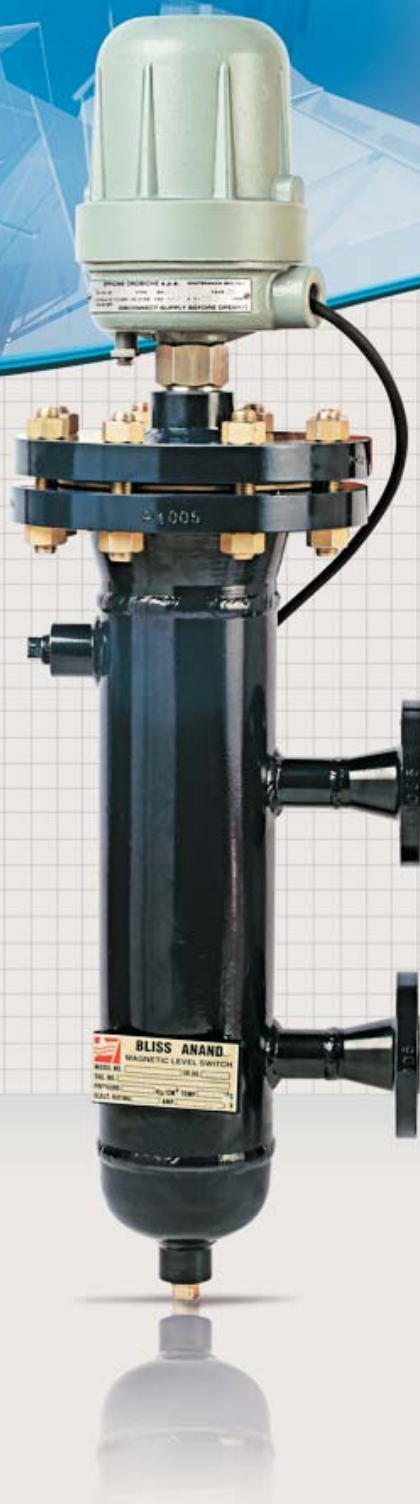




**BLISS ANAND**

# Level Switches







# Level Switches

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# LEVEL SWITCHES

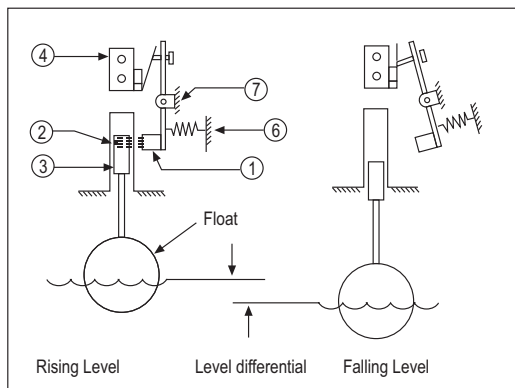


## OPERATING PRINCIPLE

### FLOAT OPERATED LEVEL SWITCH

The basic operating principle provides for a magnetic switch action resulting from a change in liquid level, which moves a magnetic attraction sleeve into the field of an externally located magnet. This principle eliminates problems associated with flexing diaphragm seals, bellows seals, as well as "fouling" problems encountered by probe type devices.

The illustration alongside demonstrate the operating principle using a float to provide the operating motion. A falling liquid level causes a downward movement of the magnetic attraction sleeve (3) moving it below the magnetic field (2) Generated by the externally mounted magnet (1) the bias spring (6) Then causes the magnet to pull away from the sealing tube (5) In turn actuating the switch (4) the reverse action takes place on rising level, with attraction sleeve being moved into the magnetic field causing the magnet to pull in towards the sealing tube in turn actuating the switch.

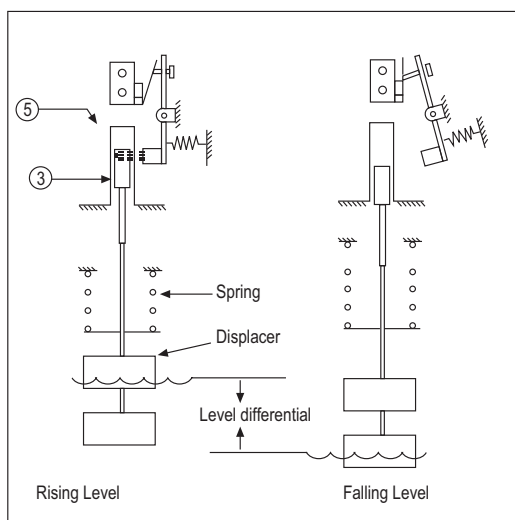


Float Operation

### DISPLACER OPERATED LEVEL SWITCH

Displacer operated level switch offers control feature not found in float operated level switches. The basic sensing element consists of a weight (displacer) heavier than the liquid, suspended from a spring. When the liquid contacts the displacer, a buoyancy force is produced, which causes the effective weight of the displacer to change, in turn, causing the spring to seek a new balance position which moves the attraction sleeve into the field of magnet.

This principle provides for wide switching differentials and allows the desired level switching point to be adjusted by moving the displacer up or down the suspension cable. A further advantage allows for adaption to high pressure application since displacers have substantially heavier wall thickness than floats and in some cases are made out of solid material.



Displacer Operation



## LEVEL SWITCHES

### ELECTRICAL SWITCH MECHANISM- TYPE 2 & 3 (MICROSWITCH)

#### DESCRIPTION

Bliss Anand Type 2 & 3 switch mechanism are fitted with magnetically operated snap-action contact switches.

#### FEATURES

The Bliss Anand switches operating mechanisms are constructed entirely in AISI 304 stainless steel and fitted with a terminal board of resin suitable for high temperature applications.

These two switches mechanism differ in the type of snap-action switches fitted and cover a wide range of applications and operating conditions.

#### APPLICATIONS

##### Type 2-Standard Microswitch

The Bliss Anand Type 2 dry contact switch mechanism is designed for general application with liquid temperature upto 120°C when standard switches are used and upto 230°C when high temperature switches are required.

Higher temperature requires special housing design. Process application may require switching at different levels a maximum of two switch mechanism SPDT to two switch mechanisms DPTP can be assembled in the same housing.

##### Type 3-Hermetically Sealed Microswitch

This Bliss Anand switch mechanism has the same feature as type 2 but is provided with hermetically sealed snap-action switches suitable for highly corrosive environment.

Microswitches suitable for process temperature upto 400°C are available on request.



