

1 Safety-related information

- Before using this product, carefully read these instructions for use and those of the associated products.
- 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 (see section 3.2).
- Do not dispose of the instructions for use. Ensure that they are retained and appropriately used by the product user.
- Only trained and competent users are permitted to use this product.
- Comply with all local and national rules and regulations associated with this product.
- Only specialist, trained personnel are permitted to check, repair and maintain the product as described in these instructions for use and the technical manual. Further maintenance work that is not detailed in these instructions for use or in the technical manual must only be carried out by Dräger or personnel qualified by Dräger. Dräger recommend a Dräger service contract for all maintenance activities.
- Only use genuine Dräger spare parts and accessories when performing maintenance work, or the proper functioning of the product may be impaired.
- Do not use a faulty or incomplete product. Do not modify the product.
- Notify Dräger in the event of any component fault or failure.
- This product is approved according to the ATEX directive. It must only be used under the conditions specified in the approval certificate.

2 Conventions in this document

2.1 Definitions of alert icons

The following alert icons are used in this document to provide and highlight areas of the associated text that require 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. It may also be used to alert against unsafe practices.

NOTICE
Indicates a situation which, if not avoided, could result in damage to the product or the environment.

2.2 Typographical conventions

- A triangle is used in safety statements to indicate possible ways of avoiding the hazard.
- An information symbol is used for notes and additional useful information.

- Numbered paragraphs indicate that the information is sequential.
- Dashed paragraphs indicate that the information is non-sequential.

2.3 Trademarks

The following website lists the countries in which the Dräger trademarks are registered: www.draeger.com/trademarks.

Molykote® is a registered trademark of DDP Specialty Electronic Materials US 9, LLC.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Dräger is under license.

Procell® is a registered trademark of Duracell Batteries BVBA.

Varta® is a registered trademark of VARTA Consumer Batteries GmbH & Co KGaA.

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Huideruī® is a registered trademark of Huidrey Lithium Power Technology Co., Ltd

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The trademarks listed are only registered in certain countries and not necessarily in the country in which this document is published.

2.4 Abbreviations

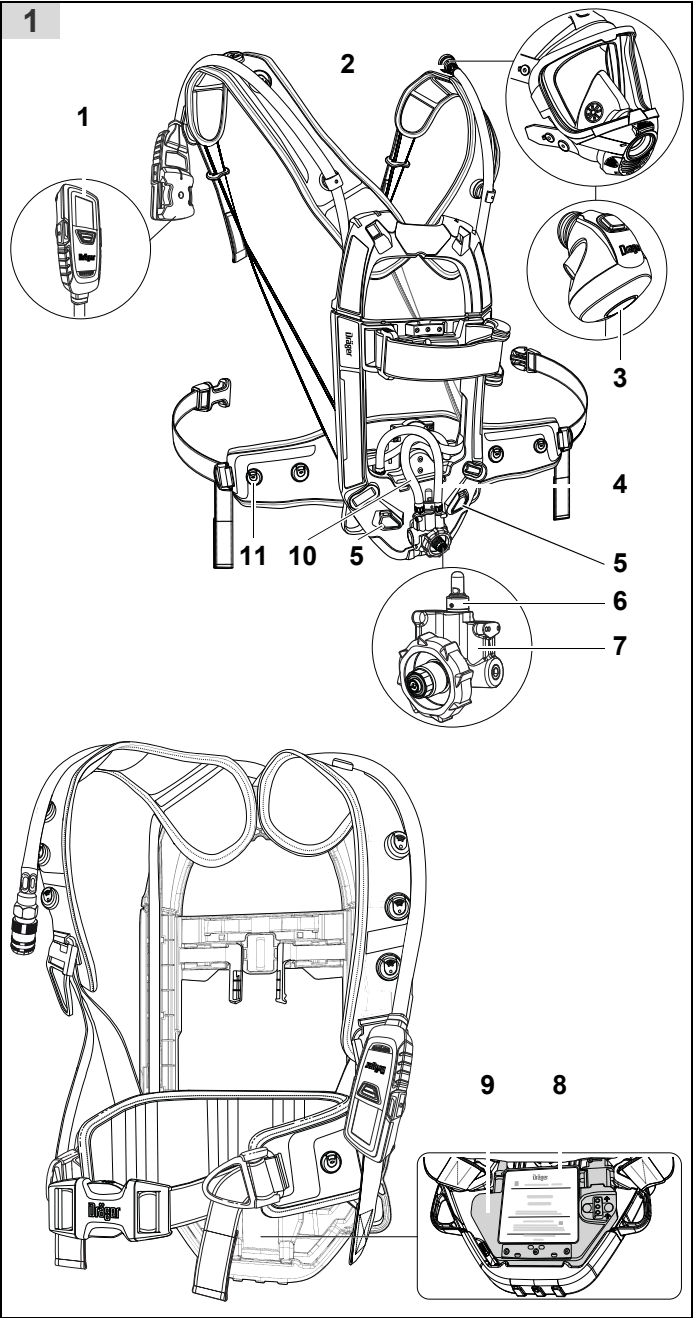
Abbreviation	Explanation
DSU	Distress signal unit
ECU	Electronic control unit
HUD	Head-up display
ID	Identity
LCD	Liquid crystal display
LED	Light-emitting diode
RF	Radio frequency
RFID	Radio-frequency identification
TFT	Thin film transistor
TTR	Time to retreat
UI	User interface

3 Description

3.1 Feature description

The PSS® AirBoss Connect is a breathing apparatus that provides the wearer with respiratory protection using an open-circuit, pressure-demand, compressed-air system. The product includes a Connect ECU electronic

monitoring system and is compatible with Dräger compressed air cylinders, masks and lung demand valves.



No	Description
1	Connect ECU
2	Medium-pressure coupling
3	Lung demand valve
4	High-pressure hose
5	Buddy-beacons
6	Warning whistle
7	Pressure reducer
8	Power pack
9	Pressure module
10	Medium-pressure hose
11	Universal accessory clip

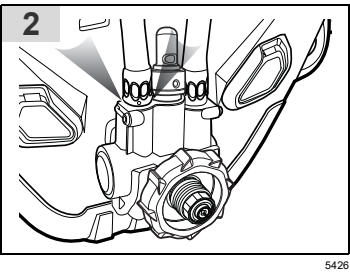
3.1.1 Carrying system

The carrying system has a carbon-composite backplate, with adjustable shoulder straps and waist belt connected using quick release connectors. Some variants feature an adjustable backplate where the height can be changed to one of three preset heights to suit the body length of the wearer (short (S), medium (M) and long (L)). The waist pad is connected at a flexible joint to compensate for the twisting and bending of the user. Pneumatic hoses and other modular components are integrated into the backplate to prevent snagging and to enhance component protection. Universal accessory clips (Fig 1, Item 9) can be fitted to the shoulder and waist pads.

The carrying system is fitted with a read-only RFID tag that has a unique hexadecimal number that can be used for equipment identification. The tag is located under the rubber cover just below the pressure reducer (Fig 1, Item 7) and can be read wirelessly by an RF reader. The tag is passive (has no battery) and requires an external source to provoke signal transmission.

3.1.2 Pneumatic system

The breathing apparatus uses a Dräger high-performance pressure reducer (Fig 1, Item 6) that reduces cylinder pressure. The pressure reducer is fitted with a warning whistle (5) that sounds when the cylinder pressure is low. Breathing air is supplied through a medium-pressure hose (9) and coupling (2) to the attached lung demand valve (3). A pressure relief valve will activate and vent air to the atmosphere at the pressure reducer (Fig 2) if the medium-pressure increases to 11–16 bar. High-pressure air is supplied through an internal capillary inside the dual-pressure hose (Fig 1, Item 4) to the pressure module of the electronic monitoring system (8).



3.1.3 Connect ECU

The Dräger Connect ECU is a battery powered integrated electronic monitoring system used on Dräger breathing apparatus. The system provides visual and audible information about the status of the breathing apparatus, and has an integral DSU. Visual information is provided on the LCD screen, and by LEDs in the LED panel of the Connect ECU UI module and in the buddy beacons in the backplate. Audible signals are emitted from an electronic sounder in the Connect ECU UI module.

3.1.3.1 Power pack

Only use the power packs described in this section with the PSS® AirBoss Connect.

The power pack is located within the breathing apparatus backplate (Fig 1, Item 7). The product can be fitted with the following power pack types.

- Primary power pack with 5 replaceable 1.5 V batteries.
 - The estimated battery life is approximately 12 months (based on 300 uses lasting 30 minutes each).
 - The power pack is supplied with the batteries fitted.

The actual battery life of the power pack depends on the system operating time, frequency of alarms, ambient temperature, and backlight use. A small amount of battery power is consumed when the system is switched off.

3.1.3.2 Connect ECU UI module



No	Description
1	LCD screen
2	Key
3	Right-hand button
4	Manual alarm button
5	LED panel
6	Left-hand button
7	Time (elapsed or remaining)
8	Cylinder pressure
9	Graphical pressure display

The Connect ECU UI module has a TFT type LCD screen which displays cylinder pressure, time, temperature, and other operational information. The screen deactivates to save power during operations, but automatically reactivates if a button is pressed or a system event occurs.

The LED panel has green, blue, red, and amber LEDs which flash or pulse to provide operational information.

The Connect ECU UI module buttons, key, and internal motion sensor control operating features of the electronic system. The control functions are described in section 4.2.1.1 and where applicable in these instructions for use.

An internal sounder emits audible signals to notify the user about breathing apparatus alarms and status messages. Varying sound patterns including continuous alarms and single or multiple tones are used to distinguish between different alarm types. The sounder uses the key slots as amplification chambers to provide clear and loud alarms. The alarm sounds are described in section 4.2.1.2, and the quiet mode which reduces alarm volume is in section 4.2.4.2.

3.1.3.3 System monitoring

Cylinder pressure

The electronic monitoring system receives and processes pressure signals from the breathing apparatus cylinder. The system uses the signals to display cylinder pressure and to provide alarm signals at preset pressure levels. The cylinder pressure signals are also used to calculate the remaining time available.

