



OPERATING INSTRUCTIONS AND REPLACEMENT PARTS

**Air Quality Test Kits
Models: LP/HP-A4K and LP/HP-A445K**

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Overview

Air Systems' breathing air quality test kits are designed to test the air produced by compressors and compressed air in cylinders. These tests are accomplished through the use of detector tubes that provide a "go/no go" test of the air quality. If a high reading is found, this signals the user that they have a potentially unacceptable quality of breathing air. If this occurs, a laboratory analysis of the air components must be made to determine the exact readings of the air quality and take corrective action. For precision laboratory analysis, contact Air Systems' customer service department, 1-800-866-8100.

Federal OSHA requires that Grade-D air be supplied to the respirator user. OSHA's air quality standards are found in Section 29CFR 1910.134(i) in the Code of Federal Regulations. OSHA's standards are taken from the Compressed Gas Association (CGA) Commodity Specification G-7.1 - 1989. CGA's standard for Grade-D air is as follows:

Carbon Dioxide:	1000 ppm maximum
Carbon Monoxide:	10 ppm maximum
Oil Mist:	5.0 mg/m ³ (Condensed Hydrocarbons)
Water Vapor:	30-80 mg/m ³ (Cylinder air only)

Our test kits use the above test tubes as standard, other test tubes are available for specific tests of suspected contaminants. Call us for your specific applications.

Oxygen tests are available from our oxygen test meter, Model AQT-O2. Consult factory for details.

Low Pressure Air Tests - 125 PSI Maximum Procedure for Model LP-A4

Model LP-A4 is supplied with a regulator/flowmeter that must be connected after the compressor's Grade-D filtration system. The male plug, 1/4" industrial interchange, installed on the inlet of the pressure regulator can be coupled directly into the air distribution manifold of the filtration system. The test will determine acceptable air quality and whether or not the filtration system is functioning properly.

STEP 1)

Attach regulator assembly to female coupling on air distribution manifold. The flowmeter should be in the vertical position for maximum accuracy.

NOTE: The 1/4" industrial interchange plug on the regulator will need to be changed or an adapter used if the coupling on the manifold is something other than a 1/4" industrial interchange.

STEP 2)

Turn the regulator knob clockwise and set pressure between 20-30 PSI. Do not adjust the flowmeter at this time.

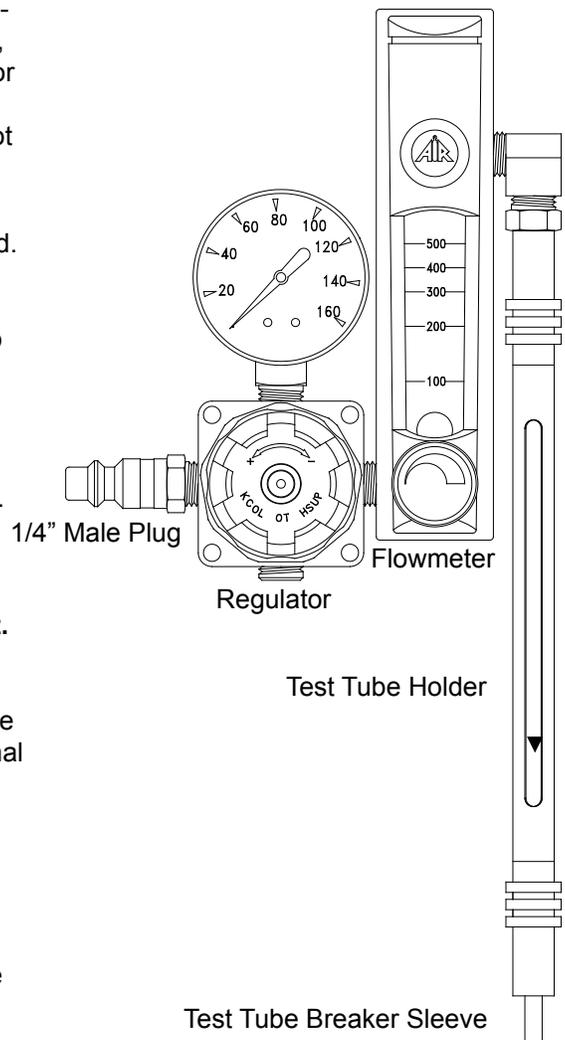
**NOTE: The recommended tube testing sequence is as follows:
water vapor, carbon dioxide, carbon monoxide, and oil mist.**

