FLOW SYSTEMS

TEST SYSTEM FOR THE AUTOMOTIVE INDUSTRY:

BODY LEAKAGE TEST STAND

4TH GENERATION

FOURTH GENERATION

Body Leakage Test Stand
Air Flow Test Stand

DESCRIPTION

An Automobile Manufacturer required a test stand to measure the airflow leakage through a vehicle cabin in order to improve quality and reduce warranty expenses on wind, road and power-train noise issues.

SYSTEM REQUIREMENTS

- Provide Pressure, Suction or Mass Flow Control within the Vehicle Under Test
- Measure Air Mass Flow Over a Wide Range (See Specifications for Ranges)
- User-friendly Test System Controller
- Highly Reproducible Results
- Optional System Check Orifices
- Data Output Corrected to Nominal Day Conditions
- Custom Quick-Disconnect Fittings for Air Flow Hose, Filter and Check Orifices
- Software for Data Logging, Corrections and Storages
- HVAC, Fog and Air Heater Options

SOLUTION

FLOW SYSTEMS designed and manufactured an Air Flow Metering System that employs a set of Bi-Directional Orifice Plates. The Test Stand controls the pressure inside the vehicle as it undergoes leakage testing, and the pressure inside the vehicle body may be positive or negative with respect to the local barometric reading. The BLTS-4th Gen is designed to deliver a wide range of flow of air at an accuracy of +/- 0.8% of reading or better, with the maximum static pressure at the vehicle being +/-1000 Pa (+/- 4.0 inches H2O @ 4°C).

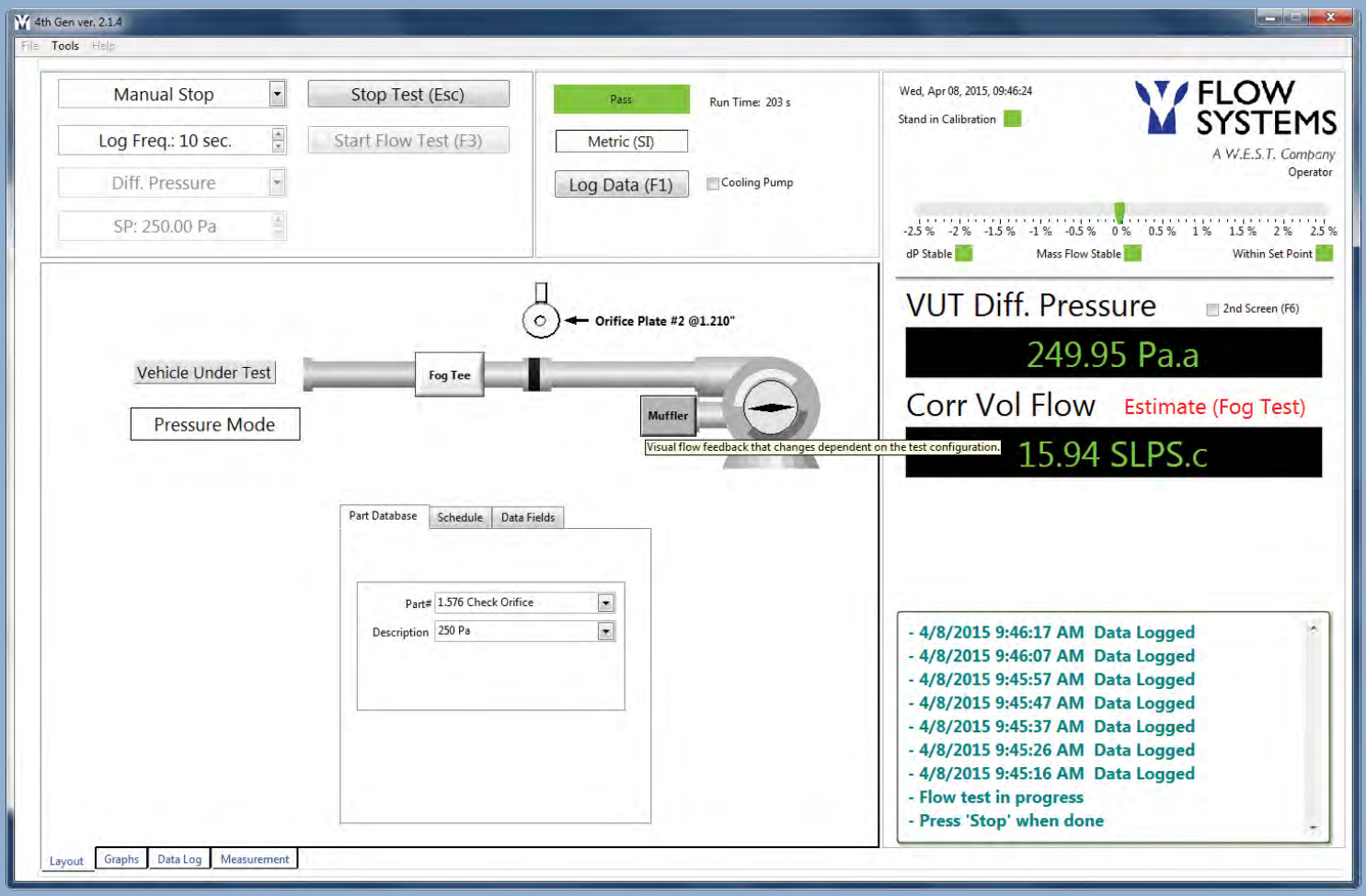
The Test Stand will allow the operator to change the flow direction. Indicators on the Operator Interface Panel display when the system is in either Pressure or Suction Mode.