Signals and alarms activate when the remaining pressure in the cylinder reaches the following levels:

Cylinder pressure	Signal
100 bar	The graphical pressure display turns amber

PSS® AirBoss Connect
Self-contained breathing apparatus

Cylinder pressure	Signal
55 bar	Low-pressure alarm 1
10 bar	Low pressure alarm 2

3.1.3.4 Time

The Connect ECU UI module displays elapsed or remaining time depending on the selected settings. Elapsed time counts and displays the time since the system was switched on. Remaining time is the time until low-pressure alarm 1 activates.

Remaining time

Remaining time is the calculated time in minutes until low-pressure alarm 1 activates. The system uses the cylinder pressure and the current consumption rate of the wearer to calculate and display the time. An initial calculation is made using a default consumption rate of 50 L/min. The calculation is then updated once per second using the actual consumption rate of the wearer (a minimum consumption rate of 50 L/min is applied to the calculation).

Retreat Alert

Retreat Alert is an alternative remaining time protocol that can be used if it is applicable in the country of use (see section 4.2.4.3).

3.1.3.5 Temperature

The Connect ECU UI module contains a thermal sensor which measures the ambient temperature. The thermal sensor is used to display temperature on screen and to activate thermal exposure alarms.

The Connect ECU tracks thermal exposure once the temperature is above a set start temperature (the default start temperature is 40 °C). Two thermal alarms are activated when the exposure exceed each alarms threshold. The alarms warn the user of a relatively long period of exposure to slightly elevated temperatures, or of a short period of exposure in high temperature situations.

The thermal exposure alarms can be disabled, or the start temperature can be configured to meet the individual operational needs of the user using Dräger PC Link (see section 3.1.8.1).

3.1.3.6 DSU

The DSU provides manual and automatic distress alarms. The manual distress alarm is activated by pressing the manual alarm button to call for help or attention. The automatic distress alarm uses a motion sensor and timer to measure the time that the wearer has been motionless (moving less than normal breathing movement). The DSU uses this information to activate a pre-alarm and a full alarm at predetermined intervals to indicate that the wearer could be unconscious or trapped. The automatic distress alarm activation times are in section 10. The alarm patterns are in section 4.2.1.2.

A limitation of the automatic distress alarm is that the motion sensor detects movement or vibration to which the wearer is subjected. If the wearer is motionless but on a moving platform (on moving or vibrating machinery for example) the automatic distress alarm might not activate.

3.1.3.7 Buddy-beacon

The buddy-beacon signal helps to see or locate other breathing apparatus wearers in poorly lit or smoke-filled areas. The normal signal is the blue LEDs on the Connect ECU UI module and on the rear of the breathing apparatus pulsing every 3 seconds. The signal changes to the red LEDs flashing twice per second when low-pressure alarms are activating. If configured, the signal changes to the amber LEDs pulsing every 3 seconds when pressure warning 1 is active, and to the red LEDs pulsing every 3 seconds when pressure warning 2 is active.

3.1.3.8 Datalog

The datalog is a record of the event history which is automatically recorded in the system memory. The datalog stores approximately 200 hours of the most recent system events. The datalog can be downloaded and viewed using Dräger PC Link.

3.1.3.9 Card reading system

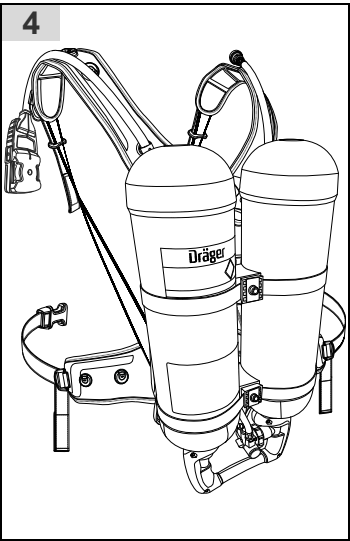
The Connect ECU UI module has a reader which can upload information from programmable cards to the system memory. User ID cards store information about the wearer (e.g. user name, brigade name, and station number). When the card is read, the system records the user ID in the datalog.

3.1.4 Compressed air cylinders

The breathing apparatus is compatible with steel or composite material cylinders of 4 to 9 litre capacities, and 200 or 300 bar pressure. Full descriptions and user instructions are contained in separate instructions supplied with the cylinder.

3.1.5 Twin pack

The breathing apparatus may be configured to be fitted with a Dräger twin pack (Fig 4).



The twin pack holds two compressed-air cylinders secured on to a mounting bracket by a pair of straps. The mounting bracket fits into the reducer mount on the backplate and is secured by locating pins at the cylinder cradle.

The twin pack holds two 6 litre or 6.8 litre capacity 300 bar cylinders. One of the cylinders is fitted with a cylinder valve and the other cylinder has a high-pressure adaptor. A stainless steel capillary tube between the cylinder valve and the high-pressure adaptor makes a pneumatic connection between the two cylinders. The connecting arrangement is protected inside a split plastic cover which can also be used as a carrying handle.

The cylinder valve used on the twin pack is a screw-type which is positioned on the inside of the cylinders (toward the backplate) when the twin pack is connected to the breathing apparatus.

The twin pack can only be fitted or removed by Dräger or trained service personnel. Details of the procedures are contained in the technical manual which is issued to service personnel that have attended a relevant Dräger maintenance course.

3.1.6 Face masks

The breathing apparatus is compatible with FPS® 7000 and Panorama® Nova face masks. Full descriptions and user instructions are contained in separate instructions supplied with the face mask.

3.1.7 Lung demand valves

The breathing apparatus is compatible with PSS® lung demand valves with the following types of connector: A, AE, ESA, and N. Full descriptions and user instructions are contained in separate instructions supplied with the lung demand valve.

3.1.8 Optional features and equipment

3.1.8.1 PC Link

PC Link is a software application that uses RF and Bluetooth® dongles to read and configure Dräger electronic monitoring systems. Configurable settings and parameters include alarm patterns, warning levels, timings, and start-up options. Readable information includes the product identification details, the firmware versions, and the datalog.

PC Link can also read and write information on programmable cards which are available from Dräger for use with this product (see section 3.1.3.9). See the PC Link instructions for use or contact Dräger for more information.

The settings specified in these instructions for use (pressures, alarm patterns, start-up options, etc.) are the default configuration settings for this product.)

3.1.8.2 Telemetry

The Connect ECU is compatible with Dräger telemetry systems, such as the Dräger PSS® Merlin®. The telemetry system is used to monitor and control breathing apparatus wearers that are deployed at an incident. The telemetry system uses radio communication to transmit status and information signals between deployed breathing apparatus wearers and an external entry control board or software system.

3.2 Intended use

When the product is used with an approved compressed air cylinder, mask and lung demand valve, the breathing apparatus provides a wearer with respiratory protection for working in contaminated or oxygen-deficient conditions.

The electronic monitoring system provides accurate cylinder pressure, time, and temperature information, and activates alarm signals at critical points. The integrated DSU provides clear, distinct, and easily recognized alarm signals that indicate wearer immobilization or a call for help or attention.

The compressed air cylinder, mask, lung demand valve, and other accessories used with this product must be certified Dräger components. They must be assembled in an approved configuration and used as described in this document and in separate instructions supplied with the accessories, otherwise operation of the product may be impaired.

3.3 Use in explosive atmospheres

The PSS AirBoss Connect, as defined in the feature description (section 3.1), is type tested for use in potentially explosive atmospheres and is suitable for use in hazardous areas up to and including zone 0 and zone 20. For further information please contact Dräger.

3.4 Limitations on use

All electronic devices could suffer a temporary loss of function if subjected to high levels of RF radiation. The system operates with no loss of performance or function when the RF radiation is removed.

3.5 Approvals

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

EU approvals	
CE 2575	CE marking and identification number of notified body
ITS-I 21 ATEX 29986	ATEX approval certificate reference
IEC approvals	
IECEX ITS 21.0025	IECEX approval certificate reference
UK approvals	
UKCA 0359	UKCA marking and identification number of approval body
ITS 21 UKEX 0328	UKEX approval certificate reference

Electronic sub-assemblies are suitable for use in the following zones:

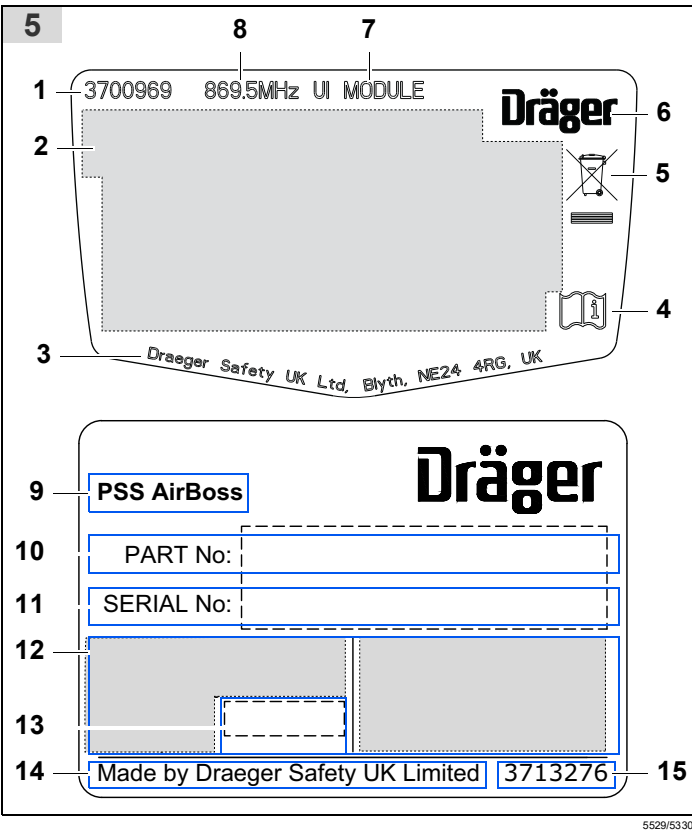
I M1 Ex ia I Ma
II 1G Ex ia IIC t4 Ga
II 1D Ex ia IIIB T135 °C Da
Ta –30 °C to +60 °C

3.6 Product marking and symbols

3.6.1 Product marking

Do not remove or alter any product label or marking.

