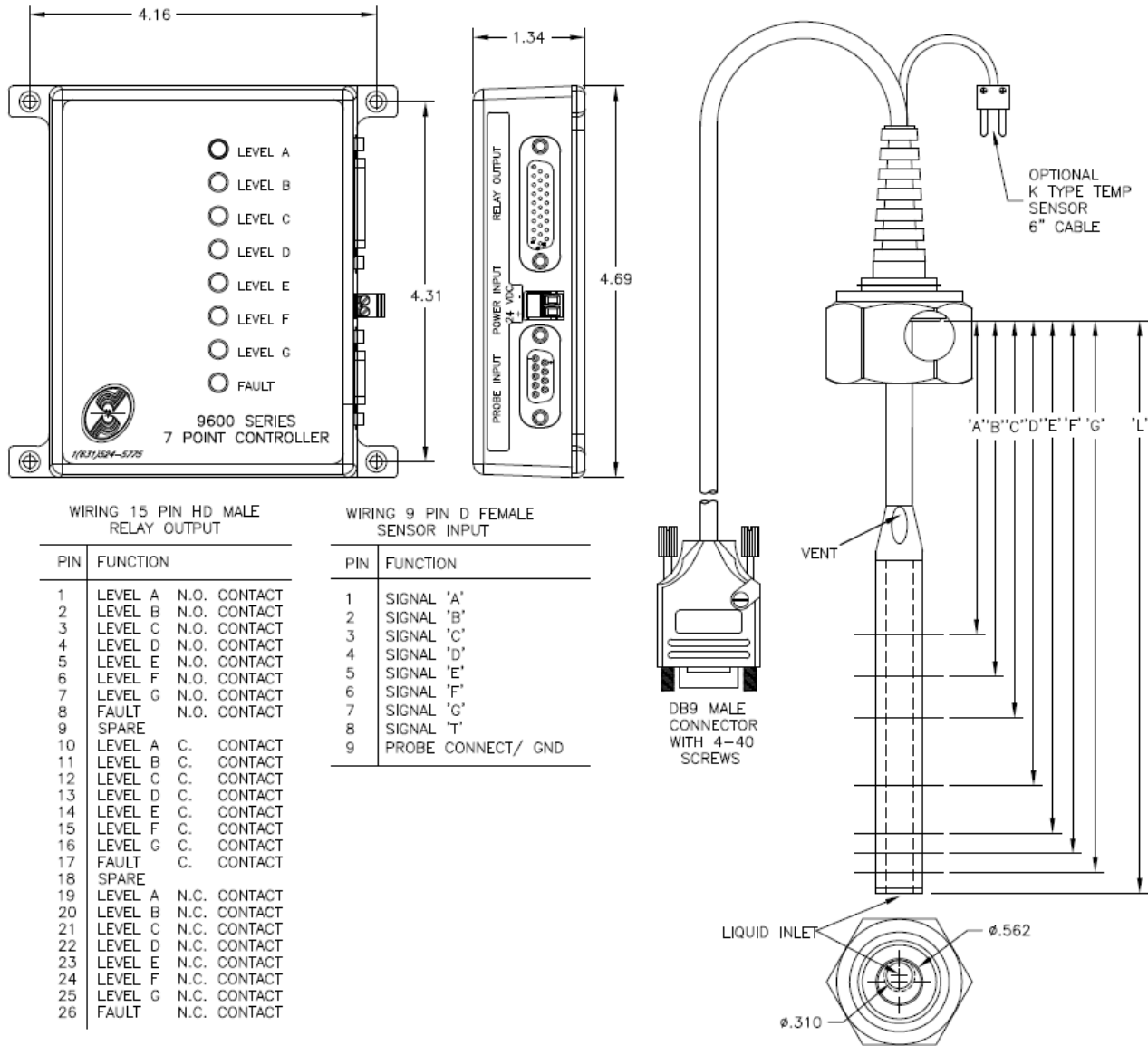
**INPUT:** 15 TO 24VDC

**OUTPUT:** 1A SPST 4 POINTS

The above electronic module is intended to connect and stay to the customers tool using the standard 4-point level sensor. This set up increases the temperature specifications of the application.

## 7 Point Remote

The Probe is custom made per drawing with Customer approval.  
 Dimensions of sensing points (A,B,C,D,E,F,G and L) Taken from VCR gland.  
 Up to 7 points are available with a 3/4" VCR fitting.



### Cleaning of sensors.

During the process of cleaning the sensors after use. **DO NOT** over heat the sensors past the temperature limit as per the drawing, or heat the sensors and rapidly cool it. This will break the bond of the ultrasonic elements from the inner tube and cause the sensing points to weaken or even fail. Take caution not to drop or strike the sensor violently, the shock can produce the above effect.

### Warranty:

Sensaras LLC, products are warranted to be free from defects in material and workmanship for a period of 24 months from the date of shipment of the original Purchaser and Order. This warranty applies to the general purchaser and to components installed, serviced and operated according to the instruction manual. Sensaras will repair or replace at its option. Claims are to be made in the warranty period. It does not apply to any component that has been damaged due to improper installation, exposed to unusual atmospheric conditions, misuse, misapplied or damage due to neglect, damage, abuse, altering or repairing.

- The Sensaras products must be maintained and installed in strict accordance with the National Electrical Code and the applicable.
- The Sensaras Product Instruction Bulletin that covers installation, operation and proper maintenance. Failure to observe this information may result in serious injury or damages.
- Please adhere to the pressure and temperature limitations shown in drawings and specifications. These limitations must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures / temperatures and their frequencies.
- Selection of materials for compatibility with the media is critical to the life and operation of the Sensaras products.
- Ambient temperature changes do affect switch set points, since the gravity of a liquid can vary with temperature.
- Our sensors have been designed to resist shock and vibration. However, shock and vibration should be minimized.
- Filter liquid media containing particulate and/or debris to ensure the proper operation of our products.
- Our sensors must not be field-repaired.
- Physical damage sustained by product may render it unserviceable.

#### **Material Returns:**

Returns are accepted on stock items up to 30 days from date of order. You must contact our Returns Department for a Return Material Authorization (RMA) # Return the goods - freight prepaid - in the original container and include original packing slip.

C. O. D. returns are not accepted. Sensaras reserves the right to apply restocking charges.

Telephone: 1-631-524-5775.

**PLS9604-07 -01/20**