




Approvals

The DrägerMan Bodyguard® II monitoring instrument, for use with compressed air respiratory protection equipment, is approved for use in potentially explosive atmospheres according to the ATEX Directive 94/9/EC and is issued with Certificate No. ITS05ATEX23993X. Notified Body: CE0359.

Intrinsic Safety Approval:

Approved according to EN50014 and EN50020 and protection class  I M 1/II 2 G EEx ia I/IIc T4 at Ta minus -30oC to plus +60oC when fitted with batteries listed in the Technical Data section of this instruction. Do Not install or change the battery, or attempt to open the instrument in a potentially explosive atmosphere. A protective rubber cover is fitted to the instrument and this must not be removed during use.

For Your Safety

This Instruction for Use for the DrägerMan Bodyguard® II must be used in conjunction with the Instruction for Use supplied with approved compressed air respiratory protection equipment.

- ◆ Use of equipment requires knowledge and compliance with National Regulations, Laws and Standards, governing the use of respiratory protection equipment in the country of use.
- ◆ Use of equipment requires wearer training and observance of these Instructions for Use.
- ◆ Use equipment only for the purpose specified in this manual, or as confirmed in writing by Dräger.
- ◆ Only trained competent personnel should inspect and service equipment at regular intervals and a record kept of such inspections and service.
- ◆ Dräger recommends a service contract be obtained from your Dräger Branch or Agent.
- ◆ Contact Dräger for details of Service Contracts and Service Training Courses.
- ◆ Notify Dräger if there is component fault or failure.
- ◆ Use only original Dräger Spare Parts for service and maintenance.
- ◆ Use only Dräger Test Equipment for service and maintenance.

Warranty and Liability Statement

Responsibility for reliable function of equipment transfers to the owner or operator when the equipment is serviced, or repaired by untrained personnel, (not employed or authorised by Dräger) or when used in a manner not conforming to its intended use.

Description and Intended Use

The Bodyguard® II instrument provides continuous monitoring of the compressed air respiratory protection equipment, movement of the wearer, and temperature. This robust and compact instrument replaces traditional mechanical pressure gauge, whistle warning unit and Automatic Distress Signal Unit (ADSU).

The following features are incorporated:

- ◆ Monitoring of available air pressure of the air containment system.
- ◆ Time to Whistle (TTW) and End of Service Time (EOST) – time display.
- ◆ End of Service Time (EOST) Visual - LED's Indicators – Standard. Audible – Optional.
- ◆ Movement Sensor and Automatic Distress Signal Unit (ADSU). 'Tally' version – this feature is active only when the 'Tally' is removed.
- ◆ Button activated manual Distress Signal (DSU).
- ◆ Temperature.
- ◆ Battery Life.
- ◆ A 'Back Light' feature - illuminating the display.

If the Bodyguard is used with a 'tally' option then the motion sensor (ADSU) is active only with the tally removed. With the tally fitted, the instrument will however perform all the remaining functions.

Available for instrument are 'snap on' IR Link and Windows based Software Packages for the programming of additional monitoring options, and datalogging with downloading of datalogged parameters.

Details of variants, approved accessories and IR Link with Windows based Software Package Options are available from Dräger on request.


Refer also to the Instructions for Use provided with the associated compressed air respiratory equipment.

Technical Data

Pressure Connection - Electronic Pressure Transducer suitable for connection, via a hose assembly, to the pressure reducer of the compressed air respiratory protection equipment - 200bar or 300bar.

Power Supply - 9 Volt battery.


Battery: - Use only approved batteries.

 For details of approved batteries refer to the label inside the battery compartment, or contact Dräger.


Battery is supplied with instrument, but not installed. Do Not install or change the battery in an explosive atmosphere. Actual service life of the battery is dependent on the original condition, operating time, frequency of alarms, temperature, and frequency of use of the back light. With the instrument switched 'Off' a small amount of power is still consumed. Remove the battery if the instrument is not to be used for long periods.

Warning Signal - EOST Indicators

Setting Range - 50bar to 60bar. Default Preset to 55bar


 All electronic devices may suffer a temporary loss of function if subjected to high levels of RF radiation. The product described will continue to operate with no loss of performance or loss of function, once the RF radiation has been removed.

Preparation for Use Fitting Battery

 Do Not install or change the battery in an explosive atmosphere. Used batteries must be disposed of in line with local waste disposal regulations.

Refer to Figure 1.

