
USER'S manual



ISO 9001
certified by:



Ci-30KS S-30 MP1

A CHEMICAL OXYGEN SELF-CONTAINED SELF-RESCUER FOR ESCAPE

DEZEGA®

LIFELONG SAFETY EXPERIENCE



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 **WARNING!**

Any use of the oxygen self-rescuer requires full understanding and strict observation of these instructions for use. The oxygen self-rescuer is only to be used for the purposes specified here.

 **WARNING!**

Original equipment manufacturer supplies «User's manual» in English or Ukrainian. For providing of «User's manual» in the official language of the country of destination, contact our local office, distributor or authorized representative.

INTENDED USE

«User's manual» is intended for study of device and requirements for everyday carrying, donning and operation of chemical oxygen self-contained self-rescuer Ci-30 KS type S-30 MP1 (hereinafter - Ci-30).

The Ci-30 is a personal respiratory protection device which uses a chemical (KO₂) to produce oxygen (within the self-rescuer) and is intended for use for escape in the event of exposure to an irrespirable atmosphere such as smoke, toxic gases or of oxygen deficiency.

Name of self-contained self-rescuer consists of:

«Ci»- which means the name of self-contained self-rescuer;

«30» – means 30 min of rated duration;

«K» – means that the device uses chemical to produce oxygen and absorb carbon dioxide (KO₂ device);

«S» – means that self-contained self-rescuer is designed for underground use.

The Ci-30 is designed and suitable for everyday carrying on the waist belt and for storage in rescue chambers or change-over stations that are placed on routes out of danger zone in mines, as well as in tunnels.

The Ci-30 is used for protection of respiratory system and eyes in case of underground workers escape from irrespirable environments due to fire, explosion, and sudden release of gas or coal dust or lacking of oxygen.

The Ci-30 may be used in other applications by agreement with manufacturer, where there is a risk of unsuitable for breathing environment.

It is prohibited to use a Ci-30 during any physical performance, for example for underground firefighting.

The Ci-30 is ready for use device in mines of different hazard category: prone to sudden outbursts of coal and gases, mines with aggressive production environment with acid mine drainage and water with high concentration of corrosion-active components: chloride and sulfate ions.

The Ci-30 has no restrictions for use and exploitation due to any medical or physiological conditions of user.

The Ci-30 is an anti-static disposable closed-circuit breathing apparatus (self-rescuer) and satisfies all requirements of AS/NZS 1716:2012, MDG 3609. Registration number is "MDR 166177 BA-0".

SAFETY PRECAUTIONS

Protect from mechanical damages, which can break the casing and KO₂ cartridge.

Unseal only when it is intended to be used for self escape.

The Ci-30 should be kept away from machines or equipment to prevent accidental damage.

Keep unsealed self-rescuers away from liquid or solid combustible materials.

Do not expose to heat.

It is prohibited to sit on self-contained self-rescuer.

Open a Ci-30 only for proper use – donning and escape in case of emergency.

Damaged self-contained self-rescuers where oxygen-containing product has direct contact with ambient atmosphere shall be immediately withdrawn from service, delivered to the surface of mine and disposed in accordance with "Disposal".



DANGEROUS!

If self-rescuer is damaged, the oxygen – containing product can cause ignition of coal, wood or other flammable materials.

PRIOR TO USE – EXAMINE THE FOLLOWING

Before wearing of a Ci-30 check that:

- lid and casing are not damaged and have no cracks, holes or splits;
- coupling straps are undamaged;
- self-rescuer is sealed;
- belt loops are not damaged and fixed on the case;

WARNING!

If the self-rescuer does not satisfy any of these abovementioned criteria, it should be withdrawn, placed into an individual, tightly closed plastic bag and sent to an authorized service center.

- moisture indicator is blue and not damaged (if moisture has penetrated into the oxygen self-rescuer, the color of the moisture indicator changes to pink)¹.

Regular visual inspection of moisture indicator allows to control normal operating condition of SCSR without special equipment. Blue color of indicator is a sign of normal operating condition. Pink color does not indicate nonoperability of self-rescuer, but necessity to check it on leak testing machine (UPG).



ACCEPT

WITHDRAW

If moisture indicator change its color to pink and/or white, Ci-30 shall be checked using a leak testing machine (UPG) by positive pressure 5 kPa (500 mm w.c.). If pressure drop is less than 400 Pa (40 mm w.c.) within 15 sec, Ci-30 may be used up to 10 days.