STEP 3)

Break the ends off a fresh test tube using the small metal breaker sleeve in the kit. Install the test tube in the rubber tube holder with the directional arrow found on the tube pointing down. Install tube by first inserting the upper end into the holder then stretching the holder over the lower

STEP 4)

The rubber tube holder is then inserted into the hose barb with the test tube arrow pointing down. Adjust the flowmeter to the flow rate per the chart on the following page and the required time. Start the test with the water vapor test tube and work through the chart.



Tube		Contaminant	Flow Rate CC/Min		Test Time In Minutes	
Gastec	Sensidyne		Gastec	Sensidyne	Gastec	Sensidyne
6A	603SPA	Water Vapor	100	500	10	1.4
2A	601SP	Carbon Dioxide	100	100	5	3.5
1A	6005P	Carbon Monoxide	100	175	3	2
109AD	6025P	Oil Mist	500	470	40	25

STEP 5)

At the end of each test period, read the tube immediately and record the results. Repeat with the other tubes until all desired contaminants have been sampled.

STEP 6)

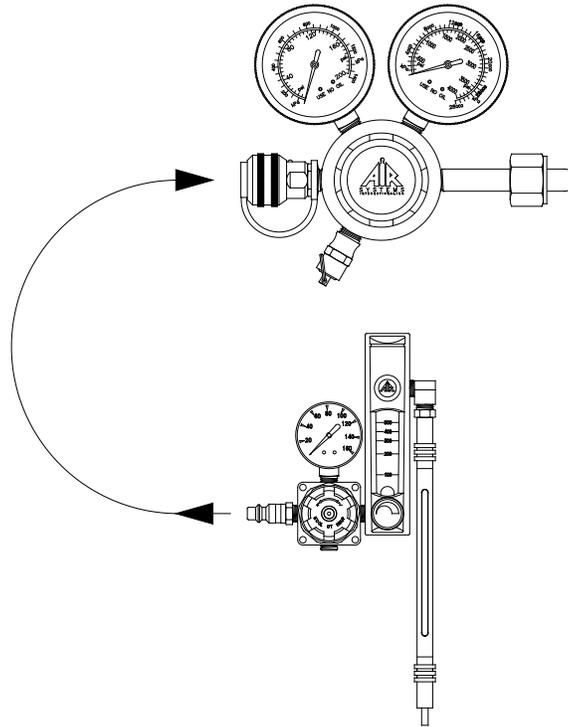
Close the regulator knob (turn counterclockwise) to shut off pressure to flowmeter. Open the flowmeter valve to bleed pressure from the flowmeter. Disconnect regulator from air distribution manifold and store system in case.

⚠ WARNING!

Do not attempt to remove regulator while system is pressurized. Always test air quality after the filter system to assure proper function. The periodic testing of CO levels does not substitute for a CO or high temperature alarm per OSHA regulations. We recommend the installation of a CO monitor in the breathing air system to continuously monitor for CO. Call Air Systems' customer service department to discuss a retrofit for your system.

High Pressure Air Cylinder Tests Procedure for Models: HP-A4 and HP-A445

Select the proper test module based on the pressure of the cylinder to be tested (HP-A4 up to 3000 PSI and HP-A445 up to 5000 PSI). A dual stage high pressure regulator is provided to reduce cylinder pressure before it is delivered to the flowmeter. The CGA-346 or 347 wrench tight nut/stem is attached to the cylinder valve. The output pressure to the flowmeter is set between 20-30 PSI. Attach the test module, Model LP-A4 to the female coupling on the regulator and follow steps 1 thru 6 on the previous page.