The Test Stand includes System Check Orifices that allow for system verification. The test stand controller software includes the ability to set the flow at various rates and allow the operator to observe the percent difference between the check orifice and the test stand orfice meter reading.

FUNCTIONS

- Correction of Flow Test Data Based on Ambient Conditions, Test Pressure, Flow Mode, and Nominal Day Conditions
- Data Record Organization with Comments
- Check Orifice Data Analysis
- Data Storage

LabVIEW™ Software for Automated Data Reduction and Logging: BLTS-DATASOFT

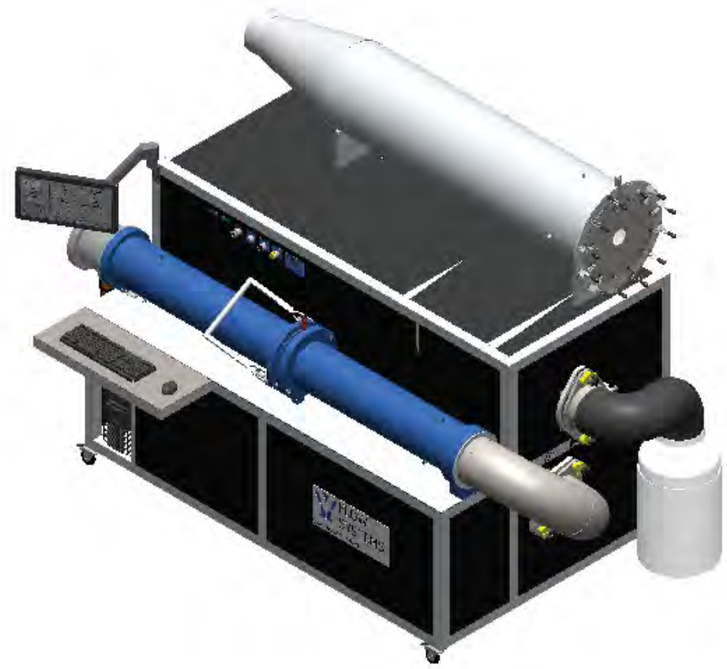


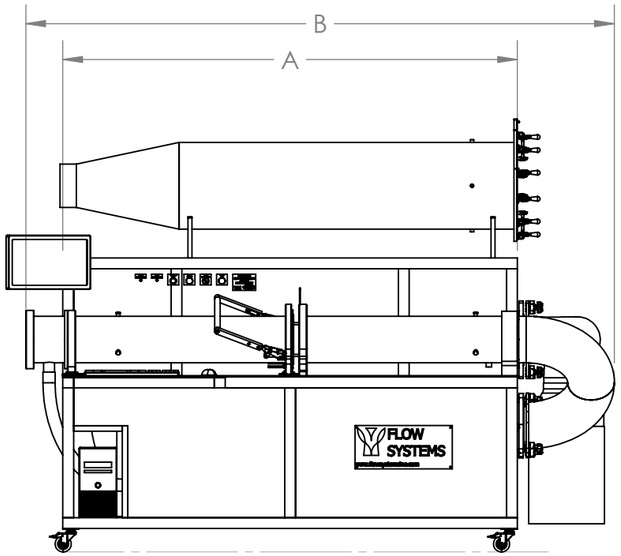
FUNCTIONS

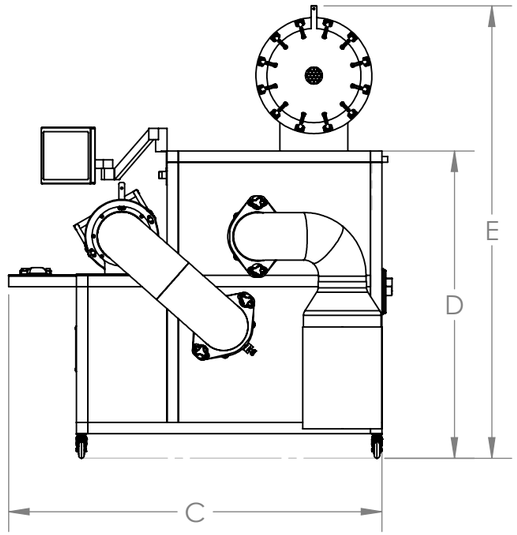
- Improved Vehicle Pressure Set-point Adjustment
- Button for Data Logging
- Indication of Flow and Vehicle Pressure Stability
- Correction of Flow Test Data Based on Ambient Conditions, Test Pressure, Flow Mode and Nominal Day Conditions
- Data Record Organization with Comments
- Check Orifice Data Analysis
- Data Storage
- On-the-fly change between SI and English Units
- Test configuration
- Test scripting
- Database for test results
- Data Record Organization with Comments
- Custom database mining utilities
- Custom report functionalities

System Layout | 4TH Gen Body Leakage VOW/HVAC Test Stand

STAND	A = LENGTH (bench)	B= LENGTH (w/ elbow)	C = DEPTH	D = HEIGHT (bench)	E = HEIGHT (w/check orifice plenum)	SHIP WEIGHT
BIP	52in / 1321mm	62in / 1575mm	46in / 1168mm	59.6in / 1513mm	75in / 1905mm	1,500lb / 680kg
G3	64in / 1626mm	78in / 1979mm	57.8in /1468mm	50.3in / 1278mm	67.9in / 1725mm	2,000lb / 900kg)
