

CREW MASK TEST SYSTEM

The AMI Crew Mask Test System is designed to automate the testing of airline crew oxygen masks and regulators. This computer controlled test instrument eliminates the cumbersome manual adjustments of regulators and flow controls by automatically adjusting and monitoring various controls and sensors.

SPECIFICATIONS:

1. Masks Tested

Following is a partial list of masks that can be tested with this instrument as well as their associated Component Maintenance Manual (CMM).

MASKS	REFERENCE CMM
BE Sweep-On 2000	#35-10-60
EROS Series MC-10-2	#35-11-10
Scott 359	#35-11-82

2. Controls and Sensors

CONTROLS	RANGE
Inlet Pressure	0 – 125 PSI
Inhalation flow	0 – 120 LPM
Exhalation flow	0 – 120 LPM
Altitude	GL - 45000 feet
Low level exhalation flow	0 – 250 SCCM

SENSORS	RANGE
Oxygen dilution	0 – 100% oxygen
Outlet pressure	± 14 inH20
Inward leak	0 – 250 SCCM
Outward leak	0 – 25 SCCM
Barometric pressure	800 – 1100 mB
Gas temperature	50 – 120 °F

3. Electrical Connection

Depending on the destination country, the test system will be equipped with a standard plug for connection to a 120VAC, 60 Hz power source or with a

220VAC, 50Hz receptacle.

4. Pneumatic System

The pneumatic system includes automatic pressure, vacuum, and flow controllers to adjust the inlet pressure, altitude, inhalation, and exhalation flows to the required levels. An oxygen analyzer and sample pump are used to measure the oxygen dilution.

Pneumatic connections include a quick connect for clean dry shop air (120 PSI max), a ¼ inch compression fitting for the test gas (oxygen, 125 PSI max), and a ¾ inch barb fitting for the vacuum supply. The latter must be capable of producing a 15 torr vacuum with a displacement of 15 CFM.

5. Connections to the Unit Under Test

The test system is equipped with connectors inside the altitude chamber for the inlet pressure hose and the outlet of the regulator or mask under test. An application specific and manufacturer dependent adapter provides the interface between the regulator outlet and the test system connector.

6. Computer

The main control system consists of a rack-mount personal computer featuring an analog output card, an analog input card, and a digital I/O card used to control the pneumatic system. The operating system is Windows 2000 or greater, while a printer is provided to print the test results.

7. Test System Software

The test system software was developed with National Instrument's Labview and it features three (3) levels of password protection, including Operator, Technician and Developer.

- The Operator level allows the user to select the proper test file and execute the complete test on a product. Results of each individual test are displayed on the monitor, while a complete report of the entire test procedure is printed upon completion as well as stored in a text file.
- The Technician level allows the user to select the proper test file, execute the complete test file, execute any of the tests individually, or test a specific test repeatedly.

- The Developer level allows a user to modify an existing test file or build a new test file by reusing tests that have already been generated. The software allows modifications to the test limits, test sequence, and dependencies in this mode.
- A Calibration program is included to aid in the calibration and maintenance of the test system.

The test system software configures the hardware and programs the control set points to perform the following regulator tests as described in the appropriate component maintenance manual (CMM).

TEST
Inward leak (Inner Leakage)
Outward leak (Outlet and full leakage)
Inhalation resistance (Flow suction)
Exhalation resistance (Flow resistance of expiratory valve)
Oxygen dilution (Altitude compensated oxygen enrichment)
Pressure breathing
Press to test operation
Compensated exhalation valve

8. System Operation

To test a specific regulator or mask, the operator simply inserts the unit into the test chamber, selects the appropriate test sequence, enters the unit serial number, and adjusts the regulator to the proper mode (normal, emergency, 100%) dictated by the instructions on the screen. Each test in the test sequence will then be performed and the results will be recorded. Once the test sequence is complete, a test report will be generated.

The test sequence is normally comprised of a group of tests, pre-configured for a specific regulator or mask. Also included in the test sequence are test parameters such as test type, control set points, and test limits.