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File Ex5148
Project 96NK15320

December 2, 1997

REPORT

on

AIR RELEASE VALVES FOR FIRE PUMPS

Val-Matic Valve and Manufacturing Corp.
Elmhurst, IL

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G E N E R A L

INTRODUCTION:

This Report describes the investigation of air release valves for fire pumps intended to be installed in accordance with the National Fire Protection Association Standard For the Installation of Centrifugal Fire Pumps, NFPA 20.

OBJECT:

The object of this investigation was to determine compliance of the air release valves with the applicable requirements.

PLAN:

The investigation of the air release valves consisted of conducting a product conformance evaluation and performance testing.

D E S C R I P T I O NPRODUCT COVERED:

Automatic air release valves in the following Models, sizes and rated pressures:

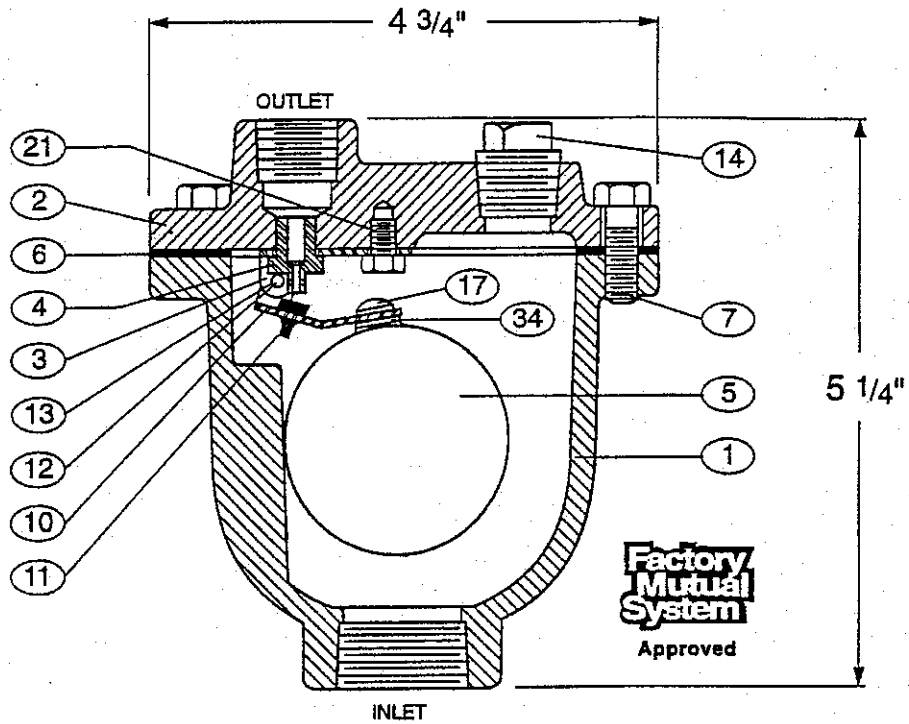
<u>Model</u>	<u>Size, in.</u>		<u>Rated Pressure, psig</u>
	<u>Inlet</u>	<u>Outlet</u>	
1/2 in. - 15A	1/2	1/2	175
3/4 in. - 15A.2	3/4	1/2	175
1 in. - 15A.3	1	1/2	175
22.4	3/4	1/2	175
22.3	1	1/2	175
22.7	1/2	1/2	300
22.9	1	1/2	300
101 WST	1	1	300
102 WST	2	2	300
103 WST	3	3	300

CONSTRUCTION DETAILS:

The devices have been examined and found to comply with the applicable requirements in effect as of the date of this Report.

USE:

The products covered by this Report are for use in accordance with the National Fire Protection Association Standard For the Installation of Centrifugal Fire Pumps, NFPA 20, and the manufacturer's installation instructions.



