ICM® Unit 2000 Plus

OPERATION INSTRUCTIONS

NOTICE

These instructions must remain attached to the ICM Unit 2000 Plus. The end user ONLY is authorized to remove them from the device.

⚠ WARNING

These instructions pertain only to the use of the version of the ICM Unit 2000 Plus which integrates with the SCBA. These instructions, in addition to the instructions supplied with the SCBA, must be carefully read and followed by all persons who use or maintain this product. This includes those who have any responsibility involving its selection or application. The ICM Unit 2000 Plus from MSA will perform as designed only if used and maintained according to the instructions. Otherwise it could fail to perform as designed and persons who rely on the SCBA could sustain serious personal injury or death.

Use of this device must be consistent with the requirements of NFPA 1500 Fire Department Occupational Safety and Health Programs.

The warranties made by MSA with respect to the product are voided if the product is not used and serviced according to the instructions in this manual. We encourage our customers to write or call for a demonstration of this equipment prior to use, or for any additional information relative to use or repairs. During regular working hours, call 1-800-MSA-2222.

For More Information, call 1-800-MSA-2222 or Visit Our Website at www.MSAnet.com

MSA *The Safety Company*

MINE SAFETY APPLIANCES COMPANY
PITTSBURGH, PENNSYLVANIA, U.S.A. 15230

DESCRIPTION

1997 NFPA COMPLIANCE INSPECTION

Inspect the entire SCBA after it is cleaned and sanitized. NFPA-1500, as well as ANSI Standards Z88.2 and Z88.5, describe three levels of inspection procedures which are to be performed. Refer to these documents, or to an inspection program prepared by a health professional in establishing an inspection program.

Prior to installation of the ICM Unit 2000 Plus, the SCBA must be upgraded to be compliant with the 1997 edition of the NFPA-1981 standard. The components must be in good working order, free of damage and significant wear. (See SCBA Inspection Instructions)

INTRINSIC SAFETY

ETL approved intrinsically safe per UL/ANSI 913 for use in Class 1, Division 1, Groups A thru D hazardous locations.
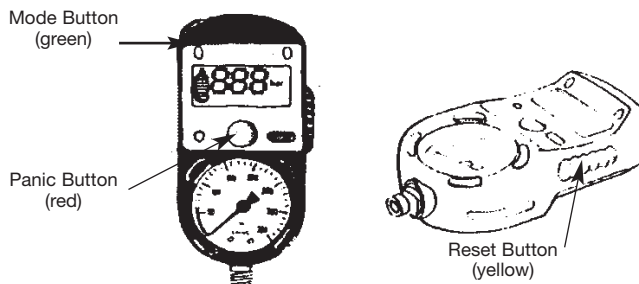
GENERAL DESCRIPTION

The ICM Unit 2000 Plus attaches to the SCBA gauge hose. See installation instructions for proper installation procedures.

The ICM Unit 2000 Plus turns on automatically when the user opens the SCBA cylinder valve. The GREEN light on the unit flashes to signal that it is activated and operating. The ICM Unit 2000 Plus has 3 control buttons:

Mode Button (green)

Panic Button (red)

Reset Button (yellow)

The RESET/OFF yellow button resets the device from the full alarm mode. It also shuts the unit off after the cylinder valve is closed and all air pressure is bled from the unit. The center red (alarm) button activates the full alarm mode **with or without** air pressure.

The mode button (green) will change the digital display window. See the during use section for details.

The PASS function uses RED and GREEN light-emitting diodes (LEDs) to display its status visually:

GREEN   LEDs start to flash when the cylinder valve is opened and shows that the device is operational.

RED   LEDs flash slowly when the device is in pre-alarm;
LEDs flash rapidly when the device is in full alarm.

Follow the donning procedures in the Air Mask instruction manual to pressurize the system. As the pressure reaches approximately 200 psig, both visible and audible alarms activate automatically, indicating that the unit is functional. When the system is fully pressurized, the alarm enters the Monitor (normal) Mode. The unit remains in sensor mode until the user shuts off the cylinder air and presses reset button twice in quick succession.

If the user is motionless for approximately 18 seconds the ICM Unit 2000 Plus goes into a pre-alarm. During pre-alarm, the device sounds 3 progressively louder tones and the RED light flash slowly. Movement of the unit cancels the pre-alarm. If the user remains motionless for 12 more seconds (approx.) the ICM Unit 2000 Plus goes into full alarm. During full alarm the PASS repeatedly sounds two high-pitched tones followed by a buzz. During full alarm the RED lights also flash rapidly.

The ICM Unit 2000 Plus can be set into full alarm at any time (even without air pressure) by pressing the alarm button.

BATTERY / AUDIBLE VISIBLE INDICATOR CHART

REDUNDANT ALARM/PRESSURE GAUGE

The ICM Unit 2000 Plus is also a multi-mode, battery-powered, low-pressure warning device which gives audible and visible warning that air cylinder pressure has reached approximately 25% of service life remains. There are two warning indicators:

- The pressure gauge face and the digital display blink.
- An audible alarm repeats single tone bursts.

INSTALLING THE BATTERY

You must install a 9-volt alkaline battery. Use only recommended battery type Duracell NEDA 1604A 9 Volt battery or equivalent.

1. Remove the four screws from the battery compartment of the unit.
2. Insert battery by using instructions inside battery compartment. Insert the battery base firmly into the case, then press down and in on the top of the battery.
3. Verify that the battery cover gasket is held in place in the battery cover.
4. Replace cover.
5. Evenly tighten cover screws by moving in an X pattern around the cover. Do not overtighten the screws. Do NOT use a thread sealant on the screws.

⚠ WARNING

Replace the battery when the low battery warning sounds. Use only recommended battery type as defined inside battery compartment. Change the battery in non-hazardous area only.

Failure to follow this warning can result in serious personal injury or death.

Audible/Visible Indicators

ACTION		AUDIBLE INDICATOR		VISIBLE INDICATOR
		without Thermistor	**with Thermistor**	
Automatic Activation (with air cylinder pressure applied)		Single Rising Tone with Bee-Bop	Single Rising Tone with Bee-Bop	GREEN/RED Light Flash Front Panel
Manual Activation		Redundant Alarm Startup — Single Rising Tone with Bee-Bop (also Full Alarm)	Redundant Alarm Startup — Single Rising Tone with Bee-Bop (also Full Alarm)	GREEN/RED Lights Flash Front Panel - Red Light Flashing
Sensor Mode (with or without Pressure)		none	none	GREEN Light Flashes
PreAlarm (with or without Pressure)	First 4 seconds (approximate)	Low Volume Rising Tone	Low Volume Rising Tone	RED Light Flashes
	Second 4 seconds (approximate)	Medium Volume Buzz	Medium Volume Buzz	
	Last 4 seconds (approximate)	High Volume Rise Tone Followed by Buzz	High Volume Rise Tone Followed by Buzz	
Full Alarm (with or without Pressure)		Two High Volume Tones Followed by Buzz	Two High Volume Tones Followed by Buzz	RED Light Flashes
Deactivation of Full Alarm	1st push of reset button	Bee	Bee	RED Light Flashes
	2nd push of reset button	Bee-Bop-Bop	Bee-Bop-Bop	GREEN Light Flashes
Deactivation of PreAlarm (with Shake or move Unit Pressure)		none	none	GREEN Light Flashes
Low Battery		1 Beep every 5 seconds	1 Beep every 5 seconds	none
Thermal Alarm Activation (see Thermal Alarm Activation Curve)		N/A	1 Beep every 3 seconds	none
Redundant Alarm				
Low-Pressure Alarm		Bee Bee	Bee Bee	Front Panels Flash

DONNING / DOFFING

DONNING THE SCBA (AND OPERATING THE ICM UNIT 2000 Plus)