- ◆ Using a 2mm-hexagon key, remove the three screws from the battery cover then carefully remove the cover.
- ◆ Insert battery into the recess of the cover with the (+) terminal located as shown in Fig. 2. Check the sealing gasket is correctly positioned and not damaged.
- ◆ Lift Bodyguard to the vertical position - line up the battery and cover and pressing on the cover, insert the battery into battery compartment. While holding the cover in position relocate the three screws and using 2mm-hexagon key secure the cover (0.4Nm to 0.5Nm). Do Not over-tighten.
- ◆ During fitting, and on connection of the battery, the Bodyguard will begin a 'self check' sequence. A single audible 'bleep' is emitted as each display changes.
- ◆ At the end of the sequence a single audible 'sweep' alarm is emitted and the display momentarily shows icon 'a' Fig. 3 (icon 'b' if tally fitted) then changes to the main display Fig. 3. The 'Green' LED flashes continuously.
- ◆ Simultaneously press and hold the RH and LH buttons – instrument will emit a single sharp audible 'Bleep' and switch 'Off' – immediately release buttons.

 An X icon with 'Fault Code' displayed indicates a 'failed self check'. Return Bodyguard to Dräger Service.

Cylinder Selection


If pre-programmed with more than one type of cylinder and the cylinder selection is 'Enabled' - select required cylinder as follows:

- ◆ Press LH button (alt. remove tally). Self check sequence will start, and when cylinder type is displayed (example Fig. 4) then press LH button.
- ◆ Press the RH button to search and display the required cylinder.
- ◆ When required cylinder is displayed press the LH button confirming selection. Bodyguard emits single 'bleep' and the self check sequence restarts.
- ◆ At the end of the sequence a single audible 'sweep' alarm is emitted and the display momentarily shows icon 'a' Fig. 3 (icon 'b' if tally fitted) then changes to main display Fig. 3. The 'Green' LED flashes continuously.
- ◆ If necessary refit tally. Simultaneously press and hold the RH and LH buttons – instrument will emit a single sharp 'Bleep' and switch 'Off' – immediately release buttons.

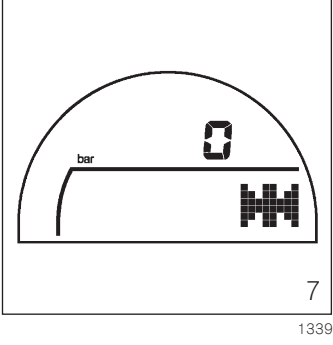
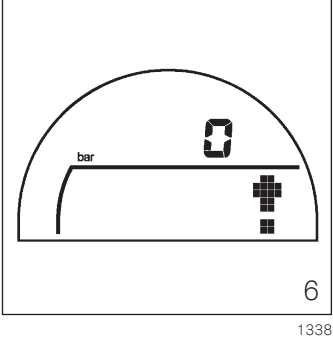
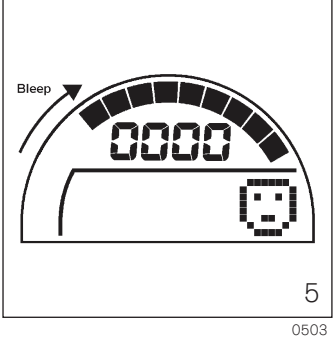
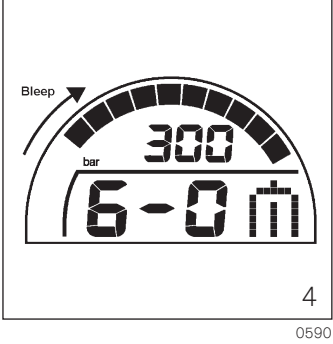
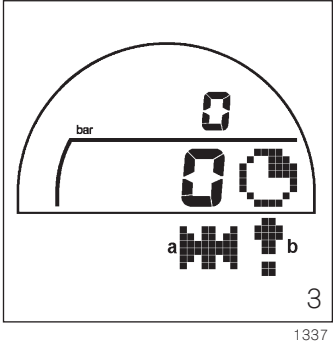
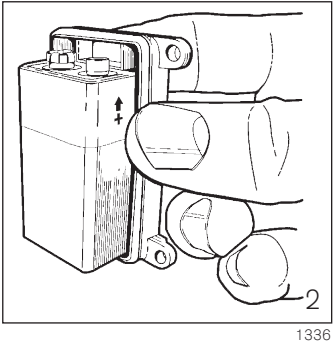
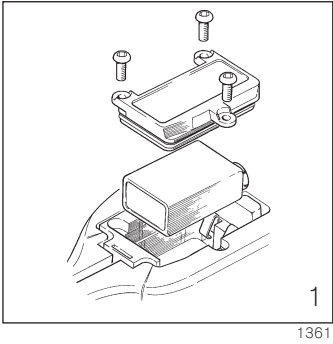
Creating/Changing User ID

