

Committed to Safety Excellence!

SR2000 Escape Breathing Device

User Guide
UMSR2000FCC1A





CSE Corporation

Committed to Safety Excellence

When you need training or safety information, contact us at:

- 1-800-245-2224
- www.csecorporation.com

⚠ WARNING

Read this guide. Failure to follow the instructions inside may result in death or serious bodily injury.

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Printed in U.S.A. March 5, 2015

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Key

⚠ DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation that, if not avoided, <u>could</u> result in death or serious injury.

∆CAUTION

Indicates a hazardous situation that, if not avoided, <u>could</u> result in minor or moderate injury.

TIP

Indicates a helpful suggestion; not a hazardous situation.

GUIDANCE

Indicates detailed procedure steps.

Service Life Plan

The service life of any SR2000 unit is 10 years from its date of manufacture, as long as its owner carries out the recommended service life plan. The SR2000 plan specifies 2 requirements:

- Inspection: Follow the instructions on Page 7.
- Battery Replacement: Follow the instructions on Page 13.

The plan applies to all SR2000 units, whether they are carried or cached.

Service Life Plan Definitions

Cached

Stored for emergency use in a designated locker or space in a mine.

Carried

Worn by a miner on the job, or stored on mobile equipment in a mine.

Date of Manufacture

The date a unit was assembled. Stamped on the unit's stainless-steel security band (for example, "MFG 01/01/16").

<u>Owner</u>

The mining company or operator responsible for purchasing, inspecting, and maintaining safety equipment.



Summary

⚠ WARNING

Miners must visually inspect their assigned SR2000 units at the beginning of every shift.

⚠ WARNING

Only trained personnel may perform SR2000 90-day inspections or approve SR2000 units for use.

Miners need gear they can trust. But a mine is a harsh environment that can damage even the most rugged safety equipment. That's why miners—and mine operators—must constantly make sure that every escape breathing device, like the SR2000, is in good condition. This guide shows you:

- How the SR2000 works
- How to inspect it so you can uncover problems before an emergency strikes, and
- How to handle it responsibly from the time you purchase it until the end of its service life.

How the SR2000 Works

Unlike oxygen tanks or SCUBA-type equipment, the SR2000 self-rescuer is compact and simple to operate. It recycles the air you breathe, absorbing toxic carbon dioxide (CO_2) and generating the natural oxygen (O_2) you need. During start-up, before your breath has activated this process, your SR200 supplies you with oxygen from a small onboard cylinder.

When the SR2000 is operating, you breathe in a safe, closed, air-tight loop:

- As you exhale, air flows through your mouthpiece and breathing hose to the parts that absorb CO₂ and generate oxygen.
- As you inhale, oxygen-rich air flows back through the breathing hose and into your lungs.
- Your mouthpiece and nose clamp seal the good air in and keep the smoke or toxic gases out.

The SR2000's onboard VitalCheck system monitors the unit's condition constantly. On an unopened SR2000, a flash of light in the inspection window once every 6 to 10 seconds tells you that:

- The onboard starter oxygen supply is OK.
- The parts inside that remove CO₂ and generate oxygen are OK.
- The unit has not outlived its service life.

The system reports a problem (the case may have been opened, moisture or debris may have entered the case, or components may have been damaged or used up) by switching off the light.

A slow-flashing light (about once every 60 seconds) tells you the VitalCheck system batteries are low and should be replaced as soon as possible. The unit is still usable in slow-flashing mode.

Safety Personnel

⚠ WARNING

If an SR2000 fails a daily or 90-day inspection (see Page 7), take it out of service right away.

Miners

⚠ WARNING

If you carry an SR2000, you must inspect it as shown on Page 7 before every shift.

⚠ WARNING

Never carry or try to use an SR2000 that shows no flashing VitalCheck light.

⚠ WARNING

Never use an SR2000 that has been opened, that has failed inspection, or that has been taken out of service.

⚠ WARNING

Once an SR2000 is unsealed or opened in any way, think of it as used up. Follow your workplace procedure for handling units that are used up or do not pass inspection.

⚠ WARNING

Keep your SR2000 and its pouch clean enough for easy inspection, but:

- Never clean it by immersing it in water
- Never pressure-wash it or clean it with petroleum-based solvents.

Trainers

⚠ WARNING

In training classes and exercises, never use an SR2000 that has been unsealed or opened, that has failed inspection, or that has been taken out of service.

Train Realistically, Train Safely

Never use an SR2000 that has been opened, that has failed inspection, or that has been taken out of service, as a training device. For safe, realistic training, CSE has developed a family of devices that simulate the SR2000 experience. Find out more about our training devices by calling 800-245-2224, or visiting esecorporation.com.

TIP

The buddy system helps keep every miner safe. If you see a problem with another miner's gear, tell him about it right away.