1. Don the SCBA following the instructions in your SCBA instruction manual.
2. When you open the cylinder valve to perform the SCBA "system checks," listen for the ICM Unit 2000 Plus automatic activation indicator as described in table.
3. The Audi-Larm™ bell must ring briefly as the SCBA is pressurized.
4. Look to verify that the GREEN lights on the unit are slowly flashing.
5. Stand motionless for about 18 seconds. Listen for the pre-alarm to sound the low volume repeated tones. Look for the RED light to alternately flash slowly.
6. Remain motionless until the full alarm activates. Listen for the alarm to sound the increasing loud repeated tones. Look for the light to flash RED rapidly.
7. Reset the ICM Unit 2000 Plus by pushing the RESET button on the side of the unit 2 times within approximately 1 second.
8. To check manual activation of the full alarm, push the alarm button on the front of the unit.
9. Reset the Alarm. Press RESET button 2 times within approximately 1 second.
10. Stand motionless until the pre-alarm sounds. Shake unit to reset the alarm.
11. If the ICM Unit 2000 Plus checks out, complete all remaining SCBA donning steps in the instruction manual.
12. Crack the bypass valve slowly to bleed off pressure until the gauge needle drops below approximately;
    530 psig - approximately (low-pressure system) or,
    750 psig - approximately (3000psi System),
    1050 psig - approximately (high-pressure system)
    The alarm will sound, the front panel will flash, and yellow light will continue until you turn the alarm off.
13. When the pressure falls below 200 psig, turn the alarm off (Sleep Mode) by pressing the reset button 2 times in rapid succession.

⚠ WARNING

If the ICM Unit 2000 Plus does not function as described in the donning procedure, do not use the SCBA. The condition must be corrected before using the SCBA.

Failure to follow the above warning can result in serious personal injury or death.

PRECAUTIONS DURING USE

Periodically check the pressure indicated on the ICM Unit 2000 Plus pressure gauge. It continually displays the cylinder pressure. When the needle reaches the red zone, the alarm will begin sounding. When the alarm starts sounding, or when the pressure reaches approximately 25% of the rated service pressure, return to fresh air.

The ICM Unit 2000 Plus redundant alarm activates when cylinder pressure drops below a level corresponding to approximately 25% of service time remaining.

When the ICM Unit 2000 Plus redundant alarm or audi-alarm activates, immediately return to fresh air.

The ICM Unit 2000 Plus stores data for downloading to a computer through an IR link. MSA sells a kit that contains all of the equipment necessary for that purpose. See your local MSA sales associate, your local MSA distributor or contact MSA customer service directly at 1-800-MSA-2222 for details.

The top green (mode) button will illuminate the front panel with one press of green button, and will change the digital display by pressing green button.

No. of times green button is pressed	LCD shows
0 (initial state)	cylinder pressure X 10
press one time	pressure display lit
press two times	time remaining at current breathing rate

⚠ WARNING

- **Actual time remaining may be less than time displayed.**
- **Increases in breathing rate may reduce remaining time more than expected.**
- **Use time indicator as general guide only.**

The time displayed is based on the continuation of the average breathing rate over the last three minutes. Increases in the breathing rate after checking the displayed time may result in less time than anticipated. Failure to account for the reduced time can result in serious personal injury or death.

DOFFING THE SCBA (TURNING THE ICM UNIT 2000 PLUS OFF)

1. Close the cylinder valve completely and release all pressure from the system following the SCBA instruction manual.
2. When the pressure falls below 200 psig, turn the device off by pressing the reset button 2 times in rapid succession.
3. The ICM Unit 2000 Plus will beep 1 time when the button is pressed once. Pressing the button a second time will then sound three beeps ("bee-bop-bop") to indicate that the unit is turned off. The lights will also stop flashing.

SPECIFICATIONS

INSPECTION

Inspect the entire SCBA and the ICM Unit 2000 Plus after EACH use and MONTHLY.

Note: Most performance properties of the device cannot be tested by the user in the field.

1. Perform the ICM Unit 2000 Plus Functional Test by following the instructions for Donning and Doffing the SCBA (Turning device on and off).
2. If all the steps are performed successfully, remove the SCBA and inspect the ICM Unit 2000 Plus unit as follows:
   a. Check for external cracks in the case or housing.
   b. Check for missing screws or loose covers.
   c. Check for signs of leaking covers or water retention in the case.
   d. Check rubber cover for damage.
   e. Check for damaged or missing buttons on the unit.
   f. Check for any visible signs of damage to components.
   g. Check for proper operation of buttons.
   h. Check for proper and secure attachment of all components to the hose and gauge.

