LEVEL - EASE

9000 SERIES

MODEL 9830-ILA
INTERSTITIAL LEAK ALARM

User Manual

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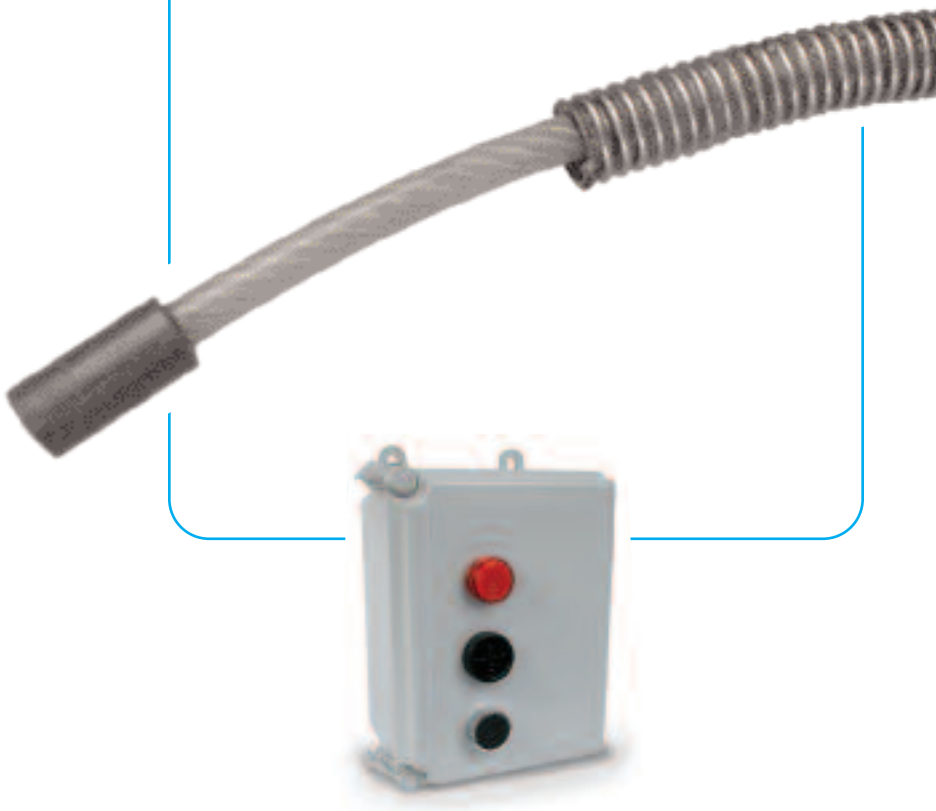
9830-ILA

Interstitial Tank Leak Alarm

Reliable monitoring of the interstitial space in double wall tanks

Over 30 years of Arjay's field proven HF capacitance technology has been applied to the 9830-ILA leak alarm. The flexible cable probe continuously monitors for the accumulation of liquid in the normally dry tank wall.

- capacitance technology alarms on any liquid
- no moving parts
- remote alarm unit mounts safely away from tank site



ARJAY

9830-ILA

The 9830-ILA probe monitors the interstitial space at the bottom of the tank and locks in on the capacitance field around the probe tip. Any liquid that intrudes into this space will increase the capacitive field and initiate an alarm.

The leak source can be from the stored product leaking from the tank or from groundwater leaking through the outer wall.

Features and Benefits

- stable stationary probe wraps the tank belly
- adjustable time delay and sensitivity to eliminate nuisance alarms
- remote electronics via standard twisted pair
- available with Intrinsic Safety Barrier for Hazardous Locations
- SS and PVC wetted parts allow for corrosive environments
- capacitance technology responds to all types of liquids

Technical Specifications - Control Unit

Operating Temperature	-20˚C to 50˚C
Power Input	24 vdc or 110 vac or 220 vac
Alarm Relay	5 amp, DPDT, dry
Standards	UL, CSA
Enclosure	Type 4X, IP65
Optional	Lights and Buzzer

Technical Specifications - Sensing Probe

Operating Temperature	-60˚C to 50˚C
Approval	CSA Class 1, Zone 2, Div 2, Groups A,B,C,D (also available with an Intrinsic Barrier Option)

The unique PMC circuit design, exclusive to Arjay, immediately converts the sensor signal to a frequency pulse for furtherance to the controller.

