STATE OF WISCONSIN
Department of Agriculture,
Trade and Consumer Protection

Approval # 20230005
(Renewal for 20190004)

Bureau of Weights and Measures
Storage Tank Regulation
P.O. Box 7837
Madison, WI 53707-7837

Wisconsin ATCP 93 Material Approval

Equipment: Mechanical Line Leak Detectors

Manufacturer: Veeder Root Company
2709 Route 764
Duncansville, PA 16635

Expiration of Approval: December 31, 2026

SCOPE OF EVALUATION

The FX1V, FX2V, FX1DV, FX2DV, and Big Flo systems were evaluated for automatic line leak detection monitoring of rigid and flexible piping in accordance with the requirements of **ATCP 93.515(8)**.

This evaluation summary is condensed to provide the specific installation, application and operation parameters necessary to maintain the subject systems in compliance with the Wisconsin Administrative Code – ATCP 93.

DESCRIPTION AND USE

FX1V, FX2V, FX1DV, FX2DV and Big Flo Line Leak Detector Systems

The FX series line leak detectors are mechanical devices that are permanently installed in pressurized line systems. The unit may be installed in a standard Red Jacket pump, downstream from the pump in a special adapter, or as a pilot valve for the Big Flo Leak Detector unit. When the pump is activated, product is metered into the line through a poppet valve. When the line pressure reaches a nominal value of 10-15 psi, the poppet valve opens and full flow into the line occurs. If the pressure does not reach 10-15 psi (i.e., a leak is present), the poppet does not open, and product flow in the line is restricted to approximately 3 gallons per minute. The FX models are designed to operate at lower flow rates than the Big Flo system.

The Big Flo leak detector is a diaphragm-operated valve which uses a pilot control valve to detect a leak. The pilot leak detector is mounted “piggy back” onto the Big Flo unit and controls the pressure on one side of the Big Flo’s control diaphragm. If the pilot detector detects a leak, it will close and put full pump pressure on the Big Flo’s control diaphragm. This will keep the control diaphragm closed and restrict the product flow. If the pilot valve is in the fully open position, which occurs when there is no leak greater than its threshold value, the pressure on the control diaphragm will be lower. This pump pressure will then lift the Big Flo’s poppet which allows the normal flow rate.

The FX1V and FX2V line leak detectors can be used with or without the Big Flo system, on rigid or flexible piping which has either single wall or double wall construction and which contains gasoline, gasoline blends with up to 10% ethanol, aviation fuel, or some solvents. The FX1DV and FX2DV line leak detectors can be used with the Big Flo system, on single or double wall rigid or flexible piping which contains diesel fuel, kerosene, or some solvents. Rigid piping diameters can be from 1 to 6 inches, and flexible piping diameters can be up to 3 inches.

TESTS AND RESULTS

The FX1V, FX2V, FX1DV and FX2DV line leak detectors for automatic line leak detection monitoring of both flexible and rigid lines were shown to have a probability of detecting a 3.0 gallon per hour leak at 10 psi of 100 percent.

LIMITATIONS / CONDITIONS OF APPROVAL

General

- All monitoring equipment shall be installed, calibrated, operated, and maintained in accordance with the manufacturer instructions, and verified every 12 months for operability, proper operating condition, and proper calibration by a certified service technician. Records of sampling, testing, or monitoring shall be maintained in accordance with **ATCP 93.500(9)**.

- The manufacturer shall submit for a revision to this Wisconsin Material Approval application if any of the functional performance capabilities of this equipment are revised. This would include, but not be limited to changes in software, hardware, or methodology.

- The Veeder Line Leak Detectors are approved for use on pipeline systems for underground storage tank facilities that contain petroleum or other chemical products. They are approved for use on rigid piping and flexible piping.

- An annual test of the operation of the leak detector shall be conducted in accordance with the manufacturer requirements for testing to the recognized leak thresholds by inducing a physical line leak as required by **ATCP 93.515(8)(d)2.** The individual performing the test must be qualified by the equipment

FX1V, FX2V, FX1DV, FX2DV and Big Flo Line Leak Detector Systems

- Critical performance parameters for the **FX1V** and **FX2V** Line Leak Detectors **with or without the Big Flo System**:

Rigid Piping: (Fiberglass or steel)

Parameter	Value
Total maximum allowable volume of product in any **rigid** test pipeline	**316 gallons or less**

Flexible Piping:

Parameter	Value
Minimum Flexible Piping Bulk Modulus	**1,280 psi**
Total maximum allowable volume of product in any **flexible** test pipeline	**50 gallons or less**

- Critical performance parameters for the **FX1DV** and **FX2DV** Line Leak Detectors **with or without the Big Flo System**:

Rigid Piping: (Fiberglass or steel)

Parameter	Value
Total maximum allowable volume of product in any **rigid** test pipeline	**362 gallons or less**

Flexible Piping:

Parameter	Value
Minimum Flexible Piping Bulk Modulus	**1,280 psi**
Total maximum allowable volume of product in any **flexible** test pipeline	**50 gallons or less**

LIMITATIONS / CONDITIONS OF APPROVAL

This approval will be valid through December 31, 2026, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Material Approval Number must be provided when plans that include this product are submitted for review.

DISCLAIMER

The Department is in no way endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive any code requirement unless specified in this document.

Effective Date: January 12, 2023

Reviewed by: _____ Date: 1/12/2023

Erik Otterson
Environmental Engineering Specialist
Bureau of Weights and Measures

Approved by: _____ Date: 1/12/2023

Greg Bareta, P.E.
Section Manager
Bureau of Weights and Measures