

# F. Bamford (Instruments) Ltd.

Ajax Works Whitehill Stockport Cheshire SK4 1NT England

Telephone 0161 480 6507

Fax 0161 474 7990

Website: www.bamfordajax.com e-mail: instruments@bamfordajax.com

**Ajax**

a member of the

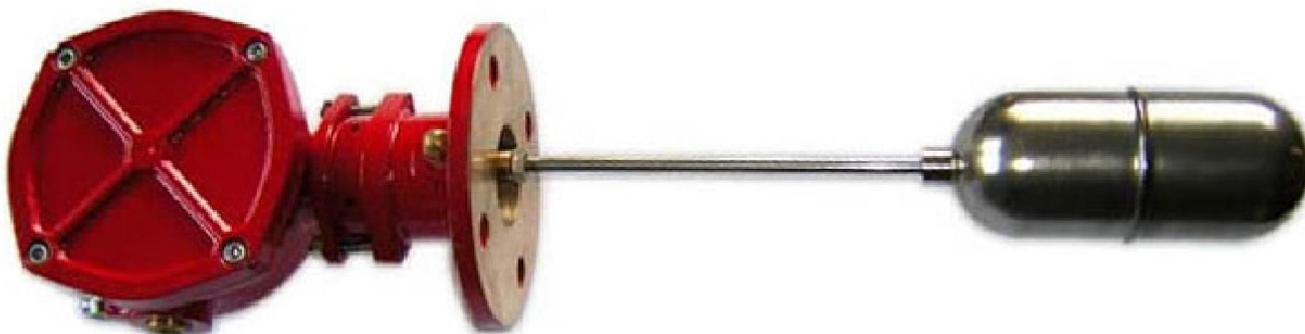
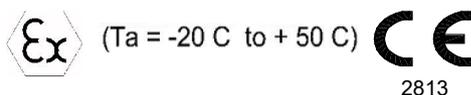
**B**amford  
Group

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## F. BAMFORD (INSTRUMENTS) LIMITED

**INSTALLATION OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE “Ajax”  
RANGE OF SERIES XP FLOAT LEVEL ALARM FITTED WITH AN ‘ATEX’ CERTIFIED  
SWITCHBOX EExd I M2 / II 2G I / IIB + H<sub>2</sub> T6 ‘CSA CERTIFICATE NO: 03ATEX1507  
Issue 2’ AS TYPICAL GA DRG. No. 321/2264C, 321Q3498, 321/3030**



### CAUTION

The following instructions apply to equipment covered by ‘CSA Certificate No: 03ATEX1507 Issue 2’

1. Do not attempt to access the Certified Switch Enclosure (GA Drawing No. 321/1871 Rev ‘L’ refers) while energised. Access to the enclosure should only be undertaken while there is no risk of a flammable atmosphere being present, dust and water should also be prevented from entering the enclosure. Before replacing the enclosure cover ensure that the sealing face of the cover (Part No. 1869E) and body (Part No. 1868C) for the enclosure are undamaged. The sealing ‘O’ Ring (Part No. 5185) should also be inspected for damage and any contamination from foreign bodies.
2. The equipment may be used with flammable gases and vapours with apparatus groups IM2 / II2G – EExd I / IIB+H<sub>2</sub> T6 with temperature class T6 in the ambient temperature range –20°C to +50°C
3. Installation to be carried out by suitably trained personnel in accordance with BS EN 60079-17:2014
4. Inspection and maintenance of this equipment shall be carried out by suitably trained personnel in accordance with BS EN 60079-17:2014
5. Repair of this equipment shall be carried out by suitably trained personnel in accordance with BS EN 60079-1:2014 and BS EN IEC 60079-0:2018
6. For assembly and adjustment of the equipment please refer to GA Drawing No. 321/2264D, 321Q3498A, 321/3030A

IMPORTANT: The requirements of these standards have been checked against BS EN 60079-1:2014 and BS EN IEC 60079-0:2018 and there are no differences affecting the latest technical knowledge for the product identified on this declaration.

G J Potts 19th October 2018



7. Components to be incorporated into or used as replacement parts for the equipment shall be fitted by suitably trained personnel in accordance with the manufacturers documentation.
8. The certification of this equipment relies upon the following materials used in its construction: Gunmetal BS EN 1982 LG2, Viton, Stainless Steel BS6105 A2-70, Nickel Plated Brass, Brass BS2870 CZ108, Brass BS2874 CZ121, Stainless Steel BS970 316L, Nylon 66, Spring Steel, Bakelite.

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised.

**Aggressive Substances:** e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

**Suitable precautions:** e.g. regular checks as part of routine inspections or establishing from the materials Data Sheets for its resistance to specific chemicals.

### **INSTALLATION INSTRUCTIONS**

Carefully unpack the instrument and clear any loose packing material. The instrument should be mounted with standard Klingerite or similar packing between flange and tank. Check that the Serial No. stamped on the switchbox is compatible with that stated on the advice note.