All calibration, control relays and power wiring is available at the main control unit. This can be safely mounted up to 1 km away from the tank.

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1.0 INSTRUMENT OVERVIEW

1.1 FEATURES

- Push-button calibration
- RF Technology
- Double pole Double Throw (DPDT) 5A relay contacts
- 0 – 20 second time delay
- Adjustable sensitivity
- Flexible SS sheathed probe with PVC active probe
- High or Low relay action
- No moving parts
- Custom probes available upon request

1.2 DESCRIPTION

The 9830-ILA has been designed to monitor for leaks within the interstitial space of a double walled tank. The Arjay probe provides a non-mechanical solution to monitoring for leaks, which eliminates the failures due to moving parts.

The control unit is mounted safely away from the tank using 2-conductor shielded wire. This distance can be up to 1 km using the Arjay Pulse Module Circuit (PMC). At the control unit two relay contacts activate on an alarm condition. The control relay is always in failsafe mode. The relay action may be set for high or low acting. One contact is typically used for alarm lights on the enclosure front and the other is used for interface with alarms, BAS, valves, etc.

The flexible probe is fed down into the tank wall cavity and extends around the belly of the tank so that the active probe tip is at the tank bottom. The probe is explosion proof and can be offered Intrinsically Safe by using an intrinsic safety barrier at the controller.

OPERATION

The unit uses an RF Capacitance measurement technique for high-resolution measurements. When the presence of fluid occurs the interstitial probe senses the change in capacitance and the control unit will indicate an alarm condition and change the state of it's dry relay contacts.

USER INTERFACE

Instrument status	2 color indicator: Green for normal operation, Red = instrument error, Red/Green (orange) for calibration confirmation.
Alarm Status	Red indicator: On when not in alarm, Off when in alarm.
Time delay	0 – 20 seconds.
Relay action	High or Low relay action. For high action, the relay is energized under normal conditions and de-energizes there is a presence of liquid. For low action, the relay is de-energized under normal conditions and energizes when there is a presence of liquid.
Dielectric switch	Primarily used in low dielectric where there is no liquid present at time of calibration.

PERFORMANCE

The unit measures capacitance in pF. Capacitance to Level translation depends on the surroundings and the type of material being measured.

Resolution	Capacitance: 0.4% of measured capacitance. Example: at 50pF, the resolution is 0.2pF and at 100pF, the resolution is 0.4pF.

SENSOR CONNECTION

2 wire + shielded cable from PMC 2000 to controller.

RELAY CONTACTS

Failsafe. DPDT 5A (resistive load) /250VAC/30VDC dry contacts. Selectable high or low acting alarm.

POWER

115VAC or 220VAC @ 25mA max.
24VDC @ 60mA max.

MECHANICAL SPECIFICATIONS

Enclosure	Standard: Nema 4x
Dimensions /Weight	8" (203.2mm) x 6" (152.4mm) x 4"(101.6mm)depth / 4lbs. (1.81kg)

ENVIRONMENTAL SPECIFICATIONS

Operating Temp.	-20 to 60°C for Controller only. For remote probe:-40 to 80°C
Relative Humidity	90% max. With no condensation.

2.0 INSTALLATION

NOTE: If any damage to the instrument is found, please notify an Arjay Engineering representative as soon as possible prior to installation.

Choose the mounting location in accordance with good instrument practice. Extremes of ambient temperature and vibration should be avoided. The flexible probe should be fed down the double wall of the tank until the active tip of the probe is at the bottom of the cavity where the initial presence of liquid would occur.

2.1 SENSOR

The interstitial probe is flexible allowing for the user to feed into the double wall of the tank down to the bottom of the cavity and to extend around the belly of the tank. The probe has a SS inactive sheath the entire length of the probe with the exception of the last 4 inches which is the active portion of the probe. The inactive sheath makes sure that the changes in the level of the tank do not interfere with the leak detector. The active probe is typically made of PVC and is inserted into the area that most likely to see the presence of liquid leak first. Enclosed in the housing is a pulse module circuit (PMC 2000) which changes the signal to a pulse signal, thus allowing the control electronics to be mounted up to one kilometre away.