Labels (Fig 5) on the product provide the following information:



No	Description
1	Dräger part number
2	Approval information (see section 3.5)
3	Address of manufacturer
4	Attention! Read and comply with the instructions for use.
5	Product disposal (see section 9)
6	Manufacturer
7	Component name
8	Operating frequency
9	Product name
10	Dräger part number
11	Dräger serial number
12	Approval information (see section 3.5)
13	Year of manufacture
14	Manufacturer
15	Label part number





















The following symbols can also be found on the product.

Symbol	Description
	Radio-frequency identification symbol
	Note for disposal
	Caution! Follow the instructions for use.


Refer to the relevant authority for explanation of approval body symbols and marking on the product.

3.6.2 LCD screen symbols

General symbols			
✓	Passed or complete	⊖	Open cylinder valve
✗	Failed or cancelled	⊕	Close cylinder valve
⏻	Switch off/on	🔊	Cylinder pressure too low
↺	Retry or refresh	🚫	Leak test fail
⌛	Cancel	🔊	Leak test pass
🔋	Battery good – Full	🔊	Leak test error
🔋	Battery good – 3/4	🔊	Leak test timing


General symbols			
	Battery good – half		Timed out
	Battery warning		PC Link connection
	Battery critical		Read card
	Manual distress alarm		Invalid card content
	Automatic distress alarm		No card detected
	Perform leak test		Quiet mode
Telemetry symbols			
	Active communication		Voluntary withdrawal
	Lost communication		Evacuate
	Not logged on		
Retreat alert symbols			
	TTR		Arrival point
	Retreat		

4 Use

 **WARNING**


Only trained and competent users (those who have attended a relevant training course) are permitted to prepare and use this product.

- Ensure that any accessories, ancillary equipment, and other protective clothing items do not interfere with the breathing apparatus and do not create a safety hazard.

 **WARNING**

The effective working duration of the breathing apparatus depends on the initial air supply available and the breathing rate of the wearer.

- Fill compressed air cylinders to their full rated pressure before use.
- Do not commence any operation using a cylinder that is less than 90 percent full.

 **CAUTION**


Equipment damage can cause the release of high-pressure air.

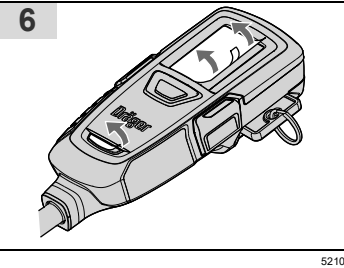
- Do not apply excessive force or use tools to open or close a cylinder valve.
- Do not drop or throw down the breathing apparatus.

4.1 Preparation for use

4.1.1 First use of the breathing apparatus

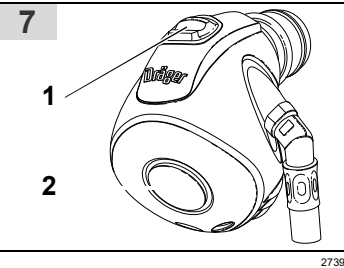
On receipt of the product, the LCD screen and LED panel have thin flexible film covers for protection. Remove the film covers before the first use (Fig 6).

-  The LCD screen and LED panel also have external protective covers. Do not remove the protective covers.



4.1.2 Before using the breathing apparatus

1. Carry out a visual inspection of the breathing apparatus (see section 6.3.1).
2. If using a breathing apparatus with universal accessory clips, ensure that blanking plugs are fitted to all clips that are not fitted with accessories.
3. Fit the batteries if necessary (see section 4.5.6).
4. Fit the cylinder (see section 4.5.7).
5. If using a breathing apparatus with an adjustable backplate, adjust the height to the position required by the wearer (see section 4.5.3).
6. Check the male element of the medium-pressure quick coupling for burring (see section 6.3.2).
7. If using a push-in type lung demand valve, check the connector for lubricant (see section 4.5.4).
8. If using a positive pressure lung demand valve, press the reset button (Fig 7, Item 1) to switch off the positive pressure.



9. Carry out a full functional test of the breathing apparatus (see section 6.3.4).
10. Connect the lung demand valve to the mask (see the lung demand valve instructions for use). Check the security of attachment by gently attempting to pull the coupling apart.
11. Put on the breathing apparatus (see section 4.5.1).

4.2 Using Connect ECU

4.2.1 Operating concept

4.2.1.1 System controls

The following controls activate product functionality.

- Press = Press and release the button.
- Hold = Press and hold the button for 2 seconds.

Each time a button is pressed a single tone sounds, or the alarm volume is briefly reduced if an alarm is sounding.

Control	Action	Function
Left-hand button	Press	Selects the choice indicated on screen
		Activates the LCD screen if deactivated
		Cycles through available operational information (remaining time, temperature, etc.)
	Hold	Switches on the system if switched off ¹ Displays a menu if menu options are available
Right-hand button	Press	Selects the choice indicated on screen
		Activates the LCD screen if deactivated
		Cycles through available operational information (remaining time, temperature, etc.) Acknowledges an evacuation request during telemetry operations
	Hold	Switches on the system if switched off ¹ Sends a voluntary withdrawal ² request during telemetry operations
Both buttons	Hold	Switches on the system if switched off ¹ Switches off the system if switched on ¹ Silences or cancels alarms
Manual alarm button	Hold	Activates the manual distress alarm (including when the system is switched off)
Key	Remove	Switches on the system if switched off ¹
	Insert	Switches off the system if switched on ¹ Silences or cancels alarms ¹
Cylinder valve	Open	Switches on the system if switched off
Connect ECU UI module	Move	Cancels the DSU pre-alarm when activated
Programmable card	Read	Uploads card data to the system memory

1. If configured
2. Voluntary withdrawal is referred to as early retreat during Retreat Alert operations.



4.2.1.2 Alarm patterns

Pre-alarm signal

An increasing-volume 3-tone alarm sounds, and the red and blue LEDs on the Connect ECU UI module flash.

Full alarm signal

A high-pitched repeating alarm tone sounds.

- During DSU alarms, the red and blue LEDs flash 3 times intermittently.
 -  displays during automatic distress alarms.
 -  displays during manual distress alarms.
- During thermal exposure alarm 2, the red LEDs flash twice per second.
- During system fault alarms, the red LEDs flash once per second.

Low-pressure alarm 1

An intermittent high-pitched alarm sounds, the red LEDs pulse every 3 seconds, and the graphical pressure display turns red.

Low-pressure alarm 2

An intermittent high-pitched alarm sounds, the red LEDs flash once, and the graphical pressure display remains red.

4.2.1.3 Switching on


Normal switch on

Switch on the system using any of the following:

- Install the power pack.
- Hold the left-hand or right-hand button (configuration-dependent).
- Simultaneously hold the both side buttons.
- Remove the key (configuration-dependent).
- Open the cylinder valve to pressurize the pneumatic system.

Self-test

When the system switches on (with or without an air cylinder fitted), the self-test runs. The system indicates a self-test pass or fail.

- Self-test pass. The system enters the start-up sequence (see section 4.2.1.5).
- Self-test fail. The Connect ECU UI module displays the fault code, and the red and blue LEDs flash 3 times intermittently.
 - Note the fault code and contact service personnel or Dräger.
 - The system automatically switches off after the preset time. To switch off immediately, press the right-hand button .

System information switch on

Hold the left-hand button to switch on and display system information including serial numbers, firmware versions, approval information, etc.

- If there is more than one page, press the left-hand button to scroll through system information.
- Press the right-hand button to return to the normal switch on sequence.

4.2.1.4 Alarm switch on


If the manual alarm of the DSU activates when the system is off, the system automatically switches on in alarm mode. The self-test and start-up sequences are omitted when the system switches on in an alarm mode.

Manual alarm switch on

To switch on the system and immediately activate the manual distress alarm, press the manual alarm button.


4.2.1.5 Start-up

When the self-test completes successfully the Connect ECU UI module displays the start-up menu. The contents and order of the menu can be configured individually for different switch-on methods.


-  Some start-up menu content is mandatory when the device is switched on by installing the power pack.

When all applicable menu options have been displayed the device enters operational mode (see section 4.3.1).

- Press the left-hand button or right-hand button to accept or acknowledge the on-screen message and progress to the next stage immediately.
- If failure conditions are detected, the system switches off. Failure conditions include critical battery level, system time-out, leak detected, and system errors.


-  If the system switches off and is still pressurized, it could immediately switch on and restart the start-up sequence.

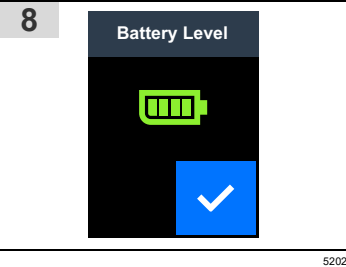
Start-up sequence



- If the system is switched on by installing the power pack, the system will detect which power pack has been installed.
 - If a primary power pack has been installed, the user is prompted to confirm whether the batteries have been replaced.
 - If the user confirms that the batteries have been replaced, the user will be prompted to confirm the battery type (alkaline or lithium).
- Battery level (see section 4.2.2).
- Cylinder selection (see section 4.2.3).
- PC Link. Select  to enable wireless connection to PC Link (see section 3.1.8.1).
- High-pressure leak test (see section 6.3.4.2).
- Read card (see section 4.2.4.1).
- Quiet mode (see section 4.2.4.2).

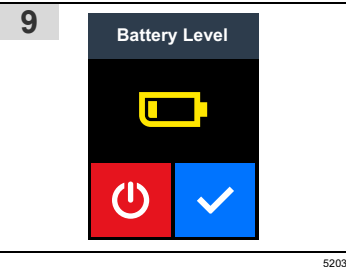
4.2.2 Battery level


The battery level is indicated as follows:

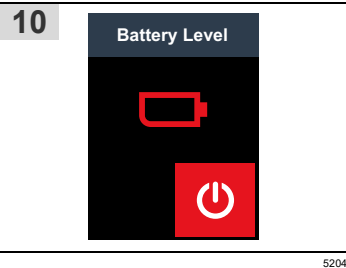
- Battery good (Fig 8). The battery charge is sufficient to remain above the critical level during the current operation.
 - Select  to proceed.