Type 2 (SPDT) Mechanism



Type 3 Hermetically Sealed

### Electrical Specification of Snap-action Switches

MECHANISM TYPE	LOAD	ALTERNATING CURRENT		DIRECT CURRENT		MAXIMUM TEMPERATURE OF PROCESS MEDIUM
		110 V	230 V	24 V	110 V	
TYPE 2 Standard	Resistive (A)	15	15	0.4	0.4	120°C / 240°F
	Inductive (A)	3.8	2.9	0.05	0.05	
	Motor (W)	100	200	-	-	
TYPE 2 Direct Current	Resistive (A)	10	-	-	10	
	Inductive (A)	3.8	-	-	2.2	
	Motor (W)	100	-	-	100	
TYPE 2 High Temperature	Resistive (A)	5	5	0.4	0.4	230°C / 446°F
	Inductive (A)	-	-	0.05	0.05	
	Motor (W)	75	150	-	-	
TYPE 3 Standard	Resistive (A)	0.25	-	4	0.25	
	Inductive (A)	0.25	-	2	0.25	

# LEVEL SWITCHES



## Switch mechanism selection guide and code system

The general characteristic of Bliss Anand switch mechanisms are described by a three digit code number, specifying mechanism type, electrical function and special features, each digit selected according to the following tables.

1st Digit Code	Switch Mechanism	
2	Type 2	
3	Type 3	
2nd Digit Code (1) (2)	Sequence and Elect Function(3)	
	1° Mech.	2° Mech.
1	SPDT	-
2	SPDT	SPDT
3	DPDT	-
4	DPDT	DPDT
5	DPDT	SPDT
6	SPDT	DPDT
3rd Digit Code	Switch Feature	
0	Standard	
1	High Temperature	
2	Direct Current	
9	Special	

### EXAMPLE:

Code 262 = type 2 switch mechanism with 1 DPDT and 1 SPDT snap action switches for direct current operation.

Code 311 = type 3 switch mechanism with a high temperature hermetically sealed SPDT dry contact switch.

### Switch Mechanism Housing

The housing of Bliss Anand switch mechanism are suitable for a wide range of environment and safety conditions.

### Housing Selection Guide and Code

Code	Execution
2	TYPE 2. EXPLOSION PROOF HOUSING
3	TYPE 3. ATEX APPROVED HOUSING



Type 2

Type 3

### ATEX SWITCH HOUSING

EExd II C T 6

#### TYPE1- WEATHER PROOF

- Features** : \* Die-cast aluminium alloy base and powder coated carbon steel cover.  
 \* 3/4"NPT electrical conduit connection rotatable through 360°C.

**Degree of Protection** : \* IP-66

#### TYPE 2- EXPLOSION PROOF CUM WEATHER PROOF

- Features** : \* Cast in aluminium alloy LM-6 powder coated. STD.  
 \* 3/4"NPT OR 1/2"NPT electrical conduit connection rotatable through 360°C standard.

**CMRS Approval** : \* IIA, IIB & IIC As per IS:2148 (ATEX-Certification provided on request)  
 \* Degree of protection IP-66

#### TYPE 3- ATEX APPROVED HOUSING

Explosion Proof Cum Weather Proof as per ATEX 94/9



## SERIES 1100

### Float Operated Level Switch with flanged external chamber

#### DESCRIPTION

Bliss Anand Series 1100 Level Switch is characterised by a flanged carbon steel chamber allowing periodic inspection and maintenance. The standard process connections are screwed 1" NPT or 1" SW, flanged connections up to 2" and ANSI 600 are also available, construction and dimensions are indicated below.

Standard constructions have AISI 316 stainless steel trim, AISI 316 SS float and series AISI 410 stainless steel attraction sleeve.

All the series 1100 models can be fitted with only one switch mechanism type 2 or 3.

All the models are factory calibrated at the minimum switching differential (i.e. 20mm±5mm with specific gravity 1.0), the differential value can be increased on instruments equipped with switch mechanism type 2 or 3. The maximum switching differential can be 50 mm.

#### SWITCH SELECTION

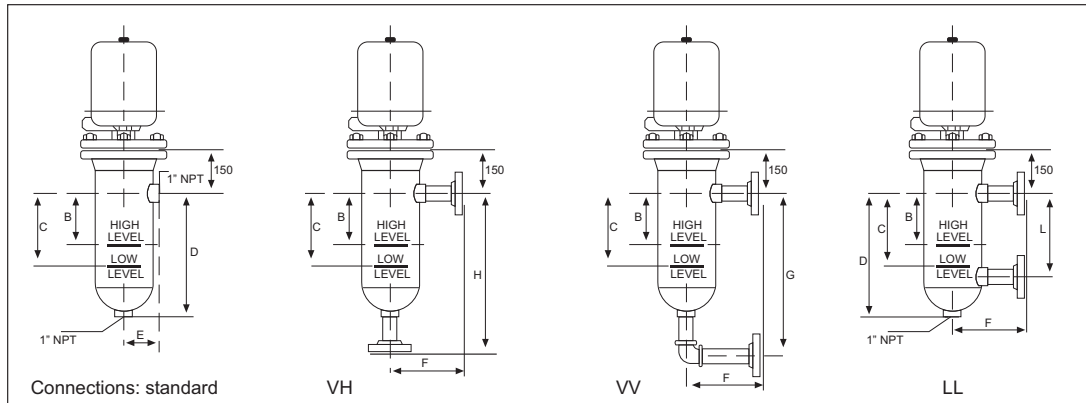
To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and specific features:

- \* AISI 316 stainless steel chamber
- \* Special corrosion resistant materials
- \* Interface control setting



#### Specifications



MODEL	MINIMUM SPECIFIC GRAVITY	MAXIMUM PRESSURE (BAR / PSI)				SWITCHING LEVEL (mm/inch)		DIMENSIONS (mm/inch)						
	Mechanism type 2, 3	Float		Chamber(1)		Mech. 2,3		A	D	E	F	G	H	L
		°C / °F 40 / 104	°C / °F 400 / 752	°C / °F 40 / 104	°C / °F 400 / 752	B	C							
1104 A	0.85	21 / 304.45	12 / 174	50 / 725	47 / 681.5	35 / 1.37	56 / 2.20							
1104 B	0.75	24 / 348	13.5 / 195.5			50 / 1.96	70 / 2.75	178 / 7.00	305 / 12.00	81 / 3.18	152 / 5.98	356 / 14.01	356 / 14.01	178 / 7.00
1105 A	0.65	35 / 507.5	21 / 304.45	69 / 1000.5	59 / 855.5	70 / 2.75	90 / 3.54	178 / 7.00	305 / 12.00	94 / 3.70	165 / 6.49	356 / 14.01	356 / 14.01	178 / 7.00
1106 A	0.55	15 / 217.5	10 / 145	62 / 899	54 / 783	101 / 3.97	125 / 4.92	178 / 7.00	305 / 12.00	110 / 4.33	180 / 7.08	356 / 14.01	356 / 14.01	178 / 7.00

