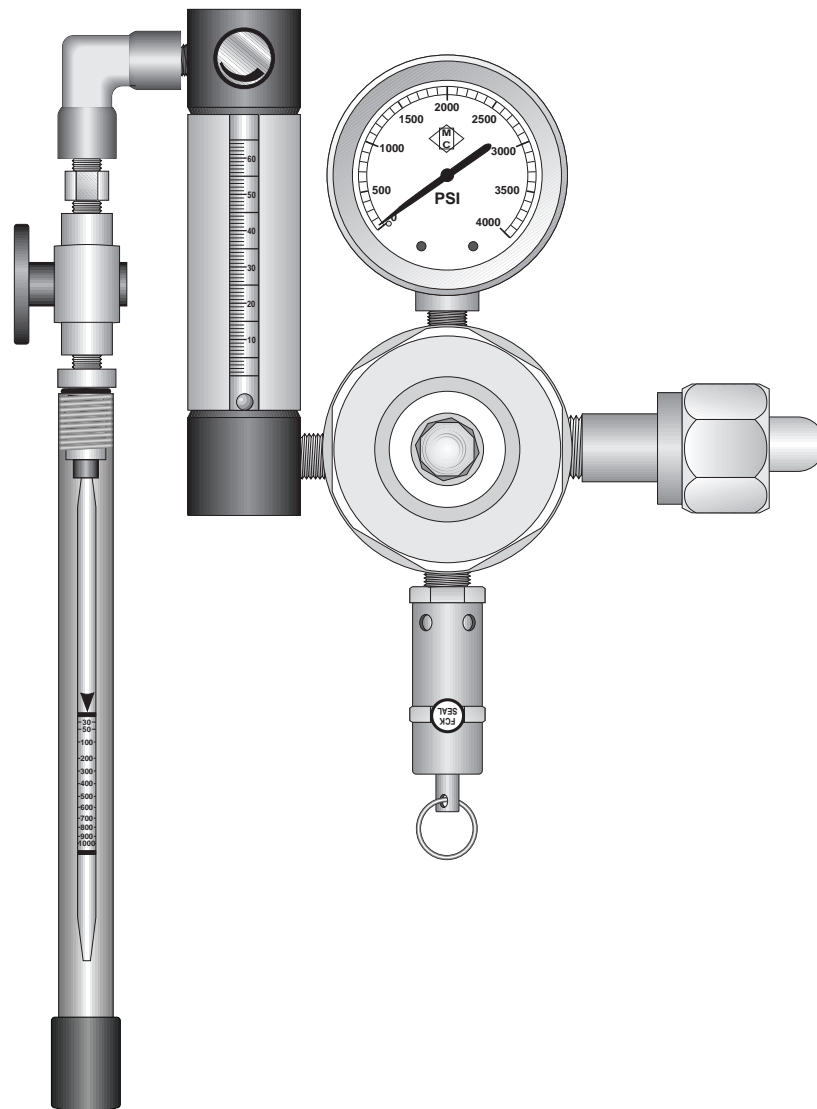


Compressed Breathing Air Analysis Kit

OPERATION AND SERVICE MANUAL



SENSIDYNE®



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PACKING LIST

The following items are shipped with the **Compressed Breathing Air (CBA) Analysis Kit:**

- Regulator
- Regulator Gauge
- Flow Controller
- Plug Valve
- Tube Holder
- *Operation & Service Manual*

***ALWAYS check to make certain
you have received all of the items listed above.***

***If you have any questions or need assistance,
contact your Sensidyne Sales Representative,
or call***

(800) 451-9444

or

(727) 530-3602

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WARNINGS !

READ AND UNDERSTAND ALL WARNINGS BEFORE USE

Read and understand **ALL** warnings before using this product. Failure to read, understand, and comply with **ALL** warnings could result in property damage, severe personal injury, or death.

Read and understand ALL applicable Federal, State, and Local environmental health and safety laws and regulations, including OSHA. Ensure complete compliance with ALL applicable laws and regulations before and during use of this product. In particular, follow ALL OSHA guidelines as set forth in Federal Register 29 CFR Part 1910.134 (d) (2) (ii) states that breathing air systems employing an oil-lubricated compressor must employ a carbon monoxide alarm or a high temperature alarm or both. The CBA Analysis System does not substitute for a CO or high temperature alarm.

UNDER NO CIRCUMSTANCES should this product be used except by qualified, trained, technically competent personnel and not until the warnings, *Operation and Service Manual*, labels, and other literature accompanying this product have been read and understood.

The *Operation and Service Manual* must be read and understood by each user before operating this product or using its accessories, in order to ensure proper and safe use and installation of this product and to ensure familiarity with the proper treatment and safety procedures in the event of an accident.

ALWAYS dispose of chemicals and calibration sources in compliance with **ALL** applicable safety laws, regulations, and guidelines for proper disposal. Failure to do so may result in environmental and property damage, personal injury or death.

DO NOT remove or alter any label or tag on this product, its accessories, or related products.

DO NOT operate this product should it fail a leak test, malfunction, or require repair. Operation of a leaking or malfunctioning product, or a product requiring repair may result in serious personal injury or death.

DO NOT attempt to repair or modify the instrument, except as specified in the *Operation and Service Manual*. If repair is needed, contact Sensidyne Service to arrange for a Returned Material Authorization (RMA).