If the SCBA passes all the inspections specified in the SCBA instruction manual, and the ICM Unit 2000 Plus passes all inspections specified above, the unit is ready to be placed in service.

If the SCBA and ICM Unit 2000 Plus do not meet all inspection requirements, the unit must be removed from service until those conditions which failed are corrected and the SCBA is re-inspected satisfactorily.

CLEANING, STORAGE AND MAINTENANCE

1. In order to maintain the ICM Unit 2000 Plus it should be cleaned after each use with a damp cloth using soap and water. DO NOT APPLY CLEANING SOLVENTS.
2. Units contaminated by chemical or radioactive materials must be decontaminated or disposed of according to all applicable regulatory standards.
3. In the event of any malfunction, return the unit for repair. Contact MSA Customer Service for return authorization.
4. Store the unit in a dry, ventilated area at ambient temperatures consistent with the battery manufacturer's recommendations.
5. NFPA 1500 as well as ANSI Z88.2 and Z88.5 prescribe SCBA inspections which are to be performed "After each use" and "Monthly". The ICM Unit 2000 Plus inspections must also be performed during these SCBA inspections.
6. DO NOT PAINT the ICM Unit 2000 Plus.
7. Do not mark or etch the surface of the ICM Unit 2000 Plus.

ICM UNIT 2000 PLUS DEVICE TECHNICAL SPECIFICATIONS THERMAL ALARM (THERMISTOR)

The ICM Unit 2000 Plus can monitor temperature conditions if the Thermal Alarm option is purchased. If the wearer is exposed to more than a pre-set limit of time/temperature, the unit will sound a tone every 3 seconds.
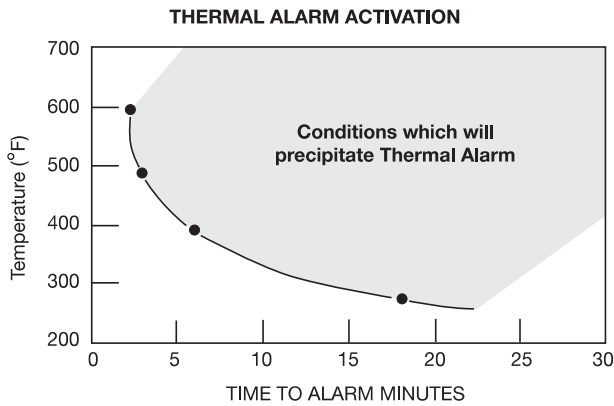
The chart shows the ICM Unit 2000 Plus thermal alarm activation curve. The time/temperature limits are based on the curve. The thermal alarm sounds if the pre-set limit exceeds the curve. The alarm will self-cancel depending on the severity of conditions. This may occur even though the temperature is above the thermal curve.

SPECIFICATIONS	
Weight	1.0 pounds (approx. 470 grams w/battery)
Alarm output	Greater than 95dBA at 3 meters
Battery	9 volt alkaline (1604 A)
Battery life	5 hours in full alarm mode
Electronics	Microprocessor controlled
Standards	Listed as intrinsically safe to ANSI UL 913, NIOSH certified for use on MMR SCBA Not evaluated by MSHA in explosive atmospheres

WARRANTY

THERMAL ALARM ACTIVATION

Temperature (°F) vs TIME TO ALARM MINUTES

Conditions which will precipitate Thermal Alarm

WARRANTY INFORMATION

The ICM Unit 2000 Plus unit is warranted to be free from mechanical defects or faulty workmanship for one (1) year from first use or eighteen (18) months from the date code, whichever occurs first, provided it is maintained and used in accordance with MSA's instructions and/or recommendations. For a copy of the complete warranty or for information on submitting a warranty claim, write to MSA, Customer Service Department, P.O. Box 426, Pittsburgh, PA 15230-0426 or call 1-800-MSA-2222.

For further information or training instructions contact your MSA representative or distributor.

For questions or comments regarding the certification of this product, contact Safety Equipment Institute:
     1307 Dolley Madison Blvd.
     Suite 3A
     McLean, VA 22101