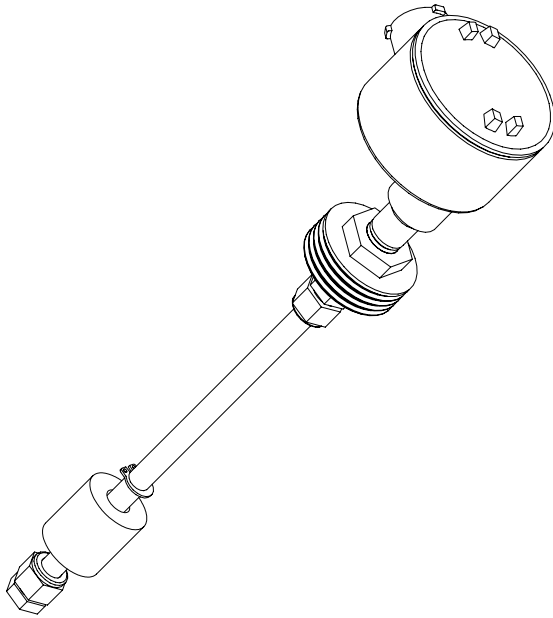


LS600 Liquid Level Float Switch Installation Instructions



Installation For Model Series: LS600, LS600M and LS600W

**For use with the
following consoles:**

LC1000	LC2000
PC1000	TMS2000
TMS3000	

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PRODUCT DESCRIPTION: The LS600 liquid level float switch consists of (3) model series as shown in the table below. All model series are supplied with minimum (1), up to (4) floats (contact factory for more floats) for liquid level sensing. If ordered by customer, manual test lever is installed on top float. Model LS600M has miniature float(s) for installation into 1" NPT minimum tank opening and applications with very close distances between set points that cannot be achieved using the standard LS600. The LS600W units are supplied with interface float(s) designed to sense levels between two immiscible liquids, typically used in an oil/water separator tank. Units can be designed to automatically detect field wiring faults when used with Pneumercator's TMS series controller FAULT-DETECT supervised wiring technology.

MODEL SERIES	MANUAL TEST LEVER	FIG.	* STANDARD SET POINT "S"				STANDARD SENSING LENGTH "SL"				STANDARD SHAFT LENGTH "L"			
			A	B	C	D	A	B	C	D	A	B	C	D
LS600	NO	1	6"	8"	12"	16"	7 1/4"	9 1/4"	13 1/4"	17 1/4"	10"	12"	16"	20"
	YES	2									11"	13"	17"	21"
LS600W	NO	1									10"	12"	16"	20"
LS600M	NO		SEE SEPARATE OUTLINE DRAWING 10620											

* Single float catalog lengths for 2" NPT STANDARD TANK MOUNT shown in table above. Multiple or single float custom sizes for RISER OR STANDARD TANK MOUNT maybe specified by customer. Note that "S1" is closest to the bottom for multiple point switches.