Detector Tube Reading and Interpretation

The following information will be helpful when reading and interpreting the detector tubes.

- A. Always read the tubes and record the results immediately after testing. In some cases stains may fade or crawl within a few hours.
- B. A tube ***may not*** be reused; even after a zero reading.
- C. The oil mist is normally used at 500 cc/min for 2 hours, however, reliable results are obtained using shorter sampling periods and correcting the reading with a multiplication factor as indicated below.

Test Duration	Multiply Reading By
30 Minutes	4
60 Minutes	2

- D. If at the end of a test it is noted that the stain has overshoot the scale, the actual concentration may be determined as follows; repeat the test with a new tube and observe the time required to reach the highest calibration mark (full scale). Multiply the full scale concentration by the ratio of recommended test time to actual test time.

Example: The H₂O tube reaches full scale (80 mg/m³) in six minutes.
 $80 \times 106 = 133 \text{ mg/m}^3$ (actual concentration).

Detector Tube Reading and Interpretation

- E. Excessive water vapor (i.e. greater than 250 mg/m³ H₂O) may cause the oil mist tube (#109-AD) to become unreliable. Run the water vapor test before running the oil mist test to determine the water vapor level. The recommended testing sequence is shown below:

First	H ₂ O (Water)
Second	CO ₂ (Carbon Dioxide)
Third	CO (Carbon Monoxide)
Fourth	Oil Mist

- F. Always use the enclosed quick connect valve to flush the system before putting the filter holder in-line for analysis. Flushing or purging should continue at 2-3 minutes until no visible water is discharged from the line.
- G. Never exceed 20 PSI into the filter holder otherwise damage to the assembly may occur.
- H. Always record the flow rate and run time on the petri dish filter holder when returning the unit for weighing.
- I. Never touch the filter membranes as the results could be contaminated.

Special Application For High Moisture Environment

High moisture content, usually above 250 mg/m³, will result in unreliable readings in the oil mist tube. To remove excessive moisture from the breathing air line, prior to running the moisture test tube, order Air System's prefilter assembly P/N FLTR020. Attach the filter to the male inlet plug located on the LP-A4 test module before performing the air test. An approximate 10% correction factor should be added to the oil tube reading to achieve a more accurate reading.

Total Particulate/Oil Mist Test Procedure For Model LP-47PF

The module has been designed for quick, accurate tests of total particulates and oil mist found in breathing air. One cubic meter of air is passed over a pre-weighted filter with the resulting difference in weight equaling the total particulate and oil found in the tested breathing air.

The LP-47PF test module is plugged directly into the output air coupling after the Grade-D filter system or into the pressure reducing regulator used for bottled air testing. Maximum pressure should not exceed 20 PSI coming into the test module. The polycarbonate test module holds the pre-weighted filter. The other end has a 1/4" plug attached which is plugged into the air outlet coupling of the breathing air system. After testing, the filter is weighed to check filter weight and a calculation is made in mg/m³.

Using the steel forceps supplied in the kit, install a 47mm pre-weighted filter in the polycarbonate filter holder. With the filters installed, plug the test module into the air outlet fitting, not exceeding 20 PSI. Adjust the flow to 50 LPM and allow the air to flow for 20 minutes. This results in 1 cubic meter of air being passed over the filters. If a different time is used it should be noted. After 20 minutes, the air is turned off at the regulator, the filter is removed from the housing using the forceps and placed in the supplied petri dish. The tested filter sample should be sent to a laboratory for weighing on a microbalance scale.