User ID is a four digit numeric code. If pre-programmed with User ID selection 'Enabled' - User ID may be created or changed as follows:

- ◆ Press LH button (alt. remove tally). Self check sequence will start, and when Fig. 5 displayed (User ID) then press LH button. First digit in series begins to flash.
- ◆ Press RH button to change first digit until number required is displayed.
- ◆ Press LH button, second digit in series begins to flash.
- ◆ Press RH button to change second digit until number required is displayed.
- ◆ Press LH button, third digit in series begins to flash.
- ◆ Press RH button to change third digit until number required is displayed.
- ◆ Press LH button, fourth digit in series begins to flash.
- ◆ Press RH button to change fourth digit until number required is displayed.
- ◆ Press LH button, Bodyguard emits single 'bleep' and the self check sequence restarts.


 During the display sequence observe Fig. 5 checking that the correct User ID is programmed. If necessary repeat the procedure.

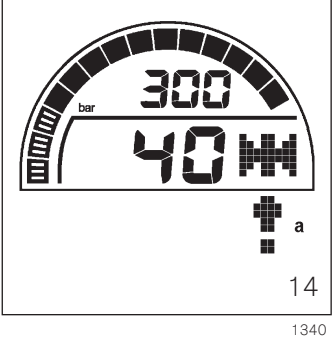
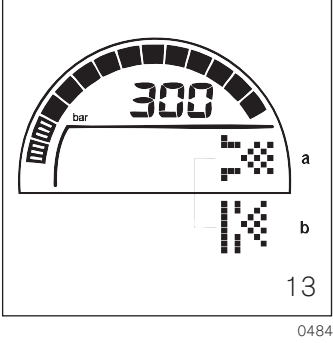
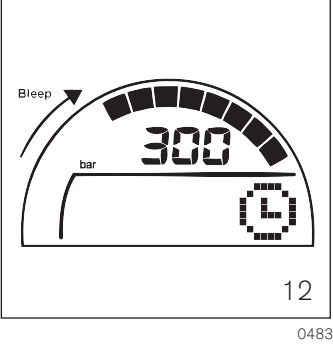
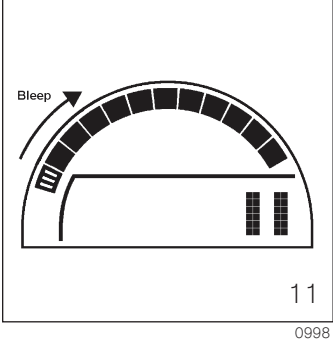
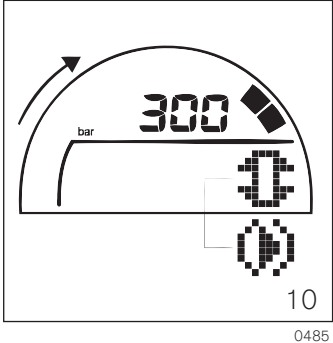
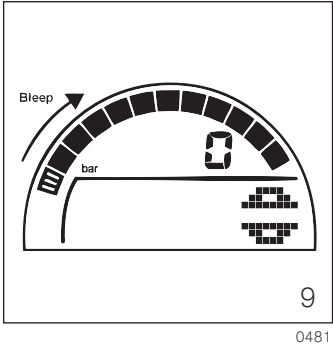
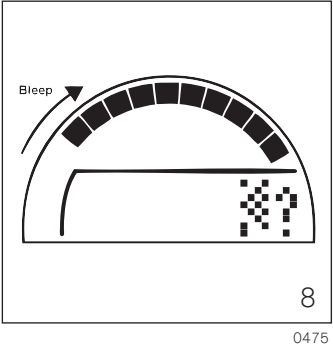
- ◆ At the end of the sequence a single audible 'sweep' alarm is emitted and the display momentarily shows icon 'a' Fig. 3 (icon 'b' - tally fitted) then changes to main display Fig. 3. The 'Green' LED flashes continuously.