After the expiry of 10 days, Ci-30 shall be withdrawn from the service.

If pressure drop is more than 400 Pa (40 mm w.c.) within 15 sec, then Ci-30 shall be immediately be withdrawn from the service.

Withdrawn self-rescuers shall be placed into the individual tightly closed plastic bag and sent to the authorized service center or representative for a decision about further using.

¹ Only for self-rescuers with moisture indicator

TECHNICAL DATA

Rated duration according to AS/NZS 1716:2012:

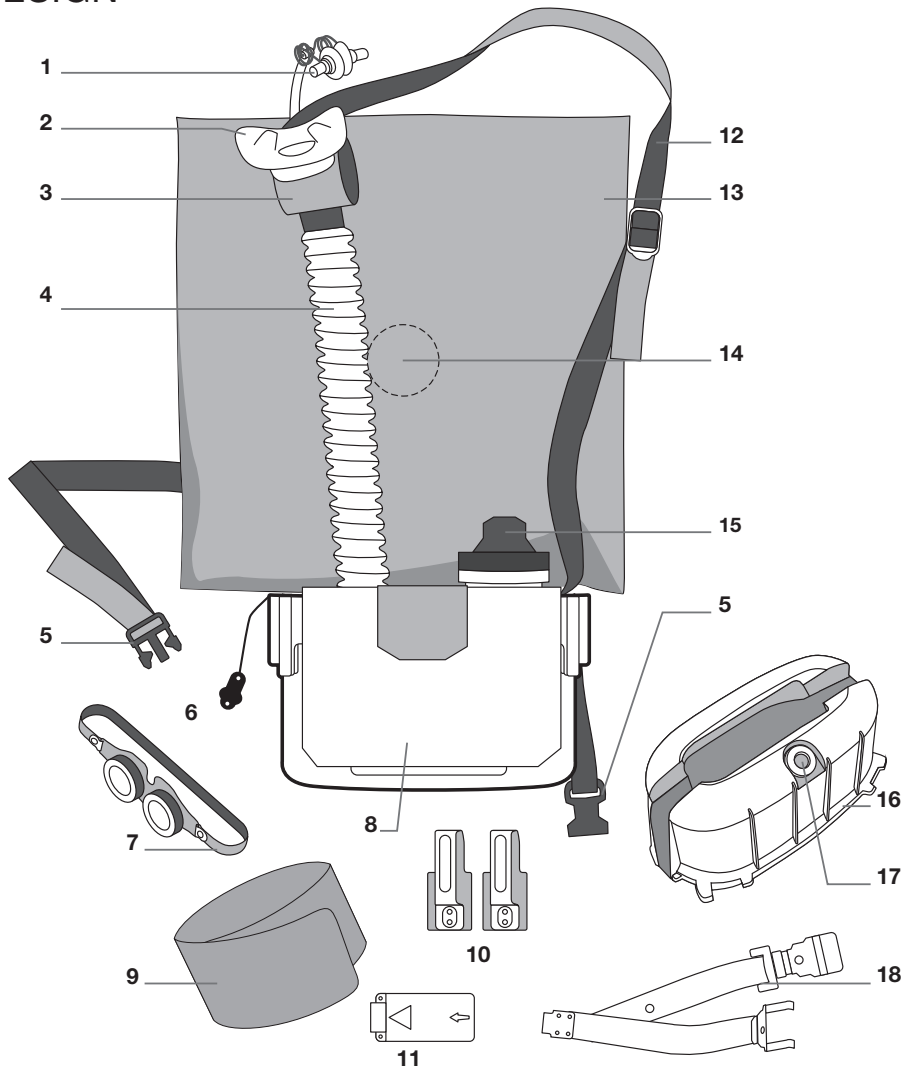
| | |
|--|---------------------------|
| - at 35 L/min (normal walking), min | 30 min |
| - at 10 L/min (sitting), min | 90 min |
| Breathing resistance (to inhalation or exhalation) during operation, max | 1,0 kPa |
| Temperature of the inhaled gas, max | 50 °C |
| Oxygen content in the inhaled gas, min ² | 21% |
| Carbon dioxide content in the inhaled gas, max | 3% |
| Volume of breathing bag | 6 liters |
| Overall dimensions: | 100 °C |
| - Height | 203±2 mm |
| - Length | 202±2 mm |
| - Width | 116±2 mm |
| Relative humidity | up to 100% |
| Ambient pressure, max | 133,3 kPa (1000 mm Hg) |
| Temperature for usage | -6 to 60° C |
| Weight | 2,5±0,1 kg |
| Shelf life for cache storage | 10 years |
| Service life ³ | 10 years |
| Service life (without restrictions) | 5 years |