- Battery warning (Fig 9). The battery charge could reach the critical level during the maximum operating time available for the breathing apparatus configuration.
 - Select  to proceed, or select  to switch off.
 - Replace the batteries before the next operational use.

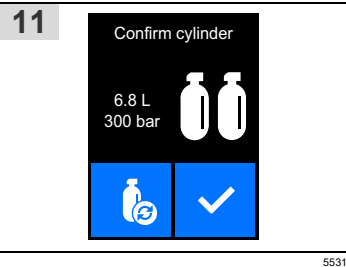


- Battery critical (Fig 10). The battery charge is not sufficient to support an operational use.
 - Select  to switch off.
 - Replace the batteries.



4.2.3 Cylinder selection

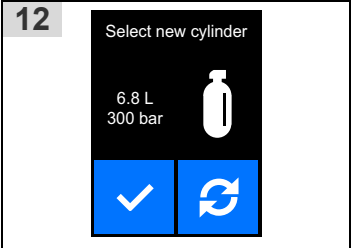
The Cylinder Selection screen shows the currently selected cylinder.



- Press the right-hand button to confirm the currently selected cylinders and proceed to the next sub-menu (if any are configured).



- Press the left-hand button to open the Select New Cylinder screen.



5532




- Press the left-hand button to select the currently displayed cylinder size.
- Press the right-hand button to switch to the next configured cylinder size.

4.2.4 Additional operating functions

The functions in this section are only available if they are pre-configured in the system. The functions can be pre-configured during manufacture or by using the PC Link available from Dräger. More information about PC Link and configuration settings is in section 3.1.8.1.

4.2.4.1 Read card



Use this procedure to upload information from a user ID card or a configuration card. See section 3.1.3.9 for more information about card types.

1. Switch on the system.
2. During the start-up sequence, present the card when the read card symbol  is displayed.
3. Hold the card against the front of the Connect ECU UI module and follow the on-screen instructions.
4. Observe the following:
 - Incorrect user ID or configuration data displayed. Select **✗**, and retry using the correct card.
 - Invalid card content . Invalid or corrupt data on card. Select **✓** to retry, or **✗** to return to the start-up sequence.
 - No card detected . Card not read within the permitted time. Select **✓** to retry, or **✗** to return to the start-up sequence.
5. If card read errors continue to occur, contact service personnel or Dräger.


4.2.4.2 Quiet mode

Quiet mode allows the user to select reduced volume alarms. It is intended for use when loud alarm noise is not wanted. Examples of use are operating in a restricted space such as a chemical protective suit or when working in a repair workshop.

Selecting quiet mode

1. Switch on the system.
2. During the start-up sequence, select activate quiet mode .
 - The alarm volume is reduced for the current operation only. The system automatically resets to full alarm volume when it is switched off.
 - Timed out . On-screen instructions not carried out within the permitted time. The system automatically returns to the start-up sequence.

4.2.4.3 Retreat alert (turn-around retreat alert)

Retreat Alert is an alternative warning protocol that can be used if it is applicable in the country of use. When configured for Retreat Alert, the system calculates a retreat pressure and time to retreat (TTR) in minutes. The TTR is displayed on the Connect ECU UI module screen with the TTR symbol . When the cylinder pressure decreases to the retreat pressure, audible and visible signals inform the wearer.

There are 2 retreat pressure calculation methods: initial retreat pressure and mission retreat pressure.

Initial retreat pressure


On opening the cylinder valve, the retreat pressure defaults to 2/3 of the start pressure. (The start pressure is the initial pressure measured when the cylinder valve is opened.)

- For example: a 180 bar start pressure = 120 bar initial retreat pressure.



Mission retreat pressure

At any time before the cylinder pressure reaches the initial retreat pressure, the wearer can set an arrival pressure at the mission arrival point. The system then recalculates the retreat pressure as: 2 × (start pressure – arrival pressure).


- For example: with a start pressure of 200 bar and an arrival pressure of 150 bar:
⇒ 2 × (200 – 150) = 100 bar mission retreat pressure.

 If the calculated retreat pressure is less than 60 bar, the system defaults to a retreat pressure of 60 bar.

Using Retreat Alert

1. Open the cylinder valve.
 - The initial retreat pressure is calculated, and the TTR displays on screen.
2. At the mission arrival point, hold the left-hand button to open the arrival menu.
 - Press the left-hand button to confirm arrival. Arrival point  displays for approximately 1 second as the system calculates the mission retreat pressure. The new TTR then displays on screen.
 - Press the right-hand button to show further options (or close the menu if there are no further options).
3. When the retreat pressure is reached, an intermittent alarm tone sounds and retreat  displays.
4. Acknowledge the alarm by pressing and releasing the right-hand button.
 - The Connect ECU UI module screen changes to display remaining time.

Early retreat

To cancel Retreat Alert before the retreat pressure is reached, hold the right-hand button until retreat  displays. Retreat Alert cancels and the Connect ECU UI module screen changes to display remaining time.

4.3 During use



WARNING

Users should be in a safe area before the low-pressure alarm 2 begins to sound.

- Fully open all cylinder valves and ensure that they remain open during use.
- Evacuate to a safe area immediately if the low-pressure alarm 2 begins to sound during an operation.

4.3.1 Operational mode

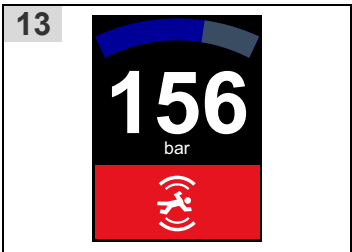
In the Operational mode, the display is divided in an upper and lower part:

- The upper part always display the pressure (see section 4.3.1.1).
- The lower part show additional information (see section 4.3.1.2).

The display will switch off after some time, unless an alarm is indicated or user input is required. The display can be switched on by pressing the left-hand or right-hand buttons. The display automatically switches itself on if there is a notification on the display, or if the pressure crosses one of the configured pressure thresholds.

4.3.1.1 Pressure display

The graphical pressure display shows the pressure relative to the rated capacity of the selected cylinder (Fig 13). If the measured pressure exceeds the rated capacity, the pressure bar will be full. The numeric pressure display shows the pressure in the configured pressure unit (bar, MPa, or psi). The colours of the numeric and graphical pressure display will change as the measured pressure crosses configured thresholds.



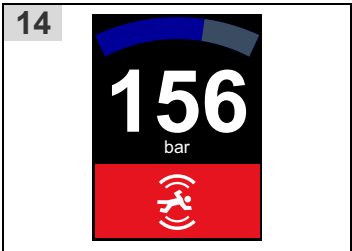
5207

4.3.1.2 Additional information

The lower part of the display show additional information and button indicators for user input. The additional information includes notifications to the user, information about alarms, battery charging status and a set of configurable information items. See section 4.3.1.3 for the configurable options.

The configurable information items is defined in a list, and the lower part of the display shows the first item in this list by default. The other information items can be navigated to using the left-hand and right-hand buttons. After a short time without any button presses, the display reverts to showing the first item.

When one or more alarms are active (Fig 14), the most severe alarm is indicated with the LEDs and sound. While an alarm is indicated, an icon representing the indicated alarm is added to the configured list of items. The indicated alarm takes precedence over any the configured items. All the information can still be navigated to via the left-hand and right-hand buttons.



5207

Certain events, such as a change of telemetry link status or if the motion sensor is disable or enabled, trigger a notification to the user in the lower part of the display. This notification is accompanied by a two short beeps. Notifications will disappear after a short time, or they can be dismissed by pressing the left-hand or right-hand button.

The lower part of the display is also used to indicate button functions. If the user is required to confirm an action, the action will be indicated by an action icon (blue background) in the lower left or lower right corner of the display according to which button needs to be pressed. If a side button is held, the action will show up next to the held button, with a countdown (3–2–1) next to it.

4.3.1.3 Configurable information items

- Elapsed time.
- Time to whistle.
- Time to turnaround (Type 1).
 - This shows Time To Turnaround when at the working location, and Time to whistle on the way to and from the working location.
- Time to turnaround (Type 2).
 - This shows Time To Turnaround when on the way to and at the working location, and Time to whistle on the way from the working location.
- Temperature.
- Telemetry link status.
- Telemetry ID.

4.3.2 Normal operation

4.3.2.1 Cylinder pressure

- Regularly check the cylinder pressure and time on the LCD screen.
- The graphical pressure display turns amber when approximately half of the cylinder air capacity remains.

- When low-pressure alarm 1 activates, approximately 25% of the cylinder air capacity remains.
 - Begin the retreat immediately.

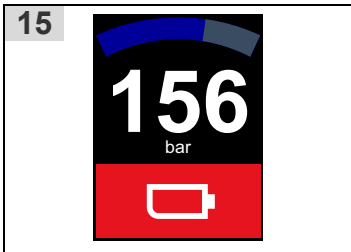
4.3.2.2 DSU functions

- To call for emergency help or attention, press the manual alarm button to activate the full alarm.
- If the pre-alarm activates, and is not required, move the Connect ECU UI module to cancel the alarm. Do not use the buttons to cancel the pre-alarm.
 - If the pre-alarm is not cancelled, the full alarm activates after the preset time.
- Cancel the full alarm as follows when required:
 - Key configuration. Fit the key. With the key fitted, the system is not in active mode. It is in a non-operational mode. Cylinder pressure is displayed on the LCD screen, but time is not displayed.
 - Button configuration. Simultaneously hold the left-hand and right-hand buttons until the alarm stops.

4.3.2.3 Critical battery level

If the battery reaches the critical level during use, the battery critical symbol appears on the event screen (Fig 15)

- Evacuate to a safe area immediately.
- When the symbol appears, there is approximately 1 hour of battery use remaining.

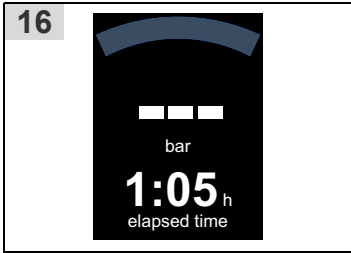


5258

4.3.2.4 During use system faults

System faults that occur during use are recorded in the system memory. The Connect ECU UI module then displays a fault code when the system switches off (see section 5.2.1). Note the fault code and contact service personnel or Dräger.