** Optional 150-pound mounting flange (not shown) is available upon request.

FIGURE 1

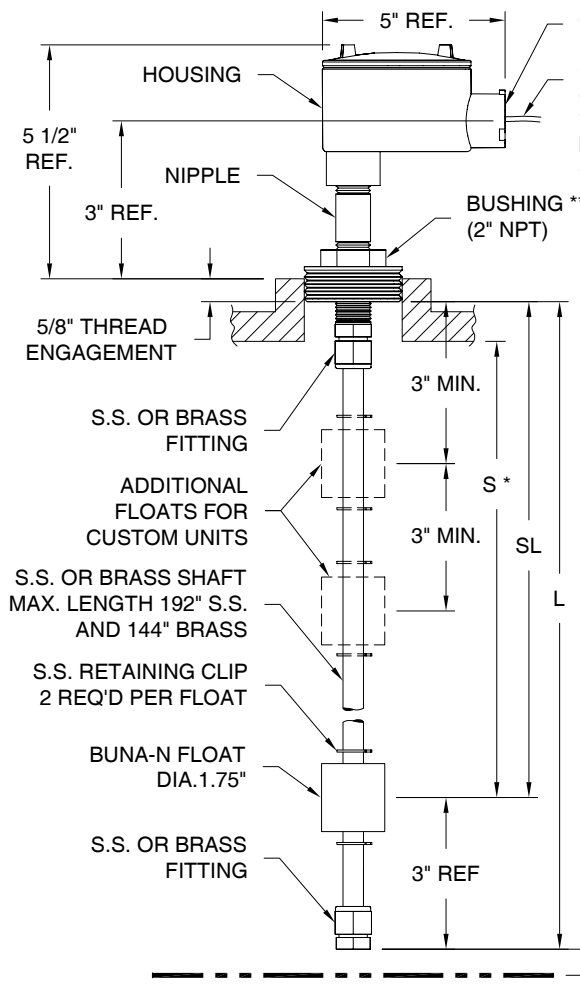
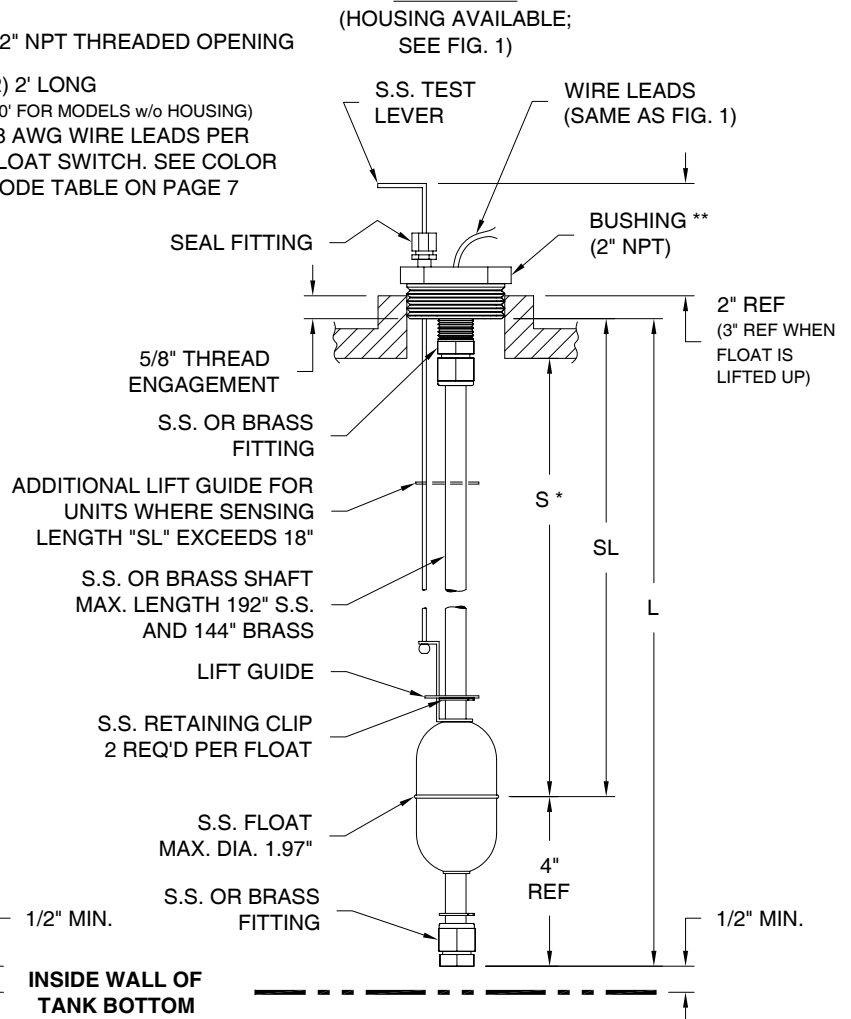



FIGURE 2



OPTIONAL S.S. FLOAT FOR 2" OR 1 1/2" NPT OPENINGS

MAX. DIA. 1.63" 

SPECIFICATIONS: NOT APPLICABLE TO LS600M.

Float Switch: Dry reed type hermetically sealed within shaft. SPST-NO rated 100W resistive load, 400V max. at 3 amp.

Temperature: -4°F to +176°F (-20°C to +80°C); +140°F (+60°C) with Buna N float.
-40°F to +257°F (-40°C to +125°C) with "X" suffix option.

NOTE: Temperature rating may be affected by any applied pressure and/or compatibility with tank contents. All conditions must be specified by customer when the order is placed.

Repeatability: 1/8" typical per set point.

Approvals:

UL913 Entity

Approved intrinsically safe for Class I, Groups C & D hazardous locations when installed in accordance with wiring drawing 50187 Ref. E139464.

