1 For your safety

1.1 General safety statements

- Before using this product, carefully read the Instructions for Use.
- Strictly follow the Instructions for Use. The user must fully understand and strictly observe the instructions. Use the product only for the purposes specified in the Intended Use section of this document.
- Do not dispose of the Instructions for Use. Ensure that they are retained and appropriately used by the product user.
- Only fully trained and competent users are permitted to use this product.
- Comply with all local and national rules and regulations associated with this product.
- Only trained and competent personnel are permitted to inspect, repair and service the product. Dräger recommend a Dräger service contract for all maintenance activities and that all repairs are carried out by Dräger.
- Properly trained service personnel must inspect and service this product as detailed in the Maintenance section of this document.
- Use only genuine Dräger spare parts and accessories, or the proper functioning of the product may be impaired.
- Do not use a faulty or incomplete product, and do not modify the product.
- Notify Dräger in the event of any component fault or failure.
- The air supply shall meet the requirements for breathing air according to EN 12021.

1.2 Definitions of alert icons

Alert icons are used in this document to provide and highlight text that requires a greater awareness by the user. A definition of the meaning of each icon is as follows:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in physical injury or damage to the product or environment. It may also be used to alert against unsafe practices.

NOTICE

Indicates additional information on how to use the product.

2 Description

2.1 Product overview

This variant of the Dräger PAS Colt Series provides respiratory protection for working in a contaminated environment using breathing air from the air cylinder.

The equipment is available as a 10 minute or 15 minute short-duration version. These are nominal durations available for use of the equipment until a whistle sounds to warn the wearer that there is low cylinder pressure. The nominal duration is determined by the capacity (volume and pressure rating) of the selected air cylinder – the actual duration is also dependent on the rate at which the wearer uses air from the cylinder (the breathing rate).

The features of the equipment are:
- The carrying system is a bandolier shoulder harness and waist belt with a hip mounted cylinder holster.
- The pressure reducer (Fig 1, Item 2) connects directly on to the air cylinder, and reduces the cylinder pressure to the medium pressure required at the lung demand valve (Fig 1, Item 1). The reducer has a cylinder pressure gauge, and a whistle that sounds to warn the wearer that there is low cylinder pressure.
- The medium-pressure hose has a quick coupling that allows rapid removal and fitting of the lung demand valve when required.
- The Dräger air cylinder and lung demand valve are described below.

Optional feature:
- Dropdown cylinder holster: assists wearer movement by making the cylinder and holster more manoeuvrable (in a confined space for example).

2.1.1 Air cylinder

Cylinders are available with a 200 bar or 300 bar working pressure rating, and in steel or composite materials. Only air cylinders listed in the Dräger certification are approved for use with the PAS Colt. Contact Dräger for further information.

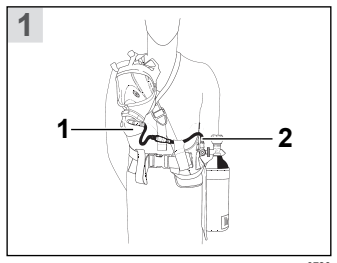
2.1.2 Lung demand valve (LDV)

A variety of Dräger lung demand valves are compatible with this equipment, with the coupling (Fig 2, Item 1) selected to match the face mask coupling (see table below):

LDV coupling	Face mask coupling	Type	Coupling type
A	P	Positive pressure	Push-in – Dräger specific
AE	PE	Positive pressure	Screw-in – M45 x 3 to EN 148-3
N	RA	Negative pressure	Screw-in – 40 mm round thread to EN 148-1

During use, the lung demand valve activates automatically as the wearer breathes, and then regulates the breathing air supply into the face mask in response to the breathing rate of the wearer.
- On positive-pressure systems, when the lung demand valve is activated, the internal valve remains open until closed by the user. Positive-pressure valves have a reset button (Fig 2, Item 2) that closes the valve when required. Pressing the reset button closes the internal valve to switch off the air flow through the lung demand valve.
- On negative-pressure systems the internal valve closes automatically to switch off the air flow through the lung demand valve.