NOTE: (1) Given values apply to standard carbon steel construction and use with non-corrosive liquids. A special extension is required when process temperature exceeds 150°C (for each switch type in such cases the diameter "A" is increased by 100mm).  
 (2) Dimensions B (switching point with rising level) and C (switching point with falling level) applies to the liquid specific gravity 1 and to instruments fitted with only one switching mechanism set at the minimum differential (not valid for interface service).



## SERIES 2200



### Float Operated Level Switch with sealed external chamber

#### DESCRIPTION

Bliss Anand Series 2200 Level Switch is designed for mounting external to the process vessel. The sensing unit is characterised by having a fully welded carbon steel chamber offering extreme simplicity and low cost. The standard process connection are screwed 1" NPT or 1" SW, flanged connections up to 2" and ANSI 600 are also available, constitutions and dimensions are indicated below.

Standard constructions have AISI 316 stainless steel trim, AISI 316 stainless steel float and series AISI 410 stainless steel attraction sleeve.

All the series 2200 models can be fitted with only one switch mechanism type 2 or 3.

All models are factory calibrated at the minimum switching differential (i.e 20mm±5 mm with specific gravity 1.0), the differential value can be increased on instrument equipped with switch mechanism type 2 or 3. The maximum switching differential can be 50 mm.

#### SWITCH SELECTION

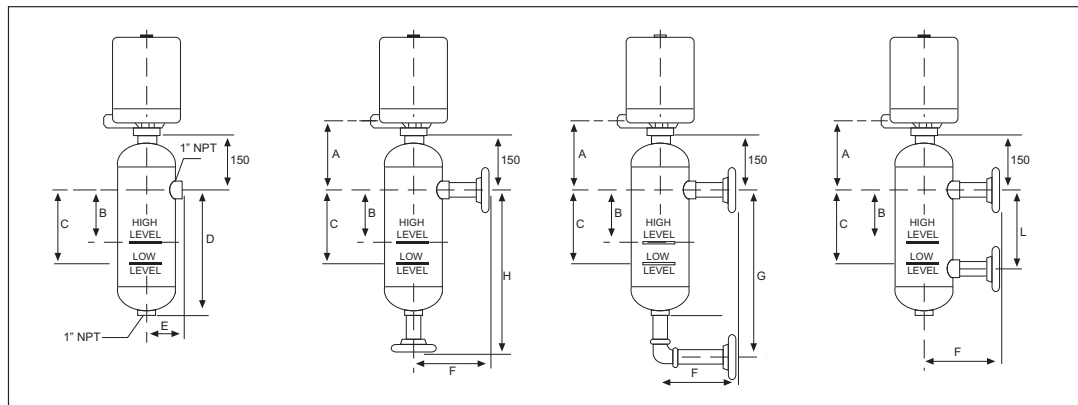
To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and other special features:

- \* AISI 316 stainless steel chamber
- \* Special corrosion resistance materials
- \* Interface control setting



#### Specifications



MODEL	MINIMUM SPECIFIC GRAVITY	MAXIMUM PRESSURE (BAR / PSI)				SWITCHING LEVEL(mm/inch)		DIMENSIONS (mm/inch)							
	Mechanism type 2, 3	Float		Chamber(1)		Mech. 2,3		A	D	E	F	G	H	L	
		°C / °F 40 / 104	°C / °F 400 / 752	°C / °F 40 / 104	°C / °F 400 / 752	B	C								
2204 A	0.85	21 / 304.45	12 / 174	50 / 725	47 / 681.5	35 / 1.37	56 / 2.20								
2204 B	0.75	24 / 348	13.5 / 195.5			50 / 1.96	70 / 2.75	178 / 7.00	305 / 12.00	81 / 3.18	152 / 5.98	356 / 14.01	356 / 14.01	178 / 7.00	
2205 A	0.65	35 / 507.5	21 / 304.45	69 / 1000.5	59 / 855.5	70 / 2.75	90 / 3.54	178 / 7.00	305 / 12.00	94 / 3.70	165 / 6.49	356 / 14.01	356 / 14.01	178 / 7.00	
2206 A	0.55	15 / 217.5	10 / 145	62 / 899	54 / 783	101 / 3.97	125 / 4.92	178 / 7.00	305 / 12.00	110 / 4.33	180 / 7.08	356 / 14.01	356 / 14.01	178 / 7.00	

- NOTE: (1) Given values apply to standard carbon steel construction and use with non-corrosive liquids. A special extension is required when process temperature exceeds 150°C (for each switch type in such cases the diameter "A" is increased by 100mm)
- (2) Dimensions B (switching point with rising level) and C (switching point with falling level) applies to the liquid specific gravity 1 and to instruments fitted with only one switching mechanism set at the minimum differential (not valid for interface service).



## SERIES 3300

### Float Operated Level Switch integral top mounting

#### DESCRIPTION

Bliss Anand Series 3300 level switch is designed without float chamber for integral mounting through the top of the process vessel (atmospheric or pressurized).

The instrument of this series to the switch are characterised by being adjustable to specific application according to the switching level, as well as to specific gravity, pressure and temperature of media whose level is to be controlled. The process connection can be screwed 1" NPT where the float can be coupled through a vessel manhole opening or flanged where the flange dimensions allow the float to pass through the vessel flange.

Standard constructions have AISI 316 stainless steel trim, AISI 316 SS float series AISI 410 stainless steel attraction sleeve and carbon steel process connection.

All the series 3300 models are fitted with only one switch mechanism type 2 or 3. Special construction available with float upto  $\phi 135 \times 175$ mm and minimum liquid specific gravity of 0.6.