UL508 General Purpose Use (electrical ratings apply ONLY to ordinary location, non-hazardous installations).

Rated 0.5A @ 120VAC, inductive.

Rated 0.25A @ 240VAC, inductive.

FM

Approved intrinsically safe with entity for Class I, II, III, Division I, Groups A, B, C, D, E, F, & G under file No. 1Q3A4.AX when used in combination with a Pneumercator LC1000 series alarm console.

APPLICATIONS: LS600 float switches are typically used in above and below ground liquid storage tanks for point level alarm and pump control applications. The float switches are used with systems such as Pneumercator LC1000 series Alarm Console, LC2000 series Leak/Point Level Console, PC1000 series Pump Controller, TMS series Tank Management System or any monitor that accepts dry contact switches to actuate audible/visual alarm indicators or relay controls. The "NCL" manual lift model has the advantage of providing a means for lifting the uppermost float to verify operation without removing the switch assembly from the tank. The "OW" models are generally used to detect HIGH and/or CRITICAL HIGH oil levels in oil/water separator tanks.

INSTALLATION:

WARNINGS: Non-compliance with the following warnings will void the warranty and may result in personal injury and/or property damage.

- Installation MUST be done by qualified personnel, familiar with local wiring codes and if applicable, explosion hazard electrical practices.
- The UL508 "General Purpose Use" electrical ratings listed above apply ONLY to ordinary location, non-hazardous installations.
- If housing must be removed for installation, hold nipple in place while unscrewing the housing. DO NOT rotate bushing or nipple relative to float shaft as this will damage internal wiring.
- DO NOT move float retaining clips. Improper positioning of retaining clips may disable switch actuation.
- NEVER modify factory-installed components.

TYPICAL MOUNTING INSTALLATIONS

1. The following are not absolutely necessary but are recommended before installing any liquid level sensing unit. Contact Pneumercator immediately if any of these tests fail or measurements are incorrect.
 - a) Confirm "open" and "closed" state of switch by connecting wire leads to an ohmmeter or continuity tester while manually moving floats up and down.
 - b) If possible, test compatibility and floatation by placing unit in a small amount of the media outside the tank.
 - c) Check the standard set point "S" and shaft length "L" as shown in the table on page 2. If installing a custom unit, confirm your measurements with the customer tank information given to Pneumercator.

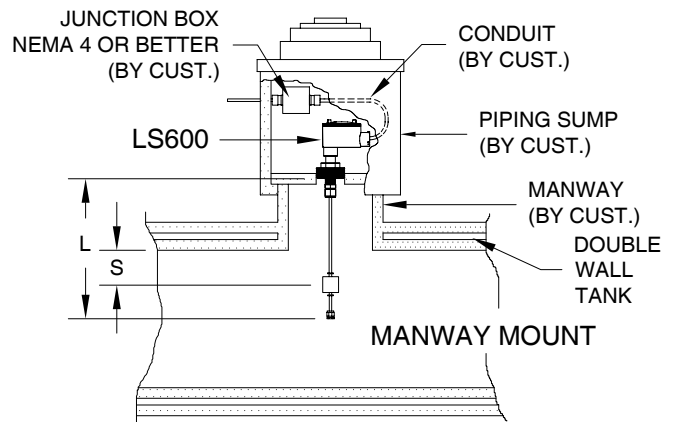
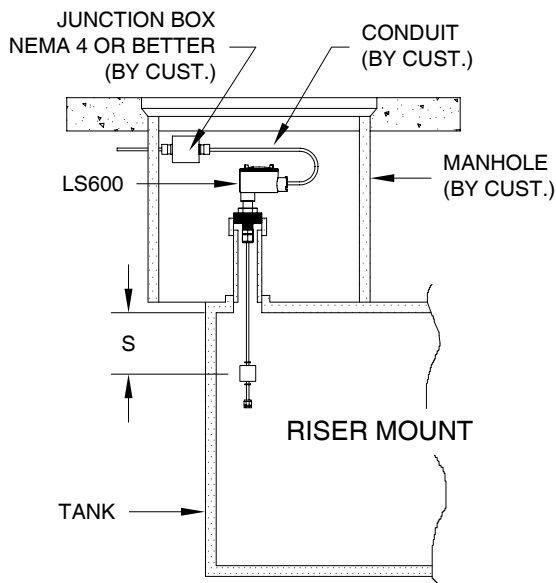
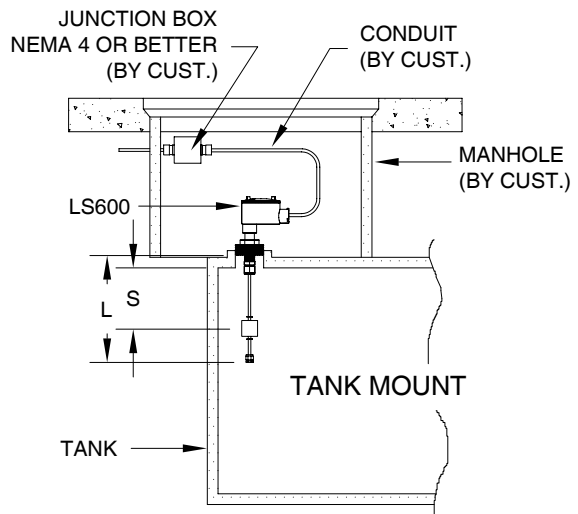
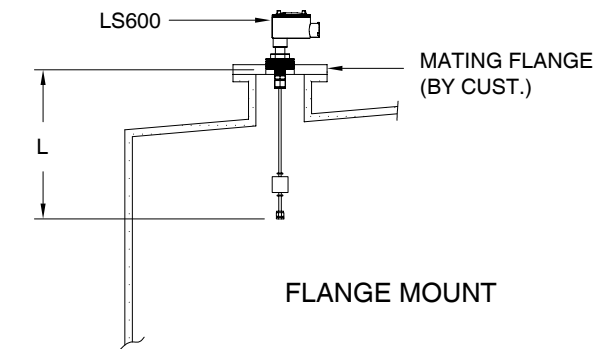
INSTALLATION CONT'D:

2. Refer to the applicable mounting installation drawing below and/or on page 5.

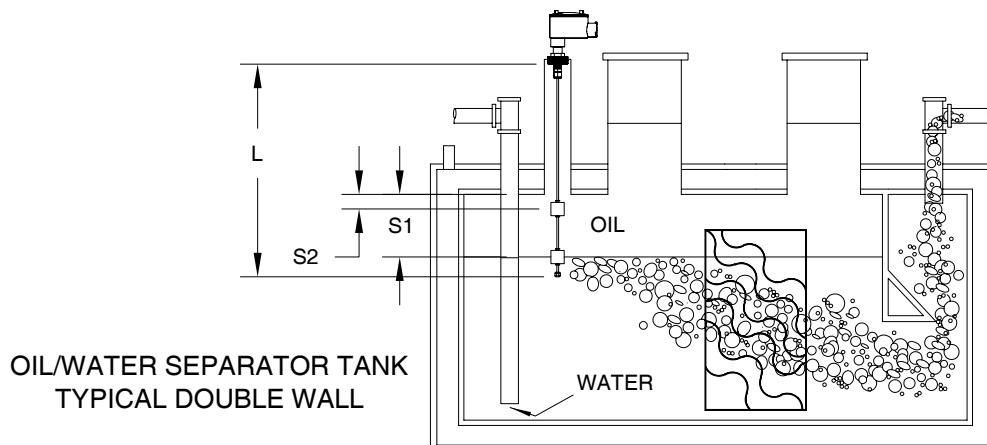
⚠ CAUTION

It is the INSTALLERS RESPONSIBILITY to ensure that they are adequately supported when handling the LS600 on top of the tank. FAILURE TO COMPLY MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