ONLY use genuine SENSIDYNE® replacement parts when performing any maintenance procedures provided in this manual. *Failure to do so may seriously impair instrument performance.* Repair or alteration of the product beyond the scope of these maintenance instructions, or by anyone other than an authorized SENSIDYNE® serviceman, *will void the warranty*, and could cause the product to fail to perform as designed and persons who rely on this product for their safety could sustain severe personal injury or death.

Review the interferences for each detector tube used in conjunction with this equipment.

Observe any temperature or humidity corrections for the detector tubes used with this equipment.

(WARNINGS continue on next page)

WARNINGS !

Use **ONLY** Sensidyne detector tubes designed for use with the CBA Analysis System. **DO NOT** to use other brands of detector tubes with the CBA tube holder.

Detector tubes contain chemical reagents. **DO NOT** ingest or allow children to ingest tube contents.

Avoid cuts from broken detector tubes.

The regulator incorporated in this equipment has a maximum inlet pressure of 3000 psig. **DO NOT** exceed this pressure.

The flowmeter will not operate properly if the regulator inlet pressure drops below 50 psig.

The CBA Analysis System should be checked for leaks on a routine basis. Cracks or leaks in the flowmeter cover tube can effect flowmeter accuracy. Leaks between the flowmeter and the tube holder will result in low detector tube readings.

The flowmeter is calibrated for breathing air. It is not accurate when applied to other gases.

The preset regulator delivery pressure of 50 psig should not be altered. The maximum safe pressure for the flowmeter is 75 psig.

DO NOT overtighten **ANY** threaded connection. Overtightening the regulator fitting can cause distortion of the threads and/or seating surface. Overtightening the flowmeter needle valve will damage fine internal threads and sensitive metering seat.

The system should always be stored in a clean dry place when not in use.

Some bottled breathing air is prepared by blending liquid nitrogen and liquid oxygen at 79% and 21% respectively. Oxygen content should be monitored when this type of breathing air is used.

DO NOT attempt to remove the CBA regulator from the breathing air source while the regulator is under pressure.

Take precautions against water entry into the regulator. Use line pressure to blow out the connector prior to regulator hookup when sampling compressed air.

Be sure that the weight of the CBA Analysis System is properly supported during hookup to compressed air lines.

Be sure that any adapters prepared for use of the CBA Analysis System on compressed air lines are capable of handling line pressure.

NEVER place the CBA regulator or flowmeter in a vise.

STANDARD SAFETY RULES

READ CAREFULLY BEFORE USING THIS PRODUCT

Some safety rules associated with compressed air systems are listed below.

This equipment is pressurized when in service and can cause personal injury if it is improperly used or maintained.

DO NOT attempt to operate this equipment if any part is damaged or broken.

DO NOT tamper with the preset regulator adjusting screws as overpressurization could occur.

DO NOT connect the flowmeter to any pressure source capable of exceeding 75 psig.

DO NOT attempt to alter or repair this equipment yourself. Return to factory for repairs.

DO NOT use this equipment for gases other than compressed air.

Compressed air at high pressures can accelerate burning of combustible materials

Compressed air cylinders should not be used for breathing air unless specifically labeled as breathing air.

Compressed air cylinders should always be secured (e.g. chained) to a wall, post or in a cylinder cart in an upright position when in use.

Compressed air cylinders should not be exposed to heat or sparks.

Smoking is prohibited in cylinder storage or usage areas.

NEVER operate motorized vehicles near a breathing air compressor inlet.

Filter systems utilized for purifying breathing air from oil-lubricated compressors employ a catalyst to convert CO to CO₂. Water contact will deactivate the catalyst.

SECTION I

INTRODUCTION

1.1 MONITORING BREATHING AIR

A chemical plant worker inspecting a tank car cleaning operation, a fire fighter donning his self-contained breathing apparatus, and a SCUBA diver on a weekend holiday all face a common situation. Each is putting his or her life on the line by hooking up to a temporary air supply. Assured that by using a life supporting device he/she is being provided maximum protection, the quality of that breathing air is probably the last thing on his or her mind.

A quantitative testing device is the only way to assure that the breathing air quality meets minimum standards. The faster, easier, and less expensive such testing is, the more often it can be applied.

A compressed breathing air system has two potential sources of contaminants: (1) those entering the system with the intake air and (2) those produced internally by a faulty compressor or inadequate filtration system. An example of the first type would be vehicle exhaust intrusion caused by locating the compressor air inlet too close to traffic areas or loading zones. An example of the second type might be oil mist accumulation caused by an overfilled oil reservoir and inadequate filter.

Some common breathing air contaminants are carbon monoxide, carbon dioxide, oil mist, and water vapor—as well as oxygen deficiency.

- **Carbon Monoxide**

Of the common potential contaminants, CO is the most deadly. It is colorless and odorless with no warning properties. CO combines with blood hemoglobin more readily than oxygen causing oxygen starvation in body tissues. Exposure causes headaches, heart palpitations, loss of equilibrium, confusion, unconsciousness, and death.

- **Carbon Dioxide**

CO₂ is also toxic but can be tolerated in much higher concentrations than CO. Effects are somewhat similar to CO, but the increased breathing rate accompanying CO₂ poisoning increases the intake of all coexisting contaminants. Exposure causes headache, dizziness, sweating, shortness of breath, increased heartbeat and blood pressure, coma, asphyxiation, and convulsions.

- **Oil Mist**

Oil mist and particulate matter are forms of condensed hydrocarbons. The larger particles are readily removed by the upper respiratory tract, but smaller particles can be retained and cause problems. Oil mist in the lungs can cause lipoid pneumonia, and emphysema.