#### SWITCH SELECTION

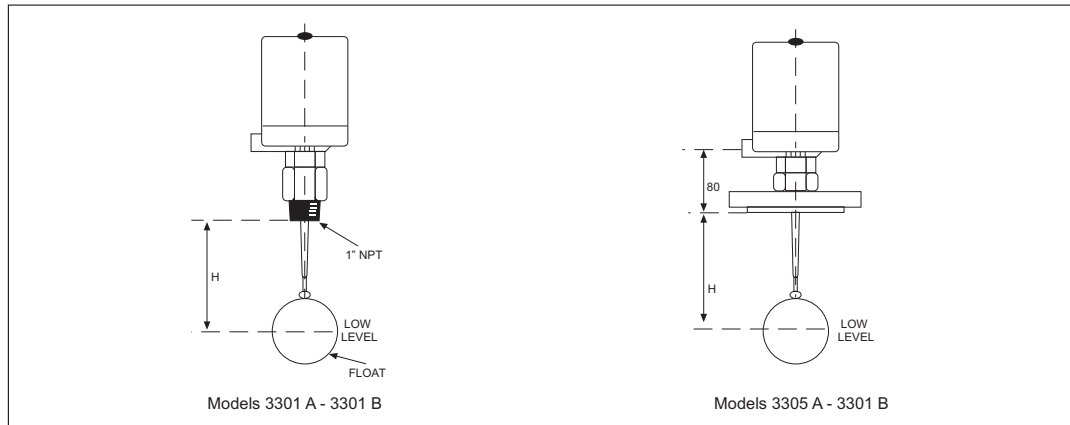
To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and other special features:

- \* AISI 316 stainless steel process chamber
- \* Special corrosion resistance materials
- \* Special insertion depth from 300 mm to 1200 mm
- \* Interface control setting



#### Specifications



MODEL	FLOAT DIAMETER (mm / inch)	MAXIMUM PRESSURE (BAR / PSI)		MINIMUM SPECIFIC GRAVITY related to insertion depth "H" (mm)				STANDARD CONNECTION
		40°C / 104°F	400°C / 752°F	Mechanism type 2, 3				
				300	600	900	1200	
3301A	76 / 2.99	21 / 304.5	12 / 174	0.70 / 0.027	0.75 / 0.029	0.82 / 0.032	0.90 / 0.035	1"NPT
3301B	90 / 3.54	24 / 348	13.5 / 195.75	0.63 / 0.024	0.66 / 0.025	0.70 / 0.027	0.74 / 0.029	1"NPT
3305A	76 / 2.99	21 / 304.5	12 / 174	0.70 / 0.027	0.75 / 0.029	0.82 / 0.032	0.90 / 0.035	3"ANSI 150
3305B	90 / 3.54	24 / 348	13.5 / 195.75	0.63 / 0.024	0.66 / 0.025	0.70 / 0.027	0.74 / 0.029	4"ANSI 300

NOTE: (1) Given values apply to standard carbon steel construction with 1" NPT.  
 (2) A special extension is required when process temperature exceeds 150°C, in such cases the dimensions "A" must be increased by 100mm.

## SERIES 4400



### Float Operated Level Switch integral side mounting

#### DESCRIPTION

Bliss Anand Series 4400 level switch is designed without float chamber for integral mounting through the top of the process vessel (atmospheric or pressurized). The attraction sleeve is operated by a float mounted on a hinged horizontal float arm. These models allow greater switching differential adjustment as compared to other float operated level switch and as a result are better suited even for turbulent applications.

They are also used when the insertion depths of top mounted models is exceeded or when overhead clearance prohibits the use of top mounted level switch.

Standard models have carbon steel body with screwed 3" NPT or flanged connection: AISI 316 stainless steel trim, AISI 316 stainless steel float and series AISI 410 stainless steel attraction sleeve. Series 4400 controls are normally fitted with only one switch mechanism.



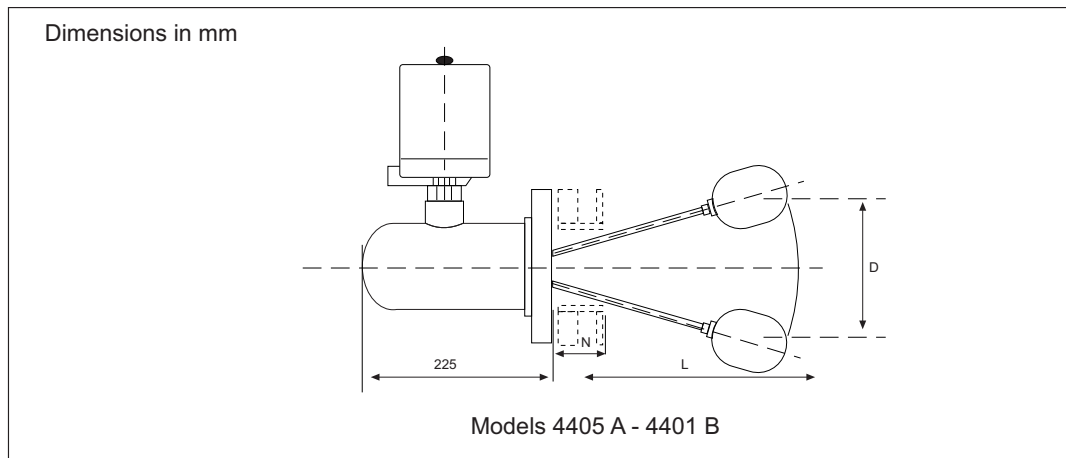
#### SWITCH SELECTION

To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below .

#### Options and other special features:

- \* AISI 316 stainless steel process chamber
- \* Special corrosion resistance materials
- \* Interface control setting

#### Specifications



MODEL	CONNECTION	MINIMUM SPECIFIC GRAVITY	MAXIMUM PRESSURE (BAR / PSI)		FLOAT STEM LENGTH (mm / inch)	SWITCH DIFFER (mm / inch)		L (mm / inch)
			40°C / 104°F	400°C / 752°F		D max	D min	
4405A	3'ANSI300	0.9	24 / 348	13.5 / 195.75	200 / 7.87	140 / 5.51	48 / 1.88	280 / 11.02
4405B	3'ANSI150	0.7	17 / 246.5	10 / 145	150 / 5.90	114 / 4.48	38 / 1.49	230 / 9.05

NOTE: (1) Given values apply to standard carbon steel construction and used with non corrosive liquids.  
 (2) A special extension is required when process temperature exceeds 150°C, in such cases the dimensions "A" must be increased by 100mm.  
 (3) The Vessel connection must have a minimum opening diameter of 78mm to allow the float to be inserted.



