Designation: F1802 – 22

Standard Test Method for Performance Testing of Excess Flow Valves[1]

This standard is issued under the fixed designation F1802; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This test method covers a standardized method to determine the performance of excess flow valves (EFVs) designed to limit flow or stop flow in thermoplastic natural gas service lines.[2]

1.2 All tests are intended to be performed using air as the test fluid. Unless otherwise stated, all flow rates are reported in standard cubic feet per hour of 0.6 relative density natural gas.

1.3 The test method recognizes two types of EFV. One type, an excess flow valve-bypass (EFVB), allows a small amount of gas to bleed through (bypass) after it has tripped, usually as a means of automatically resetting the device. The second type, an excess flow valve-non bypass (EFVNB), is intended to trip shut forming an essentially gas tight seal.

1.4 The performance characteristics covered in this test method include flow at trip point, pressure drop across the EFV, bypass flow rate of the EFVB or leak rate through the EFVNB after trip, and verification that the EFV can be reset.

1.4.1 Gas distribution systems may contain condensates and particulates such as organic matter, sand, dirt, and iron compounds. Field experience has shown that the operating characteristics of some EFVs may be affected by accumulations of these materials. The tests of Section 11 were developed to provide a simple, inexpensive, reproducible test that quantifies the effect, if any, of a uniform coating of kerosene and of kerosene contaminated with a specified amount of ferric oxide powder on an EFV's operating characteristics.

1.5 Excess flow valves covered by this test method will normally have the following characteristics: a pressure rating of up to 125 psig (0.86 MPa); a trip flow of between 200 ft^3/h and 2500 ft^3/h (5.66 m^3/h and 70.8 m^3/h) at 10 psig (0.07 MPa); a minimum temperature rating of 0°F(–18°C), and a maximum temperature rating of 100 °F (38 °C).

1.6 The EFVs covered by this test method shall be constructed to fit piping systems no smaller than ½ CTS and no larger than 1¼ IPS, including both pipe and tubing sizes.

1.7 Tests will be performed at 67 °F ± 10 °F (19.4 °C ± 5.5 °C). Alternative optional test temperatures are 100 °F ± 10 °F (37.7 °C ± 5.5 °C) and 0 ± 10°F (–18 ± 5.5°C). All flow rates must be corrected to standard conditions.

1.8 This test method was written for EFVs installed in thermoplastic piping systems. However, it is expected that the test method may also be used for similar devices in other piping systems.

1.9 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.10 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use. For specific precautions, see Section 8.*

1.11 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D1600 Terminology for Abbreviated Terms Relating to Plastics

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

[1] This test method is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.40 on Test Methods.

Current edition approved Feb. 1, 2022. Published April 2022. Originally approved in 1995 as PS 13–95. Last previous edition approved in 2015 as F1802–15. DOI: 10.1520/F1802-22.

[2] This contamination test procedure may be utilized to determine the effect, if any, of contaminants from a specific gas distribution system on the operational characteristics of an EFV under consideration for use in that system. Condensates, oils and particulates removed from that distribution system could be substituted for kerosene and iron oxide. Results obtained from using reagents or contaminants other than those specified in this test method must not be used in comparison with results obtained using the reagents specified in this test method.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method
F412 Terminology Relating to Plastic Piping Systems
2.2 *ANSI Standard:*
B31.8 Gas Transmission and Distribution Piping Systems[4]
2.3 *Federal Specification:*
DOT Part 192 Title 49 Code of Federal Regulations[5]

3. Terminology

3.1 *Definitions:*

3.1.1 *General*—Definitions are in accordance with Terminology F412, unless otherwise specified. Abbreviations are in accordance with Terminology D1600.

3.1.2 The gas industry terminology used in this test method is in accordance with ANSI B31.8 or DOT Part 192 Title 49, unless otherwise indicated.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bypass flow, n*—the flow through an EFVB after it has been activated or tripped.

3.2.2 *excess flow valve (EFV), n*—a device installed in a natural gas service line having the ability to automatically stop or limit the flow of gas in the event that the flow in the service line exceeds a predetermined level.

3.2.2.1 *excess flow valve-bypass (EFVB), n*—an EFV designed to limit the flow of gas upon closure to a small predetermined level. The EFVBs reset automatically, once the service line downstream is made gas tight and pressure is equalized across the valve.

3.2.2.2 *excess flow valve-non bypass (EFVNB), n*—an EFV which is designed to stop the flow of gas upon closure. The EFVNBs must be manually reset.