TEST PRESSURE
1.5 TIMES COLD WORKING PRESSURE-CWP

VALVE SIZE	MODEL NO.	INLET SIZE	OUTLET SIZE	CWP P.S.I.	ORIFICE SIZE
1/2"	1/2"-15A	1/2" N.P.T.	1/2" N.P.T.	175	1/16"
3/4"	3/4"-15A.2	3/4" N.P.T.	1/2" N.P.T.	175	1/16"
1"	1" -15A.3	1" N.P.T.	1/2" N.P.T.	175	1/16"

- | | | | |
|----|-------------|----|--------------------------|
| 1 | BODY | 11 | ORIFICE BUTTON |
| 2 | COVER | 12 | PIVOT PIN |
| 3 | LEVER FRAME | 13 | PIN RETAINER (NOT SHOWN) |
| 4 | SEAT | 14 | PIPE PLUG |
| 5 | FLOAT | 17 | FLOAT RETAINER |
| 6 | GASKET | 21 | LOCATOR |
| 7 | COVER BOLT | 34 | LOCK WASHER |
| 10 | FLOAT ARM | | |

Revision 2-14-97

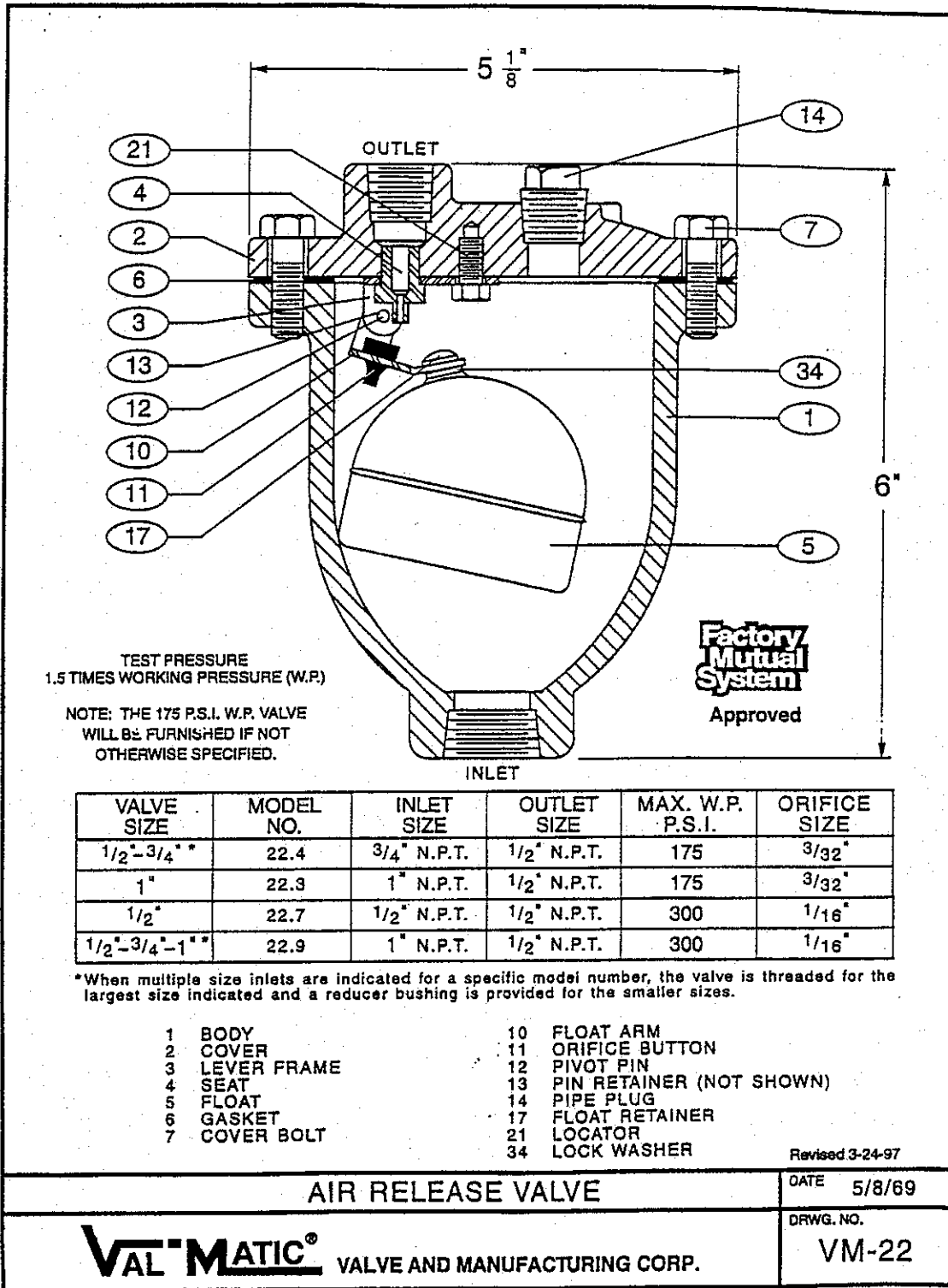
AIR RELEASE VALVE

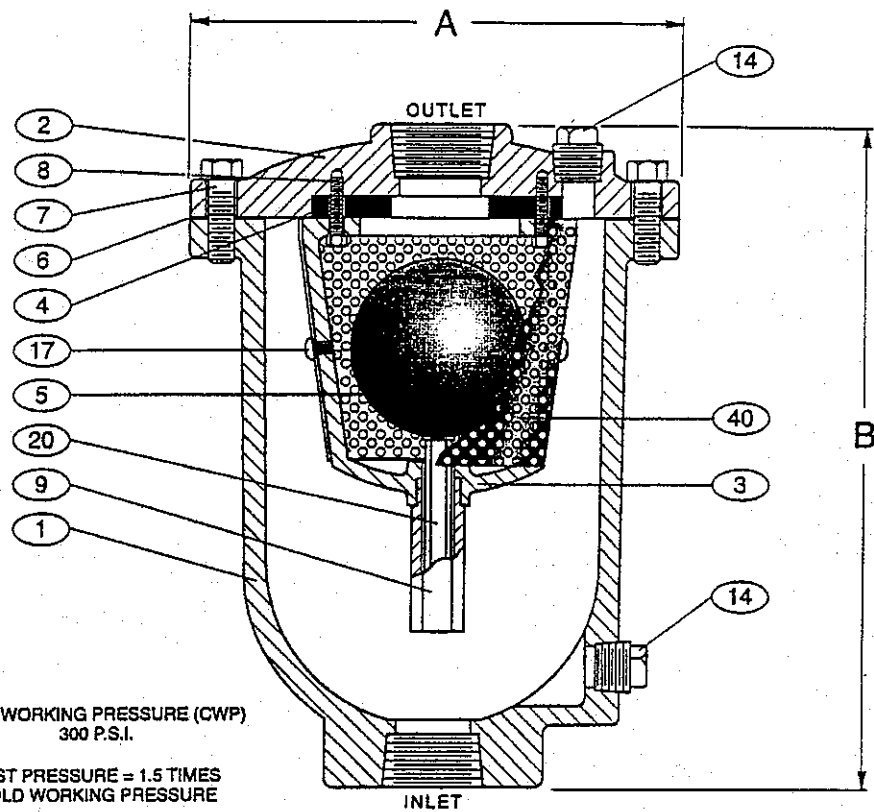
DATE 2-23-87

VALMATIC® VALVE AND MANUFACTURING CORP.

DRWG. NO.

VM-15A