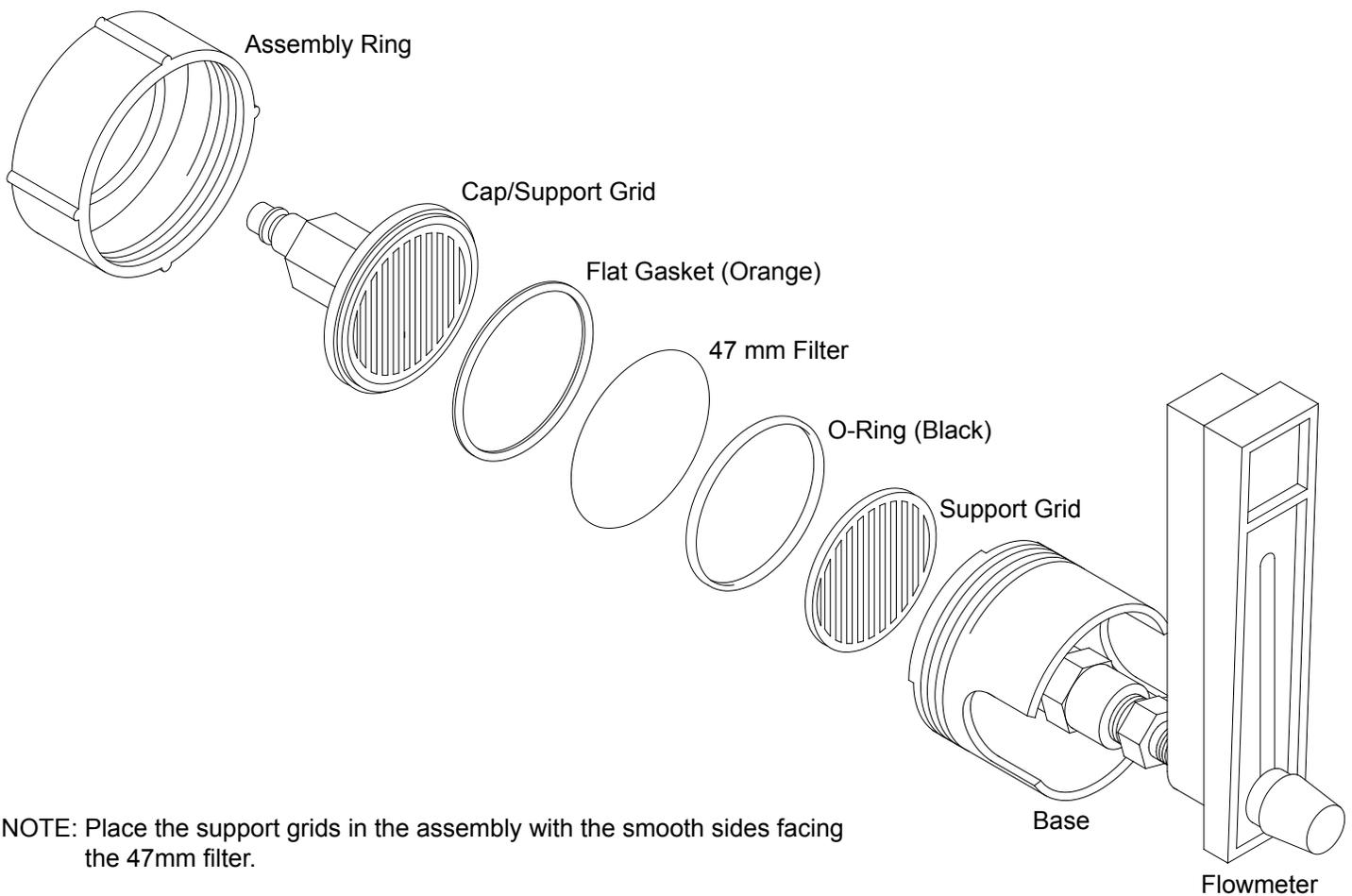
Laboratory Services Available

Enclosed in the kit is a data sheet to allow you to send your filter sample to Trace Analytics if you would like an independent laboratory to provide the weighing service for your filter. To obtain more information, contact Trace Analytics at 1-800-247-1024.