3.2.3 *leak rate, n*—the flow of test fluid passing through an EFVNB after it has been activated or tripped.

3.2.4 *Piezometer ring, n*—a device installed at a pressure measurement point in a flowing gas stream intended to eliminate the effect of the flowing gas on the measurement device. See Appendix X1.

3.2.5 *pipe, n*—refers to both pipe and tubing.

3.2.6 *standard conditions, n—for gas flow conversion,* 0.6 relative density natural gas at 14.7 psia (0.1 MPa) and 60 °F (16.6 °C).

3.2.7 *trip, n*—activation of the mechanism of an EFV to stop or limit the flow of natural gas in the service line.

3.2.8 *trip flow, n*—the flow passing through an EFV required to cause its activation to stop or limit flow.

4. Summary of Test Method

4.1 For all tests, air is intended to be the test fluid. All flows are given in cubic feet per hour of 0.6 relative density natural gas, unless otherwise specified. All tests are to be performed at 67 °F ± 10 °F (19.4 °C ± 5.5 °C), with alternative test temperatures of 0 and 100 °F (–17.7 °C and 37.7 °C). All flow rates must be corrected to standard conditions using the temperature of the air flow measured just upstream of the flowmeter (T2) in Fig. 1.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] Available from Superintendent of Documents, U.S. Government Printing Office, 732 N. Capitol Street, NW, Washington, DC 20402.

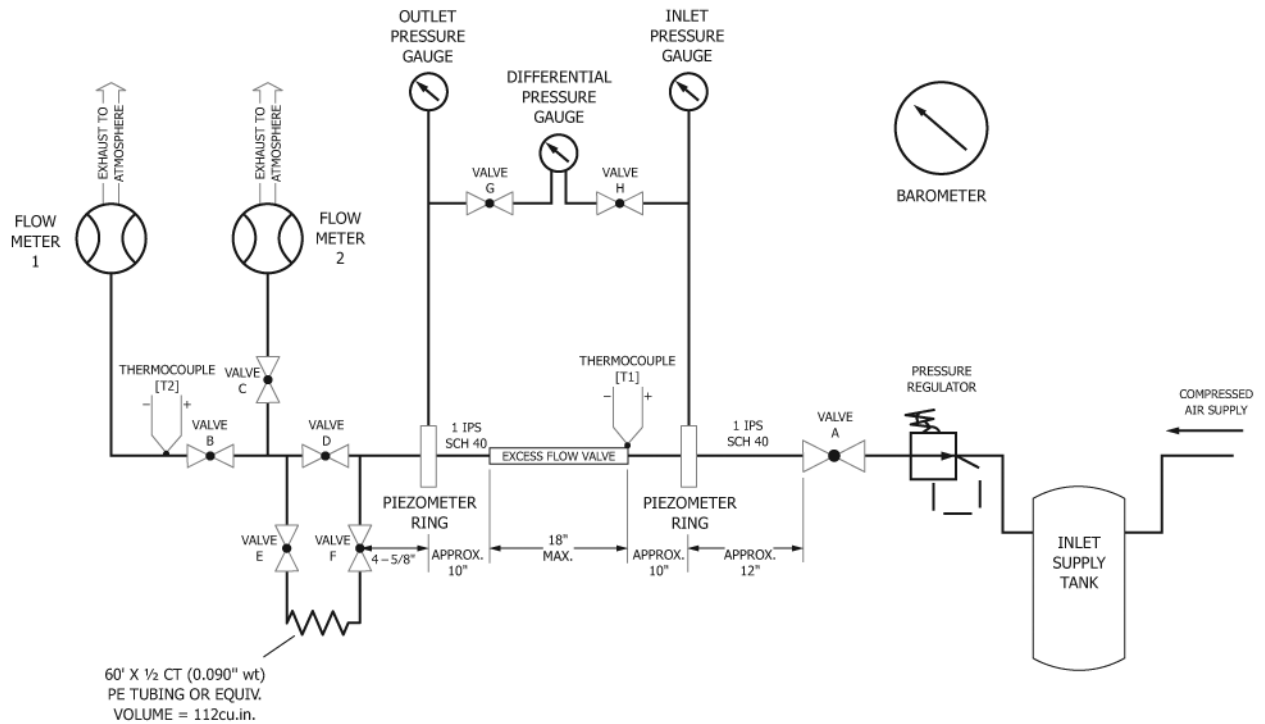

FIG. 1 Test Apparatus For Excess Flow Valves