2.2 ELECTRICAL INSTALLATION

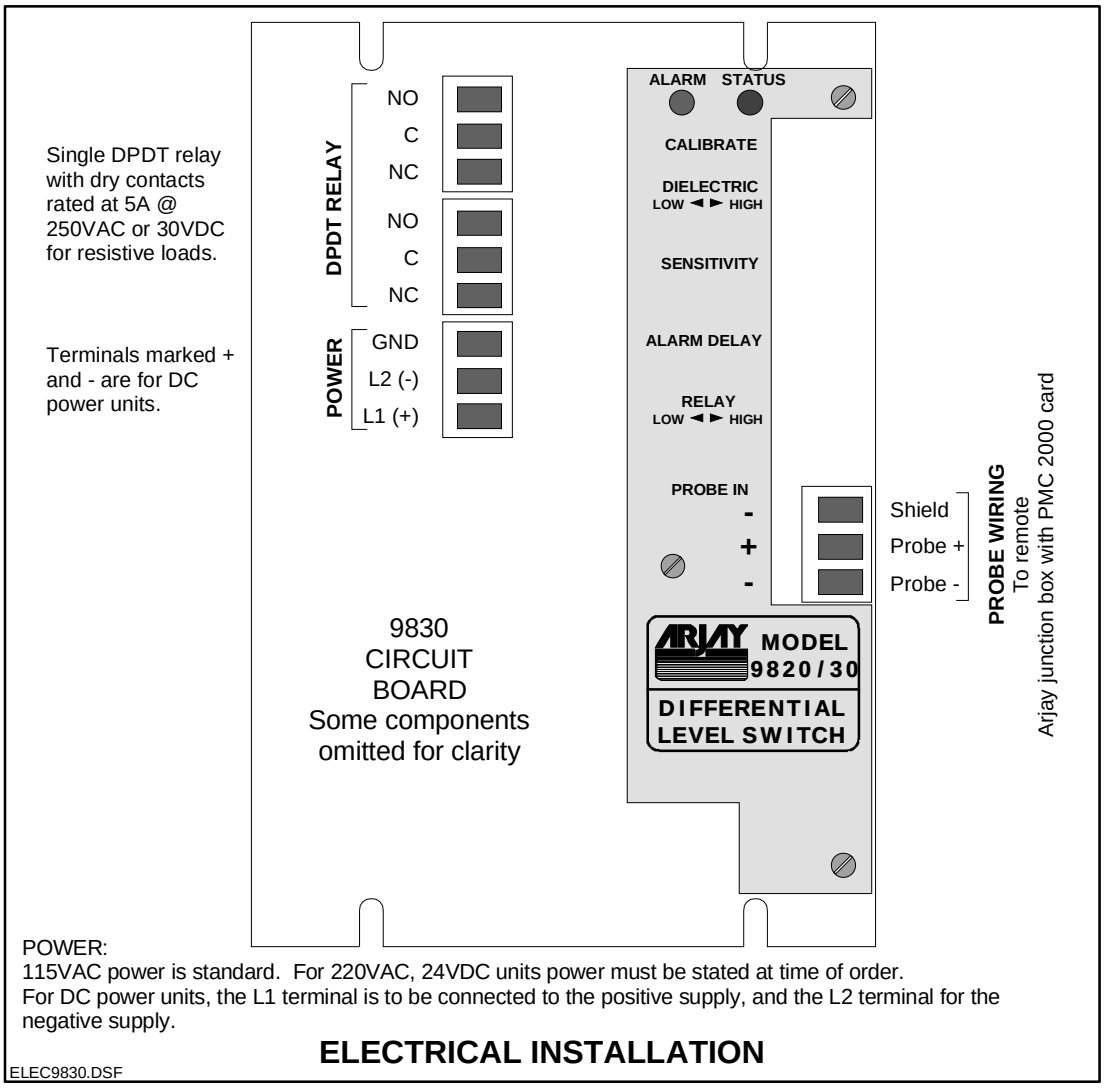


Figure 2.2

NOTE:

115VAC power is standard. Other power supply voltages are supported (220VAC. 24VDC) and must be specified at time of order.

APPLYING POWER THAN THAT MEANT FOR THE UNIT MAY CAUSE DAMAGE AND OR INJURY.

