Dräger

PA90 SERIES

Compressed Air Respiratory Protection Equipment

Instructions for Use

The self-contained open circuit respiratory protection equipment referred to in this manual conforms to EN137 and has been issued with Certificate of Assurance Number:
SH/BA/69

CONTENTS

Note; This manual describes the operating procedure for PA90 Series, Two Stage (LP) Compressed Air Respiratory Protection Equipment, with 200 or 300 bar supply pressure.

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FOR YOUR SAFETY

For correct and effective use of this apparatus and to avoid hazards, it is essential to read the following recommendations and to act accordingly!):

Recommendations

Strictly follow these Instructions for Use
Any use of this apparatus requires a full understanding and strict observation of these instructions. This apparatus is only to be used for purposes specified here.

Intended Use

PA90 Series compressed air respiratory protection equipment can only be used in conjunction with those cylinder combinations in the United Kingdom covered by the Certificate of Approval, or by national standards in force in the country of use. For information on these combinations, please contact Dräger Customer Services.The cylinder, demand valve and facepiece should be correctly assembled totheset togivemaximumrespfratory protection against harmful gases, vapours and particulate matter.

It is recommended that the cylinder, demand valve and facepiece are fitted to equipment in a clean area, i.e. a BA workshop. If it is necessary to change these components at an incident, suitable precautions must be taken to avoid contamination.

In the United Kingdom, guidance on the level of protection for Compressed Air Respiratory Protection Equipment products can be found in the Health and Safety Executive publication HS(G)53 - Respiratory Protective Equipment, a practical guide for users. Alsothe Controlof Substances Hazardous to Health (COSHH) regulations and recommendations apply to the above equipment.

Liability for proper function or damage
Liability for proper function of this apparatus is irrevocably transferred to the owner or operator, to the extent that the apparatus has been serviced or repaired by personnel not employed or authorised by Drager Service or when this apparatus has been used in a manner not conforming to its intended use. Drager Limited cannot be held responsible for any damage caused by non-compliance with the above recommendations. The warranty and liability provisions of the terms and conditions of sale and delivery of Drager Limited are likewise not modified by recommendations given above.

Maintenance

This apparatus must be inspected (1) and serviced (2) by experts at regular intervals and a record maintained of such inspections and servicing. Repairs (3) and general overhaul of this apparatus should only be carried out by fully trained and expert personnel.

We recommend that a service contract is obtained from Dräger Service Department and that all repairs are also carried out by them. Only original Drager Spare Parts should be used for maintenance (4). Observe chapters, 'Routine Maintenance and Test Intervals'.

1 Inspection = examination of actual condition.
2 Service = measures to be taken to maintain desired condition.
3 Repair = measures to be taken to restore desired condition.
4 Maintenance = inspection, service and if applicable, repair.

Product Faults

In the event of any component fault or malfunction, Drager should be notified. In the United Kingdom, it may also be necessary to contact the Health and Safety Executive (HSE), with due regard paid to the requirements of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1985 (RIDDOR).

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Statutory Requirements

In the United Kingdom. the requirements of the Control of Substances Hazardous to Health **Regulations (COSHH)** governing the use of Respiratory Protective Equipment (RPE) **should** be observed. Outside the United Kingdom, the **relevant** regulations governing the use of RPE should be observed and adhered to in the country of use.

Important Information

Compressed gas by its very nature, is a means of **storing a** high quantity of energy in a small **containad** volume, and due to the high concentration, the container: whether it be a compressed **air** cylinder or an airline flexible hose, is a potential hazard. Risks from this potential hazard can be minimised providing care is exercised in the operation and handling **of** compressed gas equipment and components.

1 This apparatus is only intended for the purposes specified in these **Instructions for** Useorforthepurpose confirmed in **writing** by Draeger Limited.

2 For safety reasons, pressure reducers should be overhauled at the stated interval.
Pressure reducers of certified apparatus are sealed by Draeger.
If original seal cap has been broken, **or removed, apparatus is not guaranteed** as being operational inaccordance with approval standards.
For authorised maintenance to be carried out, and therefore full operational state to be achieved, Draeger can only be liable if pressure reducer is serviced and re-sealed by Draeger.
This is only the case when pressure reducers are fitted with original Draeger components and sealing caps.

3 Compressed air is not to be directed onto any surface of the human body.
If compressed air is used for cleaning or removal of contaminants from components, then suitable personal protection equipment should be worn i.e. industrial gloves, safety glasses/visor etc.

4 All adjustable connections must be securelytfghtenedusingtheappropriate tools, and inspected at regular intervals for wear.

5 The cylinder valve must be fully closed, and **all** pressure in the system vented; before removal of any component from apparatus.

6 Test gauges must be calibrated once a year.

7 **Compressed gas containers (cylinders)** must be free from external damage, and must only be used if they are within the stipulated test period.
Cylinders should only be pressurised in accordance with the charging **instructions described under 'Routine** Maintenance'.

8 Component parts which are recommended for replacement at regular intervals . must be replaced regardless of visual condition and only original Draeger Spare Parts used.

9 With reference to air quality for breathing systems guidance should be sought from EN132 : 1990.

a Impurities e.g. dust, dirt, metallic particles or any other toxic or irritant substances should be kept to a minimum, but in any case should not exceed the maximum permissible exposure level.

