



UNIVERSAL MASK TEST SYSTEM

Quotation #110811

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SYSTEM OVERVIEW

AMI's Universal Mask Test System is a computer controlled test instrument designed to automate the testing of crew mask and regulators.

The Test System is designed and equipped to perform various tests on crew mask and regulators including but not limited to the following units:

PART DESCRIPTION	REFERENCE CMM
EROS Masks MC10/20, MF10/20	#35-13-60 to 35-13-63
BE Aerospace Masks Sweep-On 2000	#35-10-60
EROS Regulators Series MC-10-2	#35-11-10 subsection B
BE Aerospace Regulators Sweep-On 2000	#35-10-60 subsection 5
Scott Regulators 359	#35-11-82 subsection B

SPECIFICATIONS

The Universal Mask Test System eliminates the cumbersome manual adjustments of regulators and flow controls by using a computer control system to automatically adjust and monitor the following controls and sensors:

CONTROL	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

SENSOR	RANGE
Oxygen dilution	0 – 100% oxygen
Outlet pressure	± 14 inH2O
Inward leak	0 – 250 SCCM
Outward leak	0 – 25 SCCM
Barometric pressure	800 – 1100 mB
Gas temperature	50 – 120 °F

ELECTRICAL CONNECTION

The Test System is equipped with a standard plug for connection to a 120VAC (60 Hz) or 220VAC (50Hz) receptacle depending on the destination country.

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. By automating these controls, the need for operator adjustments is eliminated. An oxygen analyzer and sample pump are used to measure the oxygen dilution.

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

REGULATOR CONNECTIONS

The Test System is equipped with connectors inside the altitude chamber for the inlet pressure hose and the outlet of the regulator under test. An application specific and manufacturer dependent adapter is used as an interface between the regulator outlet and the test system connector.

MASK CONNECTIONS

The Test System is supplied with mask adapters, which connect to the mask under test. These interchangeable adapters are mounted onto a test fixture.

Currently, there are 3 adaptors available to interface to 4 types of mask as shown in the following table.

Mask Adaptor Part Number	Mask Type
AMI 17-00108	BE Aerospace Sweep-On 2000 one piece
AMI 17-00109	BE Aerospace Sweep-On 2000 full face
AMI 17-00109	Eros full face (MXM4[])
AMI 17-00111	Eros one piece (MXM2[])

MICROPHONE TEST SUBSYSTEM

A Microphone Test Subsystem with headphones is also supplied to allow for testing of the microphone on the mask under test.

COMPUTER / ELECTRICAL SYSTEM

An IBM compatible computer is provided as the control system, and its operating system is Windows 2000 or greater. An analog output card, analog input card, and digital I/O card are used to control the pneumatic system. A printer is also provided to print test results.

TEST SYSTEM SOFTWARE AND APPLICATION SPECIFIC SOFTWARE

National Instruments' LabView software is used to control the Test System. The software has three (3) levels of password protection, including Operator, Technician and Developer.

- The Operator level allows the operator to select the proper test file and execute the complete test on a product. Results of each test are displayed on the screen and a test report is generated at the completion of the test. This report is sent to the printer as well as stored in a text file.
- The Technician level allows a technician to select the proper test file and execute the complete test file, execute any of the tests individually, or test a specific test repeatedly.
- The Developer level allows a developer to modify an existing test file or build a new test file using 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 mask and regulator tests as described in the appropriate component maintenance manual (CMM).

TEST DESCRIPTION
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

OPERATION

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

The test sequence is usually comprised of a group of tests, which are pre-configured for a specific mask or regulator. Each test has its own parameters such as the type of test, the control set points, the test limits, etc. Qualified and authorized personnel will be capable of modifying these test parameters as needed.

PROVIDING MASKS

AMI requests that the customer provides AMI with three (3) masks for use in the preliminary and final test procedures. These masks will be returned along with the shipment of the system.

CERTIFICATES OF CALIBRATION

Certificates of calibration for all transducers used in the Test System will be delivered with the system documentation.

DOCUMENTATION

The Test System will be delivered with an operation manual, which will cover the following topics:

Operators instructions
Parts list
Electrical schematic
Pneumatic schematic
Calibration instructions

TEST REPORTS

Test results can be printed and/or stored to the hard drive at the completion of a test sequence.

WARRANTY

Automated Motion Inc. (AMI) warrants its product(s) to be free of defects in design, material and workmanship for a period of one (1) year from date of customer acceptance.

At its option, AMI will repair or replace any product(s) found to be defective as a result of implementation, design or workmanship. AMI will not be responsible for defects as a result of misuse.

This warranty will cover all system components, with the exception of items deemed to be consumable, or subjected to abuse, neglect or accident. Technical support will be available by telephone, fax, and e-mail for any problems deemed by AMI to be correctable by customer's maintenance personnel, at no cost throughout the term of the warranty. The customer will be responsible for reporting complete and accurate information for analysis.

For problems deemed by AMI to be more serious, AMI will at its discretion, provide on-site Field Engineering support at no cost. The customer will be required to provide on-site assistance as needed.

This warranty is in lieu of, and AMI will not be liable for, all other warranties, conditions or obligations, whether expressed or implied, including but not limited to implied warranties of merchantability and/or fitness for a particular purpose.

The foregoing shall constitute the exclusive remedy of the purchaser from any breach by AMI of its warranty. In no event will AMI be liable for consequential, special, or indirect damages in any action, even if AMI has been advised of the possibility of such damage.

We appreciate the opportunity to quote on your requirements and are looking forward to working with you on this exciting application. If, after review of this quotation any questions or concerns arise, please do not hesitate to contact me, or Dennis Sweeny directly.

Sincerely,

Denis Caye