- ◆ If necessary refit tally. Simultaneously press and hold the RH and LH buttons – instrument will emit a single sharp 'Bleep' and switch 'Off' – immediately release buttons.

Pre Operational Checks

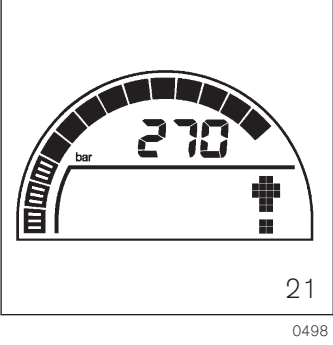
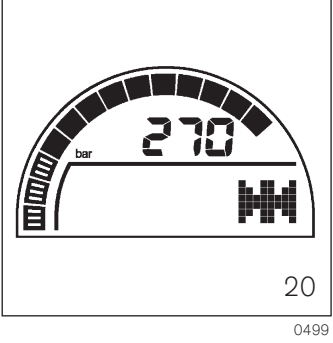
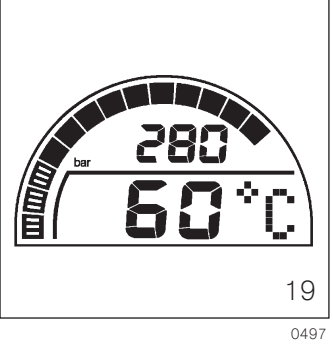
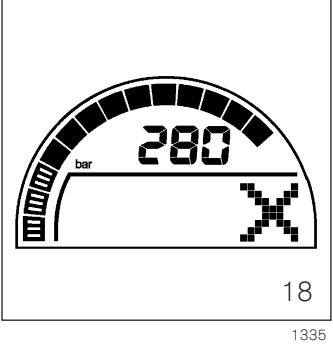
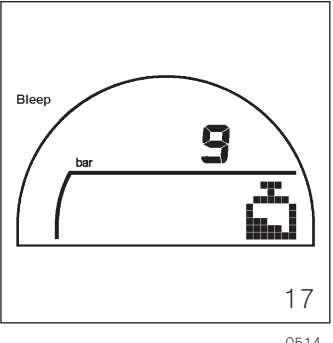
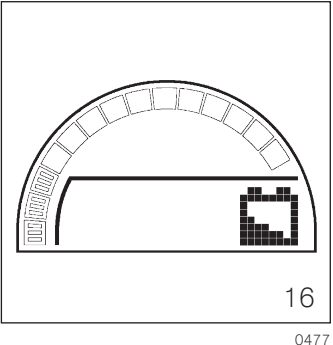
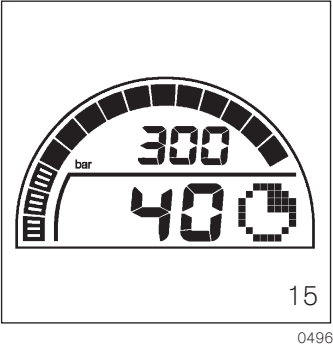
 If the Bodyguard is operated as a 'tally' version, all the pre-operational checks can be performed with the 'tally' fitted. With the tally fitted the ADSU mode is not active.



Distress Signal Checks


Button Activation

- ◆ Press LH button (alt. remove tally). Self check sequence will start.
- ◆ At the end of the sequence a single audible 'sweep' alarm is emitted and the display momentarily shows icon 'a' Fig. 3 (icon 'b' - tally fitted) then changes to main display Fig. 3. The 'Green' LED flashes continuously.
- ◆ Check Alarm - Press the Yellow button in centre of instrument. A repeating audible 'sweep' alarm is emitted and Fig. 6 is displayed.




- ◆ Simultaneously press and hold down RH and LH buttons until the alarm stops, then release buttons. The display changes to Fig. 3. Continue to ADSU Check.

Automatic Activation (ADSU Check)

 With the tally fitted the ADSU mode is not active. If checking tally version the tally must be removed.


- ◆ Place Bodyguard down – Do Not move instrument. After 21 to 25 seconds the 'pre-alarm' sounds – immediately move the instrument – the alarm will cancel.

 Do Not attempt to use buttons to switch 'Off' the pre-alarm.