Warning:
Do not use oxygen enriched air.

Two stage apparatus will accept 200bar or 300bar nominal cylinders without modification to the cylinder connector or gauge.
The effective duration of two stage apparatus is dependent on :

a Cylinder type and capacity chosen
b Rate of work.

Dräger Limited

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Purpose/Description
PA90 Series - PA92

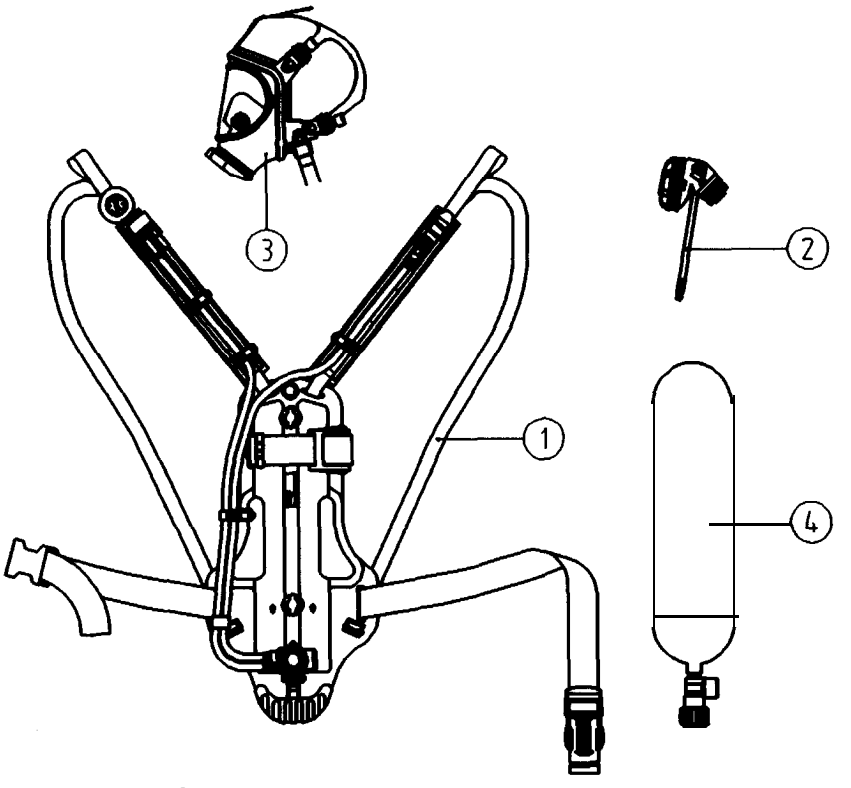
PA92 is a self-contained unit for use in non-respirable atmospheres.

Basic configuration consists of:

- Composite Backplate
- Standard Harness
- Pressure Reducerand Hose Assembly (Various cylinder connections available)
- Cylinder Contents Pressure Gauge
- Whistle Warning Unit

To complete PA92, various combinations of Panorama Nova Facepieces, Lung Governed Demand Valves (Positive Pressure or Normal Demand), and Compressed Air Valved Cylinders are available.

Refer to Technical Data - Page 8 and Order List - Page 20.



PA 92 Equipment Layout

1 Backplate, Pneumatics and Harness Assembly
2 Demand Valve (various)
3 Facepiece (various)
4 Valved Cylinder (various)

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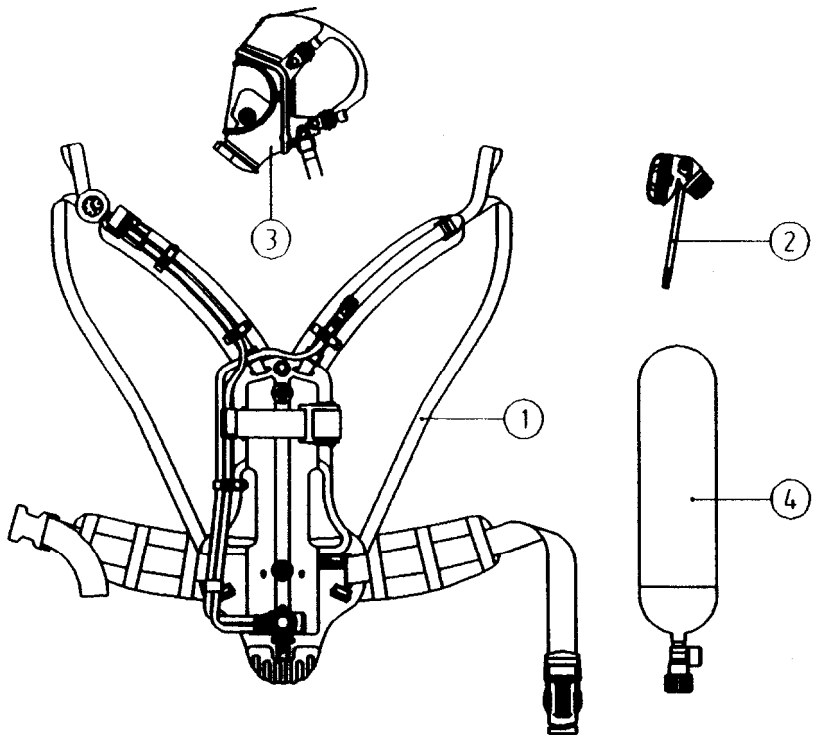
Purpose/Description
PA90 Series - PA93

PA93 is a self-contained unit for use in non-respirable atmospheres.
Basic configuration consists of:

- Composite Backplate
- Professional Harness (Plastic Buckles)
- Pressure Reducer and Hose Assembly (Various cylinder connections available)
- Cylinder Contents Pressure Gauge
- Whistle Warning Unit

To complete PA93, various combinations of Panorama Nova Facepieces, Lung Governed Demand Valves (Positive Pressure or Normal Demand), and Compressed Air Valved Cylinders are available.
Refer to Technical Data - Page 8 and Order List Page 20.