- **Water Vapor**

Water vapor in a breathing air system causes different problems. It can promote system corrosion and cause regulator failures due to icing in cold weather. It can destroy the catalyst in a filtration system that removes CO by converting it to CO₂.

- **Oxygen**

Oxygen is essential to life. In fresh air it occurs at about 21%, with the balance being mostly nitrogen. Oxygen deficiency results in loss of mental effectiveness, visual acuity, and muscular coordination. Severely deficient atmospheres can result in loss of consciousness and death.

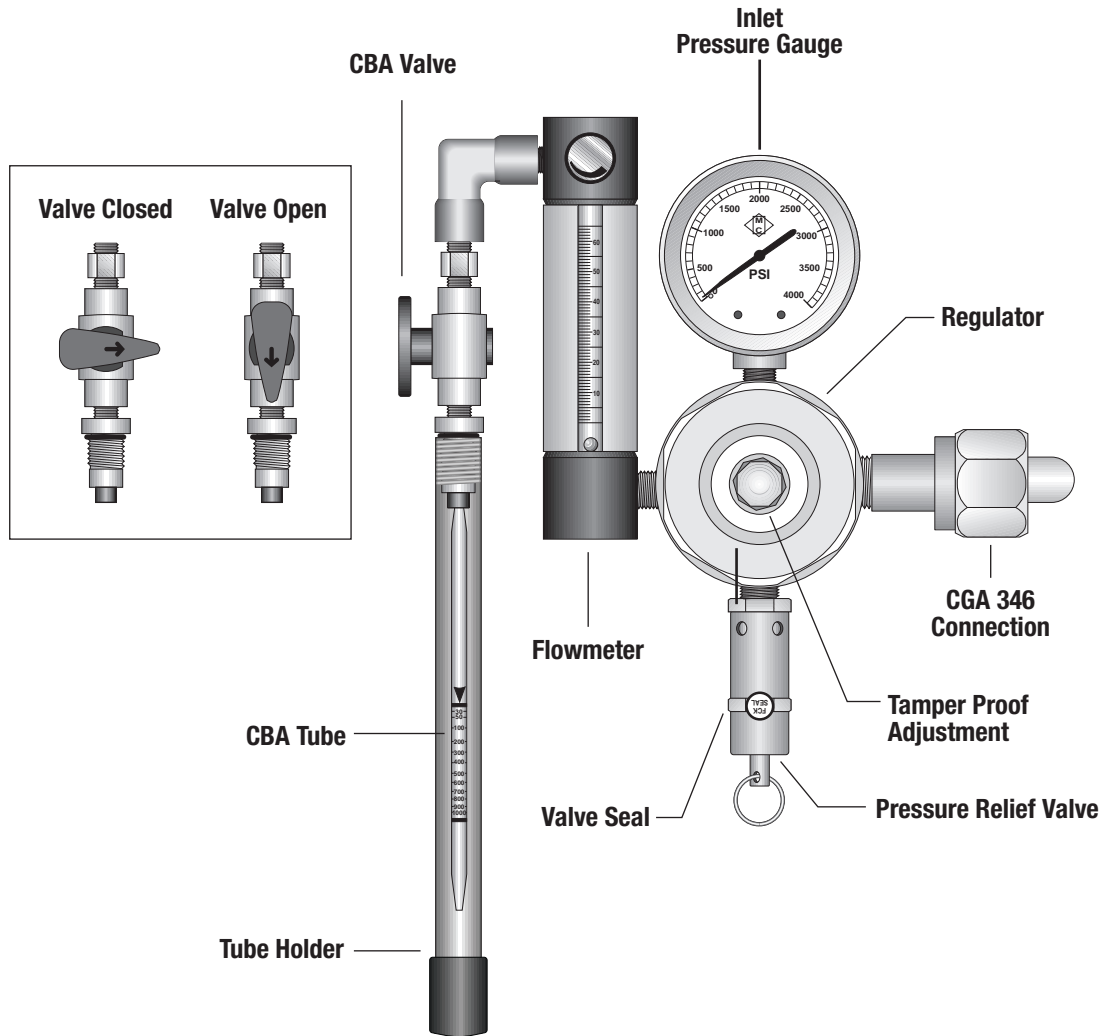


Figure 1
The Compressed Breathing Air Analysis System

1.2 CBA ANALYSIS KIT

Your Sensidyne Compressed Breathing Air (CBA) Analysis Kit includes the following components:

- Regulator (PN° 7015405)
- Regulator Gauge (PN° 7015476)
- Flowmeter (PN° 7015404)
- Tube Holder (PN° 7015374)
- Brass Male Hex Nipple (PN° 7016033)
- Brass Valve (PN° 7013910)
- Tube Holder Assembly (PN° 7013783)
- 50 ml Syringe
- Tygon Tubing

NOTE

The CBA Analysis Kit comes standard with a CGA 346 fitting for compressed breathing air cylinders. Other fittings may be installed. Consult your local gas supplier or welding supply shop.

1.3 CBA DETECTOR TUBES

The CBA Analysis Kit is designed for use with the following Sensidyne tubes:

- Carbon Dioxide (PN° 601SP)
- Carbon Monoxide (PN° 600SP)
- Oil Mist (PN° 602SP)
- Oxygen (PN° 604SP)
- Water Vapor (PN° 603SP)

WARNING

Only use the Sensidyne tubes listed above. Tubes designed for use with the CBA Analysis Kit have a part number ending in "SP."

