

# Scuba Instruments

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## The Atmospheric Inhalation Resistance (A.I.R.) Flow Test Stand

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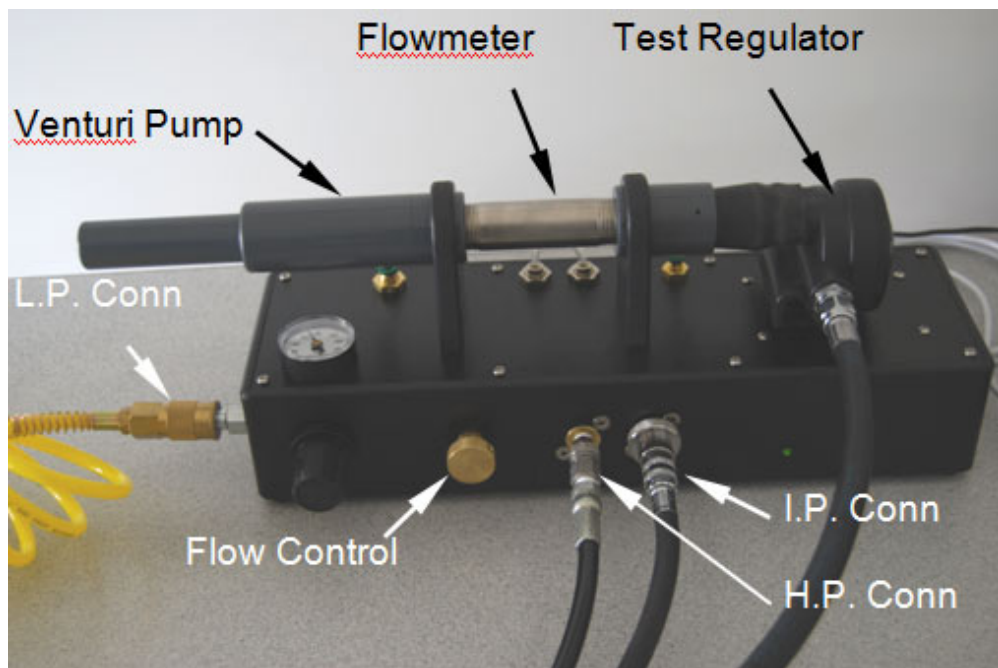
Scuba Instruments has developed a PC based flow test stand that records and documents regulator performance. Scuba Instruments' A.I.R. Flow Test Stand is designed to test diving regulators under both static and dynamic conditions. In addition to the standard "static tests" for cracking effort and intermediate pressure, the "dynamic performance" of the



complete regulator (first and second stage) can be automatically monitored, recorded and logged to files while the regulator is supplying air at varying flow rates. These dynamic tests are important on modern regulators that utilize venturi assists as part of the overall work of breathing. The following outlines the tests that can be performed with the A.I.R. Flow Test Stand:

- Precision Cracking Effort
- Static & Dynamic IP Levels
- Demand Effort vs Flow
- Venturi Performance
- Analyze Second Stage Leaks

Scuba Instruments has developed this test stand to make the technicians job of testing, evaluating, and documenting regulator performance easier by utilizing the latest in measurement and data acquisition technologies.



All data from the sensors in the test stand are processed and sent via USB interface to a PC running the test program. This information is displayed along with measurement data control functions in an intuitive familiar instrument layout as shown.