## SERIES 6600

### Float Operated Level Switch high pressure

#### DESCRIPTION

Bliss Anand Series 6600 level switch is designed for mounting external to the process vessel; they are equipped with a robust counter-balanced float and are suitable for controlling level of liquid with very low specific gravity at very high pressure.

The standard float chamber is made of carbon steel flanged type.

Process Connections are vertically inline screwed 1" NPT or 1" SW.

Standard construction have AISI 316 stainless steel trim, AISI 316 SS float and series AISI 410 stainless steel attraction sleeve.



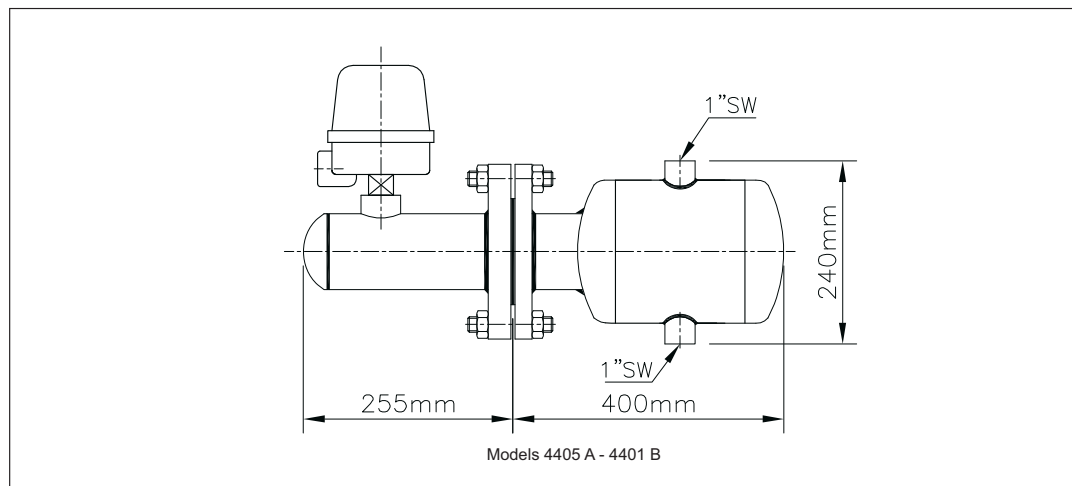
#### SWITCH SELECTION

To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and other special features:

- \* AISI 316 stainless steel chamber
- \* Special corrosion resistance materials
- \* Interface control setting
- \* Special process connection

#### Specifications



MODEL	MINIMUM SPECIFIC GRAVITY	MAXIMUM PRESSURE (BAR / PSI)				SWITCHING LEVEL (mm / inch)	
		Switch Mechanism type 2, 3	40°C / 104°F	400°C / 752°F	40°C / 104°F	400°C / 752°F	B
6605	0.65	50 / 725	50 / 725	47 / 681.5	42 / 609	25 / 0.98	25 / 0.98

NOTE: (1) Given values apply to standard carbon steel construction and use with non-corrosive liquids or to water and steam on boiler applications.  
 (2) A special extension is required when process temperature exceeds 150°C, in such cases the dimensions "A" must be increased by 100mm.

## SERIES 7700



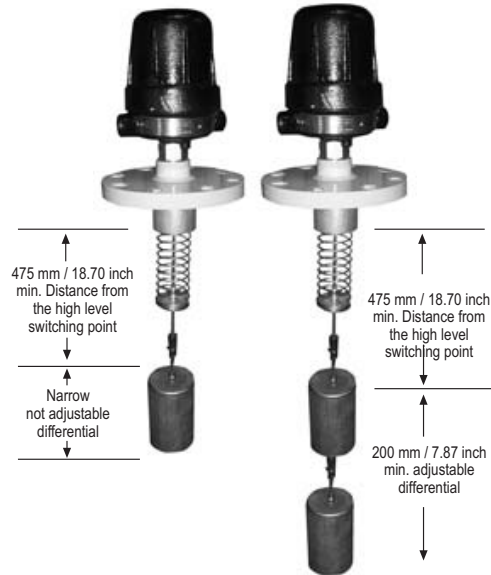
### Displacer Operated Level Switch intergral top mounted - single stage

#### DESCRIPTION

Bliss Anand Series 7700 displacer operated level switch is suitable for a wide range of applications on open or pressurized vessels of all dimensions. The use of displacer allows for wide switching differential, field adjustable switching points and use on high pressure applications.

The single stage series are equipped with a single mechanism and are available with narrow or wide switching differential. The narrow range models are factory set to work with a fixed differential (60 mm average) slightly variable according to the liquid specific gravity; the switching level can be adjusted readily by changing the displacer position on the suspension cable. The wide switching differential models are fitted with two separate displacer for rising or falling level; by changing the relative position of the displacer on the cable the differential setting as well as the switching level can be adjusted.

The carbon steel connection to the vessel can be screwed 3' NPT or flanged 3' ANSI 150 as standard; the trim is in AISI 316 stainless steel, the attraction sleeve is in series 410 AISI stainless steel and the displacer spring is stainless steel or in porcelain with AISI 304 stainless steel suspension cable of 2 cm long.



#### SWITCH SELECTION

To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and other special features:

- \* AISI 316 stainless steel chamber
- \* Special corrosion resistance materials
- \* Interface control setting
- \* Extra length suspension cable (upto 15mm)

#### Specifications:

Maximum pressure: 70 bar at 230°C

On the flanged process connection models the maximum pressure can be limited by the flange rating and its material of construction

MODEL	SWITCH FUNCTION	PROCESS CONNECTION	DISPLACER MATERIAL	MINIMUM SPECIFIC GRAVITY RELATED TO THE PROCESS TEMPERATURE				
				Switch Mechanism type 2,3				
				40°C / 104°F	100°C / 212°F	150°C / 302°F	200°C / 392°F	230°C / 446°F
7701 S	NARROW DIFFERENTIAL (FIXED)	SCREWED	PORCELAIN	0.50	0.50	0.65	0.70	0.75
7702 S			SS - 316					
7703 S		FLANGED	PORCELAIN					
7704 S			SS - 316					
7705 S	LARGE DIFFERENTIAL (ADJUSTABLE)	SCREWED	PORCELAIN	0.50	0.60	0.70	0.90	1.00
7706 S			SS - 316					
7707 S		FLANGED	PORCELAIN					
7708 S			SS - 316					

NOTE: (1) The single stage narrow differential Model can operate with all values of specific gravity from the minimum in the table to the maximum of 2 and to maximum of 1.2 for the large differential types, the latter type can accept from the setting liquid specific gravity, alteration of  $\pm 20\%$  & temperature of deviation of  $\pm 25^\circ\text{C}$ .

