

User's manual

«1PVM KS»

Chemical oxygen
self-contained
self-rescuer

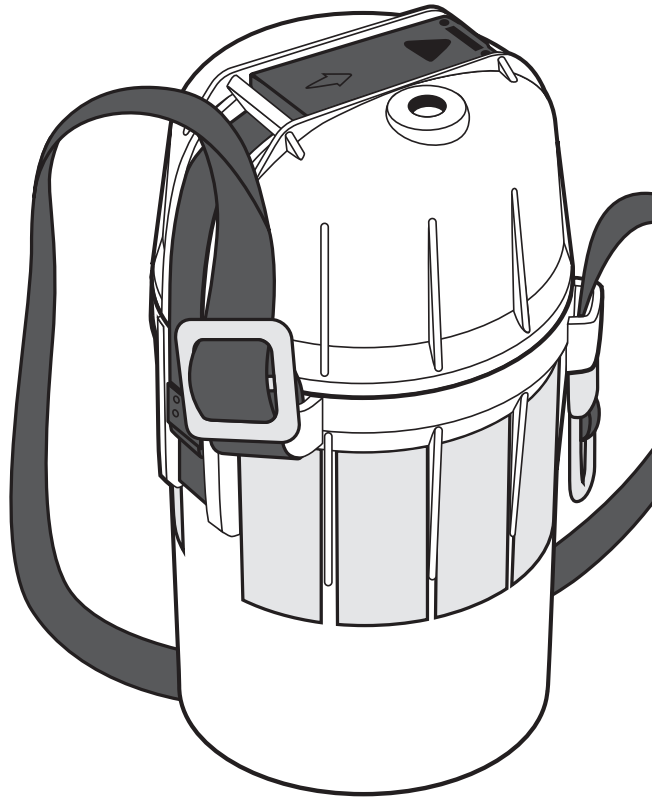
ISO 9001
certified by:



EN 13794:2002



0477



DEZEGA[®]

LIFELONG SAFETY EXPERIENCE

CONTENTS

DESIGNATION	3
SAFETY PRECAUTIONS	4
TECHNICAL DATA	5
PRIOR TO USE	6
DESIGN	7
CARRYING METHOD.....	8
RECOMMENDATIONS FOR USING, RECORDKIPING AND HANDLING.....	8
OPERATION PRINCIPLE	9
DONNING PROCEDURE	10
IMPORTANT ESCAPE RULLES AFTER DONNING THE SCSR	15
CHANGEOVER PROCEDURE	16
TRAINING.....	17
SERVICE AND MAINTENANCE INSPECTION.....	18
DISPOSAL.....	19
MARKING AND SEALING.....	20
RULES FOR STORAGE AND TRANSPORTATION	21
WARRANTY.....	22
INFORMATION FOR ORDER.....	22
ANNEX A.....	23
ANNEX B	24

 **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 1PVM KS guarantees safety and protection of 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 Ukraine. For providing of User`s manual in the official language of the country of destination. Please 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) 1PVM KS is an anti-static personal respiratory protection chemical oxygen breathing apparatus. 1PVM KS satisfies all requirements of EN13794:2002.

Name of self-contained self-rescuer consists of:

"1PVM" – which means name of self-contained self-rescuer;

"K" – means that device use chemical oxygen to produce oxygen and absorb carbon dioxide (KO₂ device);

"S" – means that self-contained self-rescuer designed for underground use.

Notified body involved in the design stage of PPE – Eurofins Product Testing Italy S.r.l., Via Courgne, n.21, 10156 TORINO, ITALY (No. 0477)

1PVM KS is designed and suitable for everyday carrying and for storage in rescue chambers or changeover stations in mines, as well as in tunnels.

1PVM KS is used for protection of respiratory system in case of underground workers escape from environments containing smoke, hazardous gases and lacking of oxygen.

1PVM KS may be used in other applications by agreement with manufacturer where there is risk of unsuitable for breathing environment due to fire, explosion and sudden release of gas or coal dust.

It is prohibited to use 1PVM KS during any physical performance, for example for underground firefighting.

SCSR may be used and stored in mines of different hazard category: prone to sudden outburst of coal and gases, mines with aggressive production environment with acid mine drainage and water with high concentration of corrosion-active components.

SCSR 1PVM KS is ready for use device, anti-static and sturdiness to open flame.

1PVM KS has no restrictions for use due to any physiological conditions of user.

