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# User's manual

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**DEZEGA**  
ROXY 30

A CHEMICAL OXYGEN SELF-CONTAINED SELF-RESCUER FOR ESCAPE

**DEZEGA®**

LIFELONG SAFETY EXPERIENCE

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## WARNING!

Any use of the chemical oxygen self-contained self-rescuer requires full understanding and strict observation of this «User's manual». Only in this case using ROXY 30 guarantees safety and protection of the respiratory system.

The chemical oxygen self-contained self-rescuer is only to be used for the purposes specified here.



## WARNING!

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

## DESIGNATION

«User's manual» is intended for study of device and requirements for everyday carrying, donning and operation of chemical oxygen self-contained self-rescuer.

Self-contained self-rescuer (hereinafter – SCSR) ROXY 30 is a belt worn breathing apparatus to exit from the danger zone in the event exposure to an irrespirable atmosphere.

ROXY 30 satisfies all requirements of SANS 1737:2008.

Name of ROXY 30 consists of:

«ROXY» – means name of self-contained self-rescuer;

«30» – means rated duration when testing in accordance with SANS 1737:2008 at breathing rate 35 l/min.

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

ROXY 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.

ROXY 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 ROXY 30 during any physical performance, for example for underground firefighting.

SCSR is ready for use device in mines of different hazard categories: 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.

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

## SAFETY PRECAUTIONS

SCSR should be protected from mechanical damages, which can break the case, lid, seal, cartridge and other components.

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

Do not leave close to working machines or equipment. Do not expose to heat.

Open SCSR only for proper use – donning and escape in case of emergency.

Keep unsealed and used SCSR away from liquid or solid flammable materials.

Damaged SCSRs 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".

Self-rescuer should be protected from combustibles and other flammable materials. It is also not allowed to keep used SCSRs with the ones that are in storage.



### **DANGEROUS!**

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

## TECHNICAL DATA

Rated duration in accordance with SANS 1737:2008

- at 35 l/min (escaping from dangerous environment)	30 <sup>1</sup> min
- at 50 l/min (heavy physical activity)	18 min
Breathing resistance at 35 l/min, max	1,0 kPa
Breathing resistance at 50 l/min, max	1,5 kPa
Total breathing resistance at 35 l/min, max	1,6 kPa
Inhaled gas temperature, max	65 °C
Temperature on the surface of the case at 35 l/min, max	90 °C
Temperature on the surface of the case at 50 l/min, max	100 °C
Temperature on the surface of regenerative cartridge at 35 l/min, max	150 °C
Temperature on the surface of regenerative cartridge at 50 l/min, max	180 °C
Volume of oxygen in the inhaled gas, min	21%
Average volume of CO <sub>2</sub> in the inhaled gas	1,5%
Maximum content of CO <sub>2</sub> in the inhaled air	3%
Volume of breathing bag, no less than	5 l
Weight	2,0 kg
Dimensions:	
- Height	176 mm
- Length	182 mm
- Width	85 mm
Temperature for usage	-5 +60 °C
Relative humidity	up to 100%
Ambient pressure	up to 133,3 kPa
Service life	5 years <sup>2</sup>
Shelf life	6 years

1. Depending on respiration rate, physical and medical conditions of wearer rated duration may be increased.
2. In case of observing operating procedures of current User's manual

## PRIOR TO USE

ROXY 30 shall be checked prior to daily using:

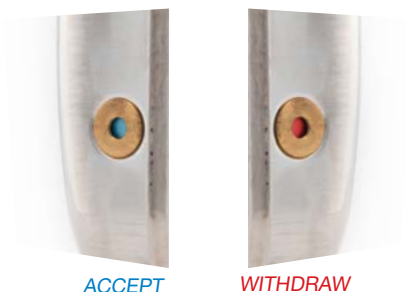
- sealing of lid and case is not damaged;
- cover and lock lever are not damaged;
- seal and safety pin are not damaged;
- lid and case are not damaged and have no cracks, holes or splits;
- belt loops are not damaged and fixed on the case;
- moisture indicator is blue and not damaged.



### WARNING!

**ROXY 30 shall be immediately withdrawn from the service if at least one of indicated requirements are not satisfied**

Regular visual inspection of moisture indicator allows to control normal operating condition of SCSR without special equipment. Blue colour of indicator is a sign of normal operating condition.



If moisture indicator change its colour to pink and/or white, ROXY 30 shall be checked using a leak testing machine (UPG or analogue) by positive pressure 50 kPa (500 mm w.c.). If pressure drop is less than 400 Pa (40 mm w.c.) within 15 sec, ROXY 30 may be used up to 10 days.

