

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

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F. BAMFORD (INSTRUMENTS) LIMITED.

INSTALLATION OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE "AJAX" RANGE OF MINIATURE VANE & SPOOL TYPE SERIES ELECTRIC FLOW INDICATORS FITTED WITH A STANDARD INDUSTRIAL SWITCHBOX GENERAL ARRANGEMENT DRAWING NUMBER: 321H666E



The Bamford Ajax AJ series of Miniature Flow Indicators are ruggedly constructed to provide automatic control and protection of machinery and plant where it is essential to monitor low flows of cooling water, lubricating oils, etc.

All models have high quality gunmetal bodies with internal wetted parts in manganese bronze as standard or other materials as an option. They are fitted with armoured glass windows to give a visual indication of flow. The switchbox houses a standard precision snap action single pole double throw micro switch which can be factory set or field adjustable. Micro switches with silver plated noble metal contacts are also available for use on I.S. circuitry. Both models are similar in action where a flow of liquid displaces a spool or vane which in turn operates a control spindle, through a patented rolling seal, which makes contact with the micro switch. By adjusting the position of the micro switch, an alarm trip can be achieved at differing flow rates.

1. For assembly and adjustment of the equipment please refer to GA Drawing No. 321H666 'E'
2. 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.

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 which may have entered the inside of the body. When mounted in a horizontal pipeline the switch housing must be positioned in the northern axis. If a stop valve is fitted in the circuit the instrument should be fitted after this.

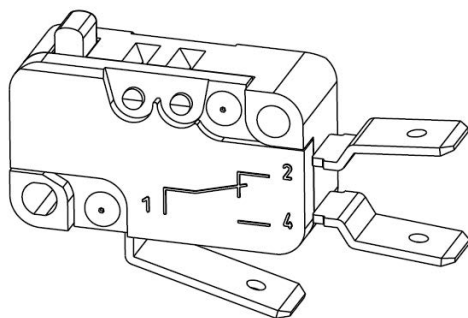
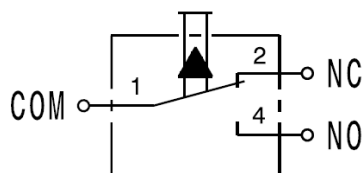
Where possible It is recommended that the unit be fitted in the pipeline at a distance of at least ten times the pipe bore size up-stream and five times downstream from bends or other instruments to give effective operation.

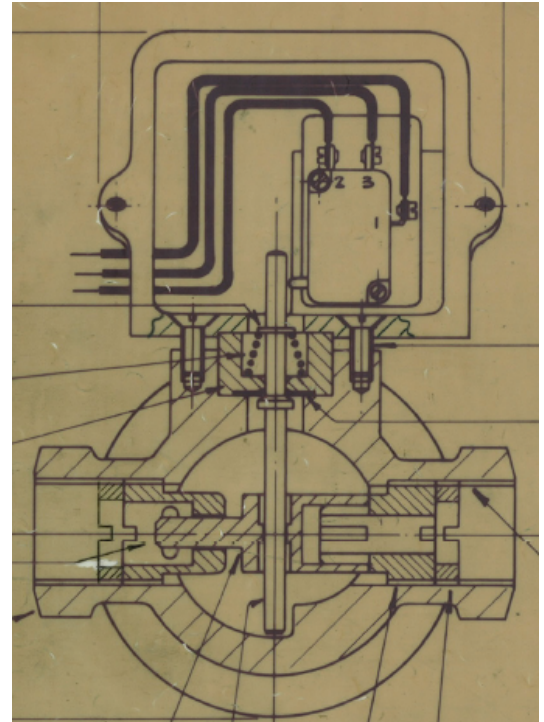
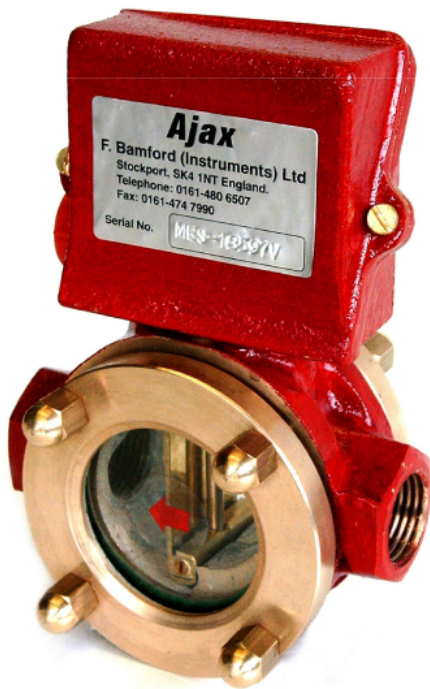
ENTRY INTO SWITCH HOUSING - NOTE: If already wired and in service, **ISOLATE ELSEWHERE BEFORE OPENING.**

The switchbox is tapped M16 x 1.5P, an appropriate approved cable gland must be used.

ELECTRICAL CONNECTIONS:

Actuating force (Newton)	Max 100cN
Connection	Plug connection 6.3 x 0.8mm, straight
Contact material	AgNi
Lever type	Plunger
Switching current	16A
Switching function(s)	Changeover contact
Switching voltage	250Vac
Temperature range	-40 - +85°C
Type	D459-V3AA





OPERATING INSTRUCTIONS

ADJUSTMENT: The following sequence should be adhered to for adjustment: -

Increase the liquid flow through the instrument to well above the safe minimum quantity (If out of the pipeline, operate the vane manually to simulate this condition). Loosen the Locknut (Item 14) on the adjustment screw (Item 15) anti-clockwise until the Microswitch contacts change over at the higher flow (half a turn of this screw covers the complete range of adjustment).

Switching Range Lit/Min (GPM)	Min. Flow for Reset Lit/Min (GPM)	Typical Pressure Loss at Maximum Switching Flow (BAR G)
7 – 23 (1.5 – 5.0)	9.1 (2.0)	0.45 (Water)

Now reduce the liquid flow to the trip setting required and adjust the Microswitch to the required setting - rotating the adjustment screw clockwise finally tighten the locknut, making sure the adjusting screw does not turn, then re-check. The adjuster plate (**Item 16**) will rotate with the adjusting screw to facilitate adjustment. Check the operation of the instrument and finally ensure that the Microswitch has not been set below the minimum trip point of the instrument.

DISMANTLING

If the occasion arises for the instrument to be dismantled, the following sequence must be adhered to:- (removal from the pipeline makes the operation much more convenient). (See GA Drawing No. 321H666E for item identification No.)

- (1) Remove the top half of the switchbox body **(8)** and then the switch pivot screw **(12)** and thus withdraw the switch.
- (2) Now unscrew switchbox securing screws **(17)** and remove switchbox body **(7)**.
- (3) Remove Bezels **(19)**, Windows **(18)** and Vane Lockscrew **(30)**.
- (4) The entire spindle assembly can now be withdrawn, the Circlip **(6)** can now be removed using a circlip removal tool (see below).
- (5) Remove Spring **(5)** and Spindle **(4)** from Positioning Plate **(2)**.
- (6) When fitting a new sealing ring **(3)** the ring **MUST** protrude 0.010" above the positioning plate.

When re-assembling, the reverse to this sequence must be followed, care being taken that opposite sides of the bezel are tightened down in sequence.

The following tools are required for the above work:-

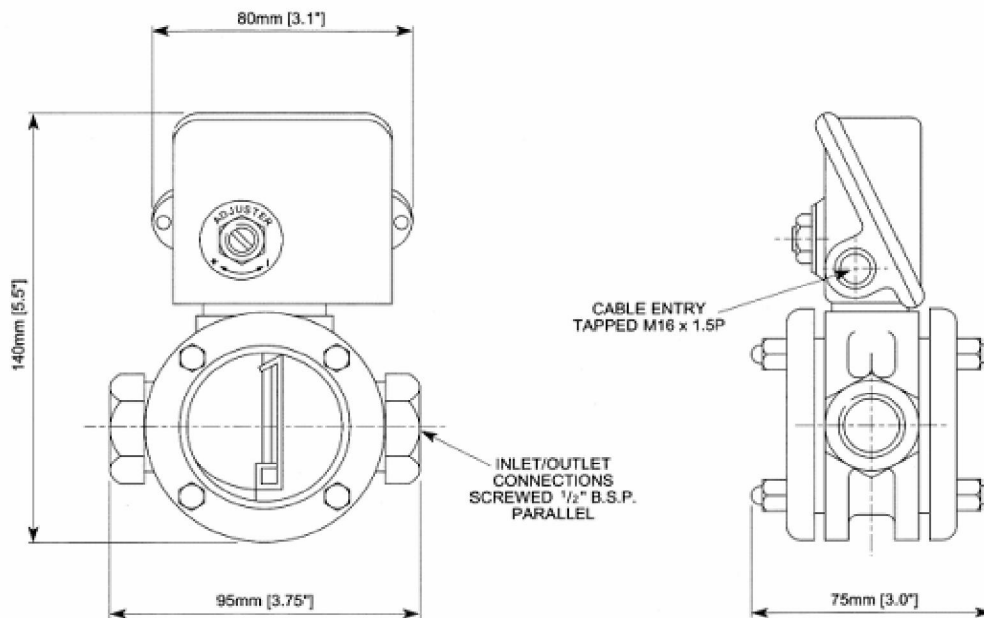
1. Small and Large Screwdrivers.
2. 3/16" U.N.F. Flat Spanner.
3. "Anderton" Circlip Tool type 1500.4C.

MAINTENANCE INSTRUCTIONS

All instruments are of proven reliability and robust construction and as such require minimal maintenance. However, in certain circumstances, and depending on the preventative maintenance schedule adopted, it may be necessary to check the condition of the window glasses and where practical remove and clean them. At the same time it would be advisable to fit a new set of window joints and also inspect the vane assembly for any signs of wear on the pivots and vane spindles, which could be detrimental to the smooth operation of the device. We would also suggest that the operating spindle and "O" ring seals are checked every 12 months and replaced every 5 years.

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

DIMENSIONAL DRAWINGS



VANE TYPE ILLUSTRATED
(SPOOL TYPE IDENTICAL
IN OVERALL DIMENSIONS)

Specifications

FLOW DETAILS

TYPE	Max working Pressure (Bar G.)	Model No.	Switching Range Lit / Min (GPM)	Min. Flow for Reset Lit / min (GPM)	Typical Pressure Loss at Maximum Switching Flow (Bar G.)
VANE	7	7668	7 - 23 (1.5 - 5.0)	9.1 (2.0)	0.45 (Water)
	20.5	7669			
SPOOL	7	7670	1.1 - 7.0 (0.25 - 1.5)	2.3 (0.5)	0.3 (Oil at 80°C 120cst)
	20.5	7671			

Process Connections:
½" BSP parallel female
(both models) and
½" BSP taper or NPT
Female (Vane Type only)

Maximum Working Temperature:
Both models 95°C

Hydraulic Test Pressure:
1½ times maximum working pressure

Materials of Construction:
Body:
Gunmetal BS EN 1982 LG2
Stainless Steel 316

Conduit entry:
M16 Female or an M16 Male
X M20 Female adaptor

Wetted Parts:
Manganese Bronze BS 2874 CZ114
Stainless Steel 316

Windows:
Toughened Soda Lime
To BS 3463

Window Joints:
N.A.F. BS 7531 Grade Y

Switch Housing:
Gunmetal BS EN 1982 LG2

Directors: A.W Smith, B.Sc. P. Hampson (Secretary)
Registered Office: As above Registered in England No. 1123934 V.A.T. No. 158 4804 35



Certificate No: FM13215

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