The lung demand valve can also be activated manually by pressing the front button (Fig 2, Item 3) to open the internal valve and activate air flow when required. Pressing the front button during use delivers additional air (supplementary air) into the mask of the wearer.



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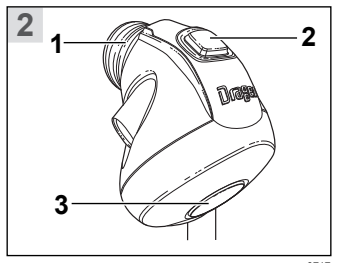

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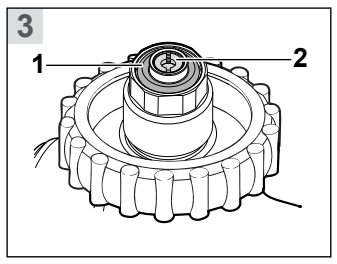

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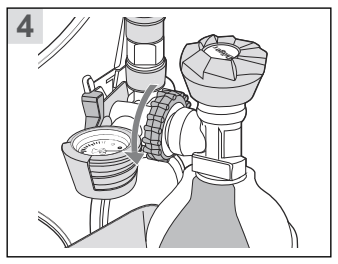

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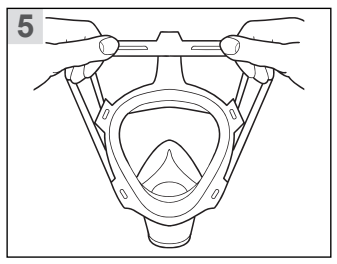

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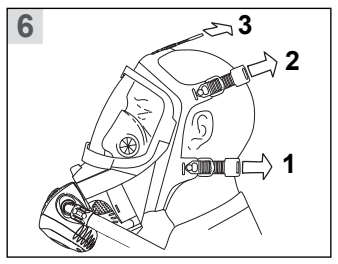

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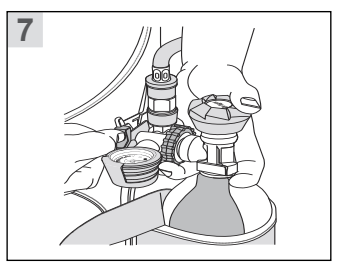

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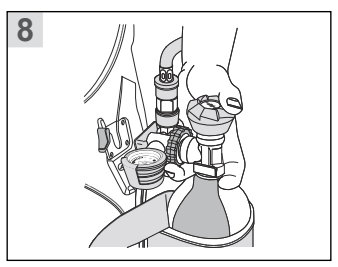

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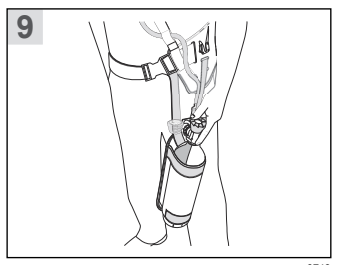

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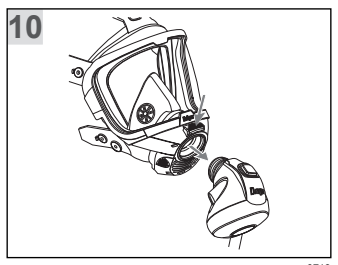

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2.2 Intended use

When this product is used with an approved face mask, air cylinder and lung demand valve, it provides the wearer with respiratory protection for working in contaminated or oxygen-deficient conditions. It is intended for use in applications where a high level of respiratory protection is required. The equipment is intended to be used only for short duration applications.

The air cylinder, face mask (full face mask conforming to EN 136 Class 2 or Class 3) and other accessories used with this product must be certified Dräger components, assembled in an approved configuration; otherwise the operation of the device may be impaired. Contact Dräger for further information.