Inspection

By law, inspecting an escape breathing device like the SR2000 is part of the daily routine for everyone who goes into a mine. Regulations also require mine operators to inspect every unit every 90 days. Both inspections are serious business.

For Miners, Every Day

In an emergency, it's too late to wonder if your SR2000 is ready for use. To be sure you can count on it, inspect it carefully before every shift.

What You'll Need

- The SR2000 you carry
- Your SR2000 pouch

For Safety Personnel, Every 90 Days

Mine operators must inspect every escape breathing device carried on the job, or stored in a cache, four times a year. This inspection includes the same steps as the daily inspection, but only trained personnel are authorized to perform the 90-day inspection and approve devices for use

What You'll Need

- Access to all company-owned SR2000s, whether carried on the job or cached.
- Pouches for all units carried on the job

Inspection Definitions

Cached

Stored for emergency use in a designated locker or space in a mine.

Carried

Worn by a miner on the job, or stored on mobile equipment in a mine.

Checkpoints (Daily and 90-Day)

1. Pouch (Omit if unit is cached without pouch)

- Pouch holds SR2000 securely. Not too loose or too badly damaged to hold unit securely.
- SR2000 can slip out easily when needed.
- Pouch is free of built-up dirt or other substances or objects that could make SR2000 hard to remove.

GUIDANCE

- Begin inspection by taking SR2000 out of pouch.
- Replace pouch if too badly damaged to hold SR2000 securely, or if SR2000 doesn't slip out easily for
 use.
- Remember that the CSE pouch designed for SR2000 is an ideal fit.

All OK? Go on to Checkpoint 2.

2. Clean and Clear

- SR2000 case is clean enough for broken tamper-proof tab or other damage to be seen.
- Inspection window on top of case is clear enough for VitalCheck light to be seen.

GUIDANCE

Do not scratch inspection window when cleaning. Wipe gently with a clean, damp cloth.

• Keep SR2000 free of built-up dirt or other substances that could make it hard to inspect or use.

⚠ WARNING

Keep your SR2000 and its pouch clean enough for easy inspection, but:

- Never clean it by immersing it in water
- Never pressure-wash it or clean it with petroleum-based solvents.

All OK? Go on to Checkpoint 3.



3. VitalCheck Light

Here's how to read the VitalCheck Light:

	Normal Flash	Slow Flash	<u>No Flash</u>
	(Flashes every 6 to 10 seconds)	(Flashes approximately every 60 seconds)	
<u>Visual</u>			
Rescuer Status	• OK to use	 Low batteries. Unit is usable. A trained technician should replace both batteries as soon as possible. 	 Unit fails inspection. Do not use unit.

GUIDANCE

- If the VitalCheck light goes dark during your shift, tell your supervisor as soon as possible. Follow your company's procedure for quickly getting a replacement.
- Only trained technicians may replace VitalCheck system batteries and approve unit for use. See Page 13 for the Battery Replacement procedure.

∆CAUTION

Do not use an SR2000, or approve it for use, if VitalCheck light is not visible. Unit with no visible light may be damaged, used up, or past its service life.

OK? Go on to Checkpoint 4.

4. Tamper-Proof Tab

• Red tamper-proof tab that seals the case latch on top of SR2000 is intact.

GUIDANCE

Inspect tamper-proof tab for breaks or damage.

⚠ WARNING

Do not use SR2000, or approve for use, if tab is missing or broken. Missing or broken tab can mean case has been opened, that moisture or debris has entered case, or that components have been damaged or used up.

OK? Go on to Checkpoint 5.

5. Case Damage

• Case shows no cracks, breaks, holes, gaps or openings.

OK? Go on to Next Steps.

Next Steps

For Miners, Every Day

- If your SR2000 passes all five checkpoints, it's safe to use on your shift.
- Do not use an SR2000 if it fails any of the checkpoints.
- If your SR2000 does fail inspection, follow your workplace procedure for disposing of it and getting another unit before you start your shift.

For Safety Personnel, Every 90 Days

- Document your inspections according to MSHA guidelines and workplace procedures.
- Follow your workplace procedure for handling SR2000s that do not pass inspection.
- Contact your local CSE representative if you need more information.

TIP

- Don't take a chance. If you're not sure your SR2000 is safe to carry, ask your foreman or supervisor about it before your shift begins. Get a replacement you know you can trust before you go to work.
- Follow your workplace procedure for handling an SR2000 that does not pass inspection.
- Carry nothing but your SR2000 in its pouch. When you need air in a hurry, tools or personal items can get in the way.



Battery Replacement

The batteries that power the SR2000's VitalCheck system will need to be replaced at least once during each unit's service life. When battery power is low, the system will warn you by shifting to slow-flash mode (about once every 60 seconds). At low power, the system can monitor the SR2000's status for only a short time, so replace the batteries as soon as possible. If the batteries run down completely, the entire SR2000 becomes unusable. It cannot be repaired or returned to service.