PA 93 Equipment Layout

1 Backplate, Pneumatics and Harness Assembly - Basic Unit
2 Demand Valve (various)
3 Facepiece (various)
4 Valved Cylinder (various)

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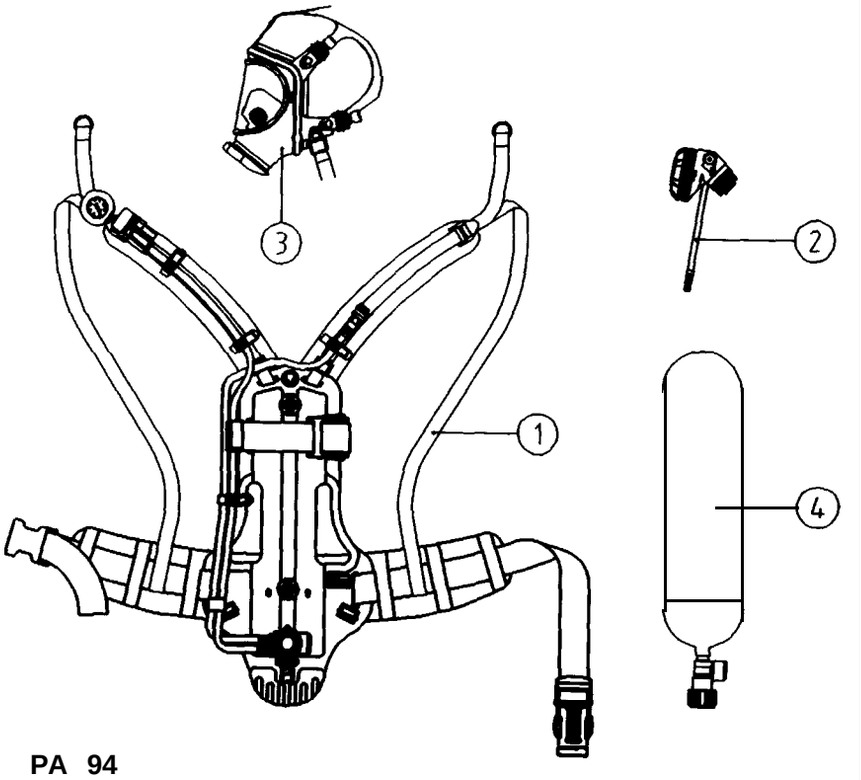
Purpose/Description
PA90 Series · PA94

PA94 is a self-contained unit for use in non-respirable atmospheres.
Basic configuration consists of :

- Composite Backplate
- Professional Harness (Metal Shoulder Buckles)
- Pressure Reducerand Hose Assembly (G5/8 DIN cylinder connection)
- Cylinder Contents Pressure Gauge
- Whistle Warning Unit

To complete PA94, various combinations of Panorama Nova Facepieces, Lung Governed Demand Valves (Positive Pressure and Normal Demand), and Compressed Air Valved Cylinders are available.
Refer to Technical Data · Page 8 and Order List · Page20.



PA 94
Equipment Layout

1 Backplate, Pneumatics and Harness Assembly -Basic Unit
2 Demand Valve (various)
3 Facepiece (various)
4 Valved Cylinder (various)

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Technical Rata
PA90 Series

High Pressure Connection (Standard)	G5/8 as per DIN 477: Part6
Other connections available:	French Standard
	Italian Standard
	Japanese Standard
Facepiece and Demand Valve Connections:	
PA90A	Push-In
PA90AE	M45 x 3 Thread
PA90N	40mm Thread
Dimensions:	
Length	620mrn
Width	320mm
Height	150mm
Weight of Apparatus	3.0kg less cylinder

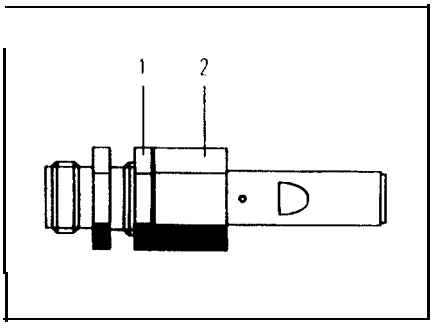
Single cylinders are available from 6L to 12L - in steel and/or composite materials- pressure fill 200 or 300bar.
Twin 4L capacity , 200 and 300bar cylinders, are also available, for further details contact Dräger Customer Services.