(2) Porcelain displacer can be used up to a maximum temperature of 95°C in pressurized vessels containing water of condensates.



## SERIES 7700

### Displacer Operated Level Switch intergral top mounted - dual stage

#### DESCRIPTION

Bliss Anand Series 7700 dual stage level switch completes the displacer operated range of instruments. These types are fitted with two switch mechanism and are available with narrow or wide differential.

The narrow differential models are provided with two displacers and are factory set to work with a fixed differential (60 mm average) slightly variable with the liquid specific gravity; the switching level of each stage can be readily adjusted by changing the position of the displacer on the suspension cable.

The wide switching differential models are fitted with three displacer for rising and falling level switching. The various combinations of the displacer is illustrated in the diagram alongside; for each stage, changing the relative position of the displacer on the cable changes the differential setting as well as the switching level setting.

The carbon steel connection to the vessel can be screwed 3'NPT or flanged 3' ANSI 150 as standard; the trim is in AISI 316 stainless steel, the attraction sleeve is in series 410 AISI stainless steel and the displacer spring is stainless steel or in porcelain with AISI 304 stainless steel suspension cable of 2 cm long.

#### SWITCH SELECTION

To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

#### Options and other special features:

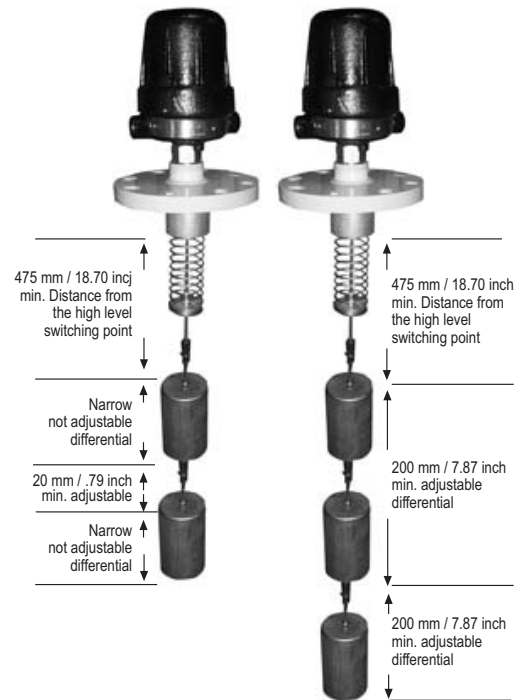
- \* AISI 316 stainless steel chamber
- \* Special corrosion resistance materials
- \* Interface control setting

#### Specifications:

Maximum pressure: 70 bar at 230°C  
On the flanged process connection models the maximum pressure can be limited by the flange rating and its material of construction

MODEL	SWITCH FUNCTION	PROCESS CONNECTION	DISPLACER MATERIAL	MINIMUM SPECIFIC GRAVITY RELATED TO THE PROCESS TEMPERATURE				
				Switch Mechanism type 2,3				
				40°C / 104°F	100°C / 212°F	150°C / 302°F	200°C / 392°F	230°C / 446°F
7701 D	NARROW DIFFERENTIAL (FIXED)	SCREWED	PORCELAIN	0.72	0.80	1.00	1.10	1.20
7702 D			SS - 316					
7703 D		FLANGED	PORCELAIN					
7704 D			SS - 316					
7705 D	LARGE DIFFERENTIAL (ADJUSTABLE)	SCREWED	PORCELAIN	0.55	0.60	0.80	1.00	1.10
7706 D			SS - 316					
7707 D		FLANGED	PORCELAIN					
7708 D			SS - 316					

NOTE : (1) The dual stage model can operate a given liquid specific gravity between the above indicated minimum and the maximum value of 1.2 at given temperature. Liquid specific gravity variations of 10% from the set value of liquid temperature variations of 25°C can be accepted.  
(2) Porcelain displacer can be used up to a maximum temperature of 95°C in pressurized vessels containing water or condensates.



# SERIES 8800



## Displacer Operated Level Switch with flanged external chamber

### DESCRIPTION

Bliss Anand Series 8800 displacer operated level switch is designed for external mounting on very high pressure process plant such as hydraulic accumulators and natural gas compressors and as level controllers on liquids of very low specific gravity.

The dismantlable carbon steel chamber is provided with flanges designed in accordance with ASME CODE SEC.VII. Div. 1 App. 2.

The standard process connection are screwed 1"NPT or 1" NPT SW, flanged connections are also available according to ANSI B 16.5.

Standard models have AISI 316 stainless steel trim, AISI 316 stainless steel float and series AISI 410 stainless steel attraction sleeve. The displacer spring is in stainless steel.

All the series 8800 models can be fitted with only single switch mechanism, the factory built-in setting allows normal operation with liquid specific gravities within the limits shown in the data.

### SWITCH SELECTION

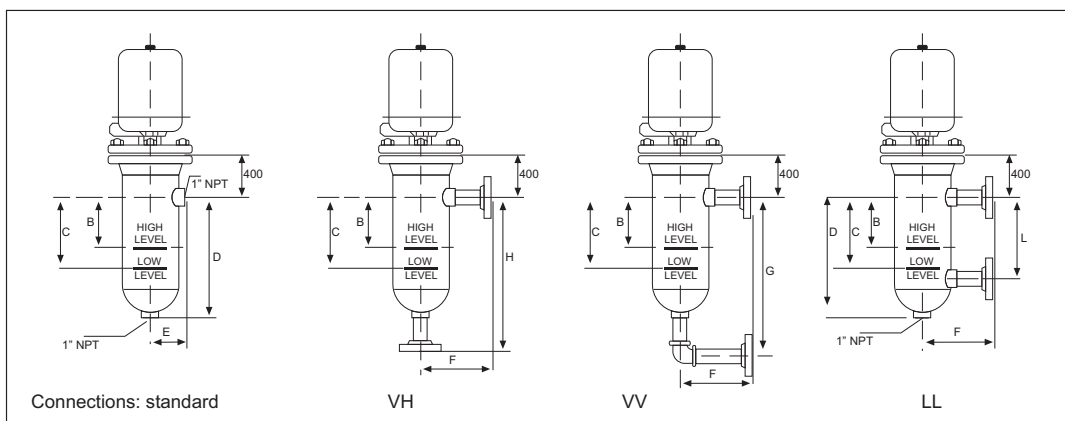
To select the correct model according to the operating conditions and the data of media whose level has to be controlled refer to table below.