3.0 STARTUP AND CALIBRATION

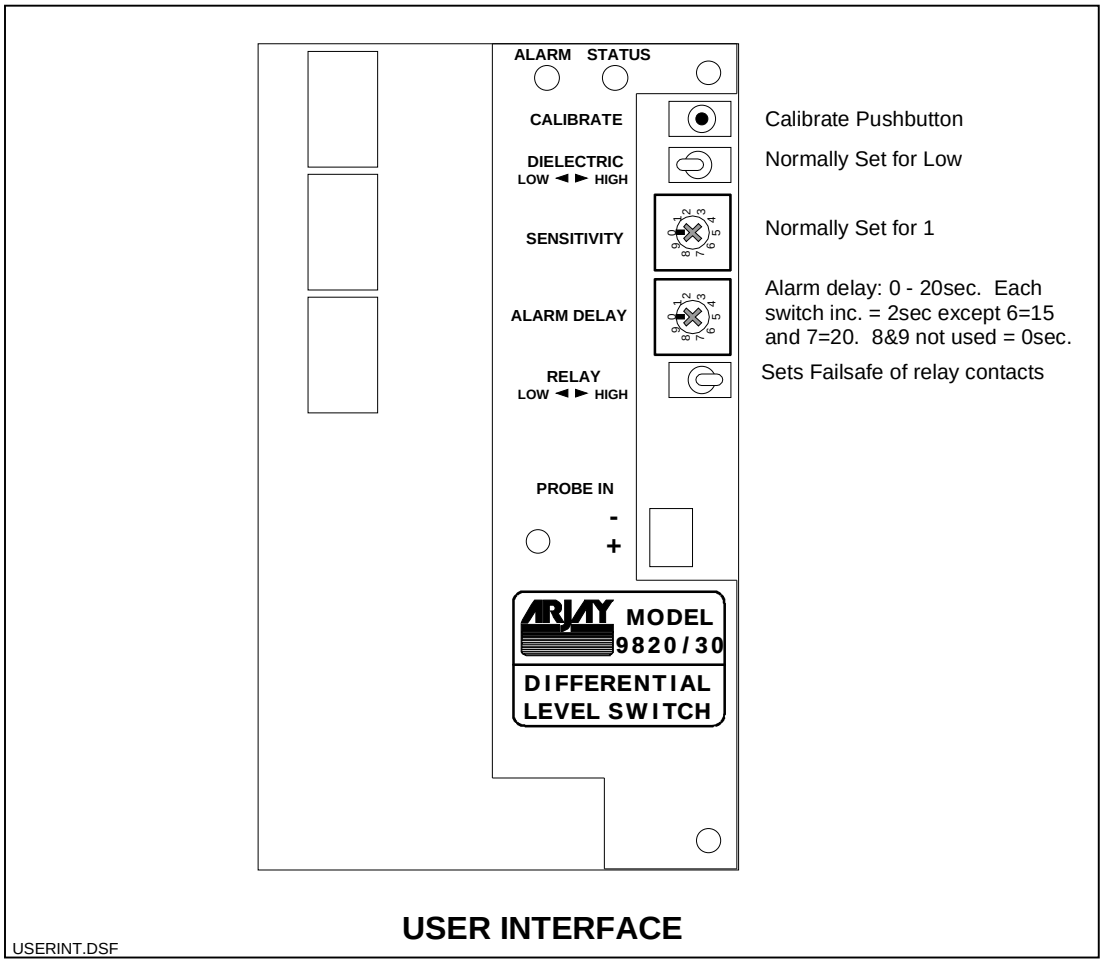


Figure 3.0

3.1 POWERUP

After the unit has been installed as per the installation procedure in section 2, power up the unit. The Status indicator should be Green. The red Alarm indicator may be on or off and is not valid until a successful calibration has been done.

If the Status indicator is red refer to the troubleshooting procedure in section 4.0 for details.

3.2 CONTROL AND FUNCTION SWITCHES

Set up the control and function switches as follows:

3.2.1 Failsafe

Put the selector in the "HI FAILSAFE" position. This will keep the relay energized during a normal dry condition. On alarm; the relay will de-energize. A power failure will also cause the relay to de-energize, signalling an alarm condition.

3.2.2 Alarm Time Delay

This is set via the Alarm Delay switch. An alarm based on the Relay Action switch must be present for at least the time delay value for the relay to switch to the alarm state. There is no delay when switching off the alarm. The delay range is 0 – 20 seconds.

