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OWNER'S MANUAL

BLAST HELMET

APOLLO 100 CE

Supplied air respirator with continuous air flow Cat. III Equipment class 4 B

in acc. with DIN EN 14594:2018

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1 Scope of Manual

This manual covers the startup, operation, maintenance, replacement of parts and measures that ensure the safe operation of the Apollo 100 CE blast helmet.

Read the entire manual before startup or operation of the equipment.

The following additional components may be used in conjunction with the Apollo 100 CE blast helmet:

Article no.	Description	Remarks	
03580 D or 03527 D	CPF-20 or CPF-80 air filter	Installation between air supply and air supply line	
23825D	Clem Cool air conditioner	In place of the pressure regulation valve to cool the air	
044111	Climate control	In place of the pressure regulation valve to heat or cool the air as required	
These additional components are installed between the air supply and the air supply line.			
100577	Leather cape for Apollo 100	In place of the nylon cape (e.g. if a lot of blast media rebounds)	
22892D	CMS-2 carbon monoxide alarm	Carbon monoxide monitor - located outside the helmet	
29766D	CMS-4 carbon monoxide alarm	Carbon monoxide monitor - integrated in the helmet	

2 Application and Limitations

2.1 General description

The Apollo 100 CE blast helmet was developed especially for use in blasting operations and is approved in accordance with DIN EN 14594:2018 (and MSHA-NIOSH).

2.2 Restrictions and information in acc. with DIN EN 14594:2018

- a) The helmet enables the wearer to be supplied with breathable air, which must comply with EN 12021. The air is fed at a continuous flow rate to a mask via a breathing line. The equipment has an adjustable air flow valve that is worn by the operator. An air supply line links the equipment wearer with the air supply.
- b) Excess and exhaled air is released to the ambient atmosphere.

The following temperatures are prescribed for:

Storage:	0°C to +30°C
Operation:	-6°C to +40°C
Transport and handling:	-20°C to +50°C

- c) The length of the line between the filter and the control valve on the helmet must not exceed 40 m. We sell the line in pre-cut lengths of 5, 10, 20 and 40 m. A maximum of three lines can be connected.
- d) The supplied air must have a pressure between 5 and 8 bar. This pressure can be ensured by using our CPF 20 air filter with integrated pressure regulator.
- e) The pressure in the air supply line must not exceed 8 bar.
- f) To ensure that the operator is supplied with sufficient oxygen, the air flow should be between 160 l/min and 200 l/min. The air indicator will be activated by the minimum amount, i.e. the flag will be retracted.

g) <u>Warning</u>: The helmet is intended for use in an atmosphere that does not represent an imminent danger to human life or health and contains at least 19.5 % by volume oxygen. The operator should be able to escape from this atmosphere without needing to use the helmet.

The Apollo 100CE blast helmet will not provide adequate protection in certain highly toxic atmospheres caused by e.g. lead-contaminated dust that results from removing lead-containing paints or other paints, asbestos, heavy metals etc. In such cases, there may be a risk to human life and health.

Lead poisoning may cause death. The maximum workplace concentration has been defined as 0.1 mg/m³ of air (TRGS 900). For this reason, the blasting contractor must always determine which type of paint is to be removed and, if necessary, ensure that operators wear a blast hood or helmet that is approved for use with these substances or an additional respirator. In accordance with DGUV Regulation 112-190, Class 4B blast protection equipment can be used at up to 500 times the threshold value.