- ◆ Place Bodyguard down – Do Not move instrument. Allow the instrument to enter 'pre-alarm' – Do Not move to cancel. If no movement is detected after a further 8 second a repeating audible 'sweep' alarm is emitted and Fig. 7 is displayed.
- ◆ Simultaneously press and hold down RH and LH buttons until the alarm stops then release buttons. The display changes to Fig. 3. The 'Green' LED flashes continuously.
- ◆ If necessary refit tally - the alarm stops, then the display changes to Fig. 3. The 'Green' LED flashes continuously. Simultaneously press and hold the RH and LH buttons – instrument will emit a single sharp 'Bleep' and switch 'Off' – immediately release buttons.

High Pressure Leak and Whistle Warning Test


- ◆ Check that the cylinder valve is 'closed'. Positive Pressure Lung Demand Valves - switch 'Off' positive pressure.
- ◆ Press LH button (alt. remove tally). The Self check sequence will start and when Fig. 8 is displayed – 'press' the LH button. Bar graph segments sweep to the right and the 'open valve' icon is displayed. See Fig. 9.

 During display of Fig. 9 the bar graph segments will begin sweeping to the right. If the valve is NOTICE not opened before the last segment disappears, the low-pressure icon is momentarily displayed then the check sequence will restart.


- ◆ When Fig. 9 is displayed immediately 'Open' the cylinder valve fully to pressurise system. Display changes - Fig. 10 - actual pressure displayed alternating 'close valve' and 'press RH button' icons.
- ◆ 'Immediately 'Close' valve - 'press' RH button. The display will change to Fig. 11 indicating that the pressure stabilisation timing has started.
- ◆ After a few seconds the instrument emits a single 'Bleep' then display changes to Fig. 12 indicating the start of the leak test timing.

 During the leak test timing sequence the pressure reading may reduce by up to 10bar. This may be due to the settling of the pressure reducer.

- ◆ The Bar graph segments sweep to the right and the flashing Icon 'a' Fig. 13 displayed at end of the timing sequence - equipment 'Passed' test. Continue to EOST Indicators - Whistle Alarm Test.

 Flashing Icon 'b' Fig. 13 displayed at end of timing sequence - equipment 'Failed' test. Vent NOTICE pressure from the system and switch 'Off' Bodyguard. Investigate source of leak, rectify and repeat test.

EOST Indicators - Whistle Alarm Test Icon 'a' Fig. 13 displayed - equipment 'Passed' test.

 The 'Pass' icon ('a' Fig. 13) will remain displayed for up to three minutes, during which time the NOTICE venting procedure tests may be started. After three minutes however, if the venting procedure has not started, the display will momentarily show an 'X' icon – the self check sequence will restart and then finally Fig. 3 will be displayed showing actual system pressure. The Green LED flashes at one second interval confirming that Bodyguard is now in 'operational mode'. Proceed to EOST Indicators - Whistle Alarm Test.

- ◆ Positive Pressure Lung Demand Valves - cover outlet of demand valve with ball of hand, press centre of rubber cover turning 'On' positive pressure. Slowly vent system by carefully lifting ball of hand maintaining a slow decrease in pressure. Normal Demand Lung Demand Valves - Slowly vent system by carefully pressing centre of rubber cover.
- ◆ During venting observe the display - at the pre-set pressure the two Red LED's at the base of the instrument begin to flash. a. If the electronic audible alarm is 'Enabled', this will also activate (rapid 'Bleep') and should continue to sound down to 10bar. b. If Bodyguard is fitted to equipment having a mechanical whistle, the alarm signal of the whistle will begin at the pre-set pressure.
- ◆ Continue to slowly vent until both the pressure and time displays indicate '0' bar and the open valve icon begins flashing.
- ◆ Allow the bar graph to sweep to the right until the display momentarily shows icon 'a' Fig. 3 (icon 'b' - tally fitted) and a single 'sweep' audible alarm is emitted. The display then automatically changes to main display Fig. 3. The 'Green' LED flashes continuously.
- ◆ If necessary refit tally. Simultaneously press and hold the RH and LH buttons – instrument will emit a single sharp 'Bleep' and switch 'Off' immediately release buttons.
- ◆ Switch 'Off' positive pressure lung demand valves.