LP47PF Specifications

Holder Material	Polycarbonate
O-Ring	Ethylene Propylene Rubber
Maximum Operating Temperature/Pressure	100° Fahrenheit @ 50 PSI 38° Celsius @ 3.4 Atmospheric
Sterilization	250° Fahrenheit (121° Celsius) For 15 Minutes
Filter Diameter	47mm
Pre-Filter Diameter	42mm
Filtration Area	11.3 cubic cm
Connections	1/4" MPT or 1/4" Barb

LP47PF Assembly



NOTE: Place the support grids in the assembly with the smooth sides facing the 47mm filter.

Filter Handling Tips

1. Never handle filter with fingers. Use blunt, curve tipped forceps (wet or dry filters) or vacuum tweezers (dry membrane).
2. Filter identification can be made by marking the bottom side of the petri dish with an indelible black or blue pen.

Sterilization

Holders*; loaded or unloaded with membranes can be repeatedly autoclaved at 250° F (121° C) for 15 minutes @ 15 PSI or sterilized purging with standard sterilizing gas mixtures (not >20% ethylene oxide).

* Loosen assembly ring 1/8 of a turn. Retighten after autoclaving. Inlet and outlet should be covered with appropriate autoclave wrap during autoclaving.

Disassembly

STEP 1)

Unscrew assembly ring. Remove cap and flat gasket.

STEP 2)

Carefully unload membrane.

STEP 3)

Remove o-ring.

STEP 4)

The support grids should be removed for cleaning as needed.

Cleaning

STEP 1)

Disassemble holder completely.

STEP 2)

Wash all parts with a suitable solvent (i.e. isopropyl alcohol). Do not use acetone.

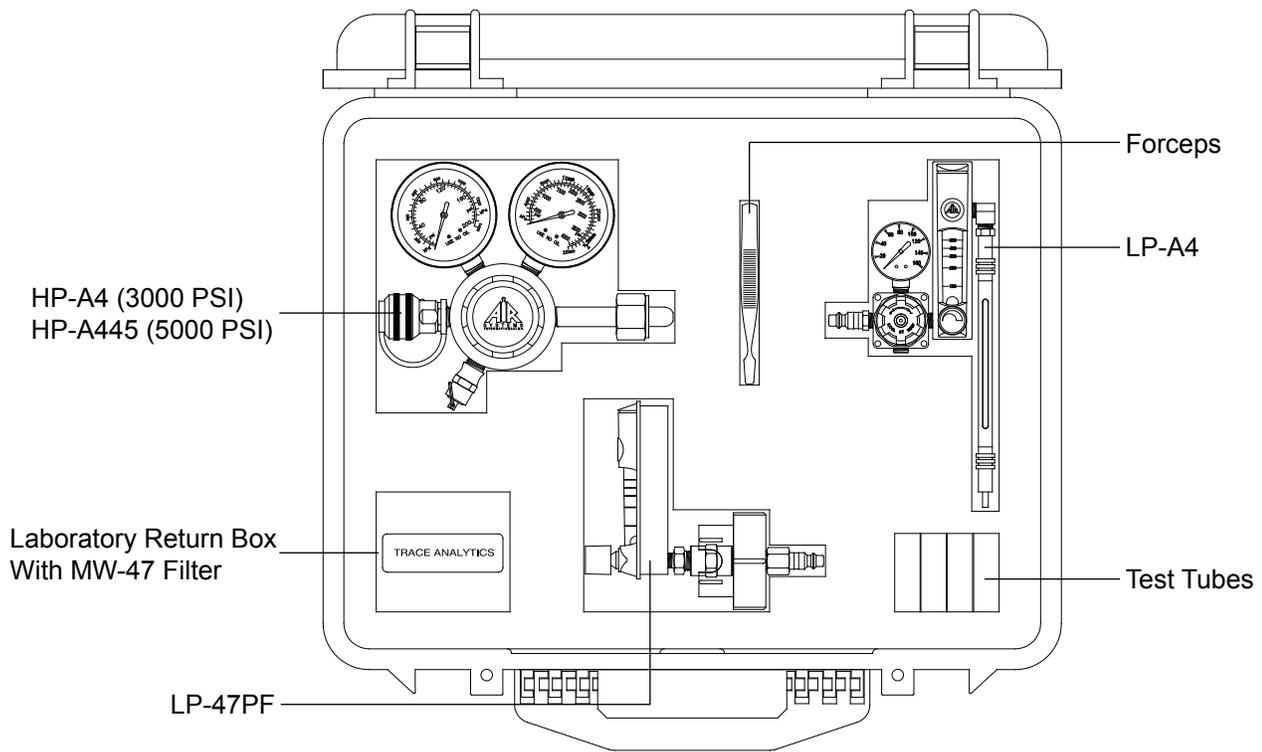
STEP 3)