COLD WORKING PRESSURE (CWP)
300 P.S.I.

TEST PRESSURE = 1.5 TIMES
COLD WORKING PRESSURE

VALVE SIZE	MODEL NO.	A	B	INLET SIZE	OUTLET SIZE
1"	101WST	7"	9 1/2"	1" N.P.T.	1" N.P.T.
2"	102WST	9 1/2"	12"	2" N.P.T.	2" N.P.T.
3"	103WST	9 1/2"	12"	3" N.P.T.	3" N.P.T.

- | | |
|--------------|--------------------|
| 1 BODY | 8 RETAINING SCREW |
| 2 COVER | 9 GUIDE BUSHING |
| 3 BAFFLE | 14 PIPE PLUG |
| 4 SEAT | 17 SCREEN RETAINER |
| 5 FLOAT | 20 GUIDE SHAFT |
| 6 GASKET | 40 BAFFLE SCREEN |
| 7 COVER BOLT | |

Revised 3-25-97

WELL SERVICE AIR VALVE

DATE 8-19-71

VALMATIC[®] VALVE AND MANUFACTURING CORP.

DRWG. NO.
VM-100WS

T E S T R E C O R D N O. 1SAMPLES:

Representative samples of the Models 1/2 in. - 15A, 1 in. - 15A.3, 22.4, 22.3, 22.7, 22.9, 101 WST and 103 WST were used in this investigation.