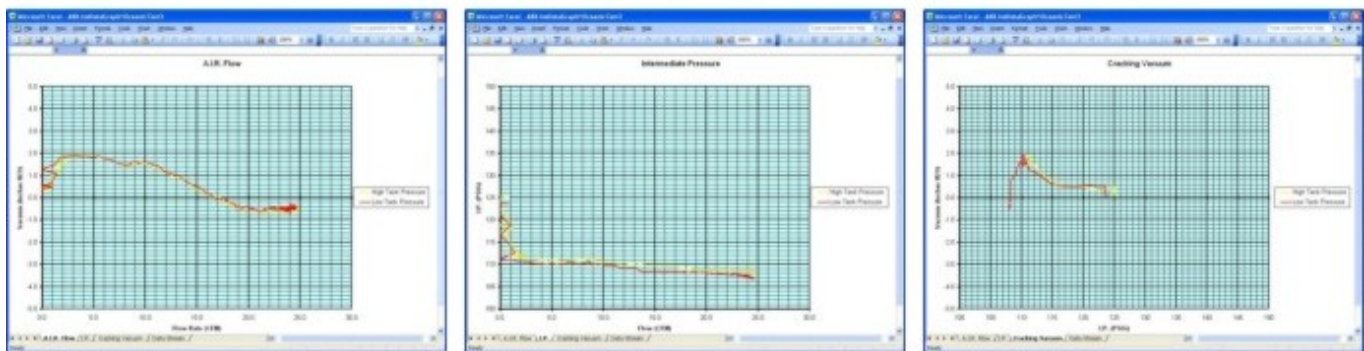
The main display provides analog representations of gauges as well as digital values. Analog gauge response times are fast and are comparable to the mechanical gauges used in conventional instruments. The accuracy of the pressure measurements are typically  $\pm 0.25\%$  FS at standard conditions and the flowrate measurement accuracy is typically  $\pm 1.0\%$  FS at standard conditions. Analog to digital conversions are resolved to 10 bits (0.1%). The analog representations of the gauges are augmented with digital counterparts to allow increased measurement resolution.

Two modes of measurements are provided; free-run testing or data logging. The free-run testing mode allows the technician to perform testing of the first and second stages of the regulator while making adjustments. The data logging mode allows the technician to perform diagnostic testing prior to regulator maintenance for evaluation and final testing to verify regulator performance after maintenance. All data values for Flowrate, H.P., I.P. and Vacuum are written to an Excel spreadsheet during a data log cycle. Two data log cycles are provided, one for tests emulated at high tank pressure and one for low tank pressure. The high and low tank pressures can be simulated through an optional H.P. manager connected to a high pressure source or SCUBA tank. The flowrate is controlled by the operator through a manual air control valve located on the test stand. The test stand requires a low pressure (100-150 psi) air supply. This low pressure can be generated by a low pressure port on a diving regulator, a pressure reducing regulator, or a standard low pressure air compressor.

A	B	C	D	E	F	G	H	I	J	K	L	M
Flow Rate	LP	Vacuum	H.P.		Dive Store Name	Malibu Scuba Repair		Rush				
0.0	136	0.0	3202		Technician's Name	Glynn Palmer					Labor	9
0.0	136	0.0	3201		Test Date	October 5, 2010					Parts	6
0.0	136	0.0	3201		Repair Number	12345					Parts Discount	11
0.0	136	0.0	3201		<b>Customer Information</b>							
0.0	136	0.0	3201		First Name	Eric					Print Billing Info	Ye
0.0	136	0.0	3201		Last Name	Rippon						
0.0	136	0.0	3201		Phone Number	818 825 3516						
0.0	136	0.0	3201		<b>Regulator Info</b>							
0.0	136	0.0	3201		Model		Serial Number	IP: MAG	Notes			
0.0	136	0.0	3201		Annual Service	Yes			Old style poppet assemb			
0.0	136	0.0	3201		Condition	Nothing Remarkable			Old HP Seat			
0.0	136	0.0	3201		1st Stage	AquaLung Legend	1234567890	136				
0.0	136	0.0	3201		2nd Stage	AquaLung Legend	1234567890	1.2				
0.0	136	0.0	3201		Octopus							
0.0	136	0.0	3201		Air II	AquaLung Air Source 3	1234567890					
0.0	136	0.1	3201		Computer	Suunto Cobra 3	1234567890	Good	Missing face shield			
0.0	136	0.1	3201		<b>Out Going Info</b>							
0.0	136	0.2	3202		1st Stage IP	IP: MAG	Annual Parts Kit	No	None			
0.0	136	0.2	3202		2nd Stage MAG	1.1	Annual Parts Kit	No	Replaced Poppet / Spring / Balance			
0.0	136	0.2	3202		Octopus		Annual Parts Kit	No	None			
0.0	136	0.3	3201		Air II		Annual Parts Kit	No	None			
0.0	136	0.3	3201		SPG		Stem O-Rings	No	None			
0.0	136	0.3	3201		Computer		Replace Battery	No	New face shield			
0.0	136	0.4	3201		Remarks Cycled 10 minutes							
0.0	136	0.4	3201									
0.0	133	0.7	3200									
0.0	133	0.7	3200									
0.0	133	1.1	3200									
0.0	131	1.1	3199									

The user may customize the spreadsheet -except for the areas data is written- to show other information related to the testing such as regulator model/serial numbers, tech notes, etc.