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

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

Withdrawn SCSRs 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.

## DESIGN



1. Upper lock lever
2. Lid
3. Back cover
4. Moisture indicator
5. Goggles
6. Regenerative cartridge
7. Breathing bag
8. Seal
9. Lower lock lever
10. Safety pin

11. Marking
12. Belt loops
13. Sealing
14. Heat shield
15. Breathing hose
16. Neck strap
17. Plug
18. Chest strap
19. Nose clip
20. Mouthpiece

## CARRYING METHOD

Everyday – on a waist belt.

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

## RECOMMENDATIONS FOR USING, RECORDKEEPING AND HANDLING

Prior to putting into service it is necessary to check ROXY 30 for leakage using UPG (or other, if specified) in accordance with «Prior to use».

Appropriate unique number for deployed SCSR and record this information according to template form (Annex A).

SCSR shall be used by each worker individually.

Reserved (not individual) SCSRs are recommended to record in the template form (Annex B).

Service life will be calculated from the date of manufacturing if there is no information about SCSR date of commissioning in accordance with «Annex A».

Take SCSR from lamp room and perform a visual check in accordance with “Prior to use” prior to descending into the mine.



### **WARNING!**

It is prohibited to store and leave ROXY 30 close to heat-radiating devices, wash by water and use as support arrangement and sitting. It is allowed to clean SCSR by wet cloth.

## OPERATING PRINCIPLE

To start the reaction of oxygen release and absorption of carbon dioxide it is necessary to do few exhalations through mouthpiece.

Exhaled air goes through the mouthpiece and heat and moisture exchanger via the breathing hose to the regenerative cartridge. In the regenerative cartridge, the exhaled gas is purified from carbon dioxide, enriched by oxygen and then goes into the breathing bag. Surplus breathing gas is removed from breathing bag via relief valve.

ROXY 30 has a pendulum scheme of airflow.

When user makes an inhalation, the breathing gas goes backwards: from breathing bag through the cartridge via breathing tube to the heat and moisture exchanger, mouthpiece and to the user's respiratory system.

The absorption of carbon dioxide and production of oxygen in regenerative cartridge is exothermic (producing heat). This temperature increase will be felt by the wearer on the casings and in the inhaled gas.



### WARNING!

Warming of case and inhaled gas indicate normal operation of SCSR.

## DONNING PROCEDURE



In case of emergency immediately don the SCSR.

To activate Roxy 30 do the following:

### Step 1:

- rotate the Roxy 30 on your waist belt to the front of your body;
- kneel down;



### Step 2:

- slightly rise SCSR with both hands, remove safety pin with middle fingers of both hands by moving toward you and break the seal;

### Step 3:

- hold the SCSR with one hand, detach the lock lever with another hand lifting it down and throw the lock lever away;
- lift off the lid and remove the self-rescuer from the case;
- turn the lid over, take the red side of neck strap in hand, detach the self-rescuer from the lid and throw the lid away;



### Step 4:

- remove helmet;
- put on the neck strap;





### Step 5:

- remove plug from the mouthpiece and straighten the breathing hose;
- handle the mouthpiece with both hands, move close to the mouth, exhale several times into SCSR's mouthpiece till breathing bag fully inflates and relief valve opens;
- put the mouthpiece into your mouth so that its plates are positioned between lips and gums, clench the tooth grips with your teeth;
- place the nose clip on your nostrils;

**You are already isolated from the surrounding atmosphere!**



### Step 6:

- put on the protective goggles;
- put on helmet;
- continue to breathe calmly through your mouth;
- adjust the neck strap avoiding stretching of breathing hose and feeling the weight of SCSR in the mouth;
- wrap the long side of the chest strap around your body and fasten it to the short side of the chest strap;
- adjust the length of the neck and chest straps if necessary, do not overly tighten;
- keep calm and escape from the hazardous area.

**WARNING!**

When adjusting the neck strap length hold the self-rescuer so that the mouthpiece is not pulled out from the mouth by the weight of the case.

**WARNING!**

The total time of ROXY 30 donning should take no more than 15 seconds.

## IMPORTANT ESCAPE RULES

- leave the emergency site walking evenly. Running and fast walking are not recommended because it may tear your breathe and need more amount of oxygen.
- walk slower or stop in case of any breathing difficulty, recover normal breathing rhythm and then continue walking.
- plan your way and chose shortest way to the whiff of fresh air or to the refuge or rescue chamber.
- keep mouthpiece tight between teeth and lips.
- inhaled breathing gas is warm and dry; it shows normal working condition of SCSR. Unusual taste of inhaled gas is safe and permissible.
- do not squeeze of breathing bag and protect from mechanical damages: it may cause oxygen loss.