Rinse in clean water.

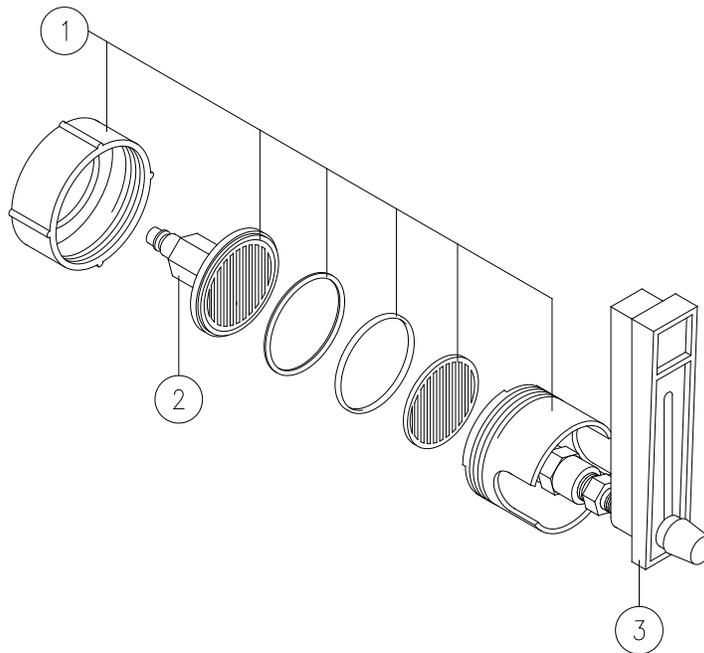
Operating Tips

- 1) Check to see that the assembly ring is tightened after making inlet and outlet connections.
- 2) Never operate holders above 50 PSI @ 100°F (3.4 atmospheric @ 38° C)
- 3) Periodically inspect seals for signs of deterioration (cracks, discoloration, etc.) and replace as needed.