2.3 Limitations on use

This product is not approved for use in CBRN applications.

Use in potentially explosive atmospheres
- The PAS Colt Series are type tested as suitable for use in potentially explosive atmospheres. Electronic sub-assemblies are ATEX certified. The combinations are suitable for use in hazardous areas up to and including zone 0 and zone 20. The combinations can be used in atmospheres containing gases of the gas explosion group IIC, with the exception of combinations using the f 2 range of face masks, which are only suitable to be used in atmospheres containing gases of the gas explosion group IIB.
- Do not charge the cylinder in a potentially explosive atmosphere.

2.4 Approvals

The European standards, guidelines, and directives according to which this product is approved are specified in the declaration of conformity (see declaration of conformity or www.draeger.com/product-certificates).

3 Use

WARNING

Fill the PAS Colt air cylinder to the full rated working pressure prior to use, and do not commence any operation using a cylinder that is less than 90 per cent full (or greater when national regulations dictate).

The cylinder air quality shall meet the requirements for breathing air according to EN 12021.

3.1 Preparation for use

3.1.1 Visual inspection

Carry out a visual inspection, checking the full breathing apparatus including all component parts and accessories. Check that the equipment is clean and undamaged, paying particular attention to pneumatic components, hoses and connectors. Typical signs of damage that may affect the operation of the breathing apparatus include impact, abrasion, cutting, corrosion and discoloration. Report damage to service personnel and do not use the apparatus until faults are rectified.

3.1.2 Fitting the cylinder

1. Ensure that the cylinder is fully charged.
2. Check the threads of the cylinder valve port and the pressure reducer. Ensure that the O-ring seal (Fig 3, Item 1) and the sintered filter (Fig 3, Item 2) in the reducer are clean and undamaged.
3. Fully insert the cylinder into the carrying holster. To prevent damage, ensure that the cylinder remains clear of the hand wheel of the pressure reducer while inserting the cylinder.
4. Align the cylinder with the pressure reducer and tighten the hand wheel hand tight (Fig 4). Do not use tools or over tighten.

3.1.3 Functional testing

Leak and whistle test

WARNING

If the breathing apparatus fails to meet any of the standards or parameters described in the functional tests, or if an immediate leak is evident, there is a system fault. Report the fault to trained service personnel or contact Dräger. Do not use the breathing apparatus until the fault condition is rectified.

1. Positive-pressure systems: press the reset button (Fig 2, Item 2) to switch off the valve.
2. Open the cylinder valve slowly, but fully, to pressurize the system. During pressurization the whistle will briefly sound.
3. Ensure that cylinder is fully charged and then close the cylinder valve.
4. Wait one minute and then observe the pressure gauge and reopen the cylinder valve. The gauge must not show an increase in pressure of more than 10 bar (one radial marking on the gauge face). Investigate and repair any leak before use (see Section 4). If necessary, use a soapy solution to locate the leak.
5. Close the cylinder valve and vent the system as follows:
   - Positive-pressure systems: cover and seal the lung demand valve outlet with the palm of the hand. Press the front button (Fig 2, Item 3) to activate air flow and then lift the hand to very slowly vent.
   - Negative-pressure systems: carefully press the front button (Fig 2, Item 3) to very slowly vent.
6. The whistle must commence in the range 110 to 100 bar.
7. Positive-pressure systems: press the reset button (Fig 2, Item 2) to switch off the valve.

3.1.4 Putting on the PAS Colt (ready position)

See also Fig 1 which shows the PAS Colt worn in the ready position.