Note: ***If is advised that 12L cylinder should not be used in areas with restricted entry and exit.***

Note: *Connecting 'Y'piece for Twin Cylinders - See Order List Page 22. Effective duration (in minutes) is calculated for moderately heavy work rates (airconsumptionapproximately 40 L /min) e.g. Whistle Warning Unit nominally set at 50bar. Ask for details*

Whistle Adjustment

Whistle Adjustment
Slacken lock-nut (1)
To increase whistle setting turn adjusting nut (2) clockwise.
To decrease whistle setting turn adjusting nut anti-clockwise
When desired setting has been reached, tighten lock-nut.
Recheck as stated on pages 10 or 12.



Preparation for Use

Fitting compressed air cylinder.

- Fully open cylinder support strap on backplate.
- Checkcylindervalveinletandpressure reducer threads are not damaged and sealing O-ring is in position and not damaged.
- With apparatus in horizontal position, slidecylinderthroughcylindersupport strap from top of backplate, towards cylinder connector on pressure reducer, and locate valve port to pressure reducer handwheel. (Fig.1).
- Lift complete unit into upright position and screw handwheel on pressure reducer into cylinder valve port - handtight only.
- Where fitted hook anti-vibration strap to handwheel (Fig. 2).
- Place complete unit back into horizontal position.
  Adjust cylinder retaining strap by pulling it lightly to take up slack;(Fig.3); to activate camlock mechanism; pull end of strap back over cylinder. (Fig. 4).
- Firmly press loose end of strap onto velcro.

Connecting demand valve to apparatus (PA90A, AE and N)

- Connect demand valve to apparatus by inserting and pressing male coupling (on demand valve hose) into female coupling on supply hose until locked.

Note:

Locking mechanism is automatic, but check that assembly is engaged *and secure.*

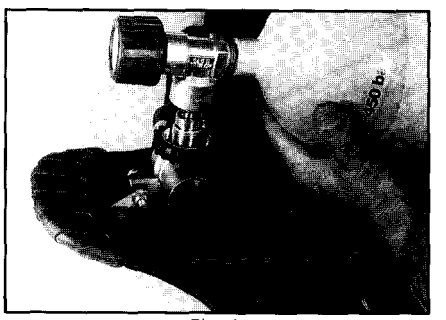


Fig. 1

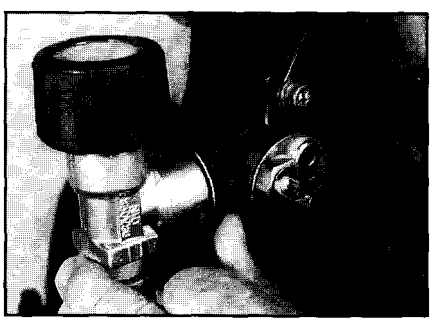


Fig. 2

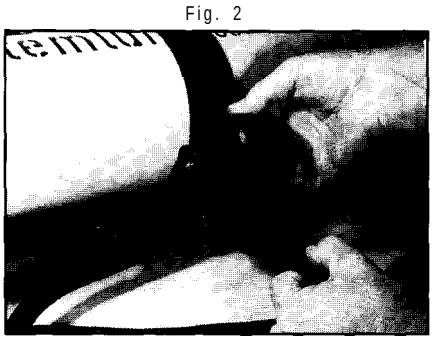


Fig.3

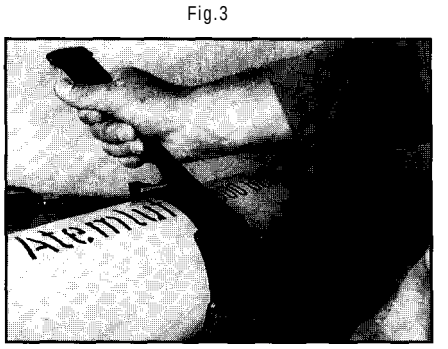


Fig.4

Operation Checks

High Pressure Leak Test

- For positive pressure type demand valves ensure lever on demand valve is pressed towards front cover; this switches 'OFF' positive pressure mechanism (Fig. 5).
- Open cylinder valve slowly, but fully, to pressurise system.
- Close cylinder valve.
- Observe pressure gauge, pressure shall not drop more than 5 bar in 1 minute.

Whistle Warning Unit Test

PA90A and PA90AE

Cover demand valve port with ball of hand and press centre of rubber cover (Fig. 6). to activate positive pressure.

Vent apparatus slowly by carefully lifting ball of hand and maintain a slow steady decrease in pressure

PA90N

Vent apparatus slowly by gently. pressing centre of protective cap i e.. supplementary supply activation

- Observe pressure gauge.Whistle warning unit should sound at pre-set pressure.
- Ifwhistledoesnotsoundat appropriate pressure. reset whistle as per instruction on Page 8.
- Following above check, de-activate dernand valve positive pressure by pressing lever towards front cover (Fig.5)

Connection of demand valve to facepiece -Push-In Type A

- Ensure facepiece port and O-ring on demand valve are free from dirt and damage.
- Push demand valve into facepiece port until it clicks into position.
- Check attachment is secure by pulling demand valve away from facepiece -there should be no axial movement.

Connection of demand valve to facepiece ‣ Screw-In Type AE and N

- Use thumbs to screw in handwheel until thread bites, into facepiece port.
- Align demand valve vertically with centre line of facepiece (Fig. 7). and tighten.

