Model 3900
Liquid Level Switch

The Model 3900 Liquid Level Switch (Figure 1) is a pneumatic snap acting or electric SPDT or DPDT High/Low level switch. This rugged instrument applies the same "Force Balance" control mechanism as the Model 3200 Liquid Level Controller, combined with a compact vertical cage assembly. The Model 3900 is designed specifically to meet the level control requirements found on onshore and offshore oil and gas production equipment.

Features:

- **Electric or Pneumatic -** The Model 3900 Liquid Level Switch can be fitted with either a non-bleeding pneumatic snap (on/off) pilot or a SPDT or DPDT electric switch.
- **Field Reversible -Switch Action -** Changing switch action requires no special tools and no additional parts, and can be easily done without removing the instrument from the vessel. Refer to the **Switch Action** section on Page 2.
- **Field Reversible Mounting -** Simply follow the instructions provided on the inside of the instrument's cover. Again, no special tools and no additional parts are required.
- **Marine Service -** The Model 3900 Liquid Level Switch comes standard with stainless steel internals for marine type environments.
- **NACE -** The Model 3900 Liquid Level Switch can be made to meet NACE MR-01-75 material specifications for sour service.

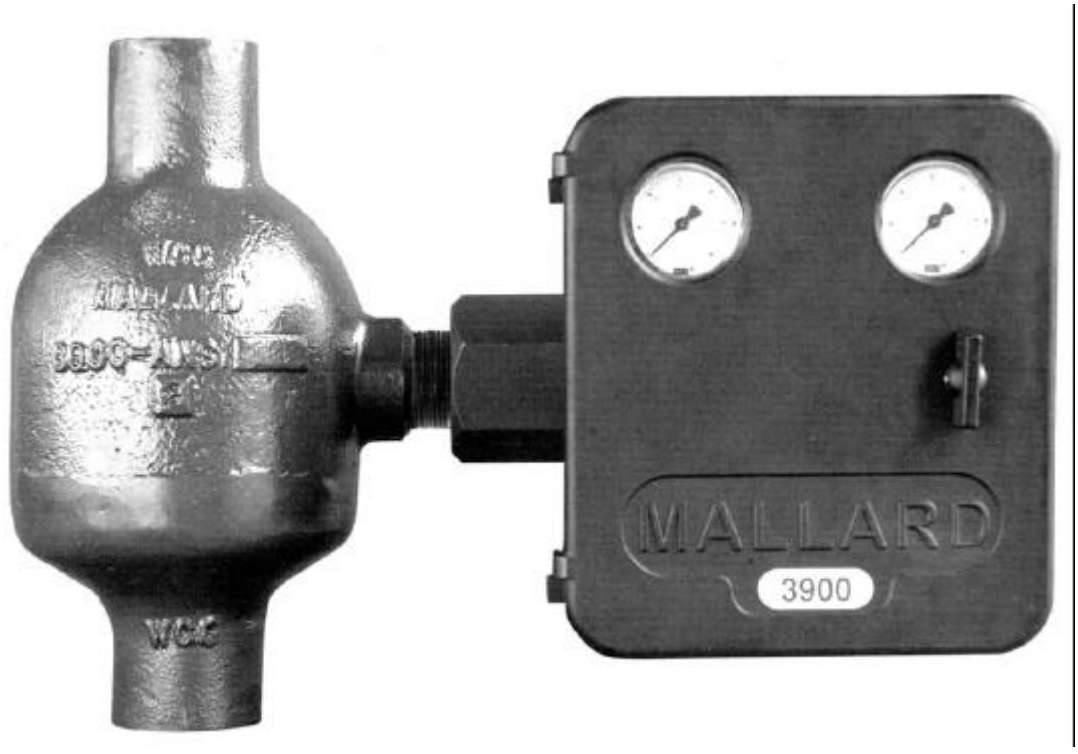

Figure 1. Series 3900 Liquid Level Switch (right-hand mounting shown)

SPECIFICATIONS:

Available Process Connections
- Screwed: 1.00" FNPT
- Butt Vveld[(1)]: *2.00"*
- Flanged[(1)]:1.00",1.50", & 2.00"
- Socket Weld[(1)]: 1.00"

Displacer Cage Pressure Ratings[(2)]
- FNPT, BVVE, SWE: 2250 psig (155 bar)
- 150# RF: 275 psig (19 bar)
- 300# RF: 740 psig (51 bar)
- 600# RF: 1480 psig (102 bar)
- 600# RTJ: 1480 psig (102 bar)
- 900tt RF: 2220 psig (153 bar)
- 900# RTJ: 2220 psig (I53 bar)

