

SPECIFICATION

SafeSite™ Stainless Steel Fuel Pipe & Leak Monitoring System

1.0 GENERAL DESCRIPTION AND STANDARDS

- 1.1 Stainless Steel Piping:** Pipe and fitting systems shall be provided where required by the Contract Drawings. The Contract Drawings show the type, number, size and location of stainless steel product piping systems for each site. Each stainless steel product piping system 1" diameter and larger shall be Brugg Pipe Systems Stainless steel Pipe and Fittings, as manufactured by Brugg Pipe Systems Rome, Georgia.
- 1.2 Leak Monitoring System:** Pipe Leak Monitoring System shall be provided where required by the Contract Drawings. The system shall be listed with the National Work Group of Leak Detection Equipment (NWGLDE). The Vacuum Leak Monitoring System shall either be integrated into the SafeSite FOC Fuel Oil Control System or provided as a Standalone SafeSite Leak Monitoring System.
- 1.3 Manufacturers:** Subject to compliance with requirements, provide integrated pipe and monitoring system supplied by Core Engineered Solutions, Inc.

2.0 DESIGN AND CONSTRUCTION

- 2.1 Stainless Steel Piping:** Each piping system shall be constructed of stainless steel and shall be suitable for use with the products to be stored in the tank system; the piping system shall be UL-listed (UL-971A and UL1369) and approved by authorities having jurisdiction; and third part tested by licensed P.E. for temperatures to 1,110 degrees Fahrenheit for both primary and secondary pipe.
- 2.1.1** Each stainless steel piping and fitting joint shall be mechanically bonded. The pipe shall be certified to a pressure rating of 240 PSIG with a minimum 1,725 PSIG burst pressure.
 - 2.1.2** Adhesives shall not be required or allowed on the stainless steel pipe system.
- 2.2 Leak Monitoring System:** The pipe leak monitoring system shall consist of, but not be limited to the following components:
- 2.2.1** Vacuum pump – UL and ULC listed, 50 PSIG, 24inHG, 0.52 CFM
 - 2.2.2** Liquid safety barrier
 - 2.2.3** System vacuum setting shall be 10inHG
 - 2.2.4** Pressure gauges – 30inHG, 100PSIG, liquid filled, stainless body with brass intervals
 - 2.2.5** Compound gauges – 30inHG, 100PSIG or sized to 1.5 times the system operating PSIG.
 - 2.2.6** Stainless steel bracket for manifold and pump assembly (4B finish).
- 2.3 Leak Monitoring System Control Panel:** The pipe leak monitoring system shall continuously monitor the interstitial space of double wall piping for integrity and tightness of both the primary and secondary (containment) pipe. The pipe leak monitoring system control panel shall consist of, but not be limited to the following:
- 2.3.1** Power requirements – 120 VAC 1 phase with neutral
 - 2.3.2** Enclosure – NEMA 4X (suitable for outdoor and high corrosion areas)
 - 2.3.3** Listings: UL508A listed, CSLA listed and meets NEC (NFPA70), NFPA 30 and NFPA 37 requirements. Suitable for Class 2, Division 2, Groups B, C and D
 - 2.3.4** Display – 6-Inch Micro-Graphic Touch Panel with TFT color LCD, 320 x 240 dot, 32k color display with LED backlight

- 2.3.5 PLC – Micro-Analog PLC with relay ladder logic programming, real time clock/calendar and battery-backed memory
- 2.3.6 Interface with building management (BMS) via ModBus or a Dry Contact Output (General Fault Alarm)
- 2.3.7 System summary alarm (1) dry contact
- 2.3.8 Modbus RTU communications port (configurable up to 115.2k baud) and TCP/IP.

3.0 INSTALLATION

- 3.1 The contractors will supply a recent (3 years) certification of training from the pipe manufacturer with their submittals along with client references from at least twenty (20) successful installations.
- 3.2 All above grade stainless steel piping shall be installed in accordance with the Manufacturer's recommendations, applicable codes, and as shown on the Contract Drawings.
- 3.3 Hangers, brackets, supports, anchors, clamps, and other devices shall be hot-dip galvanized after fabrication and before assembly and installation. They shall be installed to make the entire pipe system self-supporting and rigid. Defective or inaccurately constructed hangers, brackets, supports, clamps and other hardware shall not be used. Machine bolts, 5/8-inch in diameter and of proper length, shall be used throughout for securing the hangers, brackets, clamps, and supports for pipes larger than 3 inches, and 1/2-inch diameter bolts for pipes 3 inches and smaller.
- 3.4 The bracket and assembly shall be factory assembled and wired to the fuel oil control panel, or may alternately be installed as a standalone unit and certified by a SafeSite Fuel System Controls representative.

4.0 OPERATION

- 4.1 Programming: The system must be programmed by a factory trained technician or by the direction of a factory representative. The following parameters will be factory programmed (but not limited to this list).
 - 4.1.1 System type of test – Vacuum
 - 4.1.2 Test target to start a test – 8inHG
 - 4.1.3 Test duration – 1 hour increments
 - 4.1.4 Maximum loss to fail a test – 2inHG
 - 4.1.5 Number of failed tests in a row to activate an alarm – 3 failed attempts
 - 4.1.6 Number of failed attempts to start a test to activate an alarm – 1 failed attempt
 - 4.1.7 Alarm will disable the fuel pump
- 4.2 Automatic Operation: The system is designed to run only in the automatic test mode. The system monitors and controls the test media (vacuum) for the maximum loss for a programmed length of time. When testing, the system will perform the following:
 - 4.2.1 Prepare for the test
 - 4.2.2 The vacuum pump will start
 - 4.2.3 The system will stabilize before starting a test
 - 4.2.4 The system will start a test when the test media is stable
 - 4.2.5 The system will monitor the media for changes and either pass or fail a test based on the results.
- 4.3 Test Results: The system will log the results of a passed or failed test.
 - 4.3.1 Activate the alarm and send a signal to a BMS as programmed. If the alarm is activated, press *Alarm Acknowledge* button on the front cover to silence the alarm.
 - 4.3.2 Disable the fuel pump(s).

4.4 Types of system failure:

- 4.4.1 If the secondary pipe is compromised, the system will lose vacuum and the alarm is activated.
- 4.4.2 If the primary pipe is compromised, fuel will leak into the secondary pipe and fill the liquid barrier which will activate the alarm.
- 4.4.3 Each pipe run shall have an isolation valve to determine the specific pipe that is leaking in the event of a leak condition.
- 4.4.4 Automatically prepare for the next test as programmed.

For drawings or more information contact Core Engineered Solutions at www.core-es.com
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