- h) <u>Warning</u>: During a period of very high use, peak respiration may produce negative pressure in the helmet.
- i) <u>Warning</u>: The air supply must comply with EN 12021.
- j) <u>Warning</u>: The moisture content in the breathing air must be kept within the limits specified in EN 12021 to prevent the supplied air respirator with continuous air flow from freezing. If the equipment is used at a temperature below 4°C, the moisture content must be limited to prevent freezing.
- k) <u>Warning</u>: The equipment must not be operated with pure oxygen or oxygen-enriched air.
- <u>Warning</u>: Each operator connected to the air supply system must check that the capacity of the system is adequate as described in the information provided by Clemco.
- m) It is imperative that operators follow the instructions for donning the equipment as provided by Clemco. These are contained in Sections 4 (Preparation) and 6 (Operation) of this owner's manual.
- n) The air supply line is not resistant to contact with hot surfaces or boiling water and is therefore not labelled accordingly.
- o) The air supply line is not antistatic and is therefore not labelled accordingly.
- p) Do not use aggressive chemicals or solvents to clean the equipment. This may irritate or harm the operator and alter the properties of the material used. Please also consult the instructions concerning cleaning products and disinfectants in Section 9 of this owner's manual.
- q) No assistance is required when using the respirator because the operator will be warned if the air supply falls to inadequate levels by the flag of the air indicator dropping in his field of vision. If the operator is wearing ear protection or soundproofed communications equipment, there is therefore no need for any further measures to be taken.
- r) <u>Warning</u>: Particular attention must be paid to ensuring that the apparatus is not accidentally connected to other gas supplies, e.g. oxygen, acetylene or nitrogen. Never connect the breathing air line to an air source that has not been tested for gas or particulate contamination.

- s) The operator must assess the risk of potentially dangerous substances (e.g. nitrogen) at the workplace.
- t) The blast helmet is labelled in the customary manner. This label is clearly visible and durable.

Explanation of the respirator label (Section 7, EN 14594:2018):

Line 1: Type designation → Apollo 100 Line 2: Serial number of the blast helmet → currently a five-digit number Line 3: Number and year of the European standard and equipment class → EN 14594: 2018 4B Line 4: left - Storage temperatures to which the respirator is resistant – symbol acc. to EN132→ 0°C to +30°C Line 4: middle – Month and year of manufacture (MM-YYYY) → (example: 04 – 2019) Line 4: right – Symbol: "See information provided by manufacturer" → open book with "i" Line 5: Name of manufacturer → Clemco International GmbH Line 6: Address of manufacturer → Clemco International GmbH, Carl-Zeiss Str. 21, 83052 Bruckmühl Line 7: Country of manufacture → Made in Germany Line 8: CE symbol and number of the notified monitoring body →CE symbol and number of the notified monitoring body

u) The cape and cape fastener are also labelled. The blast helmet is not suitable for use for other operations such as welding or painting.

-The helmet is not suitable for use in flammable atmospheres.

-The helmet can be worn with the head in the usual vertical or slightly inclined position.

-The air indicator will not function in forced postures, e.g. with the head in a horizontal position when lying down.

-The helmet also protects the skin on the operator's head and neck from grazing caused by rebounding blast media.

-The quality of the air supply is critical and very important for ensuring the safety and wellbeing of the operator.

-Do not use a piston compressor (oil bath) to generate the breathing air as there is a strong risk it may produce high carbon monoxide concentrations.

-The presence of excessive carbon monoxide concentrations may result in the operator's death.

-If special air sources are used, e.g. a cylinder trolley or portable air tanks, these must be equipped with warning devices in accordance with EN14594:2018.

v) A maximum of four operators can be connected simultaneously to the CPF filter.

-Only the Clemco <u>breathing air hose with one-hand safety coupling and the hose nozzle made of</u> <u>stainless steel with the marking 299-S has to be used.</u> The corresponding plug-in socket has two safety notches - see picture below.

CE - APPROVED	Attention - NOT ALLOWED!
Breathing air hose with safety coupling and labeled	Breathing air hose with coupling and plug-
sleeve (material: stainless steel)	in socket made of brass and clamp
Marking stainless steel sleeve: 299-S	

2.3 Toxic dust poisoning

The following applies for model 1 and model 2 protective clothing in accordance with DIN EN ISO 14877:2003 (D):

Research has identified the potential risks of lead poisoning to unprotected operators and other personnel who may be exposed to lead-containing abrasive dust in the vicinity of abrasive blasting operations. This dust is primarily the result of removing lead-containing paints. A risk to human life and health may also result from paints containing heavy metals, asbestos or other toxic dust. Lead poisoning may cause death. The maximum workplace concentration has been defined as 0.1 mg/m³ of air (TRGS 900).

For this reason, the blasting contractor must always determine which type of paint is to be removed and, if necessary, ensure that operators wear a blast hood or helmet that is approved for use with these substances or an additional respirator.

In accordance with DGUV Regulation 112-190, Class 4B blast protection equipment can be used at up to 500 times the threshold value.

2.4 Ear protectors

Ear protectors must be worn when using the blast helmet.

2.5 Expiry date of the PPE or certain of its components

The equipment must be properly serviced, maintained and stored. All rubber components must be replaced at the latest 5 years after the date of manufacture. It is recommended that the blast helmet is replaced after a maximum of 10 years.

3 Description of the equipment

The minimal version of the blast helmet consists of the following components:

- Helmet with chin strap, suspension and cape
- Breathing air line (length approx. 700 mm)
- Air supply line (length 10 m) with quick coupling (female)
- Air control valve

4 Preparation

Check and/or prepare the following components:

 Remove the cape (see 8.4).
 Detach and adjust the helmet suspension (see 7.2).
 Inner lens (replacement, see 8.1)
 Outer lens (replacement, see 8.2)
 Three perforated cover lenses (replacement, see 8.2)
The blast helmet should never be used without the inner lens, outer lens and
cover lenses in place.
Attach the air control valve to the belt.
 Screw the breathing air line coupling to the air inlet of the helmet.
 Attach the other end to the air control valve.
Never carry the blast helmet by the air line but always use the handle to avoid
damage to the air line.
 Attach the air supply line to the air control valve using the quick coupling.
 Attach the other end of the line to the air filter, either CPF-20 or CPF-80 (more than one operator).

5 Air Supply

The air supply to the blast helmet is a critical element of operator safety and is not included in the scope of delivery. Please read this section with particular care. Poor air quality may result in illness or death of the operator (see 2.2).

5.1 Air quality

The quality of the air supply is critical and very important for ensuring the safety and wellbeing of the operator. Particular attention must be paid to ensuring that the equipment is not accidentally connected to other gas supplies, e.g. oxygen, acetylene or nitrogen.

Never connect the breathing air line to an air source that has not been tested for gas or particulate contamination.

Do not use a piston compressor (oil bath) to generate the breathing air as there is a strong risk it may produce high carbon monoxide concentrations.

The presence of excessive carbon monoxide concentrations may result in the operator's death. The breathing air must meet the following requirements:

- The air supply must comply with EN 12021.
- The breathing air for the blast helmet must contain at least **19.5 % by volume oxygen**.
- Before using the helmet, please read the owner's manual, all instructions and labels, and all warnings concerning the **compressed air source**. Please observe the compressor manufacturer's statements/warnings concerning the use of the compressor.
- If using an oil-lubricated compressor for the air supply, a high temperature monitor and/or a carbon monoxide alarm should be fitted. If only a high temperature monitor is fitted, the air must be regularly tested for the presence of carbon monoxide. The user is responsible for testing the breathing air, the compressor, the carbon monoxide alarm, the air filter and the wearing parts. An overheated or poorly maintained compressor may produce carbon monoxide or an unpleasant smell. It is also possible to use systems to remove or convert carbon monoxide in order to ensure good breathing air quality. The maximum permissible carbon monoxide concentration in the breathing air is 10 ppm (parts per million).
- When using a compressor, the air intake must be positioned to prevent the intake of contaminants, e.g. carbon monoxide and oil components found in exhaust gases. This applies especially when using portable compressors. For this reason, no vehicles or motor-powered equipment should be operated in the vicinity of the compressor.
- An appropriate filter (e.g. CPF 20, Art. no. 03580I) must be fitted and regularly serviced to remove unpleasant smells, oil mist, condensation, rust from pipes and other constituents.
- We recommend the use of our CMS-2 or CMS-4 carbon monoxide alarm.

5.2 Air volume, pressure and line length

To ensure that the operator is supplied with sufficient oxygen, the air flow

should be between 160 l/min and 200l/min.

The air indicator will be activated by the minimum amount, i.e. the flag will be retracted.



Only CE-approved supply lines with safety couplings should be used to connect the air filter and the regulating valve (see Section 11: Replacement Parts).

The **length of the line** between the filter and the control valve on the helmet must not exceed 40 m. If it is necessary to use a longer line, please contact the manufacturer to define suitable measures.

The pressure in the supply line must not exceed 8 bar.

6 Operation

Prior to operation, the helmet, breathing air line, air supply line, air intake and all connections must be thoroughly inspected and cleaned of all dust and debris. The helmet suspension should also be inspected and adjusted if necessary (see 7.2 - Adjustments).

The following steps must be taken before operating the helmet:

(1) Air supply	 Start the compressor.
	 Open the service valve to pressurise the air supply line.
(2) Check the air pressure.	Make adjustments at the air filter.
(3) Check the equipment.	 Protective equipment
	– Helmet
	 Breathing air supply
(4) Check for leaks and fit.	 Supply lines
	- Connections
(5) Put on the equipment.	 Put the helmet on, ensuring as far as possible that no blast media gets inside it.

 Correctly position the chin strap and inner collar.
 Pull the cape down and fix below the arms using the two rubber straps on each side.
 Put on the belt with the air control valve and tighten it well.

7 Settings

Air control valve



Figure 1: Air control valve

The Clemco air control valve allows the operator to increase or decrease the air flow by turning the knob at the side while wearing the helmet. When the air supply is properly connected, the valve allows the breathing air to be regulated between 160 l/min and 400 l/min.

7.1 Adjusting and replacing the helmet suspension



Figure 2: Helmet suspension

The following steps must be taken to adjust the helmet suspension:

(1) Remove the cape.	 Open the velcro fastener on the cape.
	 Slide the end of the cape as far as the opening.
	 Pull out one end and slide it completely out of the cape holder (see 8.4).
(2) Dismantle the helmet suspension.	Push the four white plastic tabs out of the wedge-shaped holders on the inner shell.
(3) Remove the vinyl sweatband.	Unfasten buttons A + B in Figure 2.
(4) Adjust the helmet suspension.	 The helmet suspension fits head sizes 6.5 to 8 (marked on the headband slits).
	 Push the headband tongue into the front holder until the correct fit is achieved.
	 Adjust evenly on both sides.
	 Press the selected slits onto the pins on the front band.
(5) Reattach the vinyl sweatband.	Fasten buttons A + B in Figure 2.
(6) Check the helmet suspension.	Ensure the helmet suspension is properly adjusted.
(7) Check the suspension strap.	Check the suspension strap is in place.

(8) Reassemble the helmet suspension.	Push the four white plastic tabs back into place (see (2)).
(9) Reattach the cape.	Reverse the procedure described in (1).

The helmet suspension ensures a sufficient distance between the head and helmet. It must be properly installed and adjusted to provide the protection and comfort that the helmet is designed to achieve.

8 Maintenance / Replacing Parts

- The helmet, all lines, the air inlet and all connections should be inspected for the presence of dust and debris and cleaned before use. All parts should be inspected for wear and tear.
- Regularly inspect and clean the foam filter and screen filter in the air control valve and air inlet in the helmet.
- After use, the helmet should be hung by the handle in a clean place.

8.1 Replacing the inner lens

(1) Open the lens frame.	Open the rubber latch.
(2) Remove the inner lens.	 Remove the cover lenses and the outer lens.
	 Pull the lens gasket and inner lens off the flange.
	 Remove the inner lens from the lens gasket.
(3) Fit new inner lens.	 Clean the lens gasket and fit a new inner lens.
	 From the outside place the new lens gasket with inner lens on the opening.
	 Place the lens gasket with inner lens on the flange and push a retaining slot over the respective holding tab (see figure 3).
	 Working from both outside and inside, push the other retaining slots over the holding tabs.
(4) Fit other lenses and close the	- Fit the outer lens.
lens frame.	 Fit the three cover lenses.

8.2 Replacing the outer lens and cover lenses

Up to three perforated cover lenses can be fitted simultaneously. However, to ensure maximum visibility, we recommend using only the number of cover lenses necessary for the specific work operation. Follow the instructions below to ensure that the cover lenses can be easily removed by an operator wearing heavy work gloves. (1) Working on a smooth surface, place up to three cover lenses on the outer lens.

(2) Fold the tabs on the top two cover lenses upwards and the tab on the bottom lens downwards (see figure 3).

(3) Open the lens frame and remove the outer lens and/or the remnants of the cover lenses.

(4) Place the cover lenses with the outer lens on the inner lens so that the cover lens tabs poke through the lens frame.

(5) Hold the lenses and close the lens frame.



Figure 3: Replacing inner and cover lenses

8.3 Replacing the helmet suspension

Follow the procedure described in 7.2 (see also Figure 2).



Figure 4: Detaching the cape

(1) Open the velcro fastener on the cape.	See Figure 4.
(2) Detach the cape.	 Slide the end of the cape as far as the opening. Pull out one end and slide the cape out of the cape holder.
(3) Attach the cape.	 Open the velcro fastener. Starting at the opening, push one end through the cape holder and then slide the cape in. A non-toxic silicone spray will make this easier.
(4) Close the velcro fastener on the cape.	See figure 4.

Follow this procedure if the cape is soiled or needs to be replaced.

8.5 Replacing the inner collar

The inner collar is important in ensuring the air circulation inside the helmet and preventing the ingress of dust. To replace or wash the collar, it must be detached from the cape (see 9.4 for washing instructions). The inner collar must be replaced if it no longer fits snugly round the neck.

8.6 Replacing the lens frame

The lens frame must be replaced if the seal is no longer guaranteed or the rubber latch no longer remains closed. The sound insulation inside the helmet should also be replaced when replacing the lens frame.

8.7 Replacing the chin strap

Replace the chin strip when it becomes worn.

8.8 Replacing the air line

The screws on the helmet and the control valve are secured with double-sided adhesive tape to prevent them from being loosened unintentionally. They should be resecured when the air line is replaced. Tape should be placed around the screws and valves approx. 2 mm from their bottom end (three quarters of the circumference is sufficient).

9 Servicing / Cleaning

Do not use aggressive chemicals or solvents to clean the equipment. This may irritate or harm the operator and alter the properties of the material used.

9.1 Filter

The filter (foam) is inside the control valve. It must be removed when it becomes soiled. Use a small screwdriver to prise off the snap ring and remove the screen filter and the soiled foam filter. Reassemble the components in reverse order.

9.2 Nylon cape

The cape can be machine-washed in warm water using a mild detergent. It can be dried in a tumble dryer at the lowest temperature setting. Do not dry clean. See 8.4 for how to detach the cape.

9.3 Leather cape

The cape can be brushed or cleaned with a damp sponge. (Do not wash, dry clean, iron or use chlorine bleach.)

9.4 Inner collar

For reasons of hygiene, the inner collar should be washed daily to remove sweat and dust. Detach the collar from the cape (zipper) and wash in warm water and a mild detergent. The collar can be dried in a tumble dryer at the lowest temperature setting. Do not dry clean.

9.5 Sweatband/helmet suspension

The sweatband, helmet suspension, suspension strap and chin strap can be washed in warm water and a mild detergent. See 7.2 for how to detach the components.

9.6 Blast helmet

The helmet should be cleaned with a disinfectant. A suitable product is Indicur from Henkel*.

9.7 Inner lens

The inner lens should be replaced if it becomes soiled or scratched. It can be cleaned with warm water and a mild detergent. Solvents such as alcohol, white spirit or ammonia must not be used. Allow the lens to air-dry. The use of cloths or similar may scratch the lens.

10 Storage

10.1 Daily storage

During breaks or at the end of work, the helmet should be hung by the handle in a clean place. Attention! This product has only been tested for its compatibility with our helmet. Please follow the manufacturer's instructions for use. We assume no liability for any skin reactions or other health problems associated with the use of the disinfectant.

10.2 Long-term storage

After cleaning and drying the helmet, tuck the cape inside. Pack the helmet in a sealed bag or film to protect it from dirt and moisture.

11 Replacement parts





11.1 Air control valve

ltem	Art. no.	Description
(-)	100042	CONTROL VALVE
	100074	BREATHING VALVE LESS BELT
(-)	04381I	FILTER SET APOLLO (foam filter, screen filter, snap ring)

11.2 Helmet

ltem	Art. no.	Description
(-)	100419	APOLLO-100 WITH CONTROL VALVE, CAPE comprising:
		100418 A100 CE blast helmet without accessories
		90130 9 mm x 0.65 m air line with screw fittings
		100042 control valve
(-)	100420	APOLLO-100 CE COMPL. WITH 5 M HOSE (SI) comprising:
		-100419 blast helmet with control valve and cape
		-100421 9mm x 5 m air line with safety coupling
(-)	100422	SAFETY-BLAST-PAKET A-100 CE comprising:
		-100419 A 100 CE blast helmet with control valve and cape
		-08921D blast suit, size 52
		-100404.9 mm x 20 m air line with safety coupling and socket
		-21042l cover lenses (25 pieces)
		-03580D CPF-20 R air filter
(1)	20975D	HELMET SHELL A-100 GREEN
(2)	99996D	INNER GASKET A-100
(3)	21044I	INNER LENS A-100 (polycarbonate)
(4)	21043I	OUTER LENS A-100 (plastic)
(5)	21042I	MYLAR LENS A-100 25PCS.
(6)	90291D	OUTER GASKET A-100
(7)	27308D	VISOR A-100 ASSY
(8)	90783D	HOLDER RUBBER LATCH BIG
(9)	90733D	RUBBER LATCH A-100 BIG
(10)	100361	AIR INDICATOR COMPL. A-100
(11)	08892I	HEAD SUSPENSION FOR APOLLO
(12)	04460I	CHIN STRAP ASSY
(13)	27309D	HOLDER FOR CHIN STRAP A-100 COMPL.
(14)	94260D	INNER NECK CUFF A-100/50
(15)	105341	CAPEHOLDER FOR APOLLO
(16)	90331D	NYLONCAPE A-100/50
-	100577	LETHERCAPE A-50/60/100 KOMPL. LEATHER
(17)	100365	FITTING A-100
(18)	04370I	GASKET FOR AIR HOSE UNION A-100 6 PCS
(19)	90130D	AIR HOSE 9 MM X 0,65 FOR A-100
(20)	100042	CONTROL VALVE
-	04430I	BELT ONLY FOR BREAK VALVE APOLLO
-	100380	EAR-SAVETY PAIR

-	100421	AIR HOSE 5 M WITH SAFETY COUPLED (SI)
-	100406	AIR HOSE 10 M WITH SAFETY COUPLING (SI)
-	100404	AIR HOSE 20 M WITH SAFETY COUPLING (SI)
-	100405	AIR HOSE 40 M WITH SAFETY COUPLING (SI)

11.3 Additional parts

23825D	CLEMCOOL
044111	CLIMATE CONTROL CC