VOW/HVAC	84in / 2134mm	108.8in / 2762mm	66in / 1676mm	54.3in / 1380mm	80in / 2031mm	3,000lb / 1,360kg







4TH GEN BODY LEAKAGE
VOW/HVAC TEST STAND

Specifications

	FLOW RANGE	PRESSURE RANGE	HOSE SIZES
BIP	1.5 to 75 slps (3.2 to 159 scfm)	125 to 250 Pa (0.5 to 1 “H2O@4C)	4” (100 mm)
G3	2.7 to 185 slps (5.7 to 392 scfm)	125 to 250 Pa (0.5 to 1 “H2O@4C)	6” (150 mm)
HVAC	0.5 to 284 slps (0.1 to 600 scfm)	+ / - 250 Pa (+ / - 1 “H2O@4C)	8” (200 mm)
VOW	15 to 800 slps (32 to 1695 scfm)	125 to 250 Pa (0.5 to 1 “H2O@4C) suction 125 to 1000 Pa (0.5 to 4 “H2O@4C) pressure	8” (200 mm)

UNCERTAINTY: Estimated to be better than 0.8% of reading with traceability to NIST standards.

REPEATABILITY: Estimated to be better than +/-0.5% as defined as 2 standard deviations divided by the mean of 20 identical samples

CYCLE TIME: 30 to 60 seconds depending on percent of maximum capacity

UNITS: SLPS, Pa, °C (SCFM, In H2O@4°C, °F.)

CONNECTION HARDWARE FROM TEST STAND TO VEHICLE

Pressure Line: ¼” OD poly tube 9 m long (30ft)
Hose Size: 9 m long (30ft). See table above for diameters

UNITS: SLPS, Pa, °C (SCFM, In H2O@4°C, °F.)

Options

- Fog Machine (Inject Oderless, Non-Staining Fog into Vehicle)
- On-Site Installation, Training, Commissioning, and Upgrades
- Auto Orifice Changer - Automatically switches test stand orifice plated as flow demand requires
- Air Heater (+10°C at 50 SLPS) for use with Thermal Camera
- Hardware & Software to Conduct HVAC Tests
- Plug & Play Instromet Calibration Panel

FLOW SYSTEMS

FLOW SYSTEMS INC.

220 Bunyan Avenue
Berthoud, Colorado 80513

CONTACT US

Phone: (970) 532-0617
Fax: (970) 532- 0748

WEBSITE

www.flowsystemsinc.com