SAFETY PRECAUTIONS

Protect from mechanical damages, which can break the case, lid, cartridge and other components.

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

Open SCSR only 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 "DISPOSING".



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 EN13794:2005 - at 35 l/min (escaping from dangerous environmental) - at 10 l/min (waiting for help)	60 min 180 min
Breathing resistance (to inhalation or exhalation) during operation, max	0,75 kPa
Inhaled gas temperature, max	50 °C
Volume of oxygen in the inhaled gas,	21%¹
Average volume of carbon dioxide in the inhaled gas throughout the rated working duration	1,5%²
Volume of breathing bag	6 L
Overall dimensions (without shoulder strap) - Diameter - Height	152 mm 262 mm
Weight	3,0 kg
Temperature for usage	From -6 °C to +60 °C
Relative humidity (at +35 °C)	Up to 100%
Ambient pressure, max	133,3 kPa
Shelf life	10 year
Service life (within shelf life)	5 year³

-
- 1 Short-time decrease of oxygen volume fraction in the inhaled gas down to 17% is allowed during the first two minutes after a self-rescuer activation
 - 2 Short-time increase of carbon dioxide volume fraction in the inhaled gas up to 3% is allowed during rated working duration
 - 3 Under the following conditions:
 - Performing of periodical inspection
 - Upon cashed storage

PRIOR TO USE

1PVM KS shall be checked prior to daily using:

- Sealing of lid and case is not damaged;
- Cover and lock lever is not damaged;
- Shoulder strap has no damages and is fixed by holder;
- Lid and case are not damaged and have no cracks, holes or splits;
- Coupling straps are not damaged;
- Moisture indicator (if installed) does not change colour from blue to pink or white.



WARNING!

1PVM KS shall be immediately withdrawn from the service if at least one of indicated requirements are not satisfied.

Regular visual inspection of moisture indicator (if installed) permits control of normal operating condition of SCSR without special equipment. Blue colour indicator's grains indicate normal operating condition of SCSR.

If grains in moisture indicator change colour to pink and/or white than 1PVM KS shall be checked using leak testing machine (PGS) by positive pressure 5 kPa (500 mm w.c.). If pressure drop is less than 400 Pa (40 mm w.c.) within 15 sec, than 1PVM KS may be used up to 10 days.

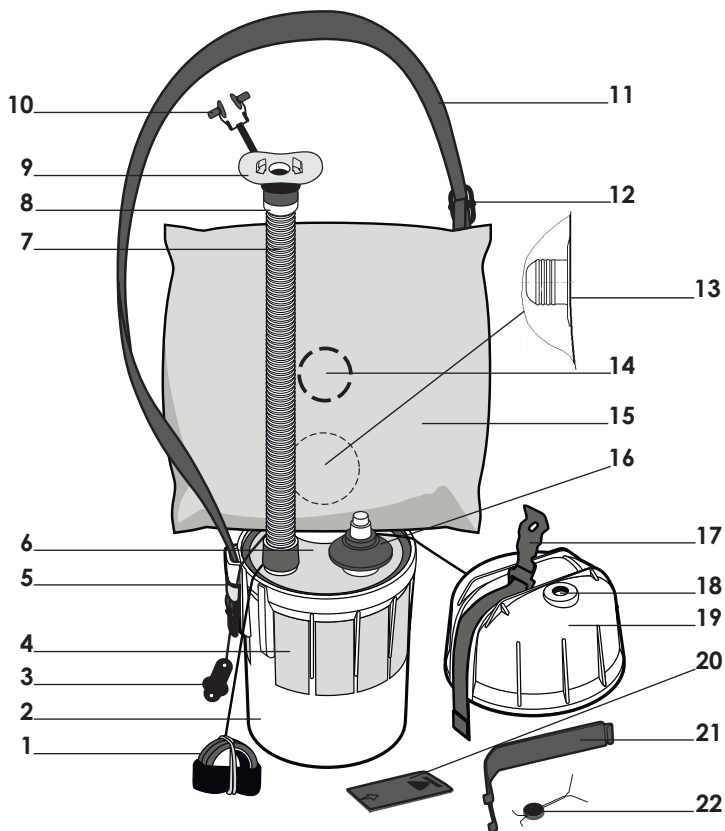
After 10 days SCSR shall be withdrawn from the service.

If pressure drop is more than 400 Pa (40 mm w.c.) within 15 sec, than 1PVM KS shall be immediately be withdrawn from the service.

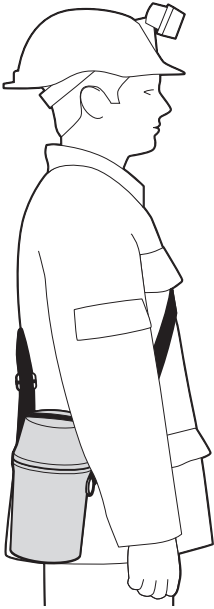
Withdrawn SCSRs shall be placed into the individual tightly closed plastic bag and sent to the authorized service center or representative for decision about further using.

DESIGN

1PVM KS consists:



- | | |
|--------------------------------|---------------------------------|
| 1. Goggles | 11. Shoulder strap |
| 2. Case | 12. Buckle |
| 3. Plug | 13. Bung |
| 4. Pictograms | 14. Relief valve |
| 5. Holder | 15. Breathing bag |
| 6. Regenerative cartridge | 16. Starter |
| 7. Breathing tube | 17. Lock lever |
| 8. Heat and moisture exchanger | 18. Moisture indicator (option) |
| 9. Mouthpiece | 19. Lid |
| 10. Nose clip | 20. Cover |
| | 21. Coupling strap |
| | 22. Seal |



CARRYING METHOD

Everyday – on a shoulder or in a vehicle.

Adjust shoulder strap prior to everyday carrying. Strap adjusting should be performed by buckle.



WARNING!

It is prohibited to adjust shoulder strap using holder for everyday carrying.

RECOMMENDATIONS FOR USING, RECORDKIPING AND HANDLING

Perform visual inspection and check for leakage 1PVM KS using PGS prior to putting into service.

Appropriate unique number for deployed SCSR and record this information into "Mine registration log book for self-contained self-rescuers" (Annex A).

SCSR may be used by each worker individual or by separate production sections.

Reserve (not individual) SCSR recommended to record in "Mine registration log book for reserved self-contained self-rescuers for mine workers and outside organizations" (Annex B).

Service life will be calculated from the date of manufacturing indicated on coupling strap if there is no information in "Mine registration log book for self-contained self-rescuers".

Take SCSR from lamp room and perform visual check in accordance with "PRIOR TO USE" prior to descending into the mine.

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

OPERATION PRINCIPLE

Starter is activated when 1PVM KS is opened and lid is thrown off. Starter emits oxygen, heat and moisture. Oxygen fills breathing bag and allows user to start breathing before reaction of oxygen-contained product begins. Heat and moisture start reaction in the Cartridge.

1PVM KS has a pendulum scheme of airflow. Exhaled air goes through the mouthpiece and heat and moisture exchanger via the breathing tube to the regenerative cartridge. In the regenerative cartridge the exhaled gas is purified from carbon dioxide, enriched by oxygen and then goes to the breathing bag. Surplus breathing gas is removed from breathing bag via relief valve.

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.

Absorption of carbon dioxide and emission of oxygen by the chemical oxygen creates heat emission that leads to the gradual warming of case and inhaled gas. Warming is a sign of normal operation of the SCSR.



WARNING!

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

DONNING PROCEDURE

In case of emergency (explosion, fire, gas blowout etc.) immediately don the SCSR.

To activate 1PVM KS do the following:



STEP 1

- Inhale and keep your breath.
- Put shoulder strap on the neck and place SCSR in front of you.



STEP 2

- Hook and turn up the lock lever of the coupling straps with one hand holding the case with another hand; tear the sealing wire and cover.

**STEP 3**

- Strong hold the lock lever in right hand, unlock the coupling straps and detach lock lever with coupling strap from the case;
- Pull the coupling strap with lid sideways up holding the case with one hand and lever it with another hand to activate starter; breathing bag begins to fill by oxygen;
- Throw lid and coupling strap away.

**STEP 4**

- Pull up heat and moisture exchanger by right hand and pull out breathing tube with mouthpiece and with breathing bag. Plug is released from mouthpiece automatically.
- Straighten the breathing bag and tube. A bung, which is located inside the breathing bag, is automatically removed from the branch pipe of the regenerative cartridge.