MODEL LS600



MODEL LS600W

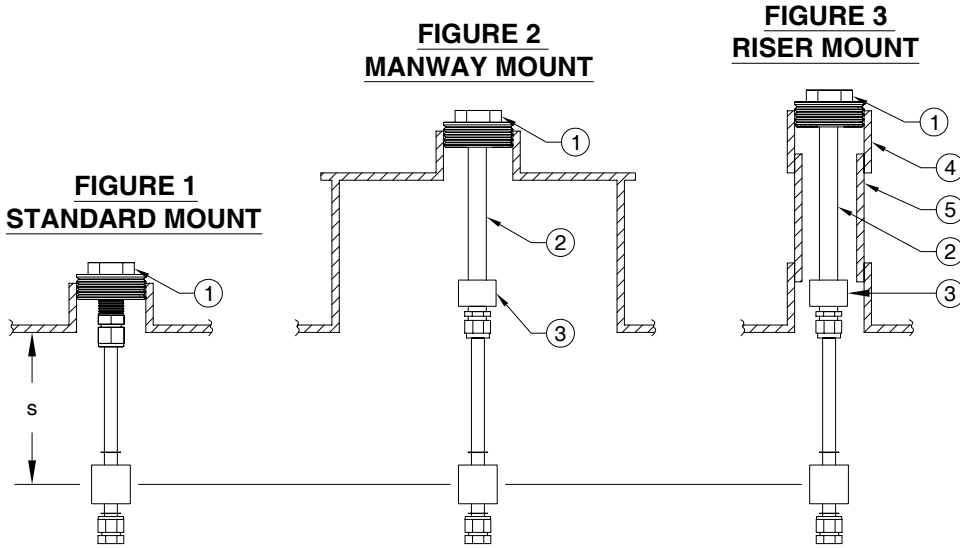


INSTALLATION CONT'D:

⚠ CAUTION

It is the INSTALLERS RESPONSIBILITY to ensure that they are adequately supported when handling the LS600 on top of the tank. FAILURE TO COMPLY MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

MODEL LS600 (w/o HOUSING)



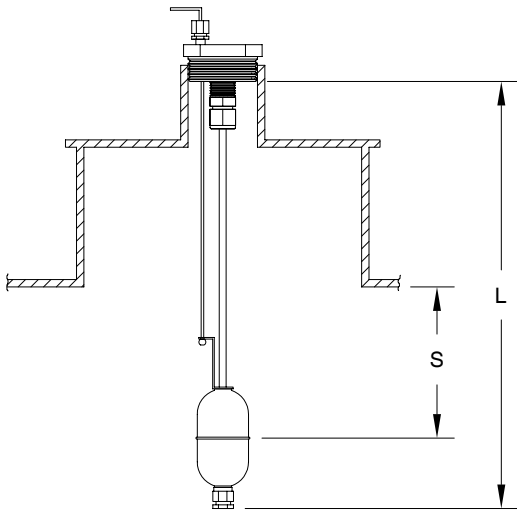
PROCEDURE:

1. STANDARD 8" HIGH LEVEL (FIGURE 1)
 - a) FACTORY SET AT 8", SCREW INTO BUSHING (ITEM 1).
2. MANWAY MOUNTED (FIGURE 2)
 - a) ADD PIPE (ITEM 2, LENGTH AS NECESSARY) AND COUPLING (ITEM 3) TO REACH BUSHING (ITEM 1) AT TOP OF MANWAY.
 - b) TO CHANGE SWITCH SETTING SHORTEN PIPE (ITEM 2).
3. RISER MOUNT (FIGURE 3)
 - a) ADD PIPE (ITEM 2, LENGTH AS NECESSARY) AND COUPLING (ITEM 3) TO REACH BUSHING (ITEM 1) AT TOP OF STANDPIPE COUPLING (ITEM 4).
 - b) TO CHANGE SWITCH SETTING, SHORTEN PIPE (ITEM 2).

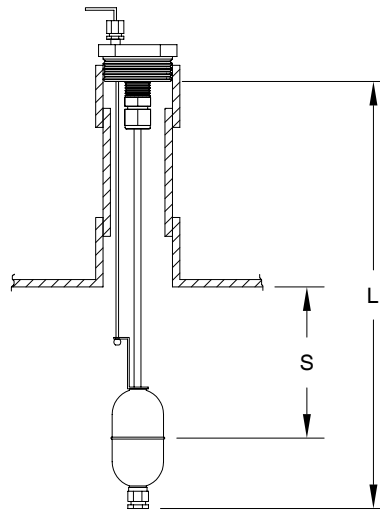
CUSTOMER SUPPLIED ITEMS	
ITEM	DESCRIPTION
1	2" DOUBLE TAPPED 1/2" NPT BUSHING
2	1/2" NPT CONDUIT PIPE
3	1/2" NPT COUPLING
4	2" NPT COUPLING
5	2" NPT STANDPIPE

MODEL LS600 (w/ TEST LEVER)