1. Open the waist belt buckle and fully extend the waist belt and shoulder strap.
2. Place the left arm through the shoulder harness, taking the harness over the head and on to the right shoulder, positioning the strap diagonally across the body with the cylinder positioned against the left hip.
3. Loop the waist belt around the waist and fasten the buckle – do not tighten.
4. Grip the cylinder valve with the left hand and lift until the waist belt is in line with the waist. Then tighten the waist belt strap until the equipment is secure and comfortable on the waist. Pull down to adjust the shoulder strap.
5. Check that the face mask port, and the lung demand valve coupling and O-ring are clean and undamaged.
6. Connect the lung demand valve to the face mask as follows:
   - Push-in coupling: press into the port of the face mask until it latches in position. Check the attachment by gently attempting to pull the coupling apart.
   - Screw-in coupling: screw into the port of the face mask and tighten hand tight. When the lung demand valve is fitted to the face mask, the connector can swivel to allow for head and body movement of the wearer.
7. Put the neck strap of the face mask over the head, and then insert the neck strap stud into the hole in the centre strap of the head harness.

3.1.5 Putting on the face mask

WARNING

Correct fit of the face mask can only be achieved if the complete mask seal makes contact with skin. Head hair, facial hair (including beard stubble and sideburns), earrings, other facial piercings and normal spectacles will interfere with the mask seal and are not permitted in the sealing area. Additionally, head hair that could affect the face mask fit (buns, pony-tails, hairpieces, etc.) is not permitted.

NOTICE

Refer also to the face mask Instructions for Use.

1. Positive-pressure systems: press the reset button (Fig 2, Item 2) to switch off the valve.
2. Open the cylinder valve slowly, but fully, to pressurize the system.
3. Detach the neck strap stud from the centre strap of the head harness.
4. Spread the head harness (Fig 5). Place the chin into the chin cup of the face mask and pull the harness over the head locating the harness centre plate on back of the head.
5. Referring to Fig 6, tighten both lower (1) and then upper straps (2) evenly towards the back of the head. If necessary, tighten the centre strap (3).
6. Breathe normally and check that the head has a full range of movement without pulling against the lung demand valve hose. If any resistance to movement is felt, readjust the hose routing and then recheck. If resistance is still felt, **do not** use the breathing apparatus and contact Dräger.
7. Carry out the mask function check.

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3.1.6 Mask function check

1. Close the cylinder valve and breathe normally to empty the system of air. When empty, the face mask should hold on to the face to indicate a positive seal.
2. Immediately reopen the cylinder valve and breathe normally.
3. Inhale and hold your breath – there should be no audible leak. If a leak is detected, readjust the head harness and retest.
4. Recommence breathing – exhaled air should flow easily out of the exhalation valve.

When the function check has been satisfactorily completed, breathe normally and proceed to the work area.

3.2 During use

The nominal duration (10 or 15 minutes) applies to a PAS Colt with a fully charged cylinder, and refers to the usage time until the whistle on the pressure reducer sounds to warn the wearer that there is low cylinder pressure. The wearer should be in a safe area before the whistle sounds.

WARNING

The available duration starts from the time that the wearer commences breathing from the air cylinder, and is dependent on the capacity of the cylinder and the breathing rate of the wearer.

Dräger strongly advise that the front button (Fig 2, Item 3) is not pressed to deliver supplementary air into the mask during use. Using supplementary air would use air from the cylinder and reduce the operating duration of the air supply.

- Regularly check the reading on the cylinder pressure gauge.
- If the whistle on the pressure reducer sounds, there is low cylinder pressure. Immediately leave the hazardous area by the shortest and safest route.

When in a safe area, remove the lung demand valve from the face mask if necessary and continue to breathe normally.

3.3 Dropdown cylinder holster (optional accessory)

- To release the dropdown cylinder holster:
  a. Hold the cylinder valve with the left hand and, with the right hand, press and hold the red button to open the locking mechanism (Fig 7).
  b. Lift the cylinder and holster clear of the locking mechanism and then release the red button (Fig 8).
  c. Lower the cylinder until it is supported by the harness straps (Fig 9).The holster is held by two harness straps, one fixed and one adjustable.
  d. Hold the cylinder valve to move the cylinder and holster as required.
- To reconnect the dropdown cylinder holster, align and press the roller on the holster into the locking mechanism.