2 Short-time decrease of oxygen volume fraction in the inhaled gas down to 19% is allowed during the first two minutes after a self-rescuer activation

3 Under the following conditions:

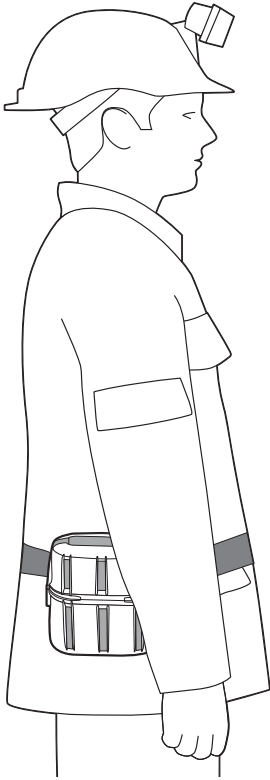
- single shift per day operations in the normal wear and tear conditions
- performing of periodical inspection

DESIGN



Ci-30 consists of the following elements:

- | | | |
|--------------------|-----------------|------------------------|
| 1. Nose clip | 7. Goggles | 13. Breathing bag |
| 2. Mouthpiece | 8. Heat shield | 14. Relief valve |
| 3. Heat exchanger | 9. Rim | 15. Starter |
| 4. Breathing hose | 10. Belt loops | 16. Lid |
| 5. Chest strap | 11. Cover plate | 17. Moisture indicator |
| 6. Mouthpiece plug | 12. Neck strap | 18. Coupling strap |



CARRYING METHOD

Every day – on the waist belt (see picture below).

After donning – on the neck strap in front.

It is recommended to use a specially designed waist belt DEZEGA-Belt.



WARNING!

If self-rescuer is damaged the oxygen-containing product can cause ignition of coal, wood or other flammable materials.

OPERATING PRINCIPLE

The starter 15 is activated when the Ci-30 is opened by removal of the lid 16. The starter releases oxygen, heat and moisture. Oxygen fills breathing bag 6 and provides the user oxygen to breathe before heat and moisture from exhaled breath activates the oxygen-producing cartridge containing KO_2 .

The mouthpiece plug 6 is released from the mouthpiece when breathing hose 4 and breathing bag 13 are pulled out.

The Ci-30 has a pendulum scheme of airflow. Breathing air passes through the mouthpiece 2 and heat exchanger 3 via the breathing hose from the KO_2 cartridge to the breathing bag and backwards. Chemical product (KO_2) in the cartridge absorbs carbon dioxide (CO_2) and moisture from the exhaled breath and emits oxygen. Surplus breathing gas is expelled via relief valve 14.

The absorption of carbon dioxide and production of oxygen by the KO_2 is exothermic (producing heat). This temperature increase will be noticed by the wearer on

the casings and in the inhaled breath. Warming is a sign of the normal operation of the self-rescuer, and should be expected.

