Franklin Fueling Systems

FMP-LSU500-U Sensors for use with EVO™ 400 and 600/6000 consoles
(for Rigid, Flexible or Hybrid Combination of Rigid and Flexible Pipelines)

AUTOMATIC ELECTRONIC LINE LEAK DETECTOR

Certification
Leak rate of 3.0 gph at 10 psi* with PD = 100% and PFA = 0%.
Leak rate of 0.2 gph at operating pressure with PD = 100% and PFA = 0%.
Leak rate of 0.1 gph at 1.5 times operating pressure* with PD = 100% and PFA = 0%.
*Since leak rate varies as a function of pressure, this leak rate and pressure were certified using an equivalent leak rate and pressure, in accordance with an acceptable protocol.

Leak Threshold
1.5 gph for leak rate of 3.0 gph.
0.1 gph for leak rate of 0.2 gph.
0.05 gph for leak rate of 0.1 gph.
A pipeline system should not be declared tight if the test result indicates a loss that equals or exceeds this threshold.

Applicability
Gasoline, diesel, aviation fuel, fuel oil #4, fuel oil #6, solvent, waste oil, ethanol blends up through E100, biodiesel blends B6-B20 meeting ASTM D7647, biodiesel B100 meeting ASTM D6751, other liquids with known coefficients of expansion and density may be tested after consultation with the manufacturer.

Specification
On pressurized rigid, flexible, or combination rigid and flexible pipelines, system can perform 3.0 gph, 0.2 gph, and 0.1 gph tests.
Tests are conducted at operating pressure.
System will not function with a mechanical line leak detector installed in the pipeline.

Pipeline Capacity
Maximum line capacity for **Hourly** testing using bulk modulus limits:

Example Pipeline	Evaluated Volume (gallons)	Evaluated Bulk Modulus (PSI)	Example Bulk Modulus (PSI)	Multiplier to Convert Evaluated Volume to Equivalent Example Pipeline Volume (multiplier)	Pressure Drop per ML on Evaluated Line (PSI)	Line Volume Equivalent to Evaluated Line Volume Based on Bulk Modulus (gallons)	Maximum Pipeline Volume Allowed for Specific Bulk Modulus (gallons)
Evaluated Pipeline	601.01	19288	-	1.000	0.0085	-	1202.02
1	-	-	5000	0.259	-	155.80	311.60
2 (APT pipeline)	-	-	5025.24	0.261	-	156.59	313.17
3	-	-	7500	0.389	-	233.70	467.40
4 (UPP pipeline)	-	-	10000	0.518	-	311.60	623.20
5	-	-	12500	0.648	-	389.50	778.99
6	-	-	15000	0.778	-	467.40	934.79
7	-	-	17500	0.907	-	545.30	1090.59
8	-	-	20000	1.000	-	601.01	1202.02*
9	-	-	25000	1.000	-	601.01	1202.02*
10	-	-	30000	1.000	-	601.01	1202.02*
11	-	-	35000	1.000	-	601.01	1202.02*
12	-	-	40000	1.000	-	601.01	1202.02*
13	-	-	50000	1.000	-	601.01	1202.02*
14	-	-	60000	1.000	-	601.01	1202.02*
15	-	-	70000	1.000	-	601.01	1202.02*
16	-	-	80000	1.000	-	601.01	1202.02*

Maximum line capacity for **Monthly and Annual** testing using bulk modulus limits:

Example Pipeline	Evaluated Volume (gallons)	Evaluated Bulk Modulus (PSI)	Example Bulk Modulus (PSI)	Multiplier to Convert Evaluated Volume to Equivalent Example Pipeline Volume (multiplier)	Pressure Drop per ML on Evaluated Line (PSI)	Line Volume Equivalent to Evaluated Line Volume Based on Bulk Modulus (gallons)	Maximum Pipeline Volume Allowed for Specific Bulk Modulus (gallons)
Evaluated Pipeline	279.51	34601	-	1.000	0.0237	-	559.02
1	-	-	5000	0.145	-	40.39	80.78
2 (APT pipeline)	-	-	5025.24	0.145	-	40.59	81.19
3	-	-	7500	0.217	-	60.59	121.17
4 (UPP pipeline)	-	-	10000	0.289	-	80.78	161.56
5	-	-	12500	0.361	-	100.98	201.95
6	-	-	15000	0.434	-	121.17	242.34
7	-	-	17500	0.506	-	141.37	282.73
8	-	-	20000	0.578	-	161.56	323.12
9	-	-	25000	0.723	-	201.95	403.90
10	-	-	30000	0.867	-	242.34	484.69
11	-	-	35000	1.000	-	279.51	559.02*
12	-	-	40000	1.000	-	279.51	559.02*
13	-	-	50000	1.000	-	279.51	559.02*
14	-	-	60000	1.000	-	279.51	559.02*
15	-	-	70000	1.000	-	279.51	559.02*
16	-	-	80000	1.000	-	279.51	559.02*

Waiting Time

None between delivery and testing.
None between dispensing and testing for leak rate of 3.0 gph.
Depending on temperature stability, 1½ to 10 hours between dispensing and testing for leak rates of 0.2 gph and 0.1 gph.
Test times include thermal stability wait periods.

Test Period

For hourly testing, response time is 14-16 minutes, with an average of 15 minutes, for a leak rate of 3.0 gph.
Without a leak present, response time is 1 minute.
For monthly testing, response time is 725-818 minutes, with an average of 369 minutes, for a leak rate of 0.2 gph.
Without a leak present, response time is 291-674 minutes.
For annual testing, response time is 761-812 minutes, with an average of 791 minutes, for a leak rate of 0.1 gph.
Without a leak present, response time is 503-687 minutes.
Test data are acquired and recorded by a microprocessor.

System Features

Permanent installation on pipeline.
Automatic testing of pipeline for a leak rate of 3.0 gph every dispenser cycle or 45 minutes.
Automatic testing of pipeline for a leak rate of 0.2 gph following a passing 3.0 gph test.
Automatic testing of pipeline for a leak rate of 0.1 gph following a passing 0.2 gph test.
Automatic pressure up, catch pressure, and other additional checks.
Indicator light and alarm activation if a leak is detected for any test. Automatic pump shutdown for 3.0 gph tests.
Optional pump shutdown for 0.2 gph and 0.1 gph tests.
Uses AUTO-LEARN® technology to automatically learn line characteristics.

Calibration

System must be checked for functionality annually and, if necessary, calibrated in accordance with manufacturer's instructions.

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Dates of Evaluations:
 Hourly Testing: 4/18/2025
 Monthly Testing: 4/10/2025
 Annual Testing: 4/15/2025