DELAY SWITCH SETTING	TIME DELAY
0	0 seconds
1	2 seconds
2	4 seconds
3	6 seconds
4	8 seconds
5	10 seconds
6	15 seconds
7	20 seconds
8 & 9	Not used and act as 0 seconds.

False alarms from disturbances can therefore be ignored. Position 8 & 9 are not used and are the equivalent to 0 seconds.

3.2.3 Sensitivity

This selector switch determines the amount of fluid level change required to cause an alarm. The switch has a "0" to "9" range with "0" being most sensitive. "1" is used for most applications. If false alarms are occurring,make sure there is time delay on. If unit still has false alarms adjust the sensivity to the next number up. Position 8 & 9 are not used and are the equivalent to 0 sensitivity.

INCREASING THE NUMBER WILL DECREASE SENSITIVITY

3.2.4 Dielectric

The intersitial alarm should be calibrated during a dry condition. The switch should be set to "LO" for this calibration.

3.3 CALIBRATION

Verification of unit should be done on a bench top before proceeding with installation. (Unit needs to be recalibrated after proper installation). With the unit wired as per the drawing #990180, power on the unit. The status LED should be green indicating that power is on and unit is getting no fault conditions. If the status led is red then unit is showing a fault. Check to make sure unit is properly wired to the pulse card. A wiring fault or pulse card failure will cause the status LED to be red. Check the wiring for continuity and proper polarity. To calibrate, verify the following function switch positions:

"TIME DELAY	Position "6" (15 seconds)
"SENS"	Position "1"
"FAILSAFE"	Hi failsafe
"DIELECTRIC"	low dielectric

With the sensor in dry condition, push the CALIBRATE BUTTON. The status LED will turn red momentarily. Release the button. The status led should be green and flashing on and off showing that it is in calibration mode. Push the calibration button one more time until it goes red. Release the button. Calibration is complete and status LED should be green and alarm status LED red showing that the relay is energized under normal conditions.