The valves have bodies and covers of ASTM A126, Class B or ASTM A48, Class 30 cast iron, with internal metallic components Types 303, 304, 316 or 18-8 stainless steel, or of ASTM A536, Grade 65-45-12 ductile iron. The elastomers used for valve seats are Goodyear Rubber Buna-N Compound NBM 37-7 and Viton Compound FPM 245-7. (See Figs. 1, 2 and 3.)

GENERAL:

Test results relate only to the items tested.

TEST METHOD REFERENCE:

The following tests were conducted in accordance with the applicable requirements:

1. Examination of Samples
2. Leakage
3. Hydrostatic
4. Cycling
5. Clogging
6. Elastomeric Materials
7. Inspection of Manufacturing Facilities

EXAMINATION OF SAMPLES:

METHOD

Representative samples were examined for compliance with the manufacturer's construction drawings.

RESULTS

The samples were found to conform with the manufacturer's drawings.

LEAKAGE TEST:

METHOD

Each sample valve was placed in the upright position and connected to a hydrostatic pressure source through the pipe inlet at the bottom of the valve. Pressure was applied to the valve without intentionally excluding air. The pressure was gradually increased to twice the rated pressure and held for 1 min.

RESULTS

The valve released air until the internal water level lifted the float, closing the valve. No leakage was observed through the orifice or valve body.

HYDROSTATIC STRENGTH TEST:

METHOD

Following the leakage test, the pressure in the test samples was increased by 300 psi/min to five times the rated pressure and held for 1 min.

RESULTS

Each valve withstood the required pressure without rupture.

CYCLING TEST:

METHOD

Sample air release valves, Models 1 in. - 15A.3, 22.3 and 103 WST, were subjected to an operation test of the valve mechanism. The device was hydraulically operated from the open to closed position for 5000 c. After the cycling test, the valve was subjected to the leakage test.

RESULTS

Each valve withstood the cycling test without mechanical failure, and no leakage was observed.

CLOGGING TEST:

METHOD

Ten grams of pipe scale were introduced into the body of each Model 1/2 in. - 15A, 22.4 and 22.7 air release valve. The scale consisted of 1 g of 0.017 in., 3 g of 0.0059 in., 2 g of 0.0029 in. and 3 g of 0.0017 in. material obtained by scraping the interior of iron pipe. A 1/2 in. diameter hose filled with air was connected to the valve, and water at 100 psig was introduced through the hose and into the valve. The valve was cycled by draining the valve and then pressurizing as described under leakage test.

RESULTS

The valves released air until closing as a result of the entrance of water. Repeated cycling and pressurization of the valves resulted in the valves exhibiting normal operating characteristics. No clogging of the outlet orifice was noted during the test.

ELASTOMERIC MATERIALS TESTS:

METHOD

Samples of the elastomeric material valve were subjected to physical and aging tests in accordance with the applicable requirements in the Standard For Check Valves, UL 312.

RESULTS

The results comply with the specified requirements.

PHYSICAL PROPERTIES:

<u>As Received -</u>	<u>FPM 245-7</u>	<u>NBM 37-7</u>
Average Tensile Strength, psi	1628	1835
Average Elongation, percent	368	303
<u>After 70 h Air Oven Aging at 100°C -</u>		
Average Tensile Strength, psi	1774	1972
Percent of Original	109	107
Average Elongation, percent	403	233
Percent of Original	110	77

INSPECTION OF MANUFACTURING FACILITIES:

METHOD

The manufacturing facility located in Elmhurst, IL was inspected to determine that it possessed the capability to manufacture the products and conduct the tests, if applicable, in accordance with the requirements specified in the Follow-Up Service Procedure.

RESULTS

The manufacturing facility had the capability to manufacture and test the products in accordance with the requirements specified in the Follow-Up Service Procedure.

C O N C L U S I O N

Samples of the products covered by this Report have been found to comply with the requirements covering the class and the products are judged to be eligible for Listing and Follow-Up Service. The manufacturer is authorized to use the Laboratories' Mark on such products which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the Laboratories' Mark are considered as Listed by Underwriters Laboratories Inc.

Report by:

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