CBA detector tubes are designed to meet the monitoring requirements for maintaining Grade D (Compressed Gas Association) breathing air. These standards are listed in Table 1 (below).

Table 2 lists the data for Sensidyne CBA Tubes. Tube packages contain detailed instruction sheets on the storage and use of the tubes, as well as instructions on interpreting tube readings. Tubes are packaged ten per box, allowing ten tests. Tubes may be used only once.

Note

The sample times and flow rates listed in Table 2 (following page) may vary slightly from the instruction sheet found in the tube box. These differences are due to adapting the Kitagawa tubes to Sensidyne hardware. Use the values given in Table 2 whenever discrepancies occur.

Gas/Substance	Level	Comments
Carbon Dioxide	1000 ppm	Maximum level
Carbon Monoxide	10 ppm	Maximum level
Oil Mist	5 mg/m3	Maximum level
Oxygen	19.5–23.5%	Minimum & Maximum levels
Water Vapor	- - -	Varies with use requirements

**Table 1
Compressed Gas Association Grade D Standards**

1.4 ACCURACY & CALIBRATION

The CBA Analysis System when used in accordance with tube instructions provides an accuracy of $\pm 25\%$.

The flowmeter is factory calibrated and should not require recalibration with normal use and proper care of the unit.

A calibration sheet is included with your unit and will provide improved accuracy over direct rotameter readings.

Should a calibration check be required the unit may be returned to the factory, or calibration may be checked using the Gilibrator 2 Calibration System or a soap film bubble meter.

Note

The sample times and flow rates listed in Table 2 may vary slightly from the instruction sheet found in the tube box. These differences are due to adapting the Kitagawa tubes to Sensidyne hardware. Use the values given in Table 2 whenever discrepancies occur.

Gas/ Substance	Part No.	Measuring Range	Flow Rate (cc/min)	Sample Time (min)	Humidity Range (%RH)	Color Change
Carbon Dioxide	601SP	100–3000 ppm	175	2	0–90	Purplish Blue to Pale Pink
Carbon Monoxide	600SP	5–100 ppm	175	2	20–90	Yellow to Dark Brown
Oil Mist	602SP	0.3–1.5 mg/m ³	470	25	0–100	Yellow to Pale Blue
Oxygen	604SP	2–24 %vol	50	n/a	20–90	White to Brown
Water Vapor	603SP	20–160 mg/m ³	500	1.4	- -	Yellow to Yellowish Green/Blue

All tubes have a Temperature Range of 0–40° C.