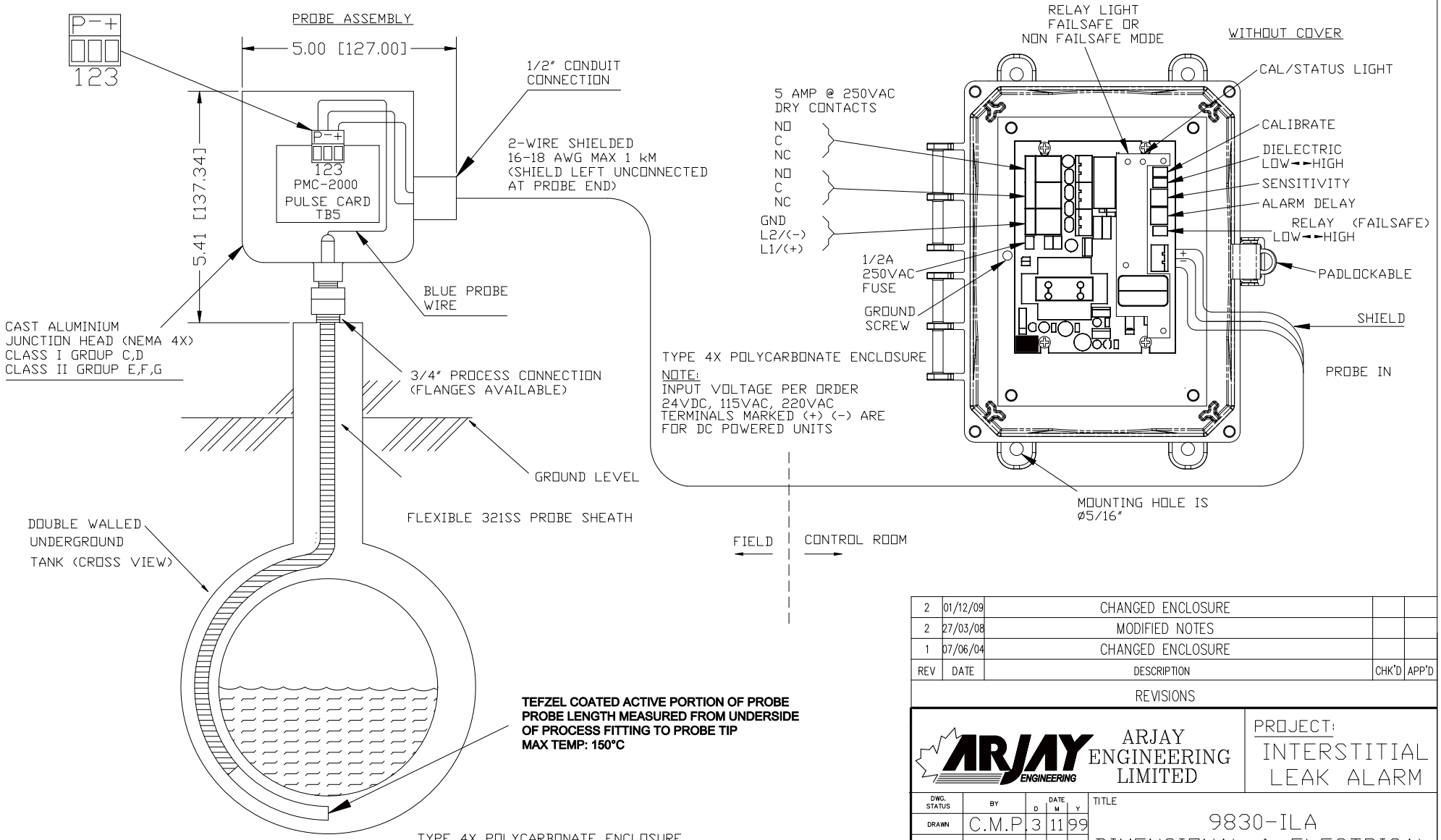
THIS COMPLETES THE SETUP AND CALIBRATION PROCEDURE FOR THE 9830 ILA

4.0 TROUBLESHOOTING

**Under normal conditions the status light on 9830 electronics (inside enclosure) should be Green and relay light should be Red. **

CONDITION	DO THIS
1. No indicators on at powerup	• Check power to unit • Make sure power applied is as specified for the unit. (e.g. 120VAC) • If power is ok, check the fuse. If the fuse is blown, call an Arjay representative to analyze why the fuse has blown.
2. Status indicator is RED (Fault Condition)	• Make sure there is a PMC 2000 card mounted in the remote junction box. • This indicates that the controller is not receiving a signal from pulse card (PMC 2000) and is weak, unstable, out of legal range, or is not present. • Verify that the polarity of the two wire shielded connection is correct such that "+" at controller to "+" at pulse card (PMC 2000) and "-" at controller to "-" at pulse card (PMC 2000). Measure with DC volt meter across "+" and "-" at pulse card (PMC 2000), it should read positive 9-10 Volts when plugged in. • Make sure there is no break in the wiring between controller and PMC 2000 card. • Disconnect probe (sensor) from "p" terminal of pulse card (PMC 2000). Verify if status LED goes to Green. • Replace the PMC 2000 card with a spare if available.

3. False alarms	• Add some time delay to unit. • If coax cable is used from sensors to pulse card (PMC 2000), make sure it is not coiled (may cause an increase in inductance). • Make sure there is no outside interference that may be causing false alarms such as an agitator, high voltage interference, or input flow to the tank affecting the probe. • Adjust the sensitivity switch to next setting to decrease the 9830's sensitivity. Test sensor after the setting has been increased to make sure the sensor can still reliably sense the presence of liquid. • Make sure separator or grease trap is filled up with water above the white Teflon (sensing area) of probe.



REV	DATE	DESCRIPTION	CHK'D	APP'D
2	01/12/09	CHANGED ENCLOSURE		
2	27/03/08	MODIFIED NOTES		
1	07/06/04	CHANGED ENCLOSURE		

REVISIONS

ARJAY ENGINEERING LIMITED

PROJECT: INTERSTITIAL LEAK ALARM

DWG. STATUS	BY	DATE D	M	Y
DRAWN	C.M.P.	3	11	99
CHECKED				
APPROVED				

TITLE: 9830-ILA DIMENSIONAL & ELECTRICAL

SCALE	REF. DWGS.	DWG. NO.	SHT.	REV.
N.T.S.		990180	1	3