LP/HPA4 and LP/HPA445 System Components

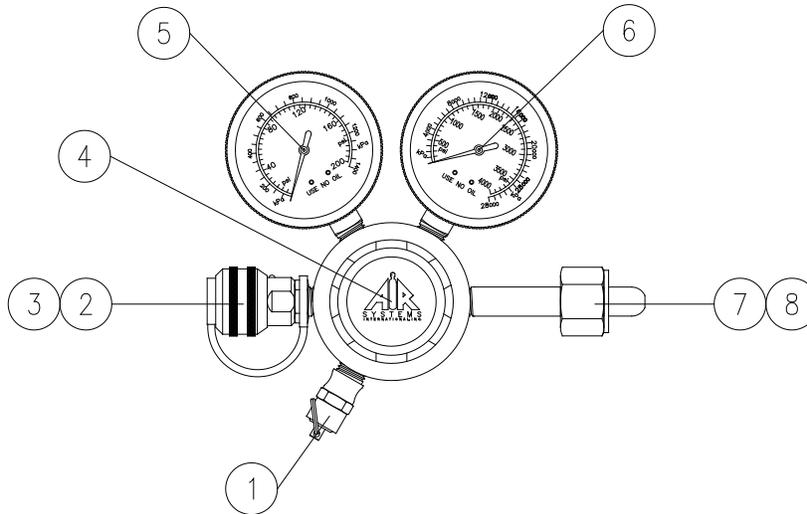


LP-47PF System Components



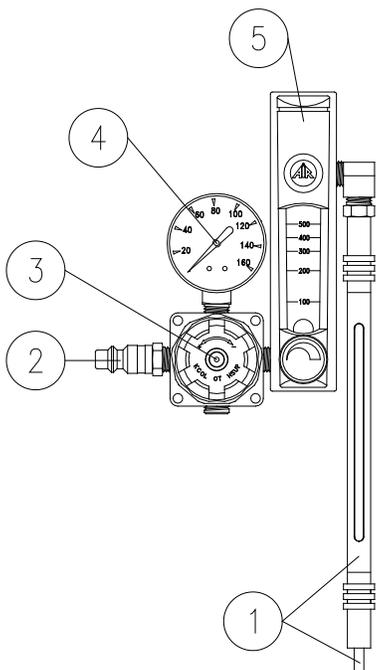
ITEM #	DESCRIPTION	PART #
1	47MM FILTER HOLDER	MWH-44
2	INLET FITTING	QDH3PL4F
3	FLOWMETER	SAM024

HP-A4/HP-A445



ITEM #	DESCRIPTION	PART #
1	125 PSI RELIEF VALVE	VR4125BR
2	HANSEN COUPLING	QDH3SL4M
3	HANSEN DUST CAP	QDH3DCAP
4	REGULATOR (HP-A4)(NO GAUGES)	REG-3000NG
4A	REGULATOR (HP-A445)(NO GAUGES)	REG-5000NG
5	0-200 PSI PRESSURE GAUGE	GA25200SRG
6	0-4000 PSI PRESSURE GAUGE (HP-A4)	GA254KSREG
6A	0-6000 PSI PRESSURE GAUGE (HP-A445)	GA256KSREG
7	CGA-346 WRENCH TIGHT NUT (HP-A4)	HPBR025
7A	CGA-346 WRENCH TIGHT STEM (HP-A4)	HPBR026
8	CGA-347 WRENCH TIGHT NUT (HP-A445)	HPBR049
8A	CGA-347 WRENCH TIGHT STEM (HP-A445)	HPBR050

LP-A4



ITEM #	DESCRIPTION	PART #
1	TEST TUBE HOLDER/BREAKER SLEEVE	CAL007
2	INLET FITTING	QDH3PL4M
3	PRESSURE REGULATOR	WL013A
4	0-60 PSI PRESSURE GAUGE	GA1560S
5	FLOWMETER	WL033NS

Warranty

Air Systems' manufactured equipment is warranted to the original user against defects in workmanship or materials under normal use for one year from the date of purchase. Any part which is determined by Air Systems to be defective in material or workmanship will be, as the exclusive remedy, repaired or replaced at Air Systems' option. This warranty does not apply to electrical systems or electronic components. Electrical parts are warranted, to the original user, for 90 days from the date of sale. During the warranty period, electrical components will be repaired or replaced at Air Systems' option.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY AIR SYSTEMS IN CONNECTION HEREWITH. UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR LOSS OF PROFITS, ANY OTHER DIRECT OR INDIRECT COSTS, EXPENSES, LOSSES, OR DAMAGES ARISING OUT OF DEFECTS IN, OR FAILURE OF THE PRODUCT OR ANY PART THEREOF.

The purchaser shall be solely responsible for compliance with all applicable Federal, State and Local OSHA and/or MSHA requirements. Although Air Systems International believes that its products, if operated and maintained as shipped from the factory and in accordance with our "operations manual", conform to OSHA and/or MSHA requirements, there are no implied or expressed warranties of such compliance extending beyond the limited warranty described herein. Product designs and specifications are subject to change without notice. Rev. 2, 12/98

Air leaks are not covered under warranty except when they result from a defective system component, i.e. an on/off valve or regulator or upon initial delivery due to poor workmanship. Air leaks due to poor delivery or damage will be covered under delivery claims. Minor air leaks are part of routine service and maintenance and are the responsibility of the customer just as are filters and oil changes.