STEP 5

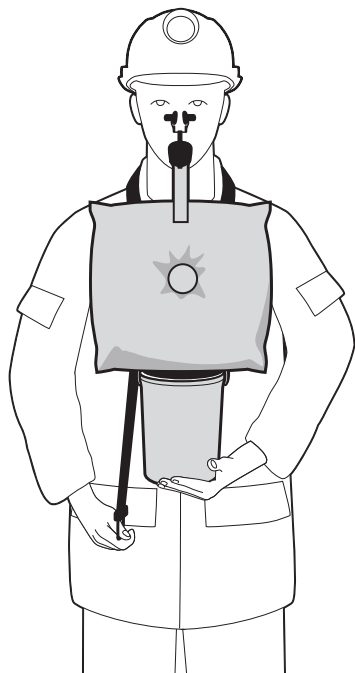
- Take mouthpiece into your mouth so that its plates are placed between your lips and gums; clench the tooth grips with your teeth.

 WARNING!

If by this point breathing bag has not started to fill by oxygen, then perform 2-3 deep inhales by nose and exhales by mouth to fill breathing bag and start reaction of oxygen enrichment in the regenerative cartridge.

- Spread nose clip apart and place clips over nose to close tight both nostrils.
- Continue to breathe through mouthpiece.

YOUR BREATHING SYSTEM IS ISOLATED FROM AMBIENT ATMOSPHERE!

**STEP 6**

- Adjust shoulder strap length:

To shorten the shoulder strap (raising the self-rescuer):

- Raise case of SCSR with left hand;
- Pull down the free end of shoulder strap to fill the SCSR weight on the neck and release it. The strap will be fixed.

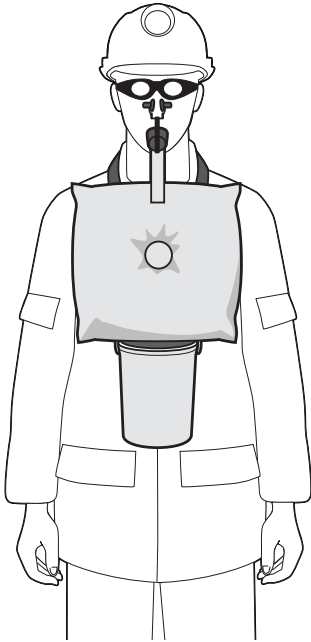
To lengthen the Shoulder Strap (lowering the self-rescuer):

- Hold the case with one hand;
- Pull the free end of the Shoulder Strap (holder is lowered);
- Fix holder in this position, release shoulder strap slightly rotating the case to the desired length;
- Release holder – the strap will be fixed.

Practice adjusting of shoulder strap with a training device.

 **WARNING!**

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

**STEP 7**

- Remove helmet and put on goggles
- Put on helmet and escape from dangerous atmosphere.

 **WARNING!**

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

IMPORTANT ESCAPE RULES AFTER DONNING THE SCSR

- Perform changeover to the reserve SCSR in changeover station if duration time of 1PVM KS is not enough for escape (see "CHANGEOVER PROCEDURE").
- 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.



DANGEROUS!

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. Temperature depends on respiratory load. Temperature will not be higher than 85 °C and allowable to user dressed in cotton garment in the end of rated duration.



WARNING!

1PVM KS is for single use only.

CHANGEOVER PROCEDURE

When appropriate to don reserve SCSR, do the following:

- Take reserve SCSR from changeover station, bend down or go on knees;
- Continue to breathe with donned SCSR;
- Remove helmet and shoulder strap from donned SCSR;
- Open reserve SCSR in accordance with procedure indicated in "DONNING PROCEDURE" Step 2 and 3;
- Take a deep inhale from donned SCSR, remove mouthpiece and nose clip. Quick don reserve SCSR in accordance with procedure indicated in "DONNING PROCEDURE" Step 4 to 6;
- Continue escape to safe area.

TRAINING

WARNING!

Training is obligatory. 1PVM KS 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 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 1PVM KS shall be less 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 with training regenerative cartridge for 15 or 50 min of duration. Training device with training regenerative cartridge completely imitates donning and breathing conditions of real SCSR.

SERVICE AND MAINTENANCE INSPECTION

No special technical service is required for storage and operation of 1PVM KS.

Maintenance inspection consists of:

- daily inspections;
- regular inspection with participation of executives from ventilation and mine occupational safety departments.

Daily inspection is a visual inspection in accordance with "PRIOR TO USE" and visual inspection at the end of shift.

Daily inspection at the end of shift include: cleaning of SCSR from coal dust, visual inspection of moisture indicator, continuity of case and lid, as well as continuity of all external components and details.