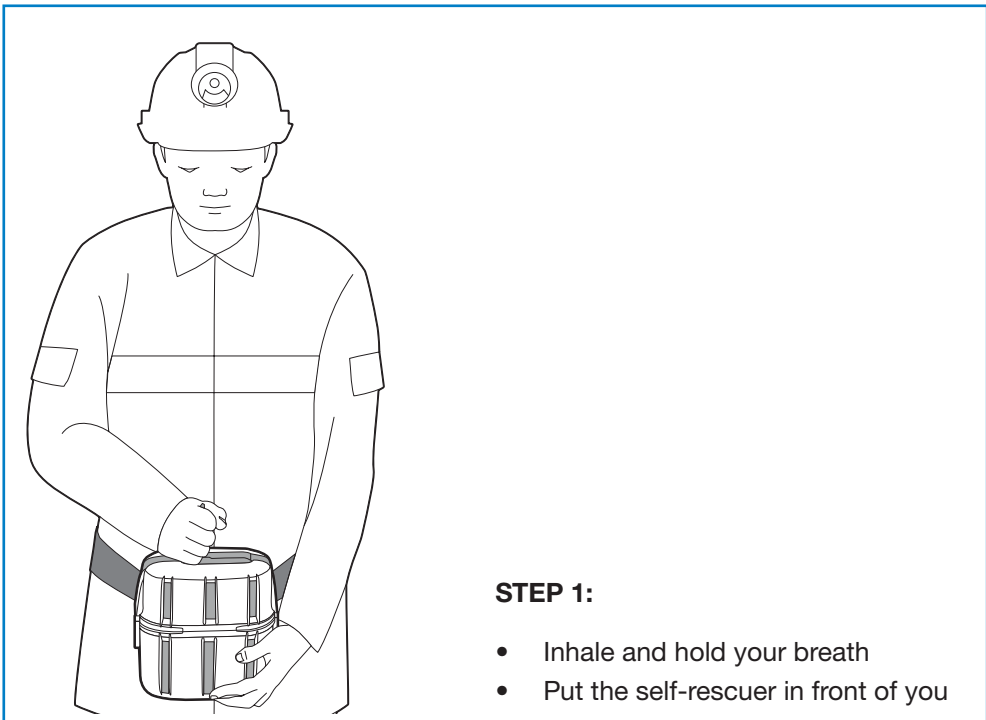
A moisture indicator 17 is located on the lid of the self-rescuer. If the indicator has changed color from blue to pink, the case seal has been damaged and the self-rescuer should be withdrawn from service and not used⁴.

WARNING!

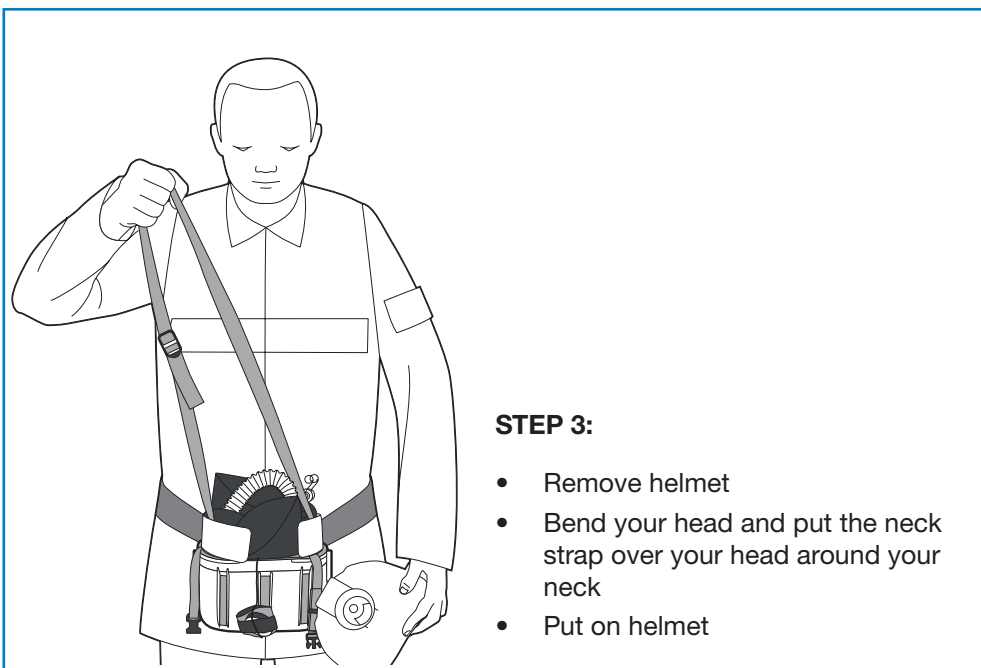
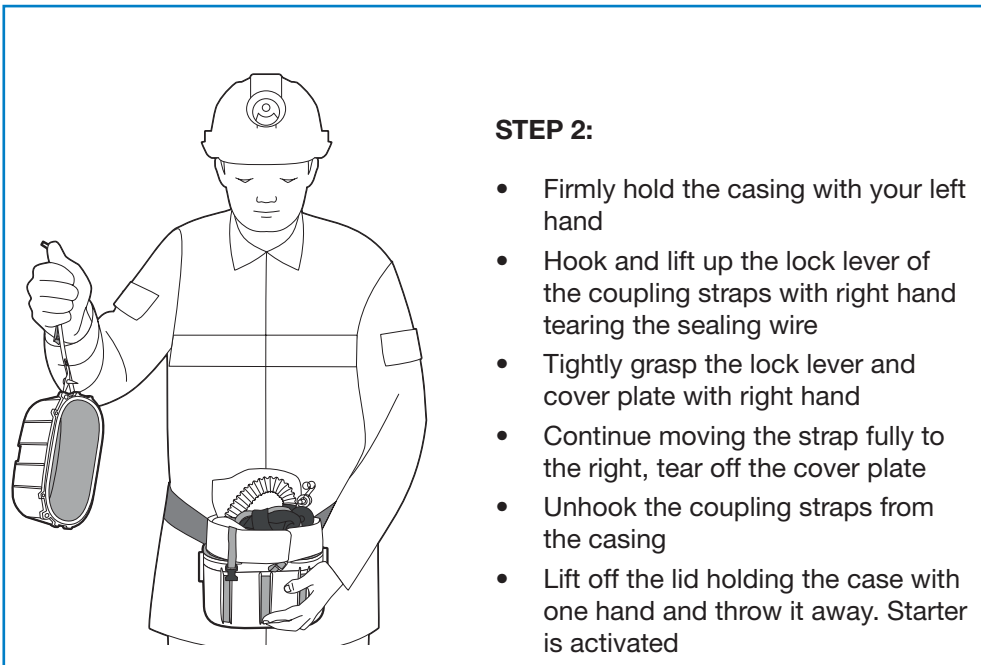
The self-rescuer is for single use only.