∆CAUTION

- Read these instructions completely before beginning battery replacement.
- Use only standard CSE-supplied replacement batteries. No other batteries are qualified for VitalCheck system use.
- Never use metal or other conductive tools to remove batteries. Metal tools can cause destructive short circuits.
- Never remove both batteries at one time. Keep at least one battery in place at all times. Removing both batteries at one time will cause the VitalCheck system to lose all data.
- Batteries may explode if handled carelessly. Never recharge, disassemble, or burn batteries.

What You'll Need

- Training in SR2000 maintenance. Battery replacement by untrained personnel will void your CSE warranty.
- A clean, level work surface in an enclosed space, such as an office, with a room temperature of about 68 77° F (20 25° C)
- The CSE SR2000 battery replacement kit
- A soft cleaning cloth
- A soft, dry brush
- A low-pressure compressed-gas duster
- A Torx-type screwdriver, size T20
- A non-conductive probe or spudger
- Fresh batteries—2 for each SR2000 unit. Use only standard CSE-supplied batteries.

Get Ready

1. Allow the unit to reach room temperature—about 68 - 77° F (20 - 25° C).

2. Rest the unit on its side, with the inspection window facing you. This position prevents a loose battery

from falling into the socket and making a wrong contact, which will make the entire SR2000 unusable.

3. Clean the inspection window and surrounding surfaces with cloth, brush, or compressed gas. Be

careful to remove dust or debris from crevice around the inspection window.

Remove Inspection Window

1. Use the Torx screwdriver to remove inspection window screws and washers.

2. Lift off inspection window and gasket.

3. Clear remaining dust or debris from edge of battery compartment port. Brush outward, away from

opening, to keep dust and debris from falling into battery compartment.

Replace Batteries

1. Remove and replace the first battery only. Ease battery out of socket with dry, nonconductive probe

or spudger.

2. Insert fresh battery with (+) side up. Press battery firmly into socket with fingertip.

3. Only after fresh first battery is in place, remove and replace the second battery. Insert with (+) side

up. Replace the second battery no more than 60 seconds after replacing the first battery. A delay

longer than 60 seconds may cause the VitalCheck system to lose all data.

Replace Inspection Window

1. After replacing batteries, install new gasket and inspection window provided in battery replacement

kit. Be careful that gasket makes smooth seal between inspection window and battery compartment

port.

2. Fasten replacement window in place with new screws and washers provided in battery replacement

kit. Do not over-tighten screws.

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Disposal

Dispose of damaged SR2000s, or SR2000s that have reached the end of their service lives, according to your workplace procedure. We recommend turning out-of-service units over to a certified universal waste handler, or returning them to us. For instructions on returning units to CSE, contact us at:

- 800-245-2224
- www.csecorporation.com

Regulatory Information

NIOSH Registration

The National Institute for Occupational Safety and Health (NIOSH) requests, but does not require, that purchasers of this device register each unit with NIOSH. Registration will enable NIOSH, which approved this model, to attempt to notify you if a problem is discovered that might affect this device's safety or performance. Registration will also help NIOSH locate deployed units to periodically evaluate whether this device is remaining effective under field conditions of storage and use. Registration may be completed on line at www.cdc.gov/niosh/npptl/registration.

U.S. Department of Transportation Notice

- For shipping purposes, Federal hazard regulations apply to any SR2000 unit in transit in the U.S.A.
- The SR2000 is covered by 49 CFR Section 173.168, Chemical Oxygen Generators.
- The SR2000 is classified as UN 3356, oxygen generator, chemical, Class 5.1 PG II.
- Classify SR2000 shipments as UN 3085, oxidizing solid, corrosive, n.o.s. (Potassium superoxide, potassium hydroxide) Class 5.1. Subrisk 8, PG 1.
- Ship undamaged and unopened SR2000 units in their original packaging.
- Before shipping damaged or opened SR2000 units:
 - Activate each unit by opening the case and pulling the starter tag.
 - o Wait at least one hour for the onboard chemical pack to complete its function and cool off.
 - o Seal each unit individually in an airtight plastic bag before placing in shipping container.

Federal Communication Commission (FCC) Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This

device may not cause harmful interference, and (2) this device must accept any interference received, including

interference that may cause undesired operation.

Changes or modifications not expressly approved by CSE Corporation could void the user's authority to operate

the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant

to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful

interference when the equipment is operated in a commercial environment. This equipment generates, uses,

and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual,

may cause harmful interference to radio communications. Operation of this equipment in a residential area is

likely to cause harmful interference in which case the user will be required to correct the interference at his own

expense.

Industry Canada (IC) Notice

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following

two conditions: (1) this device may not cause interference, and (2) this device must accept any interference,

including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de

licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de

brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est

susceptible d'en compromettre le fonctionnement.

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Approved March 5, 2015
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