Temperature Limits
- -20^{O} to 400^{O}F (-29^{O} to 204'C)

Minimum Aullowable Flid Specific Gravity
- Snap Pilot: 0.50
- SPDT Switch: 0.50
- DPDT Switch: 0.70

Available Pilots
- Pneumatic Snap (On/Off), standard
- Electric SPDT (Explosion Proof), optional
- Electric, DPDT (Explosion Proof), optional

[(1)]Top and Bottom end connections only
[(2)]M irrtim pressure ratings d 100'F.38'C

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Pneumatic Pilot Supply Pressure Requirements
- 0-20 psig: 20-30 psig min.
- 0-30 psig: 35-40 psig min.

Electric Switch Ratings
- SPDT: 15 amps @ 125, 250 or 480 VAC
- DPDT: 10 amps @ 125, 250 VAC

Supply & Output Connections
- Pneumatic Pilot:: .25 FNPT
- Electric Switch: .50 FNPT

Materials of Construction

Level Switch:
- Case & Cover: Anodized Die Cast aluminum
- Snap Pilot: Anodized Aluminum with Aluminum Seat & SST Internals
- Gauges: Bronze (Standard)
  316 SST (Optional)
  316 SST Liquid Filled (Optional)

Cage/Body Assembly:
- Cage: ASTM A216 Gr. WCC Steel
- Body: 1018 Steel
- Displacer: 316 SST (Standard)
  Alloy 20 (Optional)
- Displacer Arm: 302 SST
- Seals: Buna-N
  Viton (optional)

Switch Action

Action refers to the change in instrument "output" that results from a change in instrument "input". The "input" is the level. which is detected through the mechanical force applied to the instrument linkage from the relative weight of the displacer. The "output" is the *making or breaking* of a circuit. A Reverse Acting level switch is one that *breaks* a circuit on rising level. A Direct Acting level switch is one that *makes* a circuit on rising level.

The Model 3900 Liquid Level Switch is available in either Direct or Reverse Acting configurations. For switches equipped with the pneumatic snap pilot, *making* the pneumatic circuit means connecting supply air to the output port. Breaking the pneumatic Circuit is done by connecting the exhaust port to the output port. Changing the switch action is done by moving the Flapper Bar pivot point to the opposite side of the housing. This is easily performed in the field, and requires no special tools.

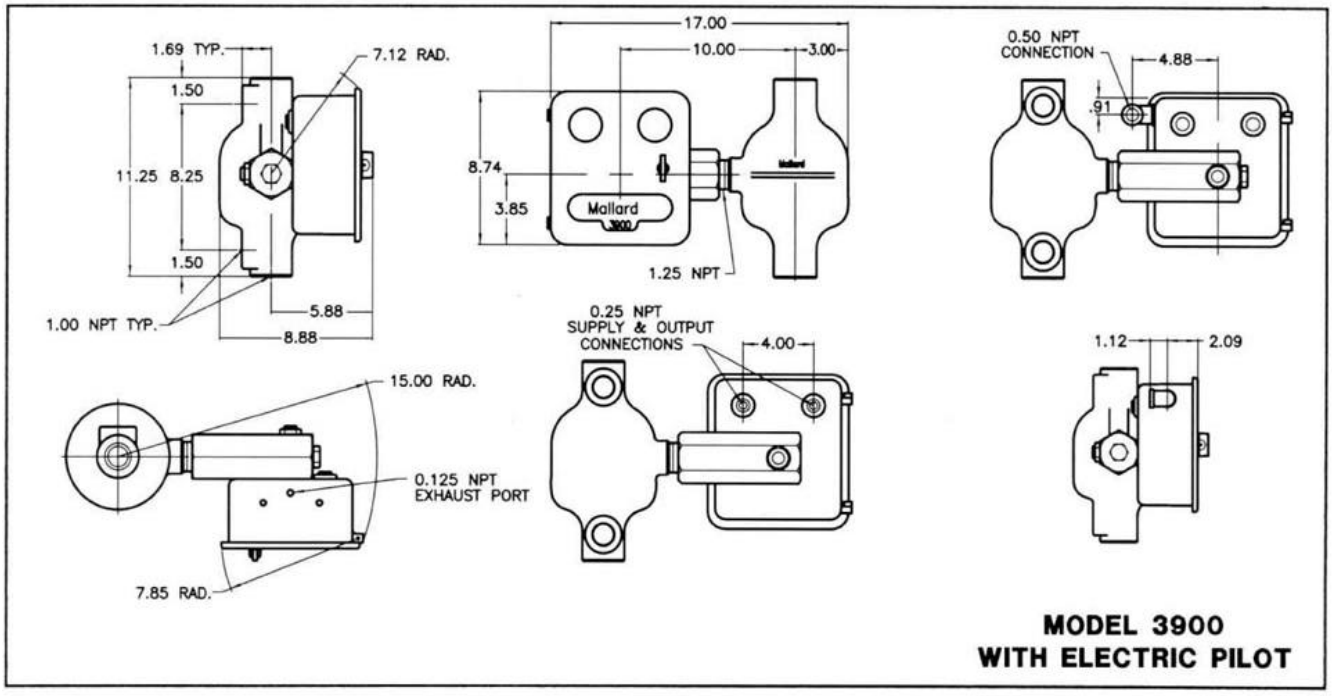
For switches equipped with the electric pilots. m*aking* the electrical circuit means closing the switch contacts. *Breaking the* electrical circuit means opening the switch contacts. The switch is supplied with three leadwires per set of contacts – "C" (common), "NO" (normally open), and "NC" (normally closed) - and a ground leadwire. If the application requires Direct Action (contacts to close on rising level), the "C" and "NO" wires must be used. If the application requires Reverse Action (contacts to open on rising level), the "C" and "NC" wires must be used. **IMPORTANT NOTE:** All Model 3900 Liquid Level Switches with electric pilots are shipped from the factory to meet the above wiring practice. If the Flapper Bar pivot point is moved to the opposite side of the housing, the action of the switch contacts will be reversed.