DONNING PROCEDURE

Immediately don the self-rescuer in case of emergency (sudden release of gas, fire, explosion). Donning procedure:



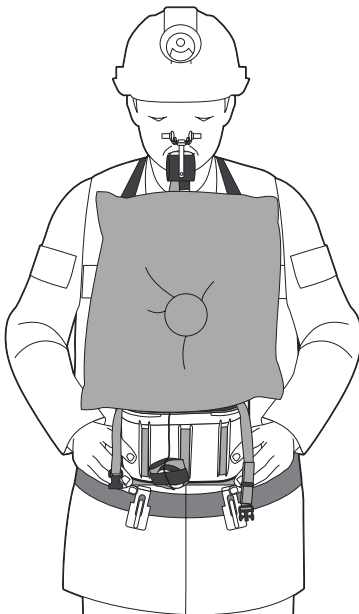
⁴ Only for self-rescuers with moisture indicator



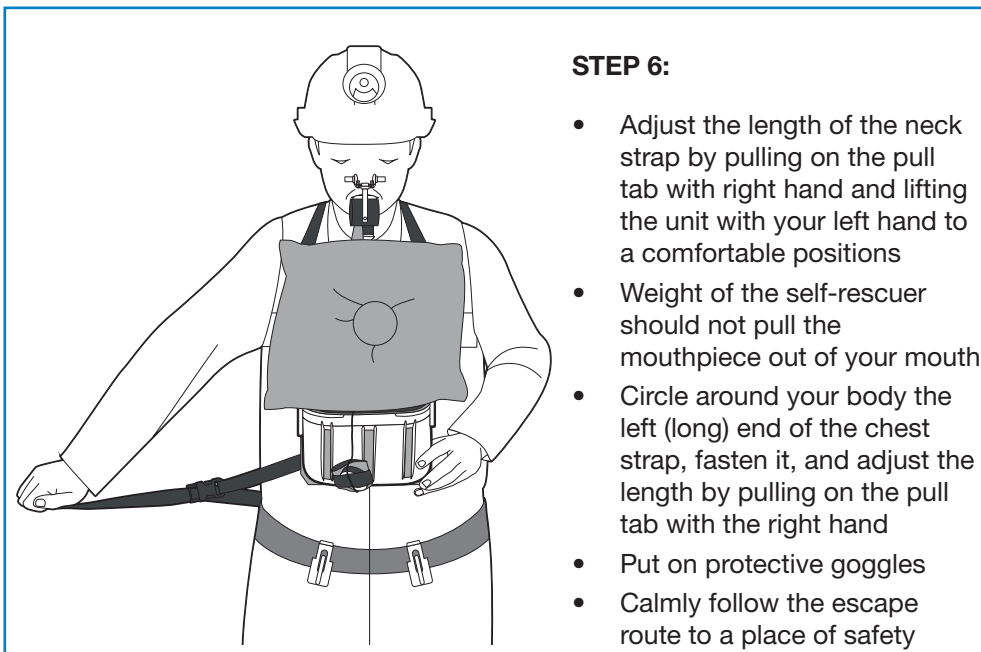
**STEP 4:**

- Pull up the heat exchanger (while doing this, the plug releases from the mouthpiece)
- Straighten the breathing bag and the breathing hose
- Place mouthpiece into your mouth, between your lips and gums
- Firmly grasp the mouthpiece with your lips
- Spread nose clip apart and place clips over both nostrils
- Continue to breathe calmly through your mouth