Regular inspection of deployed SCSR should be performed once per 3 (three) month, for SCSR cashed underground in refuge chambers or changeover stations – once per 6 (six) month.

Regular inspection includes:

- Visual inspection of case and lid. Inspection of availability 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 PGS 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.



DANGEROUS!

SCSRs which didn't pass leak test, shall be immediately be 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.

It is allowed to perform routine repairs of SCSR on the mine. Routine repair include: replacing of shoulder strap, replace of cover, replace of pictograms and reflecting labels.

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

Service life is guaranteed only in case of regular performing of maintenance inspection and service.

DISPOSAL



WARNING!

SCSR 1PVM KS is a subject of obligatory disposal. Strongly forbidden to combust, throw away and leave underground as well as perform disposing on own authority or commit to the unauthorized organizations.

Damaged SCSR where chemical oxygen has direct contact with ambient atmosphere shall be immediately delivered on the mine's surface and neutralized disassembled: with dismantled 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 sm 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 shall be sent to authorized organization for disposal. If damaged SCSR is polluted with combustive and lubricating materials then quenching by 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 SCSR (because of mechanical damages, unsealing and with expired lifetime) as well as donned SCSR 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;
- official authorization letter from original equipment manufacturer.

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 or organic liquids.

Storing room should be equipped with dry-powder fire extinguisher.

MARKING AND SEALING

1PVM KS is marked on the coupling straps, cartridge, case, breathing bag and hoses with the following information:

- Coupling Straps: inscription "Made in Ukraine" or "Made in Turkey", product index "1PVM KS", trade mark, "EN 13794:2002" – number of standard, "60 min" – nominal rated duration, "CE 0477" – EC-type certification (CE mark), serial number in the format SSSSPMMYY, where SSSSS – sequential serial number, P – letter of producer (T – Turkey, U – Ukraine, R – Russia), MM YY – production date in the format of month-year.
- Regenerative cartridge: day, month and year of cartridge production;
- Breathing bag: serial number, month and year of production;
- Breathing hose: month and year of production;
- Case: "ANTISTATIK" sign, month and year of case production, donning instruction, reflective labels.

Package 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.

1PVM KS 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-rescuer.

RULES FOR STORAGE AND TRANSPORTATION

SCSR can 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 -40 °C to +50 °C and up to 100% relative humidity (at temperature +25 °C).



WARNING!

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

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



DANGEROUS!

A self-contained self-rescuer 1PVM KS should be transported, stored and used only according to this 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 1PVM KS while meeting of transportation, using and storing rules indicated in this "USER'S MANUAL".

Warranty period of SCSR is 18 (eighteen) months from date of commissioning.

Warranty does not cover SCSR with damaged case or lid caused by violation of conditions of storing, using or transportation.

Original equipment manufacturer and keeper of original design documentation reserves the right to change design or engineering solutions applied to the 1PVM KS for the purpose of improvement of technical and service characteristics.

INFORMATION FOR ORDER

1PVM KS is supplied with six configurations:

- 1PVM KS S-60MP1-NSG: without moisture indicator and with goggles;
- 1PVM KS S-60MP1-ISG: with moisture indicator and goggles;
- 1PVM KS S-60MP1-NSN: without moisture indicator and goggles;
- 1PVM KS S-60MP1-ISN: with moisture indicator and without goggles;
- 1PVM KS S-60MP1-ESG: with electronic indicator and goggles;
- 1PVM KS S-60MP1-ESN: with electronic indicator and without goggles.

DEZEGA SP GÜVENLİK ÜRÜNLERİ SANAYİ VE
TİCARET ANONİM ŞİRKETİ

EGE SERBEST BÖLGESİ ZAFER SB MAH. NİLÜFER
SK.NO:30 GAZİEMİR, İZMİR

Tel. +90 232 251 0 394

Fax. +90 0 232 252 0 394

www.dezega.com

red. 201608.1PVM.EN.EU

CK2.00.000 P31-01

ANNEX A

Mine registration log book
for self-contained self-rescuers

_____ (Name)

Surname Name	Employee Code Position Workshop	No of SCSR		Date	Shipment for disposal
		OEM's	Mine's		
		SCSR's man- ufacturing	Commission- ing	Decommis- sioning	
Par 1. Personal SCSR					
Par 2. SCSRs in refuge chamber and changeover station					
Par 3. Reserve SCSR					

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