Table 2
CBA Tube Data

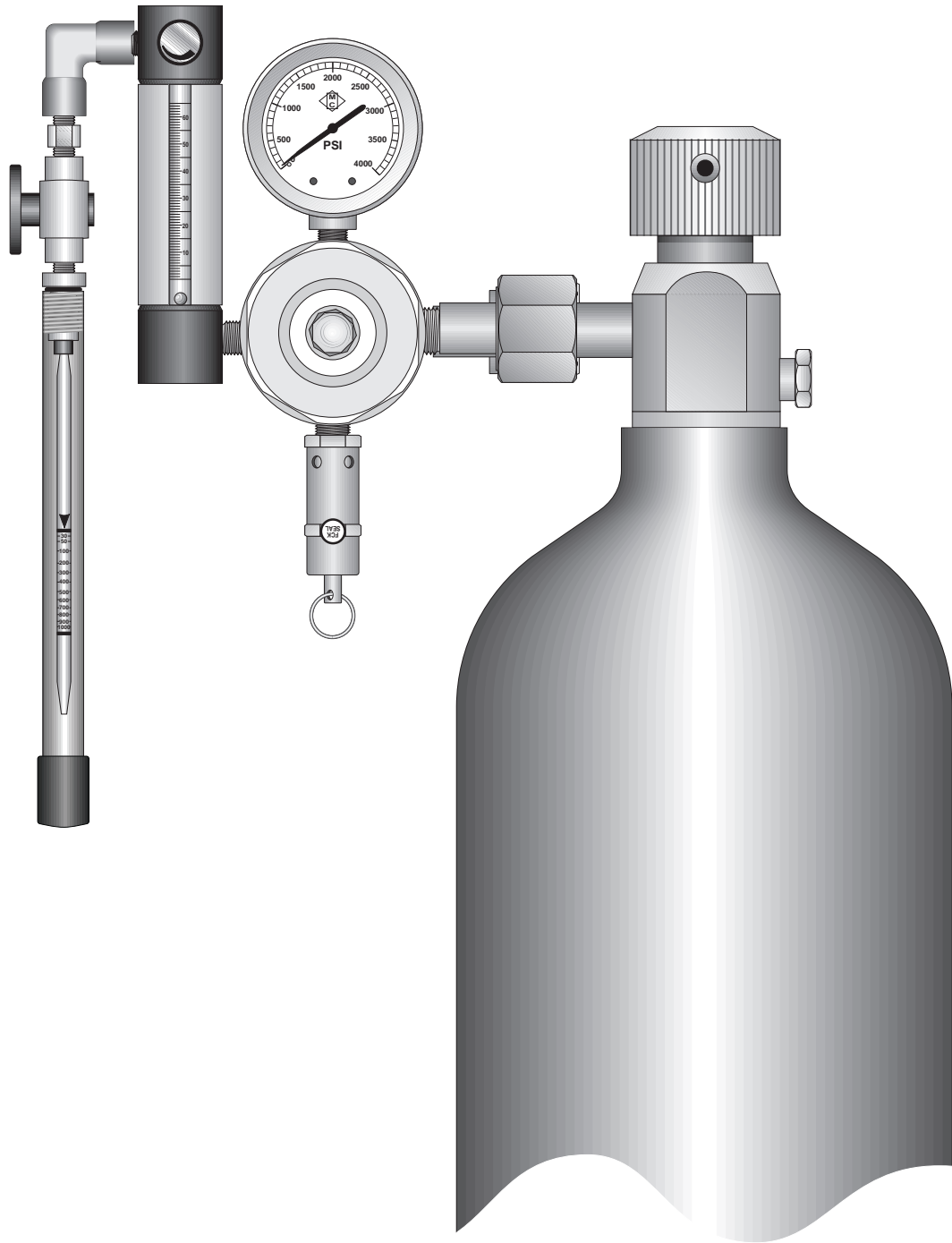


Figure 2
CBA System with Bottle

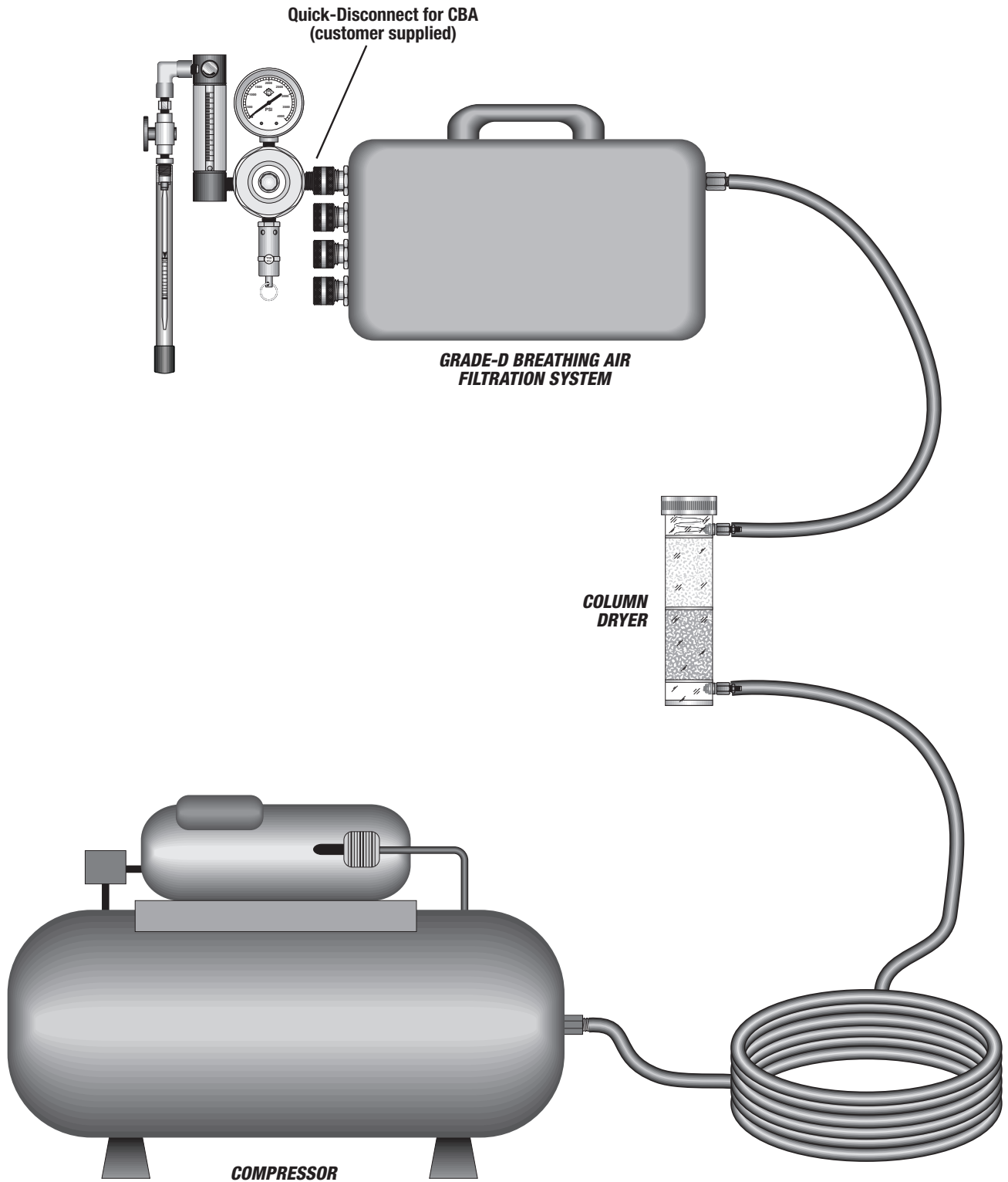


Figure 3
CBA Analysis System & Compressed Air

SECTION II

CBA ANALYSIS KIT COMPONENTS

2.1 REGULATOR

The regulator (PN° 7015405) is a two stage breathing air regulator. It is preset at the factory to deliver 50 psig to the flowmeter. It is precision-machined from solid brass stock. Internal parts are protected by a double filter system of sintered Monel metal, backed by sintered bronze. A preset safety device prevents overloading.