You are already isolated from the surrounding atmosphere

**STEP 5:**

- Slightly raising the casing with both hands, disconnect loops from the grooves of the casing with your thumbs
- Spread the heat shield between the casing and your body

**STEP 6:**

- Adjust the length of the neck strap by pulling on the pull tab with right hand and lifting the unit with your left hand to a comfortable positions
- Weight of the self-rescuer should not pull the mouthpiece out of your mouth
- Circle around your body the left (long) end of the chest strap, fasten it, and adjust the length by pulling on the pull tab with the right hand
- Put on protective goggles
- Calmly follow the escape route to a place of safety

The total time of donning procedure should take no more than 15 seconds.

WARNING!

If the breathing bag is partially filled, breathe out powerfully several times until breathing bag has been filled.

After donning the self-rescuer:

- Leave the emergency site walking steadily. Running and fast walking are not recommended. Hasty breathing consumes more oxygen.
- Walk slower or stop in case of any breathing difficulties recover normal breathing rhythm and then continue walking.

WARNING!

Do not remove mouthpiece or nose clip, do not try to talk through it, and do not inhale the surrounding air before arriving at a known fresh air location.

Gradual heating of self-rescuer casing up to:

- 60 °C on the wearer's side of heat shield;
- 100 °C on apparatus surface;

is expected and is a sign of normal operation. Normal cotton clothing should provide an acceptable level of comfort from the increases in temperature of the case.

**WARNING!**

Using of heat shield is a must for your safety to avoid overheat.

CHANGE-OVER PROCEDURE

If it is necessary to don a new oxygen self-rescuer during escape, proceed as follows:

- Take a new self-rescuer, sit or kneel down.
- Still breathe from the old oxygen self-rescuer and hold it on your lap.
- Take off the helmet and unfasten neck and chest straps.
- Open a new self-rescuer according to “Donning procedure”, step 2.
- Take a deep breath from the old self-rescuer, remove the old mouthpiece and nose clip, quickly don the new self-rescuer, adjust the neck strap, fasten the chest strap and continue going to a place of safety.

TRAINING

**WARNING!**

Training is obligatory. Only a trained user can use Ci-30.

The user’s training program should include knowledge of this manual and practical exercises for donning apparatus, belts adjustment and walking with the apparatus.

A Training self-rescuer is available and should be used for regular trainings and refresher training.

Attainments of breathing with SCSR need regular training and consolidation of knowledge. Insufficient training may cause panic in case of emergency and inhalation of dangerous gases from irrespirable atmosphere. To avoid panic reaction we strongly recommend performing training using Training device with disposable breathing training kits for 15 or 30 min of duration. Training device with training regenerative cartridge completely imitate donning and breathing conditions of real SCSR.

INSPECTIONS AND SERVICE

No special technical servicing is required for storage and operation of Ci-30 (see table below).

Self-rescuers permanently used underground must be checked every 3 months using leak tester «UPG» achieving 5 kPa (50 mBar) external pneumatic pressure⁵.

Self-rescuers stored underground must pass the leak test every 12 months⁵.

Self-rescuer is airtight and suitable for use when the pressure fall in the chamber of the leak tester is less than 400 Pa (4 mBar) during 15 seconds.

| Check | Before carrying | After 3 mos. | After 12 mos. | After 5 years | After 10 years |
|---|-----------------|-----------------|-----------------|---------------|----------------|
| Condition of lid, casing, coupling straps, seal ¹⁾ | X | | | | |
| Color of indicator ¹⁾ | X | | | | |
| Seal check | | X ²⁾ | X ³⁾ | | |
| End of service life | | | | X | X |
| End of shelf life | | | | | X |

1) See section «Before you start»

2) For self-rescuers without moisture indicator carried daily

3) For cached self-rescuers without moisture indicator

A register should be maintained for each self-rescuer detailing servicing, dates tested and results obtained for the entire shelf life of each self-rescuer.