- If a motion sensor fault occurs during use, the full alarm activates (see section 4.2.1.2).
 - Cancel the alarm and evacuate to a safe area immediately.
 - A recurring motion sensor fault activates the alarm continuously during the evacuation.
- If a sensor fault occurs, the pressure value is blanked and no pressure is shown on the graphical pressure display (Fig 16). The time displayed on screen continues to count as normal.
 - Evacuate to a safe area immediately.



5259

4.3.3 Telemetry and Retreat Alert

Telemetry and Retreat Alert are special functions that can be used with this product. The symbols used during these operations are shown in section 3.6.2.

- See section 4.2.4.3 for a description of Retreat Alert operations.
- For telemetry operations, observe the following:
 - To send a voluntary withdrawal request, hold the right-hand button.
 - To acknowledge an evacuation request, press the right-hand button.
 - See the telemetry instructions for use for all other information about telemetry operations.

4.3.4 Supplementary air



WARNING

Using supplementary air may greatly reduce the operating duration of the air supply.

- When supplementary air is used, the user must immediately evacuate to a safe area.
- The reason for using supplementary air must be investigated and repaired before reusing the breathing apparatus.

If supplementary air is required, briefly press the rubber cover at the front of the lung demand valve to deliver extra air into the mask.


4.4 After use

4.4.1 Switching off the Connect ECU

The system cannot be switched off unless the cylinder pressure indicated on the Connect ECU UI module is below a preset value.

- Close the cylinder valve and fully vent the pneumatic system before attempting to switch off.
- The battery level is displayed as the system switches off.
- If the Connect ECU UI module displays a fault as the system switches off, note the fault code and contact service personnel or Dräger.

Key configuration

- After normal use with the key removed: refit the key.
- If the system was activated with the key fitted (during functional testing for example): hold the left-hand button until  momentarily displays, then immediately release the button.

Button configuration

- Hold the right-hand and left-hand buttons until the display clears, then immediately release the buttons. If the key was removed, refit the key.

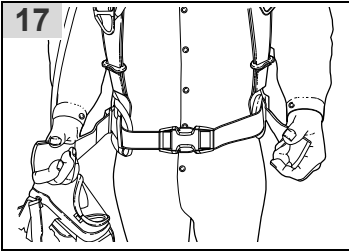
4.4.2 After using the breathing apparatus

1. Take off the breathing apparatus (see section 4.5.2).
2. Carry out a visual inspection of the breathing apparatus (see section 6.3.1).
3. Carry out a full functional test of the breathing apparatus (see section 6.3.4).
4. If using a push-in type lung demand valve, check the connector for lubricant (see section 4.5.4).
5. Remove the cylinder if necessary (see section 4.5.7).
6. Charge the cylinder (see section 6.3.5).
7. Pass the breathing apparatus to the service department with details of any faults or damage that occurred during use.

4.5 Common tasks

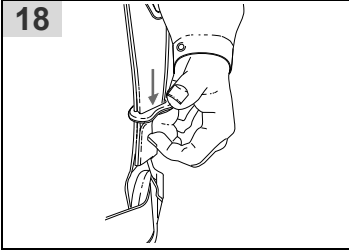
4.5.1 Putting on the breathing apparatus

1. Fully loosen the shoulder straps and waist belt.
2. Put on the breathing apparatus.
3. Check that the shoulder pads are not twisted then take the weight of the breathing apparatus on the shoulders by pulling the shoulder pull-down straps. Do not fully tighten at this stage.
4. Close the waist belt buckle.
5. Pull the ends of the waist belt forward until the belt padding fits securely and comfortably over the hips (Fig 17).



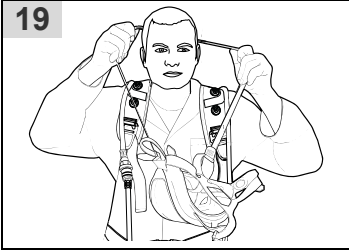
5283

6. Tuck the belt straps behind the waist pad.
7. Pull the shoulder pull-down straps until the breathing apparatus rests securely and comfortably on the hips. Do not over tighten.
8. Pull the strap retainers down to secure the strap ends (Fig 18).



5284

9. Fully loosen the mask straps.
10. Place the neck strap over the back of the neck (Fig 19).



5292

11. Press the reset button (Fig 7, Item 1).
12. Open the cylinder valve slowly, but fully, to pressurize the system.
13. Carry out the start-up condition checks (see section 4.2.1.5) and leak tests (see section 6.3.4). Carry out other start-up functions as required.
 - On completion of the start-up sequence, the system enters active mode.

i Dräger recommend that the cylinder should be full at the start of any operation or sequence of operations. The cylinder pressure must be at least 165 bar to carry out the high-pressure leak test.

14. Check the cylinder pressure reading to ensure that there is sufficient air in the cylinder for the operation.
15. Carry out a functional test of the electronic system (see section 6.3.4).
16. Set the DSU automatic distress alarm for operation as follows.
 - Key configuration. Remove the key to activate the motion sensor.
 - Button configuration. Remove the key if the motion sensor is required.
17. Put on the mask and check the seal between the mask and the face of the wearer (see the mask instructions for use).

4.5.2 Taking off the breathing apparatus

WARNING

Removing the breathing apparatus in a hazardous breathing environment is unsafe.

- Do not remove the breathing apparatus until in a safe breathing environment.

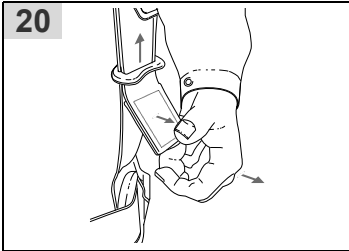
NOTICE

The product can be damaged if removed incorrectly.

- Do not remove the mask by pulling the lung demand valve.

1. Loosen the mask straps.
2. At the point when the seal between the mask and face is broken, press the reset button (Fig 7, Item 1).
3. Fully remove the mask and extend all the straps.
4. Close the cylinder valve.
5. Press the front button (Fig 7, Item 2) to vent the pneumatic system.
6. Press the reset button (Fig 7, Item 1).
7. Release the waist belt buckle.

8. Lift the shoulder harness ends to release the strap retainers (Fig 20) and then lift the shoulder strap buckles to loosen the straps.

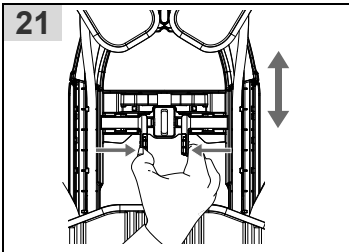


5285

9. Take off the breathing apparatus.

4.5.3 Adjusting the backplate height

1. Lift the apparatus into the vertical position.
2. Simultaneously press the two spring-loaded buttons (Fig 21).



5289

3. Slide the yoke in the required direction then release the buttons.
4. Continue sliding the yoke until the buttons engage and lock the yoke in the required position.

4.5.4 Checking and re-lubricating the lung demand valve coupling

This task applies only to the following lung demand valve types: A and ESA.

As a guide, lubricant should be felt on the fingers but not seen. If relubrication is required, lightly apply Molykote® 111 (other lubricants are not tested and may damage the equipment).

- For type A check for lubricant on the O-ring of the lung demand valve connector.
- For type ESA check the outer surface of the male part of the push-in connector on the lung demand valve.

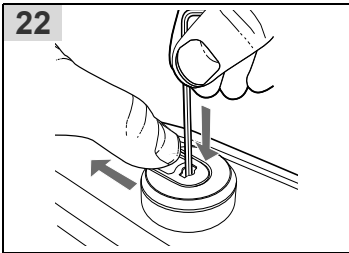
4.5.5 Using universal accessory clips

4.5.5.1 Fitting an accessory to a universal accessory clip

Work equipment

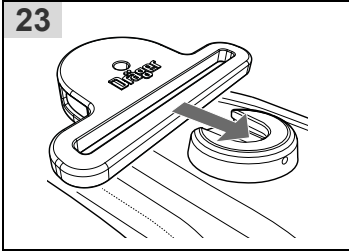
- 2.5 mm hexagon key

1. Remove the blanking plug from the universal accessory clip (see Fig 22).



5293

2. Slide the compatible accessory into the universal accessory clip (see Fig 23).



5294

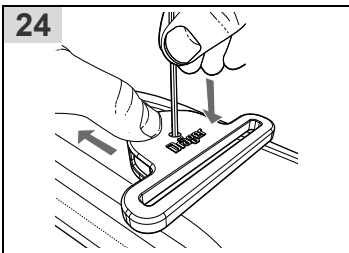
3. Ensure that the accessory is securely retained by the universal accessory clip.

4.5.5.2 Removing an accessory from a universal accessory clip

Work equipment

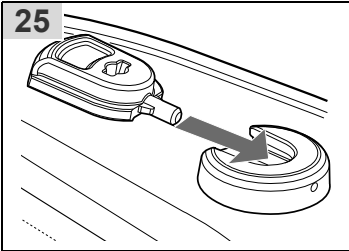
- 2.5 mm hexagon key

1. Remove the accessory from the universal accessory clip (see Fig 24).



5295

2. Slide a blanking plug into the universal accessory clip (see Fig 25) to protect it.



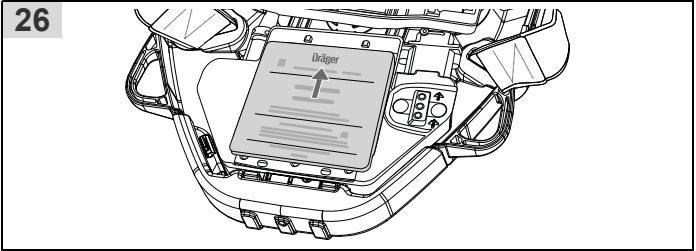
5329

3. Ensure that the blanking plug is securely retained by the universal accessory clip.

4.5.6 Fitting or replacing batteries

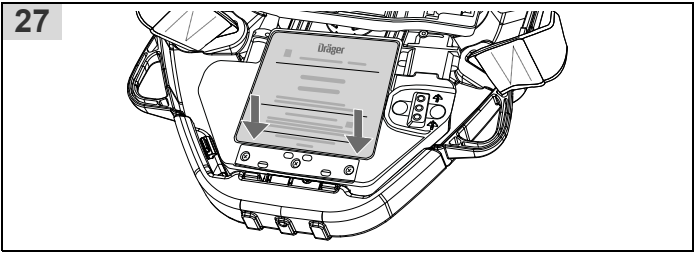
4.5.6.1 Fitting the power pack

1. Inspect the power pack and electronic monitoring system (see section 6.3.1), paying particular attention to the battery terminals and sealing rim.
2. Insert the power pack into the recess in the electronic monitoring system (Fig 26).