Warning:

For Lung Governed Demand Valves with threaded swivel connection, it may be possible for clearance between Demand Valve handwheet and retainer to be reduced due to contamination, which could result in handwheel binding with retainer; thus impairing swivel action of handwheel. This could give the user the false impression that Demand Valve is correctly and fully screwed into Facepiece port; when in fact it is not.

To check correct function of units in service, ensure handwheelon Demand Valve spins freely.

This should be done at all times prior to assembling Demand Valve to facepiece.

Units found to be binding should be taken out of service and advice sought from Draeger.

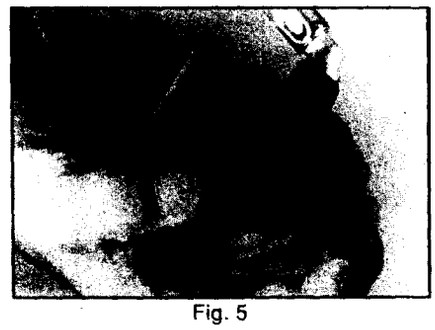


Fig. 5

Fig. 6

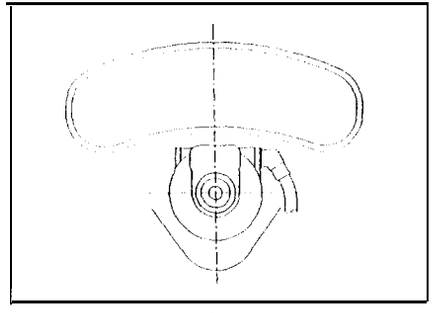


Fig. 7

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Operation

Putting on apparatus

- Put on apparatus with shoulder straps and waistbelt fully extended.
- Fasten waistbelt buckle (Fig. 8)., and secure waistbelt to hips by pulling loose ends of waistbelt away from buckle until apparatus sits securely and comfortably in place (Fig. 9).
  Tuck loose ends of waistbelt through waistbelt loops.
- Pull down shoulder straps (Fig. 10) until apparatus feels comfortable.
  Feed loose ends of straps between waistbelt pad and straps.
- Fit neckstrap of facepiece over neck and attach demand valve to facepiece.
  Refer to instructions on Page 10.
- Make sure that positive pressure type demand valve is switched to positive pressure 'OFF' mode. and
- Open cylinder valve slowly but fully to pressurise system.
  Check system pressure on gauge.
- Put facepiece on as follows:
  - **a** Spread out straps, leaving centre strap in position shown in (Fig.1 1).
    Only adjust strap if necessary.
  - **b** Place chin into facepiece.
  - **c** Place straps over head.
  - **d** Tighten lower straps, then upper straps, by pulling them towards back of head.
    Do not over tighten.

  Correct fit of facepiece is only ensured if facepiece seal makes close contact with the skin.
  Care should be taken to ensure that no facial hair, beard, stubble, side whiskers or similar interfere with facepiece seal.
  Spectacle wearers will have problems achieving a complete seal.
- On achieving face seal positive pressure type demand valves will activate automatically on first inhalation.
- Breathe normally.

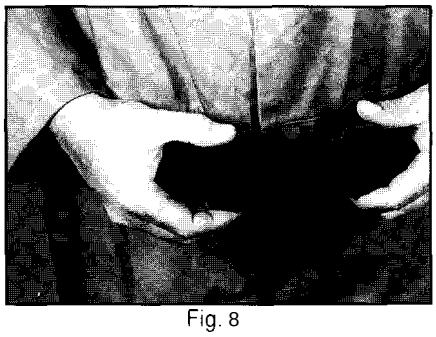

Fig. 8

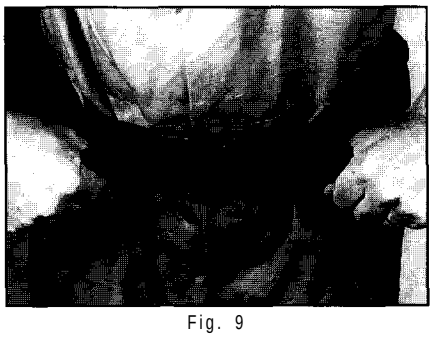

Fig. 9

Fig. 10

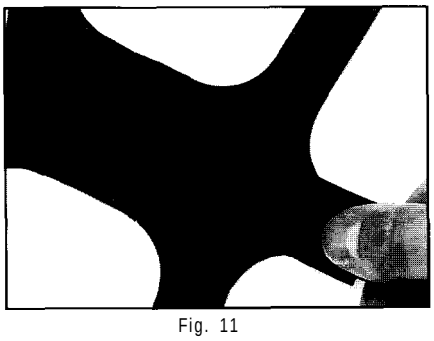

Fig. 11

Function Checks

- Check functioning of demand and exhalation valves by breathing deeply several times.
- Hold breath; unit should be balanced i.e. no audible leak.
- Continue breathing: it must be possible for expired air to flow easily out of exhalation valve.
- Check function of supplementary supply by pressing centre of protective cap.

Note: *For those user's who have followed the procedures as written (refer to Pages 9 and 10) i.e. have tested whistle warning unit before fitting facepiece to demand valve; whistle warning test described here may be omitted.*

- Close cylinder valve.
- Vent system by breathing normally and check that whistle warning unit sounds at correct pressure.
- Continue breathing until system has fully vented facepiece should hold onto face- this indicates a positive face seal.
- Open cylinder valve and breathe normally.