Table 1. Approximate Weight, Pounds (Kg)

Connection Type	Process Connection Size			
	1.00”		2.00"	
FNPT	47	(20.9)	N/A	N/A
BWE [1]	N/A	N/A	47	(20.9)
SWE [1]	47	(20.9)	N/A	N/A
150# RF [1]	52	(23.6)	59	(26.8)
300# RF [1]	55	(24.9)	63	(28.6)
600# RF [1]	55	(24.9)	67	(30.4)
600# RTJ [1]	55	(24.9)	67	(30.4)
900# RF [1]	64	(29.0)	95	(43.1)
900# RTJ [1]	64	(24.0)	95	(43.1)

[1] Top & Bottom connections only.

DIMENSIONS:



Model Number Information

Sample Model Number: 3900 - 10 FS - S V RD - S M

PROCESS CONNECTION SIZE	CODE
1"	10
2"	20

PROCESS CONNECTION TYPE	CODE	
FNPT (Screwed)	FS	
Socket Weld	SW	
Butt Weld, Sch. 40	B4	
Butt Weld, Sch. 80	B8	
Butt Weld, Sch. 160	B1	
Flanged	**RF**	**RJ**
ANSI 150	F1	J1
ANSI 300	F3	J3
ANSI 600	F6	J6
ANSI 900	F9	J9

MATERIALS OF CONSTRUCTION			
Cage / Body	**Displacer**	**Shaft / Blk Bearing**	**CODE**
WCC Steel	316 SST	303 SST	–
WCC Steel	316 SST	316 SST	A
WCC Steel (NACE)	Alloy 20	316 SST	N

PILOT	CODE
Pneumatic Snap	S
Electric SPDT, Explosion-Proof	E
Electric DPDT, Explosion-Proof	D

SEAL MATERIAL	CODE
Buna-N	B
Viton (Standard)	V
Special (specify)	X

MOUNTING ORIENTATION / SWITCH ACTION	CODE
Left Hand / Direct (Open Pneumatic Pilot on Rising Level)	LD
Left Hand / Reverse (Open Pneumatic Pilot on Falling Level)	LR
Left Hand / Electric Pilot	LE
Right Hand / Direct (Open Pneumatic Pilot on Rising Level)	RD
Right Hand / Reverse (Open Pneumatic Pilot on Falling Level)	RR
Right Hand / Electric Pilot	RE

SUPPLY / OUTPUT GAUGES	CODE
Standard Service	S
316 SST	3
316 SST, Liquid-Filled	L

CASE	CODE
Marine Service (Standard)	M
Marine Service with Piped Exhaust	N

Mallard Control Company, Inc.

P.O.Box 7544

Beaumont, Texas, USA 77726-7544