RISER - MANWAY MOUNT



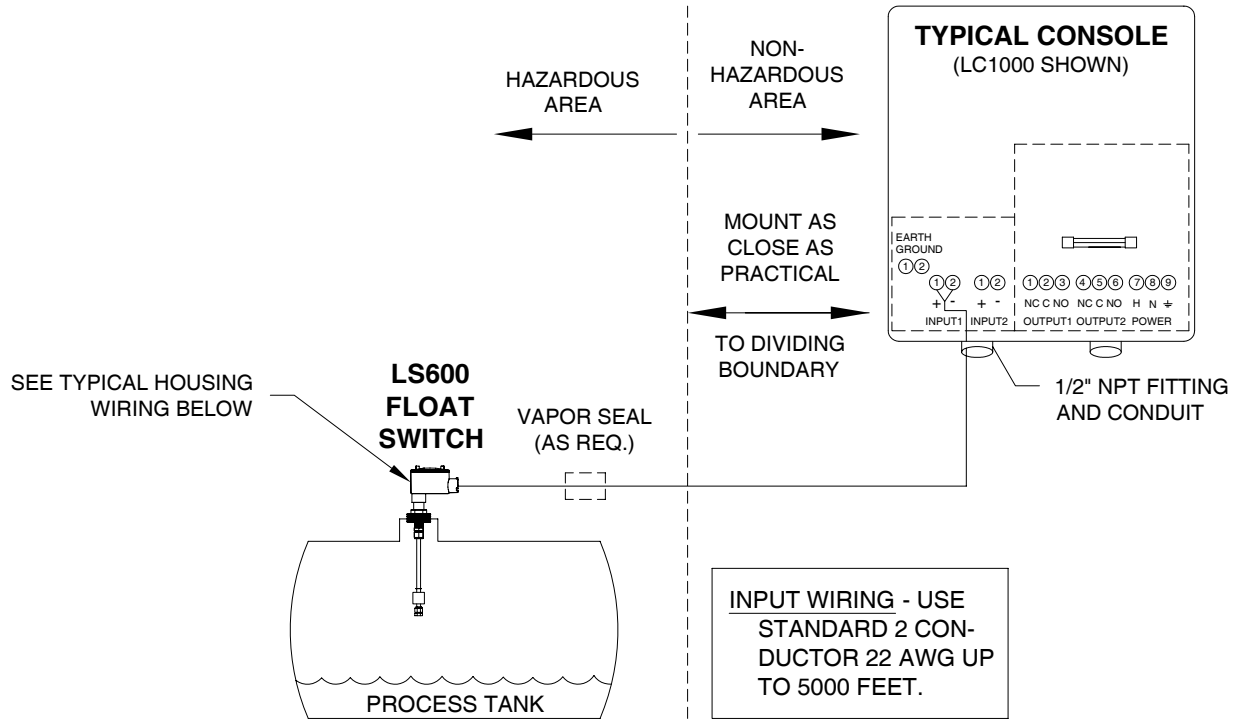
RISER MOUNT



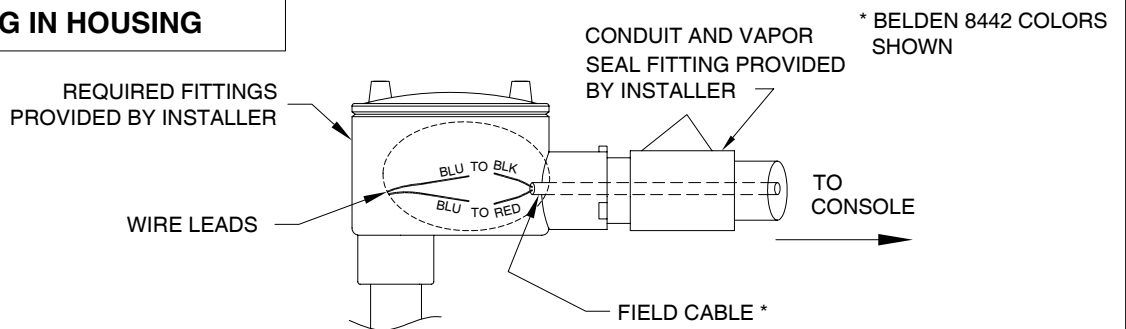
WIRING: If installing in a hazardous location, wire and install in accordance with Article 504 of National Electric Code ANSI/NFPA 70. Intrinsically Safe Wiring CANNOT be run in conduit or open raceways together with non-intrinsically safe wiring.

