

**New**



## AirElite 4h

[ KO<sub>2</sub> closed-circuit breathing apparatus  
for long-duration missions ]

**MSA**

## High-tech by experience

### New generation closed-circuit breathing apparatus: AirElite 4h

More than 113 years of competence and experience in the field of breathing apparatus and Personal Protective Equipment made it possible for MSA to develop the AirElite 4h. Together with its integrated control monitor IC-Air it forms a unique closed-circuit breathing apparatus. Now all the benefits of the KO<sub>2</sub> principle are available for long service periods of up to four hours.

#### [ Developed for practical use ]

In cooperation with the accredited testing body EXAM, all needs of mine rescue teams and fire brigades were analysed and taken into consideration. The main applications are tunnels, large storage facilities and high-rise buildings.

#### [ Safety and comfort ]

The safety and comfort of the user were the primary factors in the development of the AirElite 4h. A slim design, with breathing tubes at the side and close to the body for maximum freedom of movement and extremely easy breathing, make the AirElite 4h an indispensable piece of operational equipment.

#### [ Proven over 40 years ]

MSA has successfully applied the principle of oxygen generation from potassium hyperoxide [KO<sub>2</sub>] for breathing-air regeneration for more than 40 years.

## Development target: practise

### Convincing innovative details

# AirElite 4h

#### [ Comfortable - in use ]

- Slim construction, low weight
- Lateral breathing tubes near to the body for easy donning and doffing
- Excellent breathing comfort: low breathing resistance, low inhalation temperature, dry breathing air
- AirElite 4h starts automatically when mask connector is disconnected from the shoulder strap
- Flexible service times dependent on breathing rate [breathing air capacity > 7,200 litres]
- Unit is absolutely safe even if electronics fail
- Simple, pressure-free breathing-air regeneration in one single step
- Breath-controlled air supply without valves and regulators

#### [ Simple – before and after use ]

- Effective air cooling without ice and without pre-use preparation
- No additional logistics required for oxygen cylinders or cooling
- Minimal inspection requirements: quick, easy maintenance and reconditioning
- Maintenance-free standby storage for up to 2 years in readiness [5 years if canisters are in factory sealed condition]

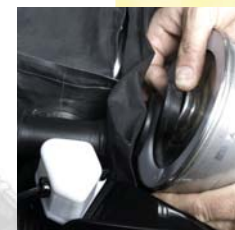
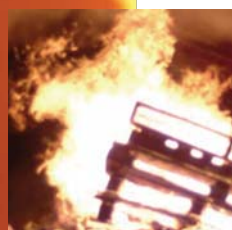
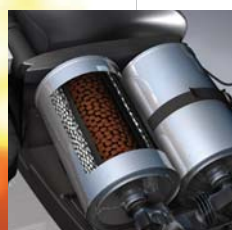
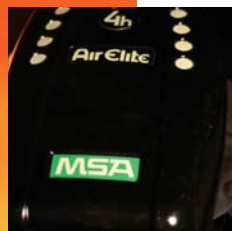
#### [ Economical - training ]

- Practically no costs for training with trainer conversion kit
- No breathing canister consumption

#### [ Intelligent – Integrated Control ]

- Integrated control and display unit
- AirElite 4h is controlled and monitored electronically
- Digital consumption indication
- Three warning stages at 50%, 20% and 5% remaining capacity [visual and acoustic warnings]
- Automatic motion sensor and alarm
- Manually activated emergency alarm

# IC-Air



# AirElite 4h & IC-Air

## Sophisticated design



# The KO<sub>2</sub> principle

## Proven technology – optimised function



Exhaled air, enriched with carbon dioxide and moisture, is directed into the exhalation bag by the valve control. A blower assists the air in its passage through the air distributor and into the two parallel-connected KO<sub>2</sub> canisters. Inside the KO<sub>2</sub> canisters, with their maintenance-free cooling, the exhaled air is liberated of carbon dioxide and humidity and enriched with fresh oxygen.



### [ Chemical process ]

KO<sub>2</sub> is a chemical which reacts spontaneously with the moisture and carbon dioxide [CO<sub>2</sub>] in the exhaled air. This reaction releases energy [heat] and oxygen [O<sub>2</sub>]. At any given time, considerably more oxygen is produced than is consumed. The person wearing the unit is provided with a reserve of oxygen which enables rapid changes from light to heavy work.



### [ Compressed oxygen & cooling logistics - not needed ]

The functioning principle of KO<sub>2</sub> makes bottled compressed oxygen and additional carbon dioxide absorbers obsolete. If nitrogen needs to be flushed, this occurs automatically by the oxygen surplus. The reaction heat is reliably absorbed by the air-cooled heat exchanger and the entirely maintenance-free water cooling effect of the canisters. Enriched with fresh oxygen and pleasantly cool, the breathing air then passes through the particle filter into the inhalation bag, and from there through the inhalation hose to the full face mask.