WARNING

The regulator has a maximum inlet pressure of 3000 psig. Do not exceed maximum inlet pressure. The regulator will not operate properly if the inlet pressure drops below 50 psig. The preset delivery pressure of 50 psig should not be altered. Above 60 psig, the safety valve will vent off excess pressure to prevent damage to the flowmeter.

The Regulator specifications are shown in Table 3.

2.2 FLOWMETER

The flowmeter (PN° 7015404) is a ball and tube assembly equipped with a metering valve. The system is back-pressure compensated to maintain constant flow when downstream pressure fluctuations occur. It is calibrated for a delivery pressure of 50 psig and for readings at the *center* of the ball (refer to Figure 4).

For maximum accuracy, the flowmeter should be mounted vertically. This may be checked with a level, although setting “by eye” is adequate. The flowmeter ball should float and rotate freely throughout the length of the tube.

NOTE

A calibration for the flowmeter is supplied with each CBA Kit. This curve should be used to achieve accurate flows.

The flowmeter is calibrated at 70°F (21.1°C) and 50 psig for *breathing air*.

CAUTION

It is not suitable for use with other gases and cannot be used with pure oxygen.

Read the flowmeter at the *center* of the ball. The flowmeter is marked with lines at 25 cc/min increments and numbers at 100 cc/min increments.

IMPORTANT

The flowmeter is housed in a pressurized cover tube. Cracks or leaks in the cover tube will affect system accuracy. Leaks between the flowmeter and the tube holder will result in low tube readings

Flowmeter specifications are shown in Table 4.

Item	Specification
Maximum Inlet Pressure	3000 psig
Outlet Pressure	50 psig preset
Inlet Gauge Range	0–4000 psi
Inlet Connection	CGA 346

Table 3
Regulator Specifications

2.3 TUBE HOLDER

The tube holder (PN^o 7013783) is designed to hold a Sensidyne detector tube leak-tight in series with the regulator flowmeter.

IMPORTANT

Use only Sensidyne CBA tubes. Other Sensidyne tubes are NOT calibrated for use with this type of sample delivery. See Section 1.3 (page 12) for further information.

2.4 REGULATOR GAUGE

The regulator gauge may be acquired separately as a replacement item. See Table 3 for regulator specifications.

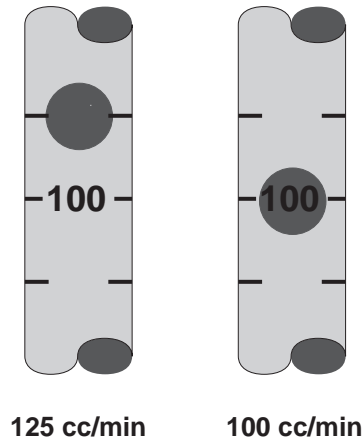


Figure 4
Reading The Flowmeter

Item	Specification
Range	100–500 cc/min
Delivery Pressure	50 psi (preset)
Backpressure Compensation	Yes
Metering Value	Integral with flowmeter

Table 4
Flowmeter Specifications

SECTION III

TESTING PROCEDURE

3.1 INTRODUCTION

The Sensidyne CBA Analysis Kit is equipped with a CGA 346 fitting for breathing air bottles. This fitting is specified by the Compressed Gas Association to be used only for breathing air bottles. The CBA Analysis Kit may also be used for compressed air systems, as a test for filtration and carbon monoxide removal devices, by providing a quick disconnect near the respirator hookup. See Figure 3 (page 15). Refer to Section 3.3 (page 20) for details on monitoring compressor-supplied systems.

3.2 BOTTLED BREATHING AIR

The following test procedure should be followed when testing bottled breathing air.

- 1) Open the bottle valve momentarily to blow away any foreign material that may have accumulated inside the connection.
- 2) Connect the regulator to the breathing air bottle and tighten it with an appropriate wrench. (The fitting takes a 1-1/8" open-end wrench). The flowmeter should be mounted vertically for maximum accuracy. Close the adjustment knob by turning it fully clockwise (do not overtighten), then open it 2 turns counterclockwise.

WARNING

Do not overtighten the regulator fitting. Severe overtightening will cause distortion of the threads and/or seating surface.

- 3) Open the bottle valve completely and read the gauge pressure on the regulator. The pressure should be no less than 150 psig and no more than 3000 psig.
- 4) Adjust the flowmeter needle valve momentarily to assure that the flowmeter ball moves freely throughout the entire length of the tube. Shut off flowmeter valve (turn it counterclockwise to open and clockwise to close).

WARNING

Do not overtighten the flowmeter needle valve. Overtightening will damage the fine internal threads and sensitive metering seat! The needle valve NEVER needs to be closed tightly.

- 5) Open the plug valve and adjust the flowmeter valve until the rotameter setting corresponds to the desired tube flow listed in Table 2 (page 13) *Use the calibration curve that comes with your kit to determine the rotameter setting.*
- 6) Close the plug valve once the flow has been set.

- 7) Break the ends off of a fresh tube and install it in the tube holder. *Note the directional arrow.* The arrow should point away from the flowmeter (or downward in the normal configuration). Insert the tube firmly into the fitting. Install the tube holder cover over the tube. Screw the cover into place.
- 10) Close the valve on the air bottle and open the flowmeter valve and plug valve to bleed residual pressure off the CBA system. Be sure the pressure is *completely* removed.
- 11) Disconnect the CBA regulator/flowmeter system and store in a clean dry place. *Do not leave it in the field.*

WARNING

Avoid cuts from broken tubes during this operation.