⚠ WARNING

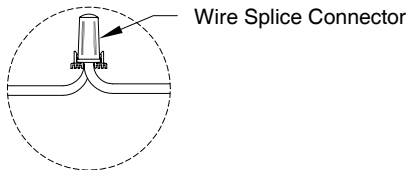
Refer to the CONSOLE installation manual and/or wiring drawing for WARNINGS and CAUTIONS before proceeding. FAILURE TO COMPLY MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.



TYPICAL WIRING IN HOUSING



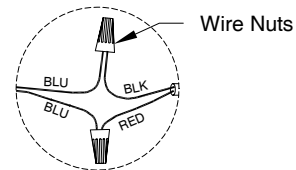
WIRE SPLICE SEAL CONNECTOR
 FOLLOW SUPPLIED WIRE SPLICE INSTRUCTIONS
 BULLETIN 179; KIT P/N 10585-2
 (kit included with LS600)



OR

WIRE NUTS
 (customer supplied)

Note: Wire splices and cable sheath ends must be sealed with epoxy from kit or suitable waterproofing sealant.



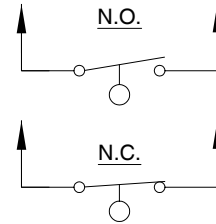
WIRING CONT'D:

COLOR CODES

All switches are set in a dry tank.

LS600 COLOR CODES		
TYPICAL SWITCH I.D.	N.O. WIRE LEADS	N.C. WIRE LEADS
OVERFILL	GRY/WHITE	GRAY
H. HIGH	VIO/WHITE	VIOLET
HIGH	BLU/WHITE	BLUE
PUMP STOP	RED/WHITE	RED
PUMP START	ORN/WHITE	ORANGE
LOW	YEL/WHITE	YELLOW
L. LOW	BRN/WHITE	BROWN

SCHEMATIC DRY TANK *



* ALL SWITCHES ARE SET IN A DRY TANK

CONSOLE WIRING

Connect (1) float per console input as required.
Single float field cable examples shown below.

LC1000

The diagram shows two input terminals labeled 'INPUT 1' and 'INPUT 2', each with '+' and '-' sub-terminals. Below them are two output terminals labeled 'OUTPUT 1' and 'OUTPUT 2', each with 'NC', 'C', and 'NO' sub-terminals. A field cable with a RED wire and a BLK wire is shown connected to the inputs.

PC1000

FOLLOW WIRING INSTRUCTIONS SUPPLIED WITH YOUR CONSOLE

LC2000

The diagram shows a single input terminal with a '+' sub-terminal. A field cable with a RED wire and a BLK wire is shown connected to the terminal.

TMS2000

The diagram shows a signal terminal labeled 'S' and a power terminal labeled '+V'. A field cable with a RED wire and a BLK wire is shown connected to the terminals.

NOTE: "S" = SIGNAL AND IS CONSECUTIVELY NUMBERED "S1" THROUGH "S8" ON THE TMS2000 CIRCUIT BOARD

TMS3000

4-PROBE/8-SENSOR CARD WIRING

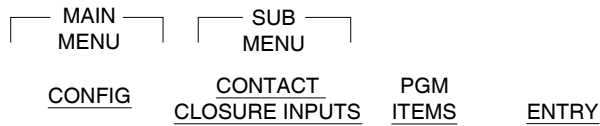
The diagram shows three terminals: GND, SIG, and +V. A field cable with a BLK wire and a RED wire is shown connected to the terminals.

16-SENSOR CARD WIRING

The diagram shows three terminals: +V, SIG, and GND. A field cable with a RED wire and a BLK wire is shown connected to the terminals.

LC1000 AND PC1000: Programming not applicable. Consoles factory configured for correct operation with LS600. Contact Pneumercator technical support if your console and/or LS600 is not working properly.

LC2000/TMSCOMM SOFTWARE PROGRAMMING: Configure the console to activate the installed LS600(s). Programming is as follows for Models LC2000, TMS2000 and TMS3000.



* Select "ALARM" to activate an indicator light and trigger START/STOP or ON/OFF for any connected device such as a pump, solenoid valve etc. Select "RELAY" to trigger START/STOP or ON/OFF for any connected device.

Note: Indicator light activation is not available with this selection.