**WARNING!**

**It is not allowed to take out mouthpiece or talk through it, remove nose clip or inhale the surrounding air before getting to the safe place.**

- in case of neediness to vomit or remove saliva from mouth cavity, then squeeze breathing tube when breathing bag is completely filled and remove mouthpiece from mouth. It is prohibited to vomit and splitting into mouthpiece and breathing tube. Next inhalation and exhalation perform via mouthpiece. Do not inhale gases from ambient irrespirable atmosphere.

Gradual heating of case sign about normal working condition of SCSR. : depends on respiratory load and allowable to user dressed in cotton garment in the end of rated duration.

**WARNING!**

**ROXY 30 is for single use only. Do not reuse it after leaving the dangerous zone and doffing.**

After reaching the place of safety, remove mouthpiece from the mouth and nose clip and put SCSR aside away from combustibles. Do not lump SCSRs together. After that, deliver SCSR to the lamp room for further disposal in accordance with «Disposal».

## TRAINING

**WARNING!**

**Training is obligatory. ROXY 30 can be used only by trained users and users who complete practical training of donning and using SCSR.**

Training should be performed in accordance with the safety regulations on mine and recommendations stated in this "User's manual".

It is recommended to perform first training under the supervision of qualified instructors in training room. Training program includes studying this "User's manual" as well as practical training of donning SCSR, using Training device with imitative cartridge.

**WARNING!**

**Total time of donning SCSR shall be less than 15 seconds.**

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 when recruiting and then once per 2 years. Training device with training regenerative cartridge completely imitates donning and breathing conditions of real SCSR: increase of temperature of inhaled gas, breathing resistance, increase of O<sub>2</sub> and CO<sub>2</sub> concentrations. Practical training can be held in classroom, smoke gallery, training gallery or mine.

## SERVICE AND MAINTENANCE INSPECTION

No special technical service is required for storage and operation of Roxy 30.

Maintenance inspection consists of:

- daily controls;
- periodical controls with participation of executives from ventilation and mine occupational safety departments.

Daily control is a visual inspection in accordance with "Prior to use" and visual inspection at the end of shift.

Daily control at the end of shift include:

- cleaning of SCSR from dust and dirt with the use of wet cloth;
- visual inspection of moisture indicator;
- continuity of case and lid, as well as continuity of all external components and details.

Periodical control of deployed SCSR should be performed once per 3 (three) months, for SCSR cashed underground – once per 6 (six) months.

Periodic control includes:

- visual inspection of case and lid and continuity of all external details and components.
- for SCSR with moisture indicator – visual check of indicator's colour. Normal operation colour is blue. SCSR is not leaktight if indicator changes colour to pink and/or white.
- leak test using leak testing machine UPG with positive pressure 5 kPa (500 mm w.c.). SCSR is leaktight and suitable for using if pressure drop in device chamber is lower than 400 Pa (40 mm w.c.) within 15 sec.



### WARNING!

**SCSRs, which didn't pass leak test, shall be immediately withdrawn from service, placed into individual tightly closed plastic bag and sent to the authorized service center or authorized representative for decision about further using.**

SCSRs that were withdrawn from service should be delivered to the service center in 10 days.

It is recommended to store and register date and results of periodical controls and routine repairs of each SCSR in lamp room within service life of unit.

### WARNING!

**Service life is guaranteed only in case of regular performing of daily and periodical maintenance inspection and service as well as service maintenance in authorized service center if necessary.**

Damaged SCSRs, unable to undergo service maintenance, must be disposed and utilized in accordance with «Utilization».

## DISPOSAL

### WARNING!

**ROXY 30 is a subject of obligatory disposal. Strongly forbidden to combust, throw away as a garbage or in municipal or industrial disposal sites and leave underground as well as perform disposing on own authority or commit to the unauthorized organizations.**

Damaged SCSR, where chemical oxygen ( $\text{KO}_2$ ) has direct contact with ambient atmosphere, shall be immediately delivered to the mine's surface and neutralized disassembled: with dismounted case, lid, breathing bag and breathing tube. Disconnect cartridge from case and submerge it by branch tube upwards into pin or other tank with water for 5-10 cm lower of water level. After ending of quenching reaction (ending of oxygen bubbling) shake apparatus and submerge it in the water again, repeat it 3-4 times. Then, apparatus with regenerative cartridge and other elements shall be sent to authorized organization for disposal.

### WARNING!

**Neutralization of regenerative cartridge should be held according to rules of safety and with the use of personal protective equipment: protective rubber gloves and glasses, filtering respirator, rubber footwear and protective clothes.**

Neutralize formed alkaline solution with 3 % acid, for example, hydrochloric acid ( $\text{HCl}$ ) and drain remaining fluid into a special place of deposit.

If damaged SCSR, in which  $\text{KO}_2$  has direct contact with ambient atmosphere, is polluted with combustive and lubricating materials then quenching with water is not allowed. Polluted SCSR shall be sent for disposal immediately. When it is impossible to immediately send polluted SCSR for disposing then it should be organized safe storage of such apparatus outside the lamp room.

**Rejected SCSRs because of:**

- inability to undergo service maintenance,
- mechanical damages,
- destruction,
- unsealing,
- opening,
- exhausting,
- expired lifetime,
- using as intended,

shall be withdrawn from service and disposed.

Disposal should be performed in accordance with local legislation and recommendations indicated in this "User's manual". Organizations which perform disposal should have:

- formal license for disposal of SCSR and neutralizing of chemical oxygen (class of hazard 5.1);
- official authorization letter (certificate) from original equipment manufacturer with regulations and permit for utilization.

SCSR's, decommissioned for disposal shall be placed in special dry storing room and kept at least 1 m away from heating devices. Avoid contacts of decommissioned SCSR with water, oil, organic liquids and new SCSRs.

## MARKING AND SEALING

ROXY 30 is marked on the regenerative cartridge, case, breathing bag with the following information:

### Case:

- On external side:

- trademark – «DEZEGA» and
- product index «ROXY 30»;

- On wearer' side:

- trademark «DEZEGA»,
- product index «ROXY 30»,
- number of standard – SANS 1737:2008,
- rated duration – «30 min»,
- serial number in the format of SSSS P MM YYYY where:
- SSSS – sequential serial number;
- P – letter of producer: T – Turkey, U – Ukraine, R – Russia
- MM YYYY – production date in the format of month-year,
- inscription «Designed in RSA», which means place of design, and
- «Made in Turkey» – place of production.
- Picture of donning procedure.

- On lateral side of case:

- serial number in the format of SSSS P MM YYYY.

Regenerative cartridge – day, month and year of cartridge production;

Breathing bag – serial number in the format of XXXX month and year of production.

**Package marking include:**

- handling signs: «Handle with care, fragile»; «Protect from heat»; «Keep dry»; «This side up»; warning sign «Do not throw»;
- main, additional and informational inscriptions;
- marking with the name of SCSR «ROXY 30» as well as indication of hazardous cargo (5.1) are allowed.

ROXY 30 is sealed by the original equipment manufacturer or authorized service center. Seal contains trade mark. Seal should be kept intact during entire shelf life. The seal can be removed only while donning the self-rescue.

## RULES FOR STORAGE AND TRANSPORTATION

SCSR must be stored indoors at ambient temperature from +5 °C to +40 °C and up to 80% relative humidity (at temperature 25 °C).

Ambient air should not contain pollution of aggressive gases, which may occur corrosion of materials. Boxes with SCSR shall be protected from direct sunlight exposure and keep at least 1 m away from heating devices.

SCSR between shifts shall be stored in lamp room on shelves at ambient air from +5 °C to +40 °C and up to 100% relative humidity (at temperature 25 °C).

It is prohibited to throw on the floor SCSR and heap together.

It is prohibited to store suitable SCSR with used.

SCSR of collective storage shall be placed in sealed containers, located on exit routes in mines or in tunnels.

SCSR can be transported in the closed and dry compartments of any kind of transport at ambient temperature from –50 °C to +50 °C and up to 100% relative humidity (at temperature +25 °C) separately from flammable and aggressive materials.

**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!**

A self-contained self-rescuer ROXY 30 should be transported, stored and used only according to the rules, described in this «User's manual». 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 ROXY 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 (eighteen) 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.

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ANNEX A

Mine registration log book  
for self-contained self-rescuers

(Name)

Surname, Name	Employee Code Position Workshop	No of SCSR		Date		
		OEM's	Mine's	SCSR's manufacturing	Commission-ning	Decommis-sioning
						Shipment for disposal, Nº of act

Par 1. Personal SCSR

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Par 2. SCSRs in changeover stations

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Par 3. Reserved SCSR

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ANNEX B

Mine registration log book  
for reserved self-contained self-rescuers for mine  
\_\_\_\_\_ workers and outside organizations

Serial No of SCSR	Name, Surname	Employee Code Position Company (name)	Date	
			SCSR Using	SCSR Returns