The data values are displayed in Excels graphics format for easy diagnostic and performance evaluation as shown.



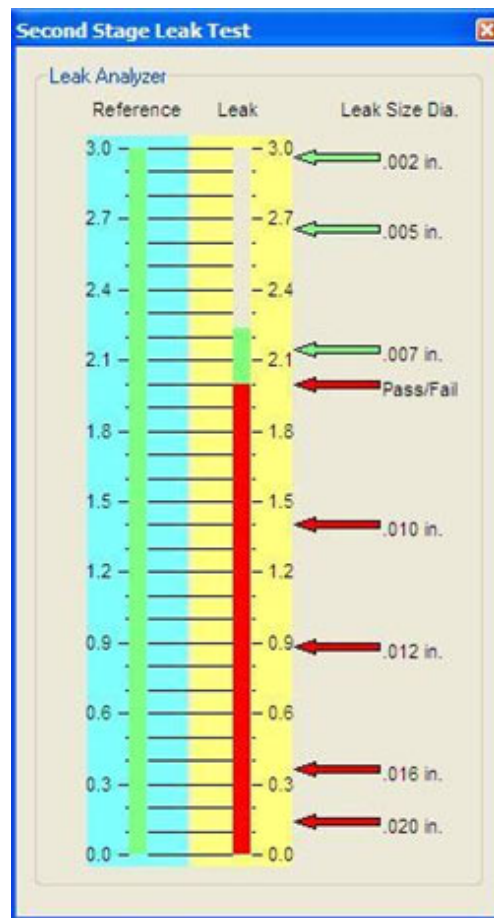
Demand effort vs. Flow & Venturi Performance

Dynamic I.P.

Cracking Effort

(click to enlarge)

A Second Stage Leak Analyzer has been added to further enhance the functionality of the A.I.R. Flow Test Stand. The Leak Analyzer is designed to measure very small leaks in the second stage regulator housing that may allow water to enter during the breathing cycle from holes with equivalent diameter sizes of .002 inch to .020 inch. The information used in evaluating a leak is displayed graphically on two scales on the Leak Analyzer Window dashboard of the PC interface. One scale represents the reference vacuum source and the other is the leak magnitude as shown.

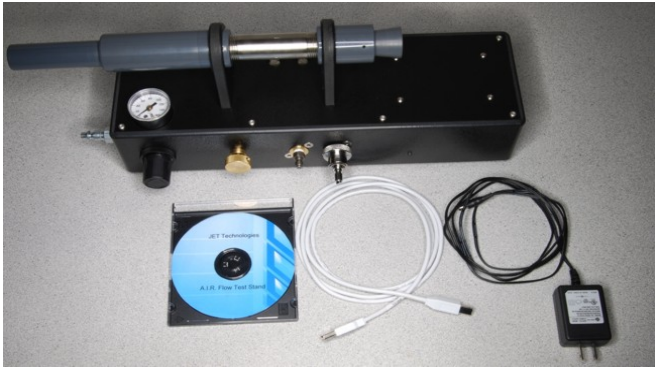


The A.I.R. Flow Test Stand includes the following items:

- Test Stand comprised of : Venturi Pump, Flow Controls, Flowmeter, Pressure Transducers, Dive Regulator interface, High Pressure & Intermediate Pressure ports, Leak Analyzer Accessories, Data Acquisition interface.
- A.I.R. Flow Test Software with drivers.
- USB Interface Cable
- Power Supply Adapter

Recommended Minimum System Requirements:

- PC with Windows XP
- One USB Port
- 256 MB RAM and 40 MB free hard drive space



A.I.R. Flow Test Stand  
SI-10200100 \$3300.00

Quantity:

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