The instrument should be installed either with the conduit entry pointing in a downward direction or in an upward direction, but the former is preferable and the following instructions assume that this position has been chosen.

### **Accessing the switch housing**

**NOTE:-** If already wired and in service, ISOLATE ELSE WHERE BEFORE OPENING. (see above)

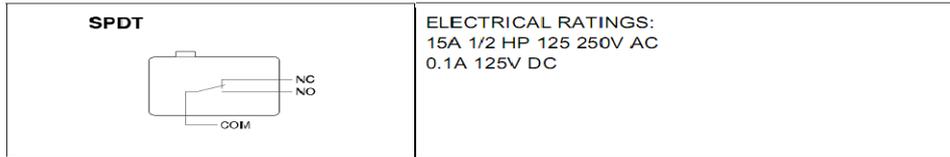
Remove the four securing screws (Part No. 5145). It is imperative that the same screws be used on re-assembly. There are two notches in the switchbox cover, place a blunt instrument into one and tap gently in a rotary direction. When the seal is broken the switchbox cover can be withdrawn from the switchbox.

The switchbox is tapped for M16, M20 or M25 conduit (as specified).

An appropriate approved cable gland of the correct size must be used.

**ELECTRICAL CONNECTIONS:** When the cover has been removed from the switchbox, the terminal block(s) is (are) accessible. Conductor size, 0.5 to 2.5 sq. mm. The connection marked "C" (common) on the terminal block(s) is the supply to the switch. Terminal marked "N.C." is normally closed (at normal flow) and terminal marked "N.O." normally opens at alarm flow condition. Wire as required to make or break (or change over when all three terminals are used) the electrical circuit on a rising or falling direction accordingly. Test that the micro switch is making/breaking correctly.

## MICROSWITCH SPDT



**EARTH CONNECTIONS:** Maximum conductor size; single strand 6 mm<sup>2</sup> fine strand 4mm<sup>2</sup>

**ADJUSTMENT:** The instrument is set in our works with the alarm point in the "mid" (horizontal) position.

The design of the sliding carriage assembly has been incorporated to prevent accidental adjustment. Therefore, time and consideration is required when adjusting these instruments. The following sequence has been found most practical for adjustment:-

Operating the float arm upwards or downwards will simulate the condition of a "rising" or "falling" level. Adjustment is achieved by using two spanners, one to hold the adjustment locknut (Item 14) stationary and the other to rotate the adjustment screw (Item 16) anti-clockwise until the micro switch(es) is (are) changing over at a higher alarm level. Now conversely for a changeover at a lower level. Again check the operation of the instrument and if correct refit the cover. N.B. to check that the switch has not been adjusted "out of range" the sliding carriage assembly can be manually pushed upwards and released to prove the function of the micro switch(es).

### **Earth connections**

Earth studs are provided both externally and internally. They can accommodate a maximum conductor size of 6 mm<sup>2</sup> single strand or 4 mm<sup>2</sup> multi-strand.

Having re-set the instrument to operate at the new setting, it should now be re-assembled into position and wired up as before. To complete process secure switchbox cover prior to switching on power supply.

**DISMANTLING:** If the occasion arises for the unit to be dismantled the following sequence must be adhered to.

Remove the two Nuts and Spring Washers (Items 34/35) from the Fixed Studs (Item 33) and carefully remove the Switch Enclosure. The Operating Spindle (Item 47) can be unscrewed and the Bellows Assembly removed.

To withdraw the Float Arm assembly, remove the dome nuts (Item 54) and unscrew the pivots to withdraw the complete sub-assembly. If the Fulcrum Pin (Item 44) needs replacing it will be necessary to replace the complete Float Trunnion (Item 45) and Spindle Assembly as these are matched together during manufacture.

## **RECOMMENDED SPARES**

These are shown marked with an asterisk on Drawing No. 321/2264D

## **SPECIAL TOOLING:**

1. M6 Allen Key
2. 1/4" Allen Key
3. 5/16" A/F Spanner
4. 1/2" A/F Spanner
5. 9/16" A/F Tube Spanner
6. Small & large screwdrivers

## **MAINTENANCE INSTRUCTIONS**

After 12 months a check should also be made on the 'O' Ring Seal in the EExd Enclosure and replaced if necessary.

To secure the cover to the switchbox, the following screws **MUST** be used.  
M6 x 16.0 long x 1.0P Socket head cap screws to conform to BS1605 Class A2-70.  
Material **STAINLESS STEEL 304** Grade A2 - 70 (700 N/mm<sup>2</sup>).

To check that the cover has been secured correctly after wiring - the maximum allowable gap, if one exists between the surfaces of the switchbox and cover, shall nowhere exceed 0.1 mm.

In conclusion, we are pleased to offer all recommended spare parts ex. stock and a 48 hour repair and refurbishing service.

## Specifications

SWITCH RATING (STANDARD)

VOLTS	DC		AC	
	RES	IND	RES	IND
30	10A	10A	10A	10A
125	0.5A	0.07A	10A	10A
250	0.25A	0.03A	10A	10A

Alternative switches may be fitted for 440 volts or intrinsic safe circuits.

### Conduit entry

Either one or two M20 or M25 x 1.5 pitch.

**Connector size:** 0.5mm<sup>2</sup> - 2.5mm<sup>2</sup>

**Earthing screw:** M5.

**Ambient temperature range of switch enclosure:**  
-20°C to +50°C

**Maximum operating temperature range of working medium:**  
-10°C to +93°C

### Switch housing:

Manufactured in either:  
Gunmetal BS EN 1982 LG2/LG4  
Stainless Steel BS EN 3100 316C16

### Wetted parts:

Phosphor Bronze PB1 BS 2870 /  
Gunmetal BS EN 1982 LG2/LG4

### Float material:

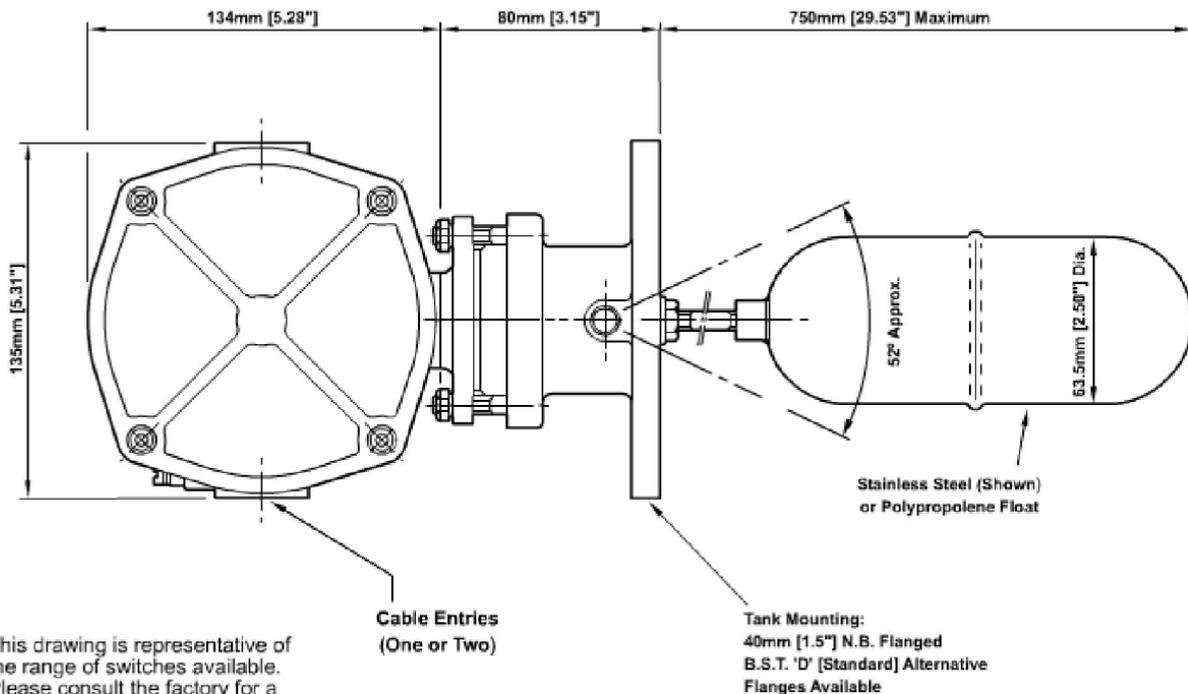
Stainless Steel 316 or Polypropolene

### Maximum Working Pressure:

10 Bar G

### Tank Mounting

40mm NB BST 'D' (Standard)  
Alternative Flanges Available



The Bamford Ajax XP series of Flameproof Float Level Alarm Switches are a new generation of ruggedly constructed devices for automatic control and reliable protection against dangerously high or low liquid levels in a tank, container or reservoir. The functionally designed enclosure is standard on all models to meet the arduous conditions experienced in the Petro-Chemical, Offshore and Mining industries. Single or double cable entries are available for fitting with approved cable glands. The standard precision snap action micro-switch is a single pole double throw type; however, one or two microswitches with silver plated noble metal contacts may be fitted to provide versatility of switching circuits.

The units are supplied with either a synthetic or stainless steel float and a lever arm length to suit requirements. In operation, the eccentrically mounted float arm activates, via a special "bellows" type seal, an internally adjustable microswitch. This allows for the device to be mounted at any liquid level without fear of leakage. The all-metal wetted parts cater for the majority of liquids.