Operation

After putting on equipment as described in the Instructions for Use, follow these instructions:

- ◆ Check that the cylinder valve is 'closed'.
Positive Pressure Lung Demand Valves - switch 'Off' positive pressure.
- ◆ Open cylinder valve fully to pressurise system. Self check sequence will start and when Fig. 8 displayed – 'press' LH button. Bar graph segments sweep to the right and the 'open valve' icon will be momentarily displayed then will change to - Fig. 10 - actual pressure displayed alternating 'close valve' and 'press RH button' icons.
- ◆ 'Immediately 'Close' valve then 'press' RH button. The display will change to Fig. 11 indicating that the pressure stabilisation timing has started. After a few seconds the instrument emits a single 'Bleep', the display changes to Fig. 12 indicating the start of the leak test timing.
- ◆ Bar graph segments sweep to the right and flashing icon 'a' Fig. 13 displayed at end of timing sequence - equipment 'Passed' test.

i If the 'flashing' Icon 'b' Fig. 13 is displayed at the end of the timing sequence - the equipment **NOTICE** has 'Failed' test. Vent pressure from the system and switch 'Off' the Bodyguard. Investigate source of leak, rectify and repeat the test.

- ◆ 'Open' the cylinder valve fully then 'Press' the RH button - the display momentarily shows Fig. 14 (icon 'a' – if tally fitted) then changes to main display Fig. 15. The Green LED flashes at one second interval confirming that Bodyguard is now in 'operational mode'.

! Do Not continue if 'Low Battery' warning icon (Fig. 16), 'Low Cylinder Contents' warning icon (Fig. 17), or 'Failed' icon (Fig. 18) displayed.

- ◆ Put on the facepiece as described in the equipment Instructions for Use – breathe normally.
- ◆ 'Close' the cylinder valve and breathe very lightly to vent pressure from the system. During venting observe the display - at the pre-set pressure the two Red LED's at the base of the instrument begin to flash.

a. If the electronic audible alarm is 'Enabled', this will also activate (rapid 'Bleep') and should continue to sound down to 10bar.

b. If Bodyguard is fitted to equipment having a mechanical whistle, the alarm signal of the mechanical whistle will begin at the pre-set pressure.

- ◆ Continue to vent slowly until both the pressure and time displays indicate '0'. When the system is vented hold breath – the facepiece should hold onto the face indicating a positive seal – immediately 'open' the cylinder valve.

i If a face leak is detected – readjust the head harness and retest.

! **NOTICE**

- ◆ On opening the cylinder valve the display changes to main display Fig. 15. The Green LED flashes at one second interval confirming that Bodyguard is now in 'operational mode' - showing actual pressure and time remaining to activation of the visual Red LED's, and if enabled the audible whistle.
- ◆ Breathe normally. Inhale and exhale three times and then hold breath – there should be no audible leaks – breathe normally.
- ◆ Press the centre of the rubber cover of the demand valve to test the function of the supplementary supply.

i If the Bodyguard is operated as a 'tally' version and the 'Tally' is fitted when in 'operating mode', the Motion Sensor will not be active. If motion detection is required activate the Motion Sensor - remove the 'Tally'.

In Use

- ◆ Regularly observe pressure and time reading of instrument display. At the pre-set pressure setting the visual Red LED's will begin to intermittently illuminate, and the audible whistle alarm, if enabled, will activate.

i If the instrument is used with equipment having an independent mechanical whistle, then the whistle alarm signal will begin at approximately the same time.

- ◆ Go on to safe area by shortest and safest route, at latest when the visual (Red LED's)

begin to intermittently illuminate or the whistle alarm sounds.

In Use Functions

Display - Operating Mode

Figure 15 shows information displayed during the complete breathing cycle. The system pressure is continuously monitored and shown digitally (numeric), and as an analogue bar graph. The lower numeric value displays the time remaining to activation of the visual Red LED's, and if enabled the audible whistle alarm. Clock dial 'icon' represents time. The Green LED on the front of the instrument illuminates intermittently when Bodyguard is in 'operating mode'.

Available to the user during the complete breathing cycle are the following additional functions.

Back Light

- ◆ To illuminate the display - press and then release the LH or RH button. The display illuminates for a predetermined time.

Temperature

- ◆ Press then release RH button. Time remaining changes to temperature (°C). See Fig. 19.
- ◆ If required, immediately press then release the RH button to change display back to 'time remaining'. See Fig. 15.

i After 5 seconds, if the button is not pressed, the display changes automatically from temperature back to 'time remaining'.

Motion Sensor

Functions as an Automatic Distress Signal Unit (ADSU).

i If the Bodyguard is operated as a 'tally' version instrument and the 'Tally' remains fitted when **NOTICE** in 'operating mode', the Motion Sensor (ADSU) will not be active. If required, remove the 'Tally' to activate the Motion Sensor.