### Options and other special features:

- \* AISI 316 stainless steel chamber
- \* Special corrosion resistance materials
- \* Interface control setting
- \* Design for low specific gravity



### Specifications



MODEL	MINIMUM SPECIFIC GRAVITY	MAXIMUM PRESSURE at 150°C (1)	DIMENSIONS (mm / inch)							SPECIFIC GRAVITY (2)	SWITCHING LEVEL	
	Mechanism type 2, 3		BAR / PSI	A	D	E	F	G	H		L	B
8801	0.60	15 / 217.5	350 / 13.77	395 / 15.55	70 / 2.75	140 / 5.51	480 / 18.89	480 / 1.89	254 / 10.00	0.60	180	253
8802		30 / 435	360 / 14.17	395 / 15.55	70 / 2.75	140 / 5.51	480 / 18.89	480 / 1.89	254 / 10.00	0.80	205	260
8803		60 / 870	367 / 14.44	395 / 15.55	70 / 2.75	140 / 5.51	480 / 18.89	480 / 1.89	254 / 10.00	1.00	210	264

NOTE: (1) Above values apply to standard carbon steel construction and use with non-corrosive liquids.  
 (2) Dimensions B (switching point on increasing level) and C (switching point on falling level) apply. To a liquid temperature of 40°C, these dimensions can decrease with temperature increase.



## LEVEL SWITCHES

### Standard and Special Options

**BLISS ANAND Liquid Level Switches are available with the following optional features (add an “S” to the model number):**

#### STANDARD OPTIONS

- \* EXTERNAL CHAMBER with side-side (LL) screwed connections, vent and drain.
- \* FLANGED CONNECTIONS ON EXTERNAL CHAMBER in size 1” 1½” and 2” upto ANSI 600 lbs rating with VH configuration (1 horizontal and 1 vertical connection) or VV configuration (2 horizontal connections) of which the lower is an elbow, or LL configuration (side-side).
- \* FLANGED CONNECTIONS in size upto 8” and pressure rating upto ANSI 600 lbs on series 3300 and 7700 models.
- \* CONSTRUCTION entirely of AISI 316 stainless steel for series 1100,2200,3300,4400,6600,7700 and 8800.
- \* SETTING OF DIFFERENTIAL to meet customers’ requirements.
- \* POSITIONING OF DISPLACERS along the suspensions cable to assure pre-set switching levels to meet the process requirement (normally displacer are field set).
- \* INTERFACE CONTROL SETTING.

#### SPECIAL OPTIONS

- \* SPECIAL COATING AND LININGS.
- \* SPECIAL TESTING INSPECTION AND CERTIFICATION.
- \* SPECIAL MATERIALS such as low temperature steel, AISI 316 L stainless steel, inconal, monel and PVC for chambers.
- \* AISI 316 L, inconal, hastelloy, monel, teflon etc. for internal parts.
- \* SPECIFIC CONNECTIONS.
- \* SPECIAL MODELS for very high pressure.
- \* EXTERNAL CHAMBER for series 7700 models.



## LEVEL SWITCHES



### NOMENCLATURE

To assure a correct and unequivocally interpretation the following nomenclature has to be used in the description of levels switches.

**PROCESSES CONNECTIONS** : Part of the level switch that is used for mounting to the process vessels.

**BODY OR CHAMBER**: Part of the level that contains the float or the displacer.

**HOUSING**: Part of the level that contains switch mechanism; it is made up of base and a cover.

**FLOAT OR DISPLACER** : Element that follows or perceives the process liquid level or specific gravity variation.

**SWITCH MECHANISM** : The mechanical device connected magnetically to the attraction sleeve and reproducing outside the process liquid the high or low level states.

**SWITCH** : Electrical device operated by the switch mechanism to give an on-off or change-over signal corresponding to the high or low level.

**TRIM INTERNAL PARTS**:

- Float or Displacer
- Attraction sleeve
- Float rod with nuts and washer
- Float lever (series 4400 and 6600 only)

**ATTRACTION SLEEVE** : Connected mechanically to the float rod, lever or displacer suspension cable transmitting the level variations to the switch mechanism. Standard execution made of series AISI 410 stainless steel.

**ENCLOSING UNIT** : Sealed non-magnetic element that contains the attraction sleeve allowing its vertical movement, it supports the switch mechanism and its housing.

**SENSING UNIT** : Complete unit except housing and switch mechanism. In series 1100, 2200, 6600 and 8800 consists of chamber, float/ displacer with stem rod, attraction sleeve and enclosing tube and include the series 3300, 4400, and 7700 process connection.

**COOLING EXTENSION** : Extension provided to space the switch housing from the chamber thereby reducing heat transfer from the process to the housing.

- NOTE : 1. The Dimensions shown this catalogue are only indicative & for correct dimensions get certified drawing from works.  
2. In the interest of technical upgradation, specifications are subject to change without notice.



# RF Level Switches

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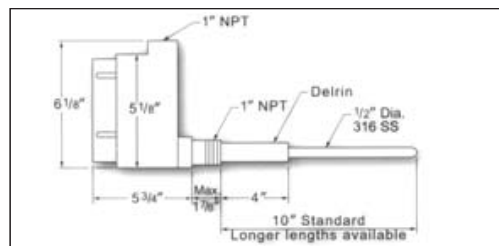


## LS 6000 Level Switch



### Low Cost, High Performance

The LS 6000 level switch is an excellent general purpose level control. This unit can sense all liquids and difficult to measure dry materials.



Like all Bliss Anand Level Switches, the LS 6000 employs a radio frequency (RF) balanced impedance bridge to sense the presence or absence of products. This technique provides the ability to ignore significant product build-up on the probe and is very stable over wide temperature swings, thus eliminating the need for seasonal recalibration.

All electronics are housed in an explosion proof enclosure and all necessary calibration adjustment and indicators are on-board, so all you need to calibrate the LS 6000 is a small screwdriver.