5429

3. Push down firmly to lock the power pack (Fig 27). Ensure that it is securely locked in place.
 - When the power pack connects, a tone sounds and the start-up sequence commences (see section 4.2.1.5).

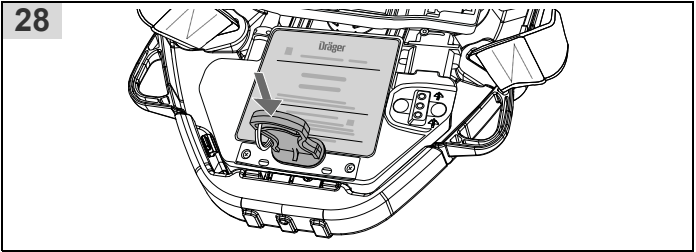


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4.5.6.2 Removing the power pack

i A removal key (Dräger part number 3356667) is supplied with the breathing apparatus.

1. Insert and press down the removal key (Fig 28).



5431

2. Remove the power pack.

4.5.6.3 Replacing 1.5 V batteries

WARNING

Improper handling and use of batteries may cause an explosion, a fire, or a chemical hazard.

- Do not remove or install the batteries in a flammable atmosphere.
- Do not expose the batteries to heat sources.
- Do not attempt to recharge any non-rechargeable battery.
- Do not short out the battery terminals.
- Use only the recommended battery type.
- Replace batteries as a matched set and do not mix new and used batteries.

NOTICE

Batteries that are not correctly disposed of may cause an environmental hazard.

- Dispose of used batteries in accordance with national or local regulations.

Use only the following approved battery types.

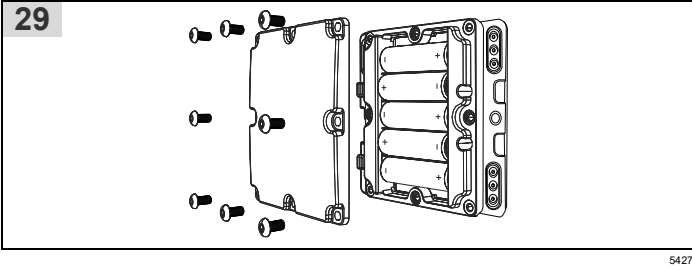
- Procell® LR6 (1.5 V)
- Varta® Industrial Pro LR6 (1.5 V)
- Energizer® Ultimate FR6 (1.5 V)
- Ansmann® Industrial FR6 (1.5 V)
- Huiderei® FR6 (1.5 V)

Work equipment

- 2.5 mm hexagon key
- Torque wrench (1 Nm)

1. Remove the power pack (see section 4.5.6.2).

2. Remove the 8 screws (Fig 29) using a 2.5 mm hexagon key.



3. Remove the battery cover.
4. Remove the batteries.
5. Install a new set of batteries observing the polarity marked inside the pack.
6. Inspect the sealing ring inside the battery cover. Contact Dräger or service personnel if sealing ring replacement is necessary.
7. Refit the battery cover and tighten the screws. Do not over tighten (Dräger recommend tightening to 1 Nm (0.7 lbf ft)).

4.5.7 Fitting and removing compressed air cylinders

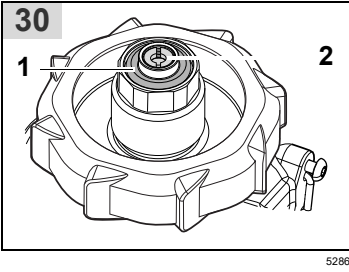
WARNING
High-pressure air release can cause injury to the user or other personnel near the breathing apparatus.
► Close the cylinder valve and fully vent the system before attempting to disconnect a cylinder.

WARNING
Impact damage to the cylinder valve or pressure reducer connector can prevent valve connection or cause an air leak.
► Handle the cylinder and breathing apparatus with care.

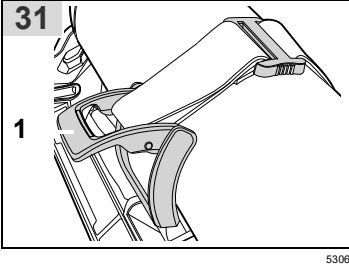
For cylinder connector types not described in this document, refer to the instructions for use supplied with the connector.

4.5.7.1 Fitting a compressed air cylinder with a threaded connector

1. Ensure that the cylinder is fully charged (see section 6.3.5).
2. Check the threads of the cylinder valve port and the pressure reducer. Ensure that the O-ring (Fig 30, Item 1) and the sintered filter (2) in the pressure reducer are clean and undamaged.



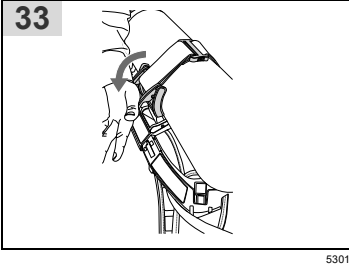
3. Lay the backplate horizontal, with the pressure reducer uppermost.
4. Ensure that the cam lever is fully open (Fig 31, Item 1).



5. Insert the cylinder through the cylinder strap.
6. Lift the cylinder and backplate into the vertical position (supported on the end of the cylinder opposite the valve).
7. Align the cylinder valve with the pressure reducer (Fig 32). Tighten the hand wheel using only the thumb and index finger until a definite stop is felt. Do not use tools or over tighten.



8. Place the backplate into the horizontal position.
9. Fully close the cam lever (Fig 33).

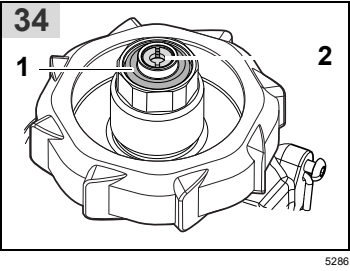


10. Check that the cylinder is secure. If it is not, adjust the cylinder strap (see section 4.5.7.7).

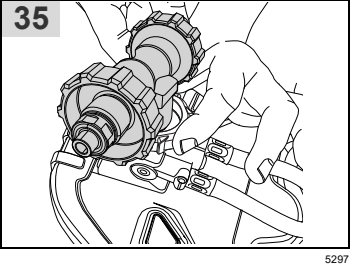
4.5.7.2 Fitting two compressed air cylinders with threaded connectors

1. Ensure that the cylinders are fully charged (see section 6.3.5).

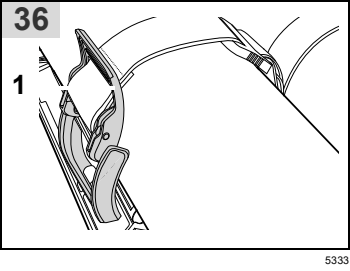
2. Check the threads of the cylinder valve port and the pressure reducer. Ensure that the O-ring (Fig 34, Item 1) and the sintered filter (2) in the pressure reducer are clean and undamaged.



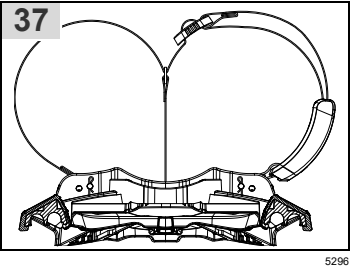
3. If not fitted, fit the connector piece on to the pressure reducer (Fig 35). Tighten the hand wheel using only the thumb and index finger until a definite stop is felt. Do not use tools or over tighten.



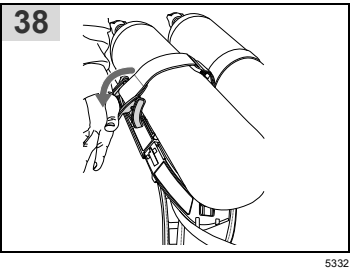
4. Lay the backplate horizontal, with the pressure reducer uppermost, and fully extend the cylinder strap.
5. Ensure that the cam lever is fully open (Fig 36, Item 1).



6. Form two loops in the cylinder strap with the centre strap (Fig 37).



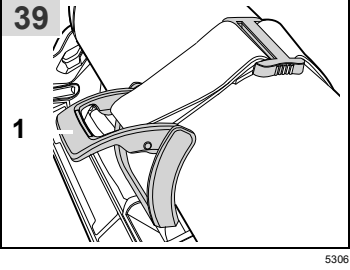
7. Insert the cylinders through the loops of the cylinder strap.
8. Align the cylinder valves with the connector piece then tighten the hand wheels using only the thumb and index finger until a definite stop is felt. Do not use tools or over tighten.
9. Fully close the cam lever (Fig 38).



10. Check that the cylinder is secure. If it is not, adjust the cylinder strap (see section 4.5.7.8).

4.5.7.3 Removing a compressed air cylinder with a threaded connector

1. Close the cylinder valve and fully vent the system.
2. Lay the backplate horizontal, with the cylinder uppermost.
3. Fully open the cam lever (Fig 39, Item 1).

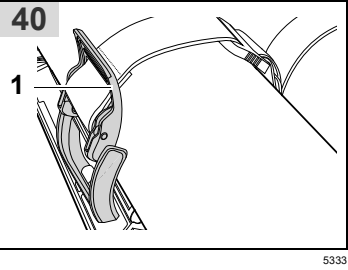


4. Disconnect the cylinder valve from the pressure reducer.
5. Lift the cylinder away from the pressure reducer and remove the cylinder.

4.5.7.4 Removing two compressed air cylinders with a threaded connector

1. Close the cylinder valve and fully vent the system.
2. Lay the backplate horizontal, with the cylinders uppermost.

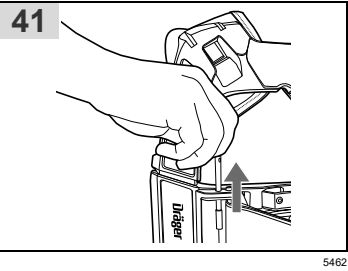
3. Fully open the cam lever (Fig 40, Item 1).



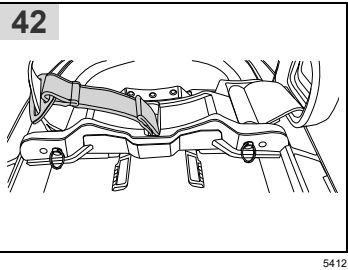
4. Disconnect the cylinder valves from the connector piece.
5. Lift the cylinders away from the connector piece and remove the cylinders.

4.5.7.5 Configuring a twin cylinder strap for use with a single cylinder

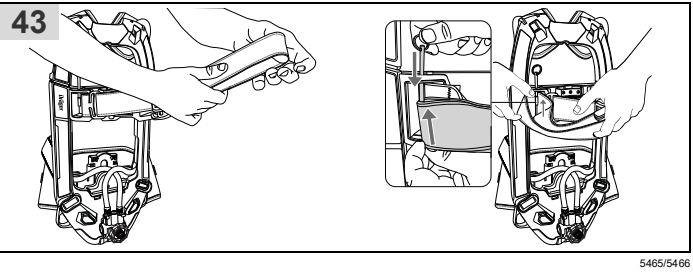
1. Pull the cylinder strap pin upwards (Fig 41).



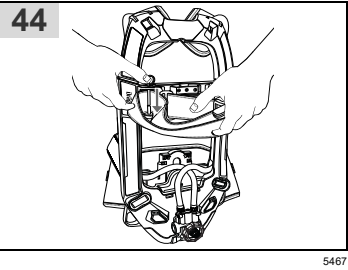
2. Move the centre strap over to the side opposite the cam lever (Fig 42).



3. Make a loop of the cylinder strap as shown and fit it to the cylinder strap pin (Fig 43).



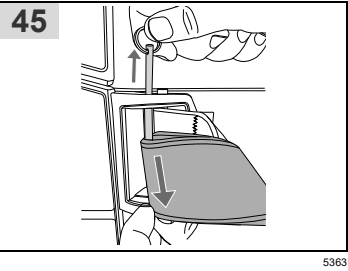
4. Push the cylinder strap pin all the way through the cylinder cradle and backplate (Fig 44).



5. Fit a cylinder to the breathing apparatus (see section 4.5.7.1).
6. Adjust the cylinder strap (see section 4.5.7.7).

4.5.7.6 Configuring a twin cylinder strap for use with two cylinders

1. Pull the cylinder strap pin upwards and remove the cylinder strap from the pin (Fig 45).

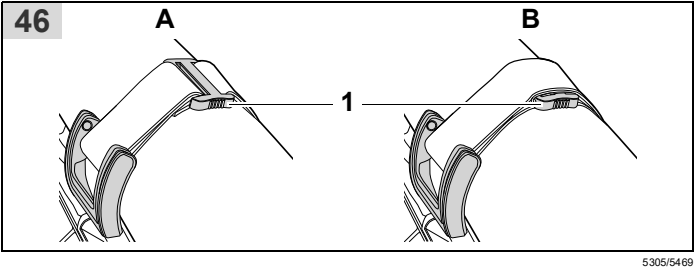


2. Push the cylinder strap pin all the way through the cylinder cradle and backplate.
3. Fit two cylinders to the breathing apparatus (see section 4.5.7.2).
4. Adjust the cylinder strap (see section 4.5.7.8).

4.5.7.7 Adjusting the single cylinder strap

1. Fit the cylinder but do not close the cam lever (see section 4.5.7.1).
2. Move the adjuster buckle (Fig 46, Item 1) so that the stitching is:
– Below the centre bar of the adjuster buckle (A, single cylinder strap).

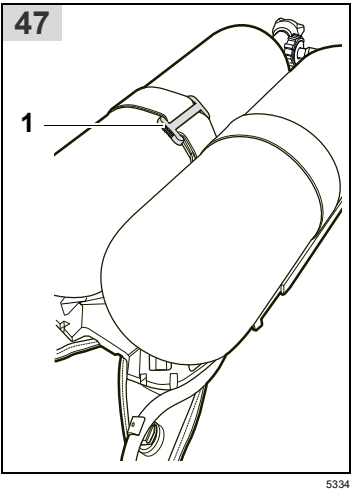
- Above the centre bar of the adjuster buckle (B, twin cylinder strap configured for use with a single cylinder).



3. Close the cam lever, and check that the cylinder is secure.
4. If the cylinder is not secure, release the cam lever and move the adjuster buckle to adjust cylinder strap tension.
 - Move the adjuster buckle toward the cam lever to loosen the strap.
 - Move the adjuster buckle away from the cam lever to tighten the strap.
5. Continue to test and adjust until the cylinder is secure.

4.5.7.8 Adjusting the twin cylinder strap

1. Fit the cylinders but do not close the cam lever (see section 4.5.7.2).
2. Move the adjuster buckle (Fig 47, Item 1) so that the stitching is below the centre bar of the adjuster buckle.



3. Close the cam lever, and check that the cylinders are secure.
4. If the cylinders are not secure, release the cam lever and move the adjuster buckle to adjust cylinder strap tension.
 - Move the adjuster buckle toward the cam lever to loosen the strap.
 - Move the adjuster buckle away from the cam lever to tighten the strap.
5. Continue to test and adjust until the cylinders are secure.

5 Troubleshooting

The troubleshooting guide shows fault diagnosis and repair information applicable to users of this product. Further troubleshooting and repair information is available in instructions for use supplied with associated equipment.

Where the troubleshooting guide shows more than one fault or remedy, carry out repair actions in the order that they appear in the guide.

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

5.1 Troubleshooting for breathing apparatus

Symptom	Fault	Remedy
High-pressure air leak or failed leak test	Loose or dirty connector	Disconnect, clean and reconnect couplings and retest
	Faulty hose or component	Substitute user replaceable accessories and retest
Air leak from medium-pressure hose connector at the pressure reducer (pressure relief valve) (see Fig 2)	Faulty O-ring, retainer, spring, or pressure reducer	Service task
Air leak from lung demand valve	Ice particles on sealing elements	Allow a rush of air to pass through the valve by pressing the front button (Fig 7, Item 2) then quickly switch off the positive pressure by pressing the reset button (Fig 7, Item 1)
Air leak from cylinder connector	Ice particles on sealing elements	Close the cylinder valve and vent the system. Disconnect then reconnect the cylinder. Pressurize the system by opening the cylinder valve slowly, but fully.
Poor sounding whistle	Whistle dirty	Clean the whistle flute and retest
Whistle not functioning	Activation mechanism fault	Service task
Difficulty connecting or disconnecting the medium-pressure quick coupling	Dirty connector	Disconnect, clean and reconnect couplings, and retest
	Burring of the male coupling	Replace the hose with the male coupling

5.2 Troubleshooting for Connect ECU

Symptom	Fault	Remedy
Fault indication during the self-test or when switching off	See section 5.2.1	Note the fault code and contact service personnel or Dräger

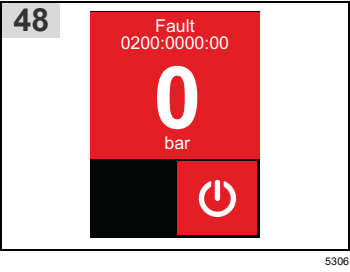
Symptom	Fault	Remedy
High-pressure leak test fail	Loose or dirty connector	Disconnect, clean and reconnect couplings and retest
	Faulty hose or component	Substitute user replaceable accessories and retest
Battery warning	Low battery level	Replace the batteries before the next operation ¹
Battery critical	Critical battery level	Replace the batteries before use ¹
Fails to switch on	Very low battery level	Replace the batteries ¹
	Poor battery connection	Inspect and clean the battery holder and terminals (see section 6.2). Contact service personnel or Dräger if there is any damage
Fails to switch off	Pressure reading is not below the preset value	Close the cylinder valve and fully vent the pneumatic system
	Key fault	Replace the key
LCD screen or LED panel obscured or illegible	Dirty screen or water/condensation ingress	Remove and clean the protective cover (see section 6.2)
	Protective cover marked or damaged	Replace the screen
	System fault or damage	Contact service personnel or Dräger

1. For battery replacement, see section 4.5.6.

5.2.1 Fault indication

Faults that are detected by the system are indicated on the screen with a fault code (see Fig 48). The code is separated into groups to identify the applicable system and nature of the fault.

If a fault indication displays during the self-test or when switching off, note the fault code and contact service personnel or Dräger. System faults which occur during use are described in section 4.3.2.



6 Maintenance

6.1 Maintenance table

Service and test the product, including out-of-use equipment, in accordance with the maintenance table. Record all service details and testing. Refer also to the instructions for use for other associated equipment.

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

Item	Task	Every month	Every year	Every 10 years
Complete product	Visual inspection (see section 6.3.1)	X		
	Functional testing (see section 6.3.4)	X		
	Breathing cycle and static tests ¹⁾		X	
Lung demand valve	Check the male element of the quick coupling for burring (see section 6.3.2)		X	
Pressure reducer	Inspect the sintered filter ^{1) 2)}		X	
	Inspect the high-pressure connector O-ring ^{1) 3)}		X	
	Overhaul. Contact Dräger for the Repair Exchange (REX) service ⁴⁾			X
Cylinder	Check test date of cylinder	X		
	Recertification		According to national regulations in the country of use	

1. These maintenance tasks can 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.
2. Replace the sintered filter if a drop in pressure reducer performance is observed during a flow check or if it is visibly damaged.
3. Replace the high-pressure connector O-ring if it is found to leak during functional testing or if it is visibly damaged.
4. 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.

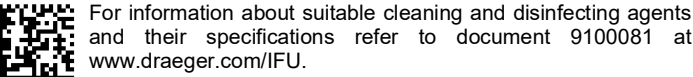
6.2 Cleaning and disinfecting

CAUTION

Trapped water and ice inside the pneumatic system can impair the operation of the product.
► Prevent any liquid from entering the pneumatic system, and thoroughly dry the product after cleaning and disinfecting.

NOTICE

Using cleaning and disinfecting methods not described in this section can damage the equipment.
► 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 and disinfecting solutions or water.



6.2.1 Cleaning and disinfecting the breathing apparatus

Clean the breathing apparatus if it is dirty. If the equipment has been exposed to contaminants, disinfect any components that come into direct and prolonged contact with the skin.

Refer also to the instructions for use for the lung demand valve, mask, and other associated equipment. Contact service personnel or Dräger if disassembly of pneumatic or electronic components is required.

Work equipment

- Use only clean lint-free cloths
1. Clean the breathing apparatus manually using a cloth moistened with cleaning solution to remove excess dirt. Remove and clean the following:
 - The protective covers (see section 6.3.3). Clean the protective covers and the LCD screen and LED panel.
 - The power pack (see section 4.5.6.2). Clean the power pack and compartment, and ensure that the contacts and locking mechanism are clean, dry and undamaged.
 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. Carry out a full electronic monitoring system functional test (see section 6.3.4.1).

6.3 Maintenance tasks

6.3.1 Visual inspection

A visual inspection must fully check the product including all component parts and accessories.

1. Check that the product is clean and undamaged, paying particular attention to pneumatic system components, connectors, and elastomeric components such as hoses.
 - Typical signs of damage that can affect the operation of the product include impact, abrasion, cutting, corrosion, and discoloration.
2. Report damage to service personnel or Dräger, and do not use the product until faults are rectified.

6.3.2 Checking the medium-pressure quick coupling

This task applies only to breathing apparatus with a removable lung demand valve. If there is any difficulty disconnecting or connecting, see the troubleshooting information in section 5.

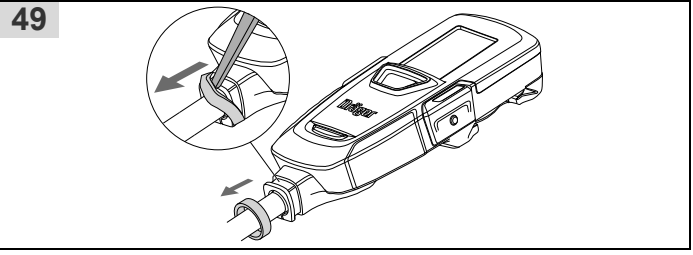
1. Press the male element into the female element of the coupling until an audible click is heard.
2. Disconnect the male element from the female element of the quick coupling.
3. Reconnect the quick coupling as per step 1.

6.3.3 Replacing the Connect ECU UI module protective covers

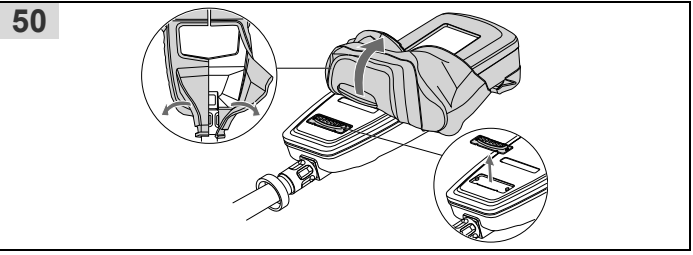
NOTICE

Sharp objects can damage the equipment.
► Do not use sharp objects or tools to remove the rubber cover.

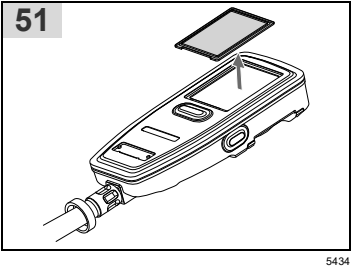
1. If the Connect ECU UI module is fitted with a key:
 - a. Remove the key.
 - b. Switch off the system (see section 4.4.1).
2. Remove the rubber band from the bottom of the rubber cover and then slide it down the hose (Fig 49).



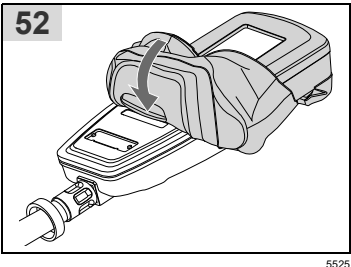
3. Fold back the rubber cover (Fig 50).



4. Remove the protective cover from the LED panel.
5. Fully remove the rubber cover from the Connect ECU UI module.
6. Remove the protective cover from the LCD screen (Fig 51).

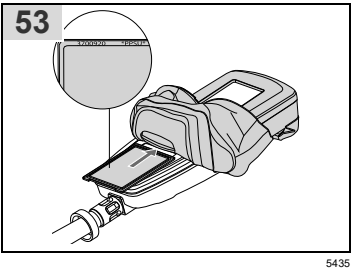


7. Clean (see section 6.2), inspect (see section 6.3.1) and replace the protective covers as necessary.
8. Ensure that the Connect ECU UI module is clean and undamaged.
9. Partly fit the rubber cover to the Connect ECU user interface (Fig 52).



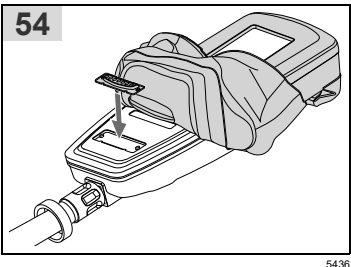
10. Fit the protective cover over the LCD screen, using the partly fitted rubber cover to hold the protective screen in place (Fig 53).

Ensure that the cover is orientated as shown, with the notch towards the bottom of the screen and the part number facing upwards (Fig 53).



11. Fit the protective cover over the LED panel then fold the rubber cover fully over the Connect ECU user interface while holding the LED panel in place (Fig 54).

Ensure that the cover is orientated as shown, with the notch towards the bottom of the screen and the part number facing upwards (Fig 54).



12. Fit the rubber band to the bottom of the rubber cover.



6.3.4 Functional testing

WARNING
Failure of the product to meet any of the standards or parameters during functional testing, or any visible signs of damage, indicates a possible system fault.
► Do not use the product and report the fault to trained maintenance personnel or contact Dräger.

6.3.4.1 Electronic monitoring system testing





If the system fails to operate as described in this section or if any fault indication appears, stop testing. Investigate and repair the fault before proceeding (see section 5 for remedy information).

The functional test is carried during preparation for use and periodic or post-repair testing of the product. To test only the electronic monitoring system, start the test at step 1. To carry out a full functional test, prepare the breathing apparatus as detailed in preparation for use (see section 4.1) and start the test at step 2.


- Press the left-hand button.
 - The self-test and start-up sequences run and the system adopts the active mode.
- Allow the screen to deactivate.
- Press the left-hand or right-hand button.
 - The screen activates.
- Press the manual alarm button.
 - The full alarm activates (see section 4.2.1.2) with the manual distress alarm symbol  on screen.
- Cancel the alarm.
 - Key configuration. Remove and refit the key.
 - Button configuration. Simultaneously hold the left-hand and right-hand buttons until the alarm stops.
- Remove the key.
- Immobilize the Connect ECU UI module.
 - After 21 to 25 seconds, the pre-alarm activates (see section 4.2.1.2).
- Move the Connect ECU UI module to cancel the alarm.
- Immobilize the Connect ECU UI module again and ignore the pre-alarm.
 - After approximately 8 seconds of pre-alarm, the full alarm activates with the automatic distress alarm symbol  on screen.

10. Refit the key to cancel the alarm.

6.3.4.2 High-pressure leak test

- Press the reset button of the lung demand valve.
- Start the leak test.
- Follow the on-screen instructions, and observe the following:
 - Leak test pass . The system automatically progresses to the next stage.
 - Leak test fail . Close the cylinder valve, fully vent the system, and investigate and repair the leak (see section 5).
 - Timed out . On-screen instructions not carried out within the permitted time. Recommence the test.
 - Cylinder pressure too low . Recommence the test using a cylinder that has a pressure above the minimum leak test start pressure.

The breathing apparatus cylinder pressure must be above the minimum leak test start pressure of 165 bar.

- Leak test error . The error is due to system pressure failing to stabilize sufficiently within the permitted time. Re-attempt the test. If the error re-occurs, do not use the breathing apparatus and contact service personnel or Dräger.

6.3.5 Charging a compressed air cylinder

WARNING
Air quality for compressed air cylinders must meet the requirements for breathable air according to EN 12021.
► Ensure that the air supply meets the EN 12021 requirements.

Refer to the instructions for use supplied with the cylinder and the charging apparatus for details of charging a compressed air cylinder.

7 Transport

Transport the product in its original packaging.

8 Storage

8.1 Storage preparation

- Extend the shoulder straps, waist belt, and the straps of the mask (see section 4.5).
- Place the 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.
- Remove the power pack (see section 4.5.6.2).
 - If the power pack has replaceable 1.5 V batteries, remove the batteries from the power pack (see section 4.5.6.3).

8.2 Storage conditions


- Store the product 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 product securely to any raised mounting point to prevent it from falling.
- If storing the equipment in a vehicle, ensure that the breathing apparatus is securely retained and does not interfere with the operation of the vehicle.

9 Disposal

9.1 General

Dispose of the product in accordance with applicable rules and regulations in the country of use.

9.2 Disposal of electrical and electronic equipment

 Electrical and electronic equipment must not be disposed of as household waste. This is indicated by the adjacent symbol.

The product can be returned to Dräger free of charge. For information please contact the national marketing organizations or Dräger.

10 Technical data

10.1 Electronic monitoring system

The following table shows the default settings for the electronic monitoring system.

Low pressure alarms	
Low-pressure alarm 1	55 bar
Low-pressure alarm 2	10 bar
Display accuracy	
At 200 bar	± 10 bar
At 40 bar	+ 0 bar / -5 bar
DSU	
Pre-alarm activation	21 to 25 seconds
Full alarm activation	Approximately 8 seconds
Telemetry radio	
Transmit power	0.5 W
Operating frequency	869.5 MHz; 469.9 MHz (UK only)
Restrictions in	AZE, BLR, GEO, RUS, SMR, and UKR
RFID	
Transmit power	42 dBμA/m at 10 m
Operating frequency	13.56 MHz
Restrictions in	GEO and UKR
Bluetooth Low Energy	
Transmit power	2.5 mW
Operating frequency	2400 to 2483.5 MHz

11 Manufacturer and document information

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