** Select name from list.

*** Select "OPEN" or "CLOSED" as required.

ISCC ENABLE	<input type="text" value="*"/>	} THESE PGM ITEMS FOR TMS SERIES ONLY
SENSOR TYPE	<input type="text" value="LS600"/>	
SENSOR MODE	<input type="text" value="OTHER"/>	
INPUT NAME	<input type="text" value="**"/>	
FAULT DETECTION	<input type="text" value="NO"/>	
NORMALLY	<input type="text" value="***"/>	

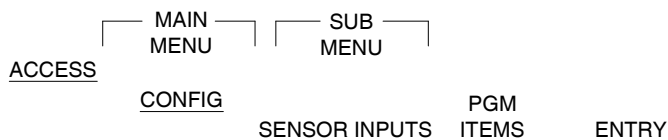
LC2000 FRONT PANEL PROGRAMMING: Configure the LC2000 to activate the installed LS600(s).

PROGRAM Mode LED Indicators		MODEL LS600 ENTRY
SENSOR	OFF = DISABLED, ON (2 Fast Blinks) = ALARM, ON (3 Slow Blinks) = RELAY	<input type="text" value="*"/>
NO/NC	OFF = NC, ON = NO	<input type="text" value="**"/>
FAULT DETECT	OFF = DISABLED, ON = ENABLED	<input type="text" value="OFF"/>

* Select "ALARM" to activate an indicator light and trigger START/STOP or ON/OFF for any connected device such as a pump, solenoid valve etc. Select "RELAY" to trigger START/STOP or ON/OFF for any connected device. Note: Indicator light activation is not available with this selection.

** Select "OPEN" or "CLOSED" as required.

TMS SERIES FRONT PANEL PROGRAMMING: Configure the TMS to activate the installed LS600(s). Programming is as follows for Models TMS2000 and TMS3000.



* Select "ALARM" to activate an indicator light and trigger START/STOP or ON/OFF for any connected device such as a pump, solenoid valve etc. Select "RELAY" to trigger START/STOP or ON/OFF for any connected device.

Note: Indicator light activation is not available with this selection.

** Select name from list.

*** Select "OPEN" or "CLOSED" as required.

SENSOR ENABLE	<input type="text" value="*"/>
SENSOR TYPE	<input type="text" value="LS600"/>
SENSOR MODE	<input type="text" value="OTHER"/>
INPUT NAME	<input type="text" value="**"/>
FAULT DETECTION	<input type="text" value="NO"/>
NORMALLY	<input type="text" value="***"/>

MAINTENANCE PROCEDURES: Pneumercator strongly recommends annual testing to ensure proper actuation of any float switch designated for overflow prevention. Additionally, it is recommended practice to annually test all point-level switches on multi-switch assemblies.

"NCL" Models:

1. Loosen seal fitting on manual lift rod.
2. Lift test rod until alarm or control point activates. If activation cannot be confirmed, troubleshoot as per step 7 maintenance procedures for all models below.
3. Push rod down and reseal fitting.

All Other Models:

1. Turn off power to the monitoring console or panel.
2. Disconnect switch wiring leads from field cable.
3. Unscrew field wiring conduit from housing if supplied.
4. Unscrew switch assembly bushing from tank mount.
5. Lift unit from tank and clear any debris that may have collected.
6. Temporarily reconnect switch wiring leads to field cable. **DO NOT** seal connections.
7. Re-apply power and manually actuate each float to confirm alarm or control point activation. If activation cannot be confirmed, troubleshoot in the following order:
 - a) Disconnect wiring for the suspect switch and confirm "open" and "closed" state of switch with an ohmmeter or continuity tester. If failure, switch is defective.
 - b) Check field wiring continuity from end to end in the "open" and "closed" state. If failure, replace field wiring.
 - c) Disconnect field wiring at console and simulate "open" and "closed" state of switch with a jumper wire connected to appropriate terminals of console. If failure, console is defective.
8. Disconnect temporary connections, reinstall unit, and restore field wiring connections.
9. Apply new seal kit to connections.

REMOVAL AND RETURNS: To remove the unit, unscrew mounting bushing or flange bolts from tank. If instructed by Pneumercator, all units should be returned as supplied. **DO NOT DISASSEMBLE** factory installed mounting fitting (bushing/flange), nipple and/or housing (see page 2).