3.4 After use

WARNING

Do not remove the equipment until in safe area, clear of hazard.

CAUTION

Do not drop or throw down equipment as damage could occur.

1. Loosen the face mask straps.
   - Positive-pressure systems: as the seal between the mask and the face is broken, press the reset button (Fig 2, Item 2) to switch off the valve.
2. Remove the face mask and fully extend all of the straps of the head harness.
3. Fully close the cylinder valve.
4. Press the front button (Fig 2, Item 3) to fully vent the system.
5. Remove the lung demand valve from the face mask (Fig 10 – push-in coupling shown).
6. Open the waist belt buckle, lift the shoulder strap buckle to loosen the harness and then remove the equipment.
7. Carry out the after use maintenance tasks in the maintenance table (see Section 5.1).

4 Troubleshooting

The troubleshooting guide shows fault diagnosis and repair information applicable to breathing apparatus users. Further troubleshooting and repair information is available in Instructions for Use supplied with associated equipment (e.g. face mask and air cylinder).

Contact service personnel or Dräger when the remedy information indicates a service task, or if the symptom remains after all remedy actions have been attempted.

Symptom	Fault	Remedy
High-pressure air leak or failed leak test	Loose or dirty cylinder connector	Disconnect, clean and reconnect the connector and retest
	Faulty hose or component	Substitute user replaceable accessories and retest
Air leak from medium-pressure hose connection at the pressure reducer (safety relief valve)	Faulty O-ring, retainer, spring or pressure reducer	Service task
High or low medium pressure	Pressure reducer fault	Service task
Poor sounding whistle	Whistle dirty	Clean whistle flute and retest
Whistle not functioning correctly	Activation mechanism fault	Service task

5 Maintenance

5.1 Maintenance table

Service and test the breathing apparatus, including out-of-use apparatus, in accordance with the maintenance table. Record all service details and testing. Refer also to the Instructions for Use for the lung demand valve, face mask and other associated equipment.

Additional inspection and testing may be required in the country of use to ensure compliance with national regulations.

Component/ System	Task	Before use	After use	Every month	Every year	Every six years
Complete equipment	Visual inspection (see Note 1 and Section 3.1.1)		O	O		
	Functional test (see Section 3.1.3)		O	O		
	Breathing cycle and static tests (see Note 2)				O	
Lung demand valve	Check push-in type connectors for lubricant (see Note 3)	O				
Pressure reducer	Medium-pressure check (see Note 2)				O	
	Inspect the sintered filter (see Note 2 and Note 4)				O	
	Inspect the high-pressure connector O-ring (see Note 2 and Note 5)				O	
	Overhaul. Contact Dräger for the Repair Exchange (REX) service (see Note 6)					O
Cylinder	Charge to correct pressure (see Section 5.2.2)		O			
	Check the initial test date stamped on the cylinder			O		
	Cylinder pressure test and recertification	According to national regulations in the country of use				
Cylinder valve	Basic overhaul	At the time of cylinder recertification				

Notes

O Dräger recommendations

1. Clean the equipment if it is dirty. If it the equipment has been exposed to contaminants, disinfect any components that come into direct and prolonged contact with the skin.
2. These maintenance tasks may only be carried out by Dräger or trained service personnel. Details of the tests are contained in the Technical Manual which is issued to service personnel that have attended a relevant Dräger maintenance course.
3. For type A check the O-ring on the lung demand valve; and for type ESA check the outer surface of the male part of the push-in connector on the lung demand valve. As a guide, lubricant should be felt on the fingers but not seen. If relubrication is required, lightly apply Dow Corning® Molykote® 111 (other lubricants are not tested and may damage the equipment).
4. Replace the sintered filter if a drop in reducer performance is observed during a flow check or if it is visibly damaged.
5. Replace the high-pressure connector O-ring if it is found to leak during functional testing or if the O-ring is visibly damaged.
6. Where the breathing apparatus is subjected to a high level of use (in training establishments etc.), reduce the overhaul period for the pressure reducer. In these circumstances, Dräger recommend that the overhaul frequency should be less than 5,000 applications of use. An application of use is defined as a single use of the fully assembled breathing apparatus, where the user breathes from the air cylinder. It does not include system pressurization for pre-operational checks.