DISPOSAL

Used self-rescuers, expired, as well as self-rescuers unfit for further use, must be disposed of.

Disposal process is following:

- Open self-rescuer.
- Manually actuate the starter.

⁵ Only for self-rescuers without moisture indicator.

- Disconnect hose and breathing bag.
- Remove the cartridge from the casing.
- Place cartridge in clean water with tubes up and keep it there, shaking slightly until bubbles stop to appear.
- Neutralize the alkaline solution produced with 3% acid, for example, hydrochloric acid (HCl).
- Sort out all the details and components by type of material (metal, plastic, resin, etc.) and dispose of in accordance with the regulations applicable in your territory.
- Record the disposal in the self-rescuer register.

Use safety glasses and gloves during disposal procedure.



WARNING!

Oxygen self-rescuers are subject to obligatory disposal and they should not be thrown away or left underground.

MARKING AND SEALING

The self-rescuer is marked on the coupling straps, casing, breathing bag and breathing hoses with the following information:

Coupling straps:

- Inscription «Made in Ukraine» or «Made in Turkey»;
- Product index «Ci-30 KS»;
- Article «S-30MP1-ISG», «-ISN», «-NSN» or «-NSG»;
- Serial number in the format of SSSSPMMYY where:
 - SSSSS – sequential serial number;
 - P – letter of producer: T – Turkey, U – Ukraine, R – Russia;
 - MMY – production date in the format of month-year.
- Trade mark;
- Number of standard «AS/NZS 1716:2012» and Registration number «MDR 166177 BA-0» ;

- Rated working duration «30 min».

Breathing bag: serial number, month and year of production.

Casing: «ANTISTATIK» sign, «>PA6<» inscription, casing month and year of production.

Lid: product index «Ci-30 KS».

Pictograms: donning instruction.

Pacage marking includes:

– Handling signs «Handle with care, fragile», «This side up», «Protect from heat», «Keep dry», warning sign «Do not throw».

– Main, additional and informational inscriptions.

Each Ci-30 is sealed by the manufacturer or an authorized service center. The seal contains the trademark and should be kept intact during entire shelf life of self-rescuer. The seal can be removed only while donning the self-rescuer.

STORAGE AND TRANSPORTATION

Self-rescuers can be stored indoors at ambient temperature from +5 °C to +40 °C and up to 100% relative humidity.

Protect self-rescuers from direct sunlight exposure and keep at least 1 m away from heat sources.

Self-rescuers should be protected by transporting them in enclosed and dry vehicles of all types at an ambient temperature between –40 °C to +50 °C and up to 100% relative humidity.

WARNING!

In case of transportation by air a freight compartment of the aircraft should be airtight and heated.

Transporting of SCSR is performed according to rules of transportation, applied to the current type of transport.



DANGEROUS!

Oxygen self-rescuer Ci-30 must be transported, stored and used only according to this manual. Improper use of self-rescuer can lead to a serious injury or death.

Any violations of this manual can cause failures in operation of SCSR, which can lead to a serious injury or cause death.

WARRANTY

Original equipment manufacturer warranties appropriates performance characteristics of Ci-30 while meeting of transportation, using and storing rules indicated in this «User's manual».

Total warranty period of all joints of SCSR and its working parameters is 12 months from date of commissioning, but no more than 18 months from date of production.

Additional warranty information is indicated in purchasing contract.

Warranty does not cover SCSR with damaged outer joints and case caused by violation of conditions indicated in this «User's manual».

Original equipment manufacturer and keeper of original design documentation reserves the right to change design applied to SCSR for the purpose of improvement of technical and service characteristics as well as service maintenance.

INFORMATION FOR ORDER

Ci-30 KS is supplied with six configurations:

- **Ci-30 KS S-30MP1-NSG:** without moisture indicator and with goggles;
- **Ci-30 KS S-30MP1-ISG:** with moisture indicator and goggles;
- **Ci-30 KS S-30MP1-NSN:** without moisture indicator and goggles;
- **Ci-30 KS S-30MP1-ISN:** with moisture indicator and without goggles;
- **Ci-30 KS S-30MP1-ESG:** with electronic indicator and goggles;
- **Ci-30 KS S-30MP1-ESN:** with electronic indicator and without goggles.

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