- ◆ If no movement detected, a 'pre-alarm' sounds after 21 to 25 seconds - if movement detected within a further 8 seconds of 'pre-alarm' the alarm is cancelled.

i Do Not attempt to use buttons to switch 'Off' the pre-alarm.

! **NOTICE**

- ◆ If there is no movement is detected at the end of the 8 second 'pre-alarm' then a higher level 'main alarm' starts. See Fig. 20.

i To switch 'Off' the 'main alarm', simultaneously press and hold down RH and LH buttons until the alarm stops then release buttons. The display changes to Fig. 15 - returning to 'operating mode'.

Panic Button

Should the wearer require help and assistance, then pressing this button activates the Main Audible Alarm Signal - Distress Signal Unit (DSU).

- ◆ To start the 'alarm' - press the Yellow button in centre of the instrument. A repeating audible 'sweep' alarm is emitted. Fig. 21 displayed.
- ◆ To switch 'Off' the 'main alarm' simultaneously press and hold down RH and LH buttons until the alarm stops then release buttons. The display changes to Fig. 15 - returning to 'operating mode'.

Low Battery

The low battery level displays the low battery 'icon' in Fig. 16 and the unit emits a beep every 5 seconds to warn that available power is low. ADSU mode can still be activated. When this 'icon' is first displayed, it is acceptable to safely use the compressed air respiratory equipment for up to 2 hours.

! When the first limit is reached - REPLACE BATTERY

After Use

i Do Not remove equipment until in safe area, clear of hazard.

- ◆ Following removal of equipment, closing of the cylinder valve and complete venting of pressure as described in the Instructions for Use - simultaneously press and hold down RH and LH buttons to switch 'Off' Bodyguard.

i Bodyguard will show '0bar' and remain in 'operating mode' until the buttons are pressed.

! **NOTICE**

- ◆ Pass equipment to Service Department.

Routine Maintenance

To be performed after use. See the Instructions for Use for the breathing apparatus referring also to the Maintenance and Test Interval Chart.

Cleaning, Disinfecting and Drying

Refer also to the Instructions for Use for the breathing apparatus.

Do Not immerse the Bodyguard in solutions. Use a clean lint free cloth moistened in either cleaning or disinfecting fluid to clean and/or disinfect the Bodyguard. Refer also to cleaning instructions in Instructions for Use for the breathing apparatus. Inspect unit for any damage. To ensure correct operational condition of the equipment use only cleaning and disinfecting solutions recommended by Dräger. The use of other products invalidates the Dräger Warranty.

Any other cleaning or disinfecting process must be covered by a written agreement with Dräger.

i Refer to manufacturers' usage instructions when using cleaning and disinfecting agents. It is **NOTICE** important that attention be paid to concentration and reaction times. Do Not use organic solvents, such as Acetone, Alcohol, White Spirit, Trichloroethylene or similar.

Dräger recommends only the following:

1. Cleaning

- ◆ Safety Wash.
- ◆ Sekusept

These products must be used with cold water, however never exceed a temperature of 30 degrees Celsius.

i Before disinfecting, rinse off cleaning solution in clean water.

2. Disinfecting

- ◆ Incidur (Bath Disinfecting)
- ◆ Wipex Cloths (Manual)

These products must be used with cold water, however never exceed a temperature of 30 degrees Celsius.

i Before drying, rinse off disinfecting solution in clean water.

Details of cleaning and disinfecting agents are available from Dräger on request.

3. Rinsing and Drying

Remove cleaning and disinfecting solutions by rinsing in clean water, followed by drying.