Use

Take pressure gauge readings from time to time whilst using apparatus.

Whistlewarningunit soundsoncecompressed air supply has reached **WWU** pressure setting.

Start escaping before whistle sounds.

ATTENTION

As regards escape: time required for approach is to be observed in addition to retreat time indicated by warning signal.

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After Use

- Switch OFF Positive pressure
- Remove facepiece.
- Close cylinder valve.
- Unfasten waistbelt by opening safety clip.
- Loosen shoulder harness straps by lifting both buckles, remove apparatus carefully.
- Do not drop or throw down as serious damage could occur to apparatus.

Removal of Cylinder

Do not attempt to remove cylinder unless cylinder valve is fully closed and system has been vented, by pressing centre of protective cap on demand valve.

When vented, reset positive pressure type demand valve by pressing lever towards front cover. (Fig. 5).

To remove cylinder, lift and pull free end of cylinder retaining strap to release camlock mechanism, loosen strap, unhook anti-vibration strap (if fitted) and unscrew pressure reducer hand wheel from cylinder valve.- anti-clockwise.

Visual Inspection and Check

Check integrity of following after use:

a All straps and harness.
b Facepiece.
c Valves.
d Connectors.
e Cylinder supports.

Above checks and monthly checks listed on Page 18, should be carried out after use. See also Routine Maintenance.

Routine Maintenance

To be performed whenever apparatus has been used, together with monthly tests on Page 18.

Charging of cylinders

Recharge cylinder to appropriate pressure as stamped on cylinder.

It is only permissible to fill compressed air cylinders which:

a Conform to National Standards in force within country of use.
b Are stamped with test date and test mark of inspection authority.
c Have not exceeded test interval indicated on cylinder.
d Do not show signs of damage or corrosion which could be a potential hazard, and that cylinder is in good condition.
e Do not show any signs of moisture (waterdroplets) inthreadedconnection.

Note:

Observe the following, so as to avoid high water content of breathing air in compressed air cylinder:

- Compressed air cylinders must not becompletelyemptied(de-pressurised) when used with compressed air respiratory protection equipment.
- Maintain above atmospheric pressure after use. If however, cylinder is completely emptied, ensure that cylinder valve is closed.
- Cylinder valve outlet should be protected against ingress of dirt and moisture at all times i.e. after removal from compressed air respiratory protectionequipment, andfitprotective cap immediately after recharging cylinder.
- Compressed air cylinders must be protected against impact and heat when transported or stored.

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Cleaning

Dirty components must be cleaned carefully and dried thoroughly after use. Facepiece and demand valve must always be cleaned, disinfected and dried after use.

Do not use any organic solvents such as Acetone, Alcohol, Benzene, White Spirit, Trichloroethylene or similar. We recommend the following:

For **cleaning:**
Dräger Wipex Cloths
Water and Liquid Soap e.g. EW80

For **bath disinfection:**
Dräger Safety Wash
Incidur
Tegodor F
Refer to Order List for recommended suppliers of above.

Note:

When using any of the above cleaning and disinfecting agents, it is important that precise attention be paid to concentration and reaction times. Refer to manufacturers usage instructions.

All liquids and in particular disinfectant residues, must be removed by rinsing in clean running water, immediately after disinfection. Excess water may be removed by using Wipex Cloths.

Do not immerse lung governed demand valve in water, unless outlet port is sealed.

When drying, a temperature of 60 degrees Celsius shall not be exceeded.

Demand Valves PA90A, PA90AE and PA90N

Should it be necessary to clean and disinfect demand valve, internally, follow these instructions:

- Remove rubber protective cover.
- Rotate bayonet cap anti-clockwise (approx. 90 degrees) using tool Pt. No. 16 28089 and remove.
- Carefully remove diaphragm by unhooking its centre location from balanced piston lever (Fig.12).

Note: To prevent *ingress of cleaning fluid into balancedpiston valve, unit should be pressurised, i.e. balanced piston closed.*

- Apply pressure (LP) viademand valve hose to close balanced piston.
- PA90A and PA90AE -depress lever (Fig.5) to switch OFF positive pressure.
- Immersedemand regulator in cleaning fluid (Refertocleaningfluid instructions).
- After cleaning ensure demand valve is thoroughly dried.
- Relocate diaphragm onto balanced piston lever (Fig.12) and locate diaphragm bead into groove in demand valve body (Fig.1 3) -note orientation.
- Re-fit bayonet cap - clockwise rotation.

Note: *Moisten lip of bayonet cap (with water) prior to fitting to prevent rotation of diaphragm.*

- Re-check position of diaphragm (Fig.14).
- Assemble rubber protective cover.
- Activate demand valve by pressing centre of front cover to blow-out any fluid residue.
- Switch off air supply.
- Carry out function checks Page 11.

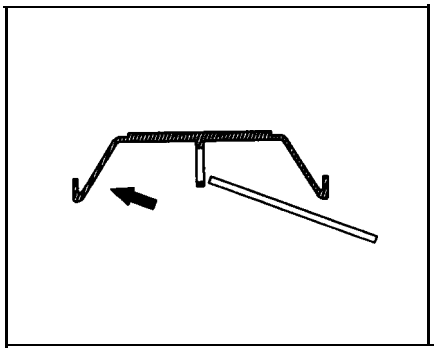

Fig.12

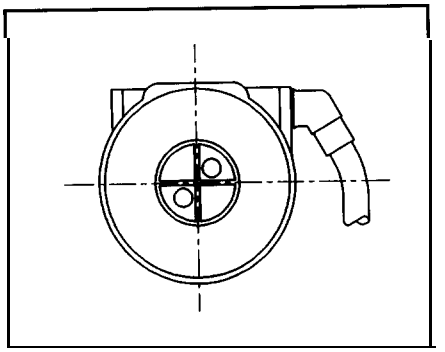

Fig: 13

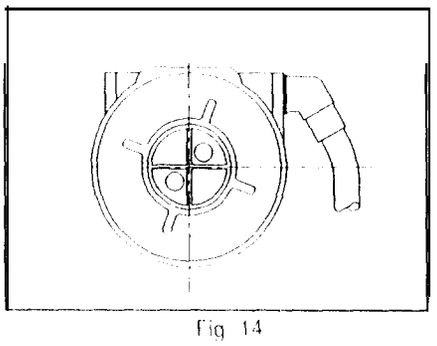

Fig 14

Pressure Reducer and Hose Assembly

Important:- Refer to Important Information, Page 4. Paragraph 2

Should it be necessary to remove pressure reducer and hose assembly from backplate for cleaning and / or disinfection, follow these instructions:

Note: *Do not immerse pressure reducer in* water or *disinfectant* solution. Use *moistened Wipex* Cloths.

Removing Pressure Reducer

(Fig.15)

- Unfasten hose loop buckles on shoulder pads and backplate to release hoses.
- Unscrew hexagon lock-nut; remove socket head screw and washers to release pressure reducer.
- Remove mounting pin from reducer and plastic sleeve from hole in mounting pin.
- Reducer and Hose Assembly can now be cleaned and disinfected. (See note above).

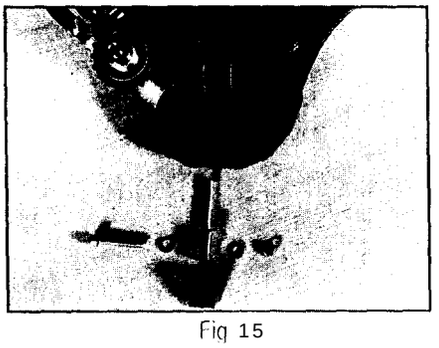

Fig 15

Re-assembly of Pressure Reducer

- insert plastic sleeve into hole in mounting pin, then pin into reducer
- Locate round end of mounting pin into slot in bracket and square end into plastic mounting bracket.
- Insert socket head screw, with washers. through mounting bracket and mounting pin cross hole, securing with locking nut.
- Secure hoses to backplate ,and shoulder pads using hose loops

Shoulder Harness and Waistbelt

Should it be necessary to remove shoulder harness and waistbelt from backplate for decontamination or cleaning, follow these instructions, for Professional Harness:

Removing Shoulder Harness

- Loosen hose loop buckles on both shoulder pads to free demand valve and gauge hoses.
- Loosen shoulder strap (2) buckles
- **(PA93)** Align and push inner retaining buckles through slots in top of backplate.
- **(PA93)** Align and push lower strap retaining buckles (2) through slots in base of backplate.
- Apply pressure tocentre of shoulder strap locking plate and rotate 90 degrees and remove harness assembly from slot in backptate

Removina Waistbell

- Align and push waistbelt retaining buckles (2) through slots in backplate.
- Apply pressureto centre of waistbelt pad rotating assembly through 90 degrees and remove from slot in backplate.

Waistbelt can only be removed or assembled one way.

Note:

a *PA94 Shoulder Harness and* Waistbelt remain as assembly *after removal from backplate.*

b *After cleaning dry shoulder harness and waistbelt at a temperature not exceeding 60 degrees Celsius*

Refitting of harness

Re-fit shoulder harness, then waistbelt to backplate (reverse of above instructions). Fit CEJN hose (LP Demand Valve Hose) over right shoulder strap and tie hose loop. Fit pressure gauge hose over left shoulder strap; tie hose loops and snap plastic shroud on gauge hose into securing clip.

Demand Valve Maintenance

Note: Disconnect *Demand Valve from apparatus before commencing disassembly.*

Replacing diaphragm

Note: *Depress reset lever (Fig.5) for Type A and AE.*

- Remove rubber protective cover and bayonet cap.
- Carefully remove diaphragm by unhooking its centre location from balanced piston lever.
- Relocate new diaphragm onto balanced piston lever (Fig.12) and locate diaphragm outer bead into groove in demand valve body (Fig. 13) note orientation.
- Refit bayonet cap - check position of diaphragm (Fig.14).
- Fit rubber protective cover.
- Carry out operational and function tests.

Conversion to Twin-Cylinder Unit

PA90 Series compressed air respiratory protection equipment can also be adapted for use as a twin-cylinder (2x4L) unit, by fitting a 'Y'-piece connector. See Technical Data, Page 8 , and Order List, Page 22.
To convert to standard (G 518 DIN 477 thread) twin-cylinder operation follow these instructions:-

* Ensure all connection threads on pressure reducer, 'Y' piece and cylinder valves are free from damage and that sealing O-rings are in position and undamaged.

- Connect both cylinders to 'Y' piece (Fig.16) - do not tighten.
- Fully open cylinder support strap on backplate.
- With apparatus in horizontal position, slide twin cylinder / 'Y' piece assembly through cylinder support strap and locate 'Y' piece port to pressure reducer hand wheel.
- Lift unit into upright position and screw hand wheel on pressure reducer into 'Y' piece port hand tight only (Fig.1 7).
- Place unit into horizontal position.
- Align cylinders centrally on backplate and tighten (handtight)handwheels into each cylinder and 'Y' piece port - hook anti-vibration strap to each hand wheel.
- Adjust cylinder retaining strap by taking up slack, then activate camlock mechanism by pulling end of strapback over cylinders.
- Locate end of strap in retaining clip.
- *Carry* out Operation and Functional Tests as described earlier.

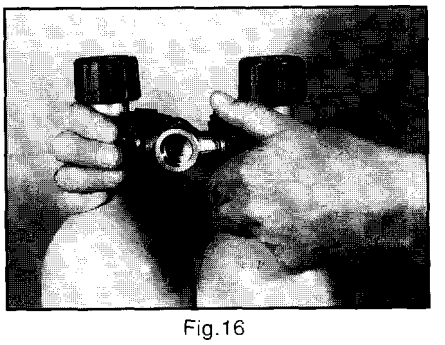

Fig.16

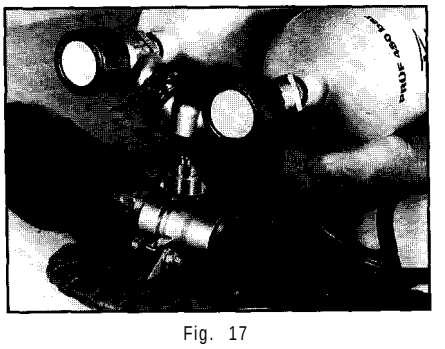

Fig. 17

FAULT-CAUSE-REMEDY

FAULT	POSSIBLE CAUSE	REMEDY
Facepiece leakage (Leak Test with apparatus In position)	Faulty or missing sealing O-ring for Plug-In connection	Fit or replace sealing O-ring
	Exhalation valve leakage	Clean and replace exhalation valve Replace as required
	Speech diaphragm defective	Replace as required
	Head straps not tight	Tighten straps
Unsatisfactory communication	Speech diaphragm defective	Replace as required
High pressure leak	Check tightness of connections	Tighten as required
	Whistle continuously in operation	Clean and reset
Safety relief valve venting	Pressure reducer defective	Return to Draeger Service
Demand valve vents (constant flow)	Banjo O-rings worn	Replace as required
	Balanced piston leakage	Replace as required
	Diaphragm fitted incorrectly	Check position refer to manual
Whistle does not sound correctly	Setting has changed Whistle dirty	Clean and reset as required

Testing the apparatus
The equipment should be tested as stated in the relevant Instructions for Use with apparatus listed below, and/or by reference to appropriate Service Manual.

Test Equipment required:
Refer to Dräger Service Manual.

Maintenance and Test Intervals

In addition to work outlined under 'Routine Maintenance, (which is to be performed whenever apparatus has been used), regular testing and servicing intervals are to be complied with, in accordance with this table.
This also applies to non-used (in-storage) apparatus

❍ Draeger Recommendation ♦ COSHH ■ Grease 'O' ring (Molykote 111) as required		After Use	Every month	Every 6 months	Every year	Every 6 years
Complete Apparatus	Cleaning	❍				
	Visual Checks	❍	♦			
	Functional and Leak Testing	❍	♦			
	Flow and/or Static Test (according to National Standards)				❍	
Lung Governed Demand Valve	Cleaning (as necessary)	■				
	Visual check of Diaphragm and Lever Assembly			❍		
Pressure Reducer	Medium Pressure Check				❍	
	Sintered Filter Change				❍	
	Basic Overhaul					❍
	Replace HP Sealing O-Ring				❍	
Cylinder	Charging	0				
	Charged Pressure Check		♦ ❍			
	Safety Pressure Test (according to National Standards)					
Cylinder Valve	Basic Overhaul (when necessary)					

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Storage

Ensure that shoulder straps and waistbelt are fully extended. Fold harnessstrapstogether on carrying frame; fold waistbelt over harness straps (Fig. 18).

Store set ready for use in a cool dry environment; free from dust and dirt. Rubber parts are to be protected from direct sunlight.

If unit is stored, available for use on wall or bulkhead mounting e.g. Fire Tender, ensure that unit is held and supported by cylinder and not backplate of unit.

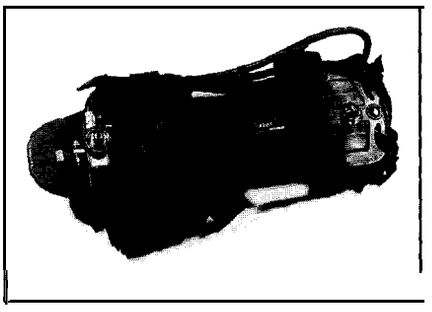

Fig. 18

Order List

Designