



**ASSESSMENT OF AMTRON VMD MODELS 101 & 102  
VALVE MONITORS**

By

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# ASSESSMENT OF AMTRON VMD MODELS 101 & 102 VALVE MONITORS

## 1. INTRODUCTION

At the request of Mr A. Magee from Amtron VMD Pty Ltd the Scientific Services Laboratory (SSL) conducted an assessment and tests on the Amtron VMD models 101 and 102 valve monitors for compliance with AS 4118.1.4-1994, "Fire Sprinkler Systems Part 1.4: Components - Valve monitors".

The Amtron VMD models 101 and 102 were previously assessed/tested as complying with the Grade A requirements of SSL document CLP191 "Specification for Tamper Resistant Valve Monitoring Switches", refer SSL reports F394/R1 (August 1990), F472/R1 (February 1991) and F565/R1 (October 1991). This report details assessments and tests to clauses where AS 4118.1.4-1994 differs from CLP191.

This report also includes assessment of the tamper resistance of valve monitors for a variety of valve types.

## 2. PRODUCT DESCRIPTION

The Amtron models 101 and 102 valve monitors are designed to indicate whether a valve is open or closed. These devices include a number of security measures which are intended to prevent the removal of the valve monitor without causing indication at signalling equipment. Each valve monitor circuit contains a coded end-of-line device and a series of hidden reed switches.

The Amtron model 102 valve monitor contains a self-indicating LED which illuminates when it is actuated and a latching mechanism which maintains the device in alarm enabling, for circuits containing multiple devices, the specific valve monitor in alarm to be identified.

The Amtron model 101 valve monitor does not contain a self indicating LED or a latching mechanism and is intended for use in voltage free type applications.

## 3. METHODOLOGY

The scope of work required in testing the Amtron VMD model 102 valve monitor to the differences between AS 4118.1.4-1994 and SSL document CLP191 is detailed below:

- i) assessment of IP rating (Clause 2.2 (e) of AS 4118.1.4-1994),
- ii) assessment of external cabling (Clause 2.2 (h) of AS 4118.1.4-1994),
- iii) assessment of terminals (Clause 2.2 (j) of AS 4118.1.4-1994),
- iv) assessment of multiple monitors (Clause 2.7 of AS 4118.1.4-1994),
- v) conduct a salt mist test in accordance with clause 3.5.5 of AS 4118.1.4-1994,
- vi) conduct a dust test in accordance with clause 3.5.6 of AS 4118.1.4-1994,
- vii) assess product information and marking to section 4 of AS 4118.1.4-1994.

The Amtron model 101 valve monitor was deemed to be sufficiently similar to the Amtron model 102 and was not required to undergo further tests. A separate assessment for compliance with clause 2.7 "Connection of multiple monitors" was made for the Amtron model 101 valve monitor.

The method of valve monitor attachment to valves was assessed in accordance with AS 4118.1.4-1994 clause 3.2.1 "Tamper Resistance".

### 3. RESULTS

Results of tests and assessments that were performed on the Amtron VMD model 102 valve monitor are detailed below and in the attached appendices.

- a) Assessment of IP rating - The Amtron VMD models 101 and 102 valve monitor have an IP rating of IP65 as evidenced by Londonderry Occupational Safety Centre Test Report No. 8180.
- b) Assessment of external cabling - external cabling meets this requirement when the Amtron VMCC panel interface board designated LEC915 Rev2 and end-of-line monitor, designated LEC907C Rev 2 are fitted to the valve monitor circuit. (Refer SSL report F565/R1, October 1991.)
- c) Assessment of terminals - the terminals on the Amtron VMD model 102 (Lab Sample XB 1299/1) were assessed as being able to accommodate conductors of a cross-sectional area of 0.75 mm<sup>2</sup>.
- d) Connection of multiple monitors (Amtron VMD model 102) on one circuit would not degrade the tamper resistance of the circuit provided that:
  1. Appropriate line monitoring is fitted, and
  2. Cabling between the interconnected valve monitors is protected by either Steel armoured cabling or Plastic armoured cabling (Clipsal cat. 263/20C or equivalent, see plate 2, Appendix B).
- e) The Amtron VMD model 102 lab sample No. XB 1299/2 was subjected to salt mist in accordance with Clause 3.5.5 of AS 4118-1.4-1994 and did not enter an alarm initiation state when energised.
- f) The Amtron VMD model 102 lab sample No. XB 1299/1 was subjected to dust in accordance with Clause 3.5.6 of AS 4118-1.4-1994 and did not enter an alarm initiation state when energised.
- g) Product marking and information was assessed and found to comply with Section 4 of AS 4118-1.4-1994. Details of product marking are shown in Appendix A.
- h) The Amtron model 101 valve monitor does not have a latching indicator as required by clause 2.7 (b) and hence is limited to one device per circuit.

- i) The methods of attaching valve monitors to valves was assessed in accordance with clause 3.2.1 "tamper resistance" for the Amtron model 102 valve monitor with each of the following valves:

Valve description	Assessment result
Central grooved butterfly valve (model A-BFV-G1, UL listing no. 4858)	Complies, See Appendix B
John gate valve 50mm dia. (markings DR AS1628 289)	Complies, see Appendix B
John gate valve 4" dia. (model BV149)	Complies, see Appendix B
Victaulic butterfly valve size 4 (Fig. V-040-3522)	Complies, see Appendix B
Vigilante butterfly valve (model G2L0 890)	Complies, see Appendix B

## 5. DISCUSSION

This report covers assessments of the Amtron VMD model 102 valve monitor to clauses of AS 4118.1.4-1194 where this Standard has differences to the Grade A requirement of SSL document CLP191. Previous assessments of Amtron VMD models 101 and 102 to SSL document CLP191 (Refer SSL reports F394/R1 (August 1990), F472/R1 (February 1991) and F565/R1 (October 1991) provide evidence of compliance to the other clauses of AS 4118.1.4-1994.

The Amtron VMD model 101 valve monitor does not include a latching mechanism or self indicating LED, hence this model does not meet Clause 2.7 (b). A limit of one Amtron VMD model 101 valve monitor per circuit would apply.

The assessment of the combination of valve and valve monitor to clause 3.2.1 determines if a valve type is compatible. All the valve/valve monitor combinations assessed in this report are compatible. Other compatible valve types are detailed in previous reports.

## 6. CONCLUSION

The Amtron VMD model 102 valve monitor meets the requirements of AS 4118.1.4-1994.

When limited to one valve monitor per circuit the Amtron VMD model 101 valve monitor meets the requirements of AS 4118.1.4-1994.

Assessing officer: *Peter Haggan 2/9/94*

Authorised by: *[Signature] 2/9/94*

## APPENDIX A

### SECTION 4: PRODUCT MARKING AND INFORMATION

REQUIREMENTS	COMMENTS	Complies
<b>4.2 MARKING</b> Monitors shall be legibly and indelibly marked with the following: <ul style="list-style-type: none"> <li>(a) Unique identifying name or trademark.</li> <li>(b) Model and serial numbers.</li> <li>(c) Year of manufacture.</li> <li>(d) Maximum and minimum working voltage.</li> <li>(e) Maximum Current rating.</li> <li>(f) Where monitors are polarity sensitive, appropriate distinguishing marks on, or adjacent to, each wiring terminal.</li> <li>(g) A box for marking the installation circuit number on the monitor.</li> </ul>	Amtron Model 102 Marked Max 30V, Min 21V Max current 200mA (+) next to positive terminal (-) next to negative terminal  Box for circuit number marked on VMD body.	Yes Yes Yes Yes Yes Yes  Yes
<b>4.3 INFORMATION</b> The following information shall be provided by the manufacturer or any agent of the manufacturer as part of the submission for type testing. <ul style="list-style-type: none"> <li>(a) Maximum and minimum sensitivity, and stability if applicable.</li> <li>(b) Diagram of connections to supervisory equipment.</li> <li>(c) Trade name, place of manufacture and model number.</li> <li>(d) List of compatible SEs for test purposes.</li> <li>(e) List of compatible valves for test purposes.</li> <li>(f) Sufficient information to assess the compatibility of the monitor with the environment and SE, eg. service temperature ranges.</li> </ul>	OFF/ON switch  supplied  Amtron VMD P/L, Moorabbin  See referenced reports(s) See referenced reports(s) See referenced report(s)	N/A  Yes  Yes Yes Yes Yes Yes

REQUIREMENTS	COMMENTS	Complies
<p><b>4.4 POINT OF SALE INFORMATION</b> The information provided with the valve monitor shall include the following:</p> <p>(a) Electrical ratings.</p> <p>(b) Quiescent and alarm state voltage and current.</p> <p>(c) If polarity sensitive, appropriate distinguishing marks to indicate correct polarity connection.</p> <p>(d) Diagram of connections to compatible SEs.</p> <p>(e) Diagrams of fittings to compatible valves.</p> <p>(f) Relevant signalling parameters.</p> <p>(g) Installation instructions and details of special tools and jigs required for each compatible valve type.</p>	<p>marked on valve monitor</p> <p>marked on valve monitor</p> <p>marked on valve monitor</p> <p>two wire device</p> <p>supplied on information card</p> <p>supplied on information card</p> <p>supplied on information card</p>	<p></p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>N/A</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>

Note: SE is an abbreviation for supervisory equipment



APPENDIX B

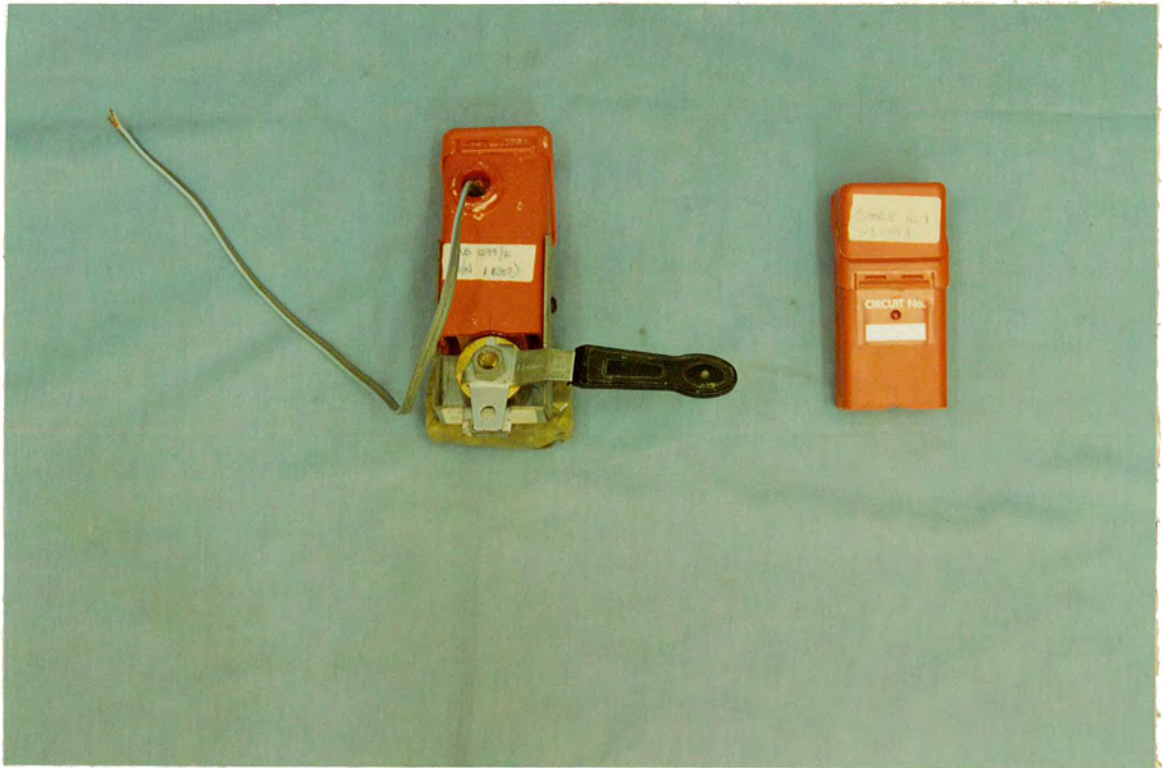


Plate 1. Amtron model 102 valve monitors

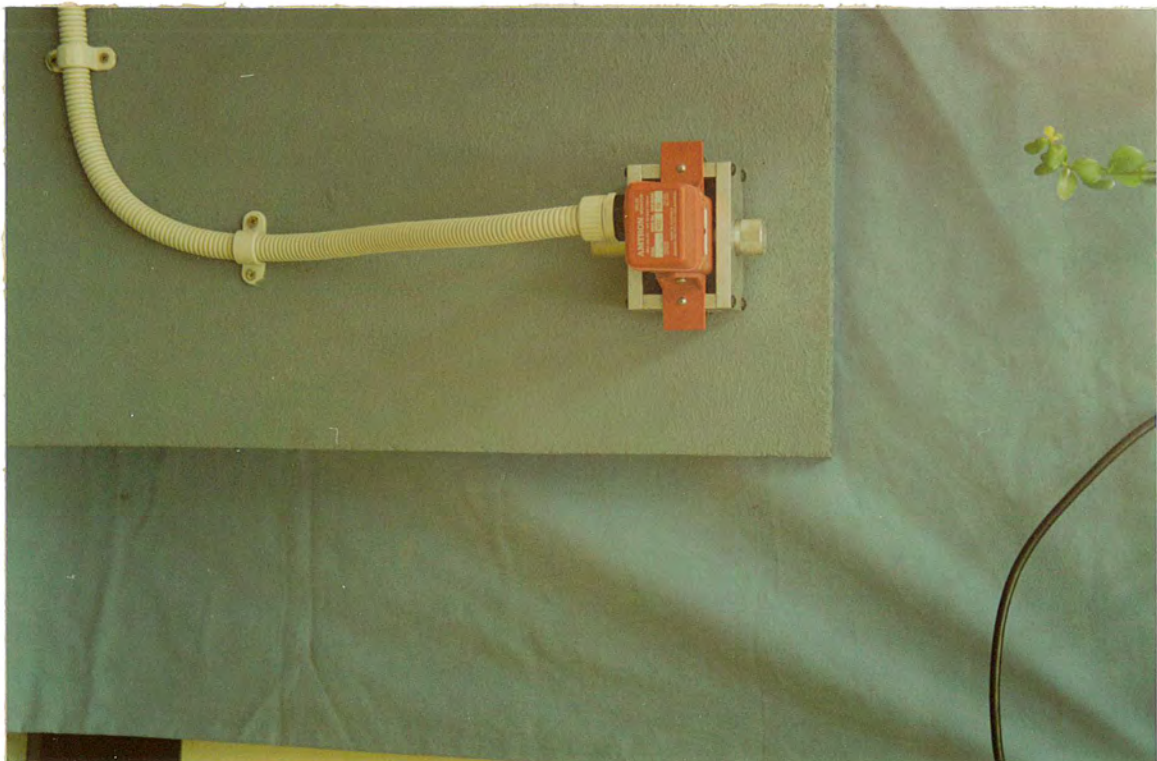


Plate 2. Acceptable cable sheath for multiple connection

APPENDIX B (cont...)

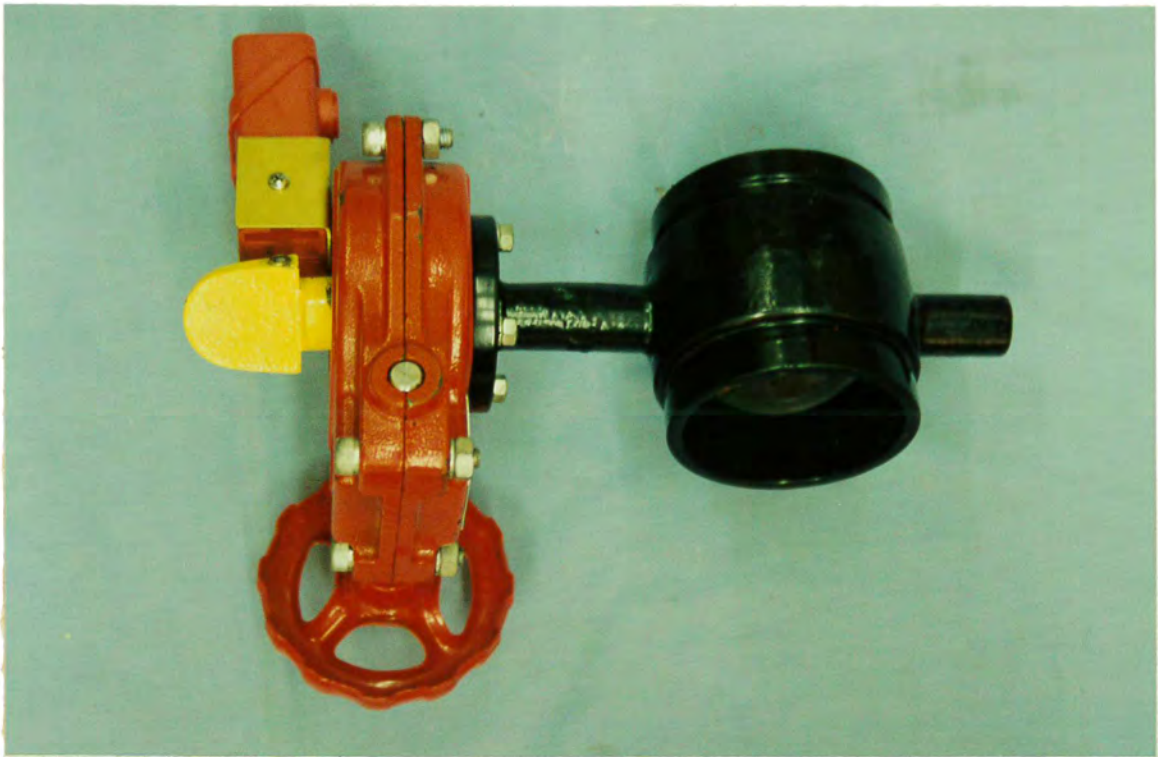


Plate 3. Assessed attachments between Amtron model 102 valve monitor and central grooved butterfly valve.

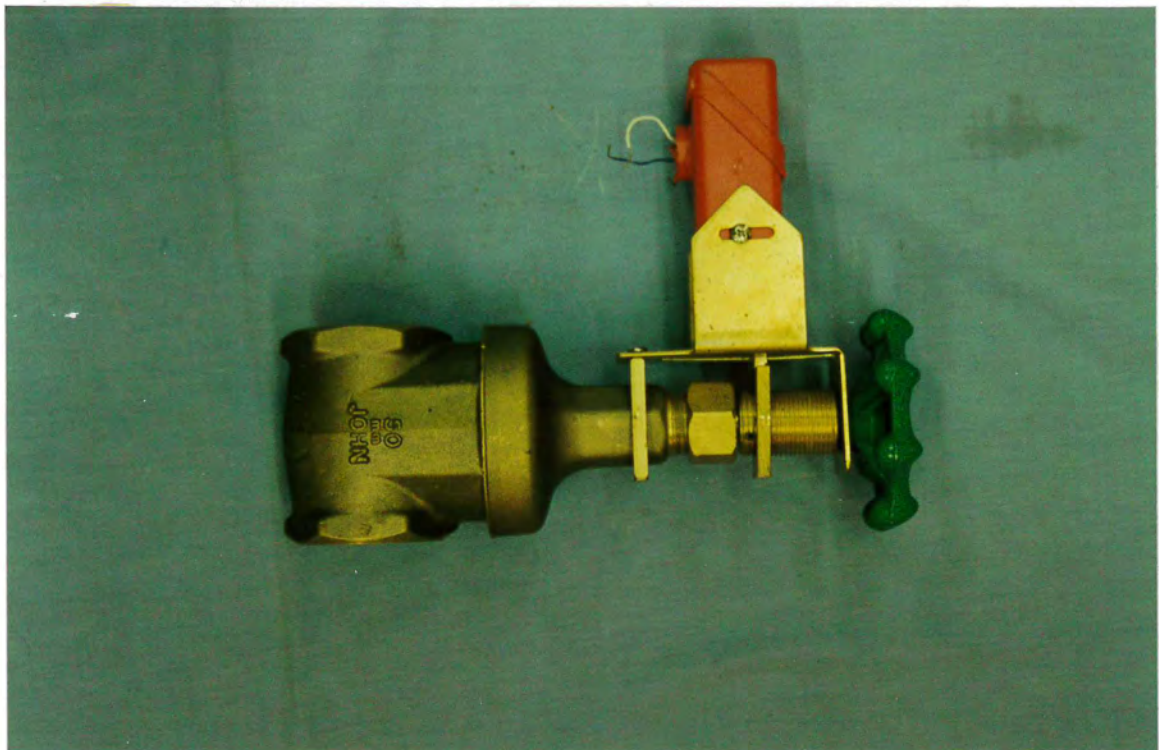


Plate 4. Assessed attachments between Amtron model 102 valve monitor and John gate valve 50mm dia.



APPENDIX B (cont...)

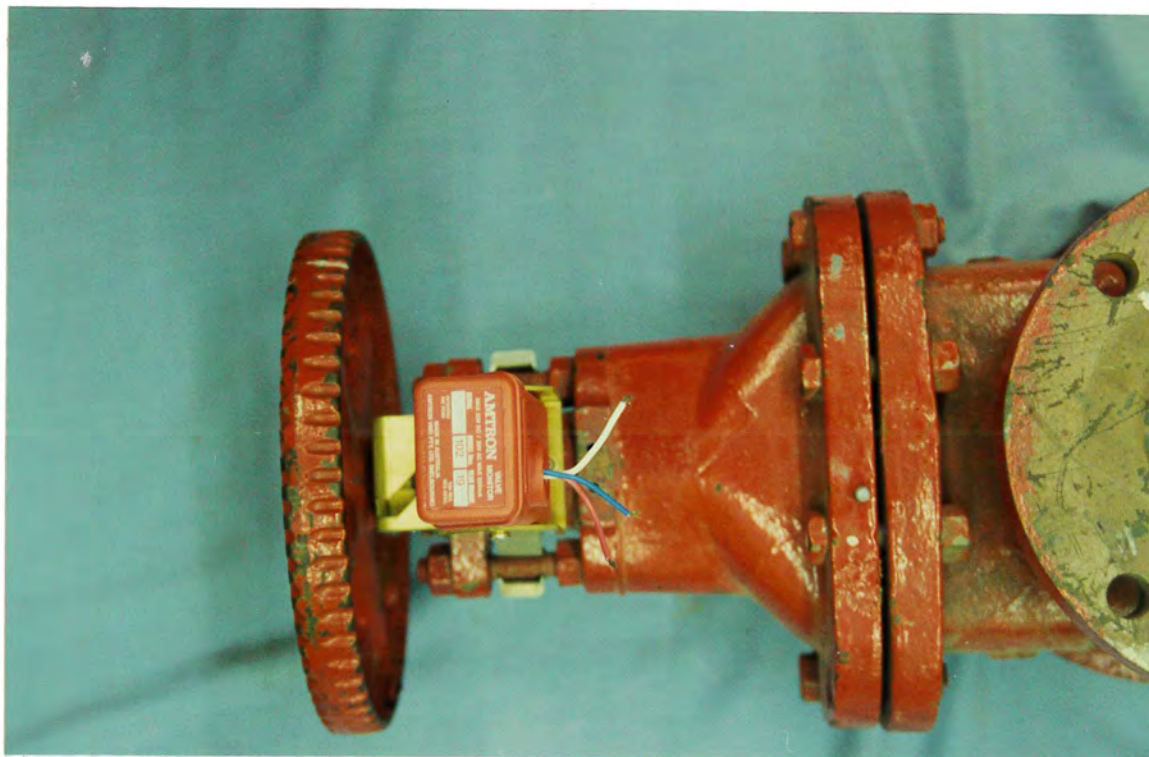


Plate 5. Assessed attachments between Amtron model 102 valve monitor and John gate valve 4" dia.

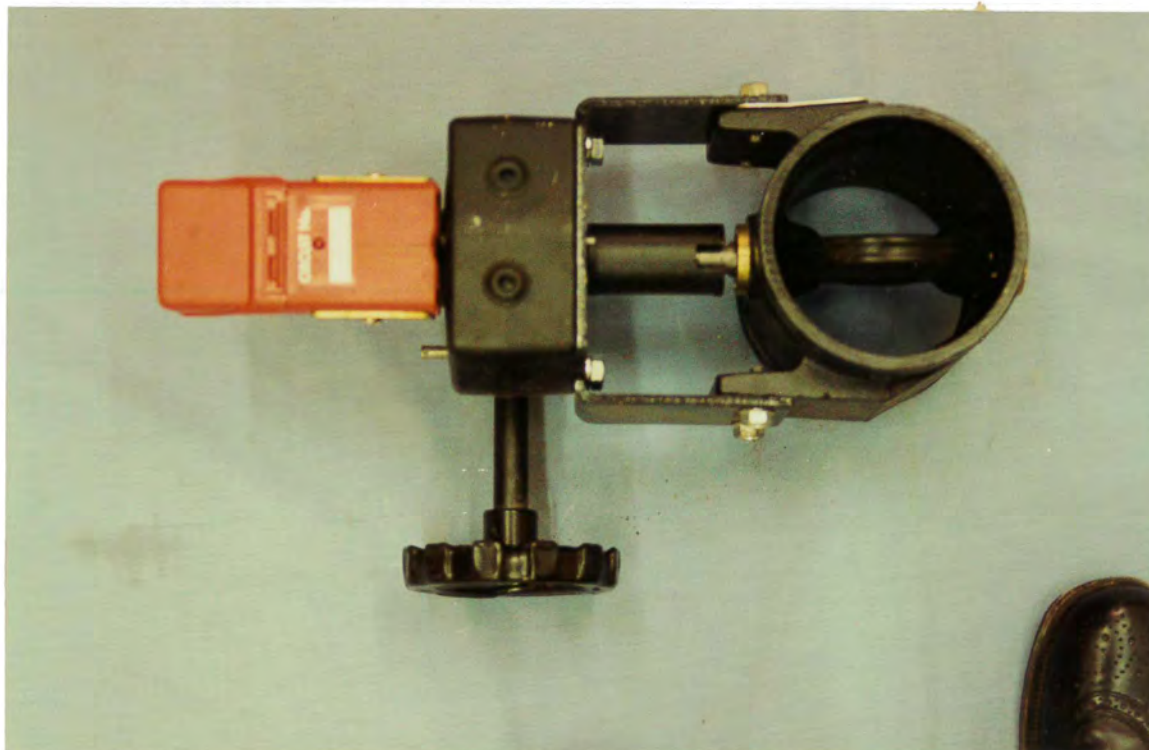


Plate 6. Assessed attachments between Amtron model 102 valve monitor and Victaulic butterfly valve size 4.

**APPENDIX B (cont...)**

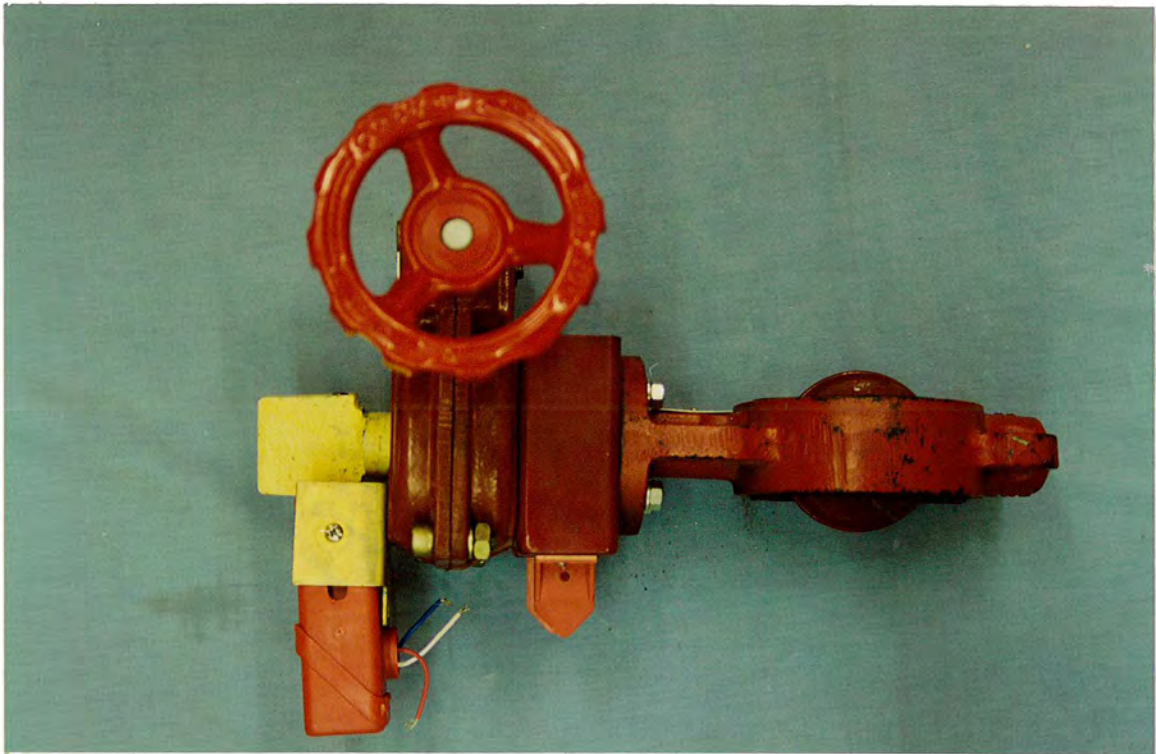


Plate 7. Assessed attachments between Amtron model 102 valve monitor and Vigilante butterfly valve.