The probe is very rugged and made of  $\frac{1}{2}$ " diameter 316 stainless steel. If a probe is too long, just cut it off with a saw. Or, if you require a longer probe, simply weld on additional rods. Probes of all lengths are available from the factory.



- Senses Liquid and Dry Materials
- Ignores Significant Product Build-up
- Simple Calibration
- Failsafe Electronics
- 5 AMP, DPDT Relay Output

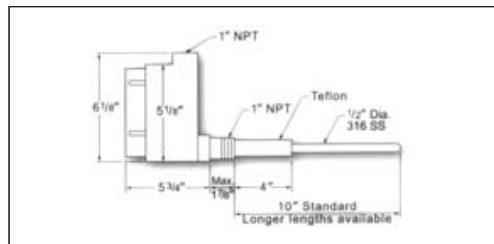


## LS 7000 Level Switch



### Most Versatile Level Switch Available

The LS 7000 level switch has all the features and reliability of the LS 6000, plus features that make it the most versatile level control on the market today.

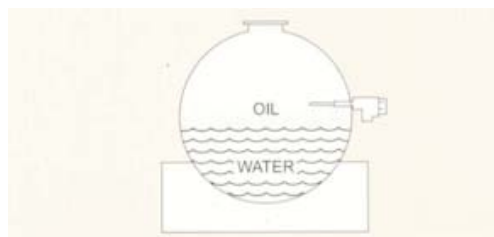


Every standard unit has an on-board fuse and surge suppressor to protect the electronics from improper supply voltages.

A built-in static arrestor protects the circuitry from hostile bin environments created by static prone materials such as plastic pellets.

An on-board test switch combined with modular electronics makes troubleshooting and repair a snap. Of course, every unit is backed by our two year warranty.

The time delay allows the user to select ON DELAY or OFF DELAY operation. The timing range is adjustable from 1/8 second to 2 hours. The timer can be used to ignore wave action in a tank, or the timer can be used to pump down a slump with a single probe.



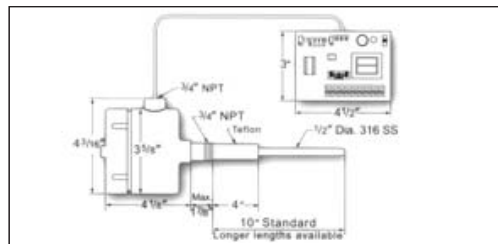
- User Programmable Time Delay
- On-Board Fuse and Spike Suppression
- Built-in Static Protection
- Failsafe High or Low Level
- On-Board Test Switch

## LS 8000 Remote Mounted Level Switch



### Remote Mount the Electronics up to One Mile from the Probe

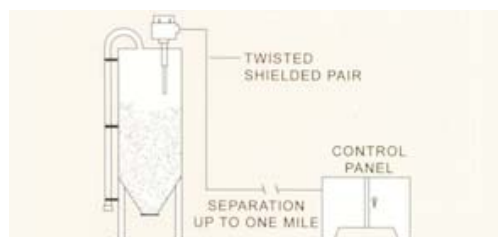
The LS 8000 remote mounted level switch is the perfect choice when it is unsafe or inconvenient to mount the electronics directly to the probe.



The probe consists of a maintenance free, epoxy encapsulated transmitter in an explosion proof housing. The transmitter is connected to a receiver with a twisted, shielded pair of wires (Belden 8760 or equal). The receive board is wired to the supply voltage and has all the necessary calibration adjustments; failsafe and time delay adjustments, and the relay output.

It is possible to calibrate the LS 8000 without climbing a tall tank, or a probe can be located up to one mile from the nearest supply voltage.

The remote mounting does not sacrifice the reliability, stability or performance that makes Bliss Anand level switches famous



- Class I, Group C & D; Class II, Group E, F & G
- Inexpensive Interconnect Cable
- Failsafe High or Low Level
- Adjustable Time Delay
- Optional Enclosures for Receiver



### Common Features

- Ignores significant product build-up
- Solid state, no moving parts
- Simple installation and calibration
- Modular electronics easily replaced
- Probe length easily field modified
- Explosion proof housing standard
- Rugged construction handles roughest products

### Liquids

- Wastewater
- Oils
- Acids
- Slurries
- Fuels
- Caustics

### Dry/Solids

- Fly Ash
- Cement
- Plastics
- Flour
- Powders
- Sand
- Grains
- Wood Chips

### Interfaces

- Oil/Water
- Foam/ Liquid

### Applications

- High/Low Level Alarm
- Auto Tank Filling
- Dry Pump Protection
- Sump Controls
- Plugged Chute Protection

### Optional Configurations Include

- Stainless Steel Enclosures
- Tri-Clamp Process Connections
- Flexible Cable Probes

### Specifications

ELECTRICAL	LS6000	LS 7000	LS 8000
Power	115 VAC (+/-15%), 50/60 HZ, 2 WATTS - STANDARD (12 VDC, 24 VDC, OR 230 VAC OPTIONAL)		
Output	2 FORM C Contacts, DPDT RELAY, 5 Amp Resistive @ 125, 230 VAC; 30 VDC		
One-Board Fuse	250mA	250mA	250mA
Selectable Failsafe	High or Low Level	High or Low Level	High or Low Level
Time Delay	N/A	Select: On or Off Delay Adj: 1/8 Sec - 2 Hrs	Select: On or Off Delay Adj: 1/8 Sec - 2 Hrs
MECHANICAL	LS6000	LS7000	LS8000
Vessel Entry	1" NPT	1 " NPT	¾ " NPT
Conduit Entry	1" NPT	1 " NPT	¾ " NPT
Probe	½ " Diameter 316 Stainless Steel Standard (Halar / Other Coatings Optional)		
Insulator	Delrin	Teflon	Teflon
Housing	Explosion Proof, Copper Free, Cast Aluminium		Transmitter: Explosion Proof Receiver: Track Mounted PC Optional Enclosures
ENVIRONMENTAL	LS 6000	LS 7000	LS 8000
Hazardous Area	Class I Group C,D Class II, Group E, F, G	Class I Group C,D Class II, Group E, F, G	Class I Group C,D; Class II, Group E, F, G
Temp: Electronics	-40° F To 185°	-40°F to 185°	-40°F to 185°
Temp: Probe	-30° F to 250°	-30°F to 450°	-30°F to 450°
Pressure: Probe	1500 PSI @ 75° F (Higher on Request)		

Special Materials of Construction Available





# BLISS ANAND

## Locations:

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### **Manufacturing Unit**

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