- 8) Open the plug valve and immediately start timing the sample (exposure times are listed in Table 2, page 13).
- 9) At the end of the sample period close the plug valve and immediately read the tube and record the results. Repeat with the other tubes until all of the desired contaminants have been monitored. Table 2 on page 13 lists the flow rates and sample times for the CBA tubes.

Note

Use the syringe to measure the flow through the oxygen tube. You may want to partially close the plug valve as the volume reaches 45 cc. This is to prevent sample overdraw.

WARNING

The oxygen tube becomes very hot during exposure. Do not touch the tube with your bare hands.

WARNING

Do not attempt to remove the CBA regulator from a breathing air source while the regulator is under source pressure!

WARNING

The CBA Analysis system should be checked for leaks on a routine basis. This may be done by applying soap solution around the connections with the system under operating pressure. The critical area to check is between the flowmeter and the tube holder. See Sections 4.1 and 4.2 (page 21).

3.3 COMPRESSOR SYSTEMS

The Sensidyne CBA Analysis Kit may also be used for monitoring compressed breathing air systems. See Figure 3 (page 15). The CBA Analysis System should be placed as close as possible to the respirator hookup. The line pressure must be above 50 psig in order for the flowmeter to work properly. The test procedure is the same as that for bottled air outlined in Section 3.2.

To use the Sensidyne CBA Analysis System with a compressed air system, prepare an adapter as outlined below in a) or b).

- a) In the sample line near the respirator hookup install a valve and a CGA 346 connection. The connection may be obtained from your local compressed gas supplier. It is the type placed on breathing air bottles.

- b) Prepare a quick disconnect adapter in the following manner. Obtain a CGA 346 bottle connection from your local compressed gas supplier. Attach it in a leak-tight manner to a quick disconnect fitting from one of your respirators. Your CBA Analysis System may now be connected directly into your respirator hookup.

WARNINGS

Take precautions against water entry into the regulator. Use line pressure to blow the connector out prior to regulator hookup.

Be sure that the weight of the CBA regulator/flowmeter is properly supported during testing.

Be sure that the adapters are leak tight and capable of handling line pressure.

Federal Register 29 CFR Part 1910.134 (d) (2) (ii) states that breathing air systems employing an oil-lubricated compressor must employ a carbon monoxide alarm, a high temperature alarm, or both. The CBA Analysis System does NOT substitute for a CO or high temperature alarm. (If only a high temperature alarm is used, frequent CO testing is required. The CBA Analysis System is suitable for such testing.)

Filtration systems utilized in purifying air from oil-lubricated compressors employ a catalyst to convert CO to CO₂. Note the following items:

- a) The catalyst is ruined if contacted by water and will no longer be effective.
- b) If CO₂ levels increase sharply between tests, this could be an indication of CO intrusion or production in the compressor.

WARNING

Most carbon monoxide intrusion into compressed breathing air systems is caused by a CO source near the compressor inlet. Never operate motorized vehicles near the inlet of a breathing air compressor!

SECTION IV MAINTENANCE & TROUBLESHOOTING

4.1 TESTING FOR LEAKS

The Sensidyne CBA Analysis System will provide maximum accuracy only if the system is leak free. Test for leaks following the procedure outlined in Section 4.2. If a leak is detected, tighten the fitting slightly and retest. Repeat until the leak is stopped.

WARNING

Do not overtighten connections. Return unit to factory if leaks persist.

Below is a list of potential leak sites that would have a direct effect on tube accuracy.

- **Tube holder fitting**
- **Regulator/flowmeter fitting**
- **Flowmeter needle valve**
- **Flowmeter cover tube**

Leaks upstream (e.g. regulator fitting) although undesirable should not affect system accuracy.

NOTE

Following leak checks allow 500 cc/min to flow through the flowmeter for 10 minutes to remove any moisture accumulation.

NOTE

Leak checks should be run at 500 cc/min with a used tube in place (use Tube No. 602SP).

4.2 LEAK TEST PROCEDURE

Perform a leak test on your CBA systems as follows:

- 1) Connect the CBA to the gas cylinder. Open the cylinder valve.
- 2) Open the CBA valve and set the rotameter flow to 500 cc/min. Remove the plastic tube shield from the CBA tube holder.
- 3) Close the CBA valve and squirt all joints (one-by-one) with Snoop[®] soap solution. If bubbles form at the joint, a leak is present. Tighten the joint and retest. At the end of testing wipe off the Snoop[®] with paper towels.
- 4) Open the CBA valve and insert a tube into the tube holder. Make certain you continue holding the tube tightly in the tube holder fitting since the Snoop[®] solution acts as a lubricant. The rotameter flow rate should slowly drop to zero. If it does not, push the tube further into the fitting until the flow rate starts to drop.
- 5) Squirt Snoop[®] over the rubber ends of the tube holder and watch for bubbles. One-by-one, squirt Snoop[®] on the tube holder joints – moving upward from the tube holder. If bubbles form at the that joint, a leak is present. Tighten the joint and retest.
- 6) If the rubber tube holder and all joints pass the leak test, thoroughly dry the unit with paper towels.