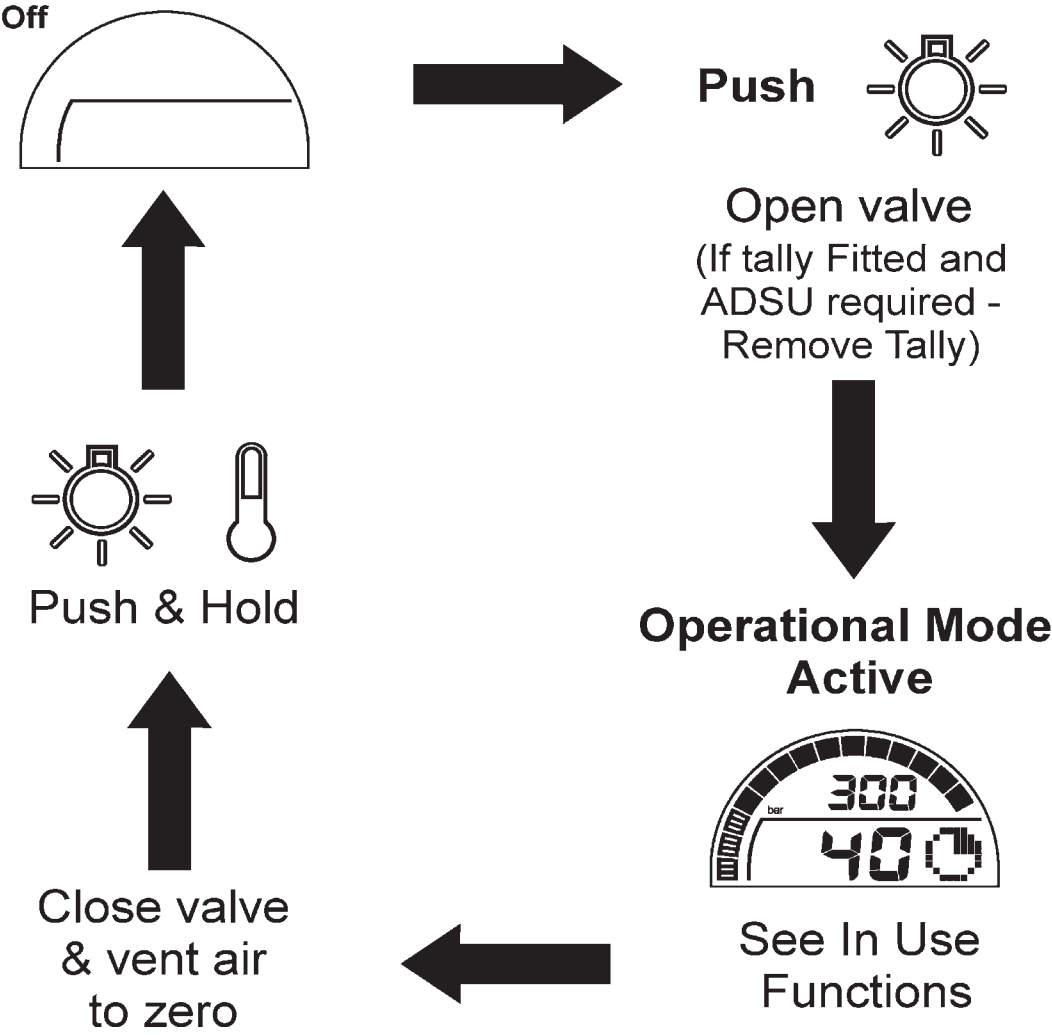
Do Not exceed a temperature of 40 degrees Celsius when drying. Immediately remove from drying cabinet when dry. Never exceed 30mins drying time.

After cleaning, carry out pre-operational tests as defined in this Instructions for Use and the Instructions for Use for the associated Compressed Air Respiratory Protection Equipment.

Storage – Ready for Use

- ◆ Store equipment 'ready for use' in a cool dry environment, free from dust and dirt. Protect rubber parts from direct sunlight.
- ◆ Refer also to the Instructions for Use for the associated Compressed Air Respiratory Protection Equipment.

Quick Start to Operational Mode



FAULT, CAUSE, REMEDY

Fault or Fault Icon	Cause	Remedy
	Low Battery	Replace battery. Refer to Instructions for Use for correct procedure and battery specification
	High Pressure Leak	Rectify cause of leak and re-test
Display showing Fault Codes suffixed with X	Instrument Failure	Disconnect from equipment and return instrument to Dräger Service
Will not switch 'ON'	Low Battery	Replace battery. Refer to Instructions for Use for correct procedure and battery specification
	Unknown	Disconnect from equipment and return instrument to Dräger Service

Other Fault Codes S, t, P, H, u, C, r, A, E.

MAINTENANCE AND TEST INTERVALS

Carry out regular Inspection, Testing and Servicing of equipment according to this table. Refer also to Maintenance and Test Interval tables in Instructions for Use for Compressed Air Respiratory Protection Equipment. These instructions apply also to non used (in Storage) equipment.

	Description	After Use	Every Month	Every Year
Bodyguard II	Clean	X		
	Visual Inspection	X	X	
	Functional and Leak Testing as defined in Instructions for Use	X	X	X
	Pressure reading check			X1)

1) Contact Dräger Service for details.