### [ AirElite 4h on KO<sub>2</sub> basis ]

- Completely breath-controlled [no mechanical control devices or valves]
- Plain construction
- Very safe function
- Immediately ready for use
- Suitable for long period storage without maintenance



# Safety matching economy

## Reduced long-term costs

The AirElite 4h also sets new standards from an economic point of view. Considerably less work is required for preparation and maintenance. And because training can be done at practically no cost, your long-term operating costs will also drop.

# Costs ↓



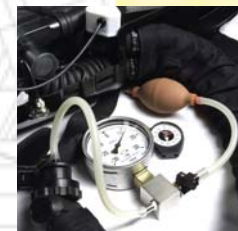
### [ Cost-free training ]

Using the TR conversion kit, a unit for real-life operation can be quickly and easily converted into a training unit. All of the training exercises can then be performed at practically no cost with reusable training canisters. The integrated P3 particle filter permits training under realistic conditions in mist and non-toxic smoke.



### [ Low cost of ownership ]

AirElite 4h does not require any additional logistics such as expensive testing equipment, oxygen transfer pumps or deep freezers. Compressed oxygen and ice candle logistics are not necessary; this reduces the investment and maintenance costs of the AirElite 4h to a minimum.



### [ Approved safety ]

At MSA, the safety of the user is the top priority, and they take it well beyond the limits of the legal requirements. AirElite 4h, for example, not only satisfies the approval requirements of the DIN 58652-2 and vfdb 0802 standards, but has also passed the tough "Flame Engulfment Test" for mining and fire brigades, with flying colours.

- DIN 58652-2
- vfdb 0802
- Flame Engulfment Test





**AirElite 4h-TR**



**Advantage AirElite**



**3S-R AirElite**

## Technical specifications

<b>Weight [without mask]:</b>	15 kg
<b>Dimensions [casing]:</b>	H x W x D = 600 x 360 x 190 mm
<b>Service time:</b>	dependent on consumption; with an average breathing rate of 30 l/min it is 4 hours; maximum 6 hours
<b>Storage at standby:</b>	-6 to +60 °C
<b>Operational temperature once in use:</b>	-15 to +60 °C
<b>Breathing resistance at 30 l/min:</b>	inhalation: -3 mbar exhalation: +5 mbar
<b>Inhaled air:</b>	temperature: 30 - 45°C humidity: 20 - 40% carbon dioxide: < 1,0 vol.% [mask not considered] oxygen: > 80 vol.%
<b>Maximum surface temperature:</b>	temperature class T4 [< 135°C]
<b>Electronic controls:</b>	<ul style="list-style-type: none"> <li>EX-protection EEX ia IIC T4/ATEX 94/9, Group 1, Cat. M1 Protection against dust and water: IP 67</li> <li>EMC in accordance with EN 61000-6-1 and EN 61000-6-2</li> </ul>
<b>Housing:</b>	polycarbonate, self-extinguishing, impact-resistant, with antistatic coating
<b>Breathing connection:</b>	full face mask 3S-R AirElite or Advantage AirElite with MSA push-to-plug connector
<b>Approvals:</b>	<ul style="list-style-type: none"> <li>EXAM in accordance with DIN 58652-2, Class 240S for work and rescue</li> <li>vfdb 0802</li> <li>ATEX 94/9 EC</li> </ul>

## Ordering information

10065152	AirElite 4h [less chemical oxygen canister kit and full face mask]
10065373	AirElite 4h chemical canister kit
10065153	3S-R AirElite full face mask
10065154	Advantage AirElite full face mask
10065375	AirElite 4h-TR training conversion kit

### MSA Europe Regional Head Offices [www.msa-europe.com]

#### Northern Europe

MSA Nederland B.V.  
Kernweg 20, NL-1627 LH Hoorn  
Phone: +31 [229] 25 03 03  
Fax: +31 [229] 21 13 40  
E-Mail: info@msaned.nl

#### Central Europe

MSA AUER GmbH  
Thiemannstrasse 1, D-12059 Berlin  
Phone: +49 [30] 68 86-555  
Fax: +49 [30] 68 86-15 17  
E-Mail: info@auer.de

#### Southern Europe

MSA Italiana S.p.A.  
Via Po 13/17 - I-20089 Rozzano [MI]  
Phone: +39 [02] 89 217-1  
Fax: +39 [02] 8 25 92 28  
E-Mail: info-italy@msa-europe.com

#### Eastern Europe

MSA AUER GmbH  
Thiemannstrasse 1, D-12059 Berlin  
Phone: +49 [30] 68 86-25 99  
Fax: +49 [30] 68 86-15 17  
E-Mail: mee@auer.de

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