SECTION V

SAMPLING TIPS

• Tips for Tube Reading

The following items will be helpful when reading and interpreting the CBA detector tubes

- 1) Always read the tubes and record the results *immediately* after testing. In some cases stains may fade or “crawl” within a few hours.
- 2) A tube may never be reused, even after a zero reading.
- 3) If at the end of a test you note that the stain has overshot the scale, the actual concentration may be determined as follows:
 - a) Repeat the test with a new tube and observe the time required to reach the highest calibration mark (full scale).
 - b) Multiply the full scale concentration by the ratio of the *recommended* test time to the *actual* test time.

Example

H₂O tube reaches full scale (110 mg/m³) in 6 minutes. Recommended time is 10 minutes.

$$\text{Ratio} = 10 \text{ mins}/6 \text{ mins} = \mathbf{1.66}$$

Thus, the actual concentration is

$$110 \times 1.66 = \mathbf{183 \text{ mg/m}^3}$$

- 4) Excessive water vapor will cause the oil mist tube (PN° 602SP) to become unreliable. Run the water vapor test before running the oil mist test. The recommended testing priority is listed below.

1st: Water Vapor

2nd: Carbon Dioxide

3rd: Carbon Monoxide

4th: Oil Mist

5th: Oxygen

Notes

The Oil Mist tube (No. 602SP) normally turns from yellow to pale blue when detecting oil mist. When the tube is exposed to excess moisture the original yellow color turns orange. However, the tube will still respond correctly (pale blue) when detecting oil mist.

*When the water vapor level exceeds 160 mg/M³ the Oil Mist tube changes from yellow to orange, then back to yellow again, **and will no longer respond to oil mist**. If the Water Vapor tube (No. 603SP) indicates levels above 160 mg/M³, do not use the Oil Mist tube.*

- 5) Always pay strict attention to the instruction sheets provided in the tube boxes. Detector tubes have limits on temperature and humidity.
- 6) Accuracy in detector tube testing is $\pm 25\%$.
- 7) The reading on the Water Vapor and Oxygen tubes should be recorded *immediately*. When the tube is removed it will continue to respond to ambient moisture. Similarly, place the tube in the holder *as soon as possible* after the ends have been broken.

APPENDIX A

PARTS LIST

Part Number	Item/Description
7015406	Compressed Breathing Air (CBA) Analysis Kit
7015405	Regulator (without gauge)
7017086	Pressure Relief Valve
7017087	CGA 346 Fitting (Nipple & Nut)
7015404-1	Flowmeter with 1/4" NPT Input Fitting
7015404-2	Flowmeter with 1/8" NPT Input Fitting
7016033	Brass Male Hex Nipple
7013910	1/8" NPT Brass Plug Valve
7013783	Tube Holder Assembly
7015476	Regulator Gauge
7017377	Syringe, 50 ml
7013786	1 mm Vinyl tubing for Tube No. 604SP
7016042	Tygon Tubing (by the foot)
7015406-0	Compressed Breathing Air Analysis Manual
601SP	Carbon Dioxide Compressed Breathing Air Tube (100-3000 ppm)
600SP	Carbon Monoxide Compressed Breathing Air Tube (5-100 ppm)
602SP	Oil Mist Compressed Breathing Air Tube (0.3-5 mg/M ³)
604SP	Oxygen Compressed Breathing Air Tube (2-24 %vol)
603SP	Water Vapor Compressed Breathing Air Tube (20-160 mg/M ³)

APPENDIX B

RETURNED MATERIAL AUTHORIZATION

Sensidyne, Inc. maintains an instrument service facility at the factory to provide its customers with both warranty and non-warranty repair service. Sensidyne, Inc. assumes no liability for service performed by personnel other than Sensidyne, Inc. personnel. To facilitate the repair process, please contact the Sensidyne Service Department in advance for assistance with a problem which cannot be remedied and/or requires the return of the product to the factory. All returned products require a Returned Material Authorization (RMA) number prior to returning product to the factory. Sensidyne Service Department personnel may be reached at:

SENSIDYNE, INC.
16333 Bay Vista Drive
Clearwater, FL 33760
(800) 451-9444
(727) 530-3602
FAX (727) 539-0550

All non-warranty repair orders will have a minimum fee whether the repair is authorized or not. This fee includes handling, administration and technical expenses for inspecting the instrument and providing an estimate. However, the estimate fee is waived if the repair is authorized.

If you wish to set a limit to the authorized repair cost, state a "not to exceed" figure on your purchase order. Please indicate if a price quotation is required before authorization of the repair cost, understanding that this invokes extra cost and handling delay. Sensidyne, Inc.'s repair policy is to perform all needed repairs to restore the instrument to its full operating condition.

Repairs are handled on a "first in–first out" basis. Your order may be expedited if you authorize an expediting fee. This will place your order next in line behind orders currently in process.

Pack the instrument and its accessories (preferably in its original packing) and enclose your return address, purchase order, shipping and billing information, RMA#, a description of the problem encountered with your instrument and any special instructions. All prices are subject to change without notice.

If this is the first time you are dealing directly with the factory, you will be asked to prepay or authorize a COD shipment.

Send the instrument, prepaid, to:

SENSIDYNE, INC.
16333 BAY VISTA DRIVE
CLEARWATER, FL 33760

ATTENTION: Service Department

RMA: _____

SERVICE OPTIONS

The Sensidyne Service Department offers you a variety of service options that will help to increase your user confidence while minimizing costly interruptions and maintenance costs. These options include initial training, on-site technical assistance, and full factory repairs. Sensidyne has developed several programs which will allow you to select just the right options which are best suited to your applications and needs. For further information, contact the Sensidyne Service Department.