5.2 Maintenance tasks

5.2.1 Removing the cylinder

WARNING

High-pressure air release may cause injury to the user or other personnel near the breathing apparatus. Close the cylinder valve and fully vent the system before attempting to disconnect the air cylinder.

1. Close the cylinder valve and press the front button (Fig 2, Item 3) to fully vent the system.
2. Disconnect the cylinder valve from the pressure reducer.
3. Carefully remove the cylinder from the holster. To prevent damage, ensure that the hand wheel of the pressure reducer remains clear of the cylinder.

5.2.2 Air cylinder charging

WARNING

Air quality for compressed-air cylinders must conform to requirements of EN 12021.

- Refer also to the instructions supplied with the cylinder and the charging unit for recharging the cylinder.
- Only charge compressed-air cylinders which:
  - Conform to national standards.
  - Feature the original manufacturer's test date and test mark.
  - Have not exceeded the test date indicated on the cylinder by the last testing station.
  - Are not damaged.
- To prevent ingress of moisture into the cylinder, ensure that the cylinder valve remains closed until connected to the charging unit.
- Recharge to the rated working pressure of the cylinder. Dräger recommend a charge rate of 27 bar/minute (rapid charging will increase the temperature resulting in an incomplete charge).
- To prevent overcharging of the cylinder, Dräger recommend using a pressure-limiting device on the charging compressor.

5.3 Cleaning and disinfecting

CAUTION

Do not exceed 60 °C for drying, and remove components from the drying facility immediately when dry. Drying time in a heated dryer must not exceed 30 minutes.

Do not immerse pneumatic or electronic components in cleaning solutions or water.

If water is trapped and then freezes inside the pneumatic system of the breathing apparatus (such as the lung demand valve), operation will be impaired. Prevent any liquid from entering, and thoroughly dry the breathing apparatus after cleaning to prevent this from occurring.

For information about suitable cleaning and disinfecting agents and their specifications refer to document 9100081 on www.draeger.com/IFU.

Refer also to the Instructions for Use for the lung demand valve, face mask and other associated equipment.

- Use only clean lint-free cloths

1. Clean the breathing apparatus manually using a cloth moistened with cleaning solution to remove excess dirt.
2. Apply disinfecting solution to all internal and external surfaces.
3. Rinse all components thoroughly with clean water to remove all cleaning and disinfecting agents.
4. Dry all components using a dry cloth, in a heated dryer or in air.
5. Contact service personnel or Dräger if disassembly of pneumatic components is required.

6 Storage

6.1 Storage preparation

- Extend the shoulder straps, waist belt and the straps of the face mask.
- For storage, place the face mask in a protective bag (contact Dräger for supply of a suitable bag).
- Route rubber hoses in such a way that the bend radius is not too acute and the hose is not stretched, compressed or twisted.

6.2 Storage conditions

- Store the equipment between -15 °C and +25 °C. Ensure that the environment is dry, free from dust and dirt, and does not subject the equipment to wear or damage due to abrasion. Do not store the equipment in direct sunlight.
- Fix the breathing apparatus securely to any raised mounting point to prevent it from falling.

7 Disposal

When required, dispose of the PAS Colt in accordance with national or local regulations for waste disposal.

8 Technical data

- High-pressure connector: 200 bar or 300 bar, standard G5/8” as per EN 144-2.
- Whistle commences in the range: 110 to 100 bar.
- Whistles cease in the range: 1.75 to 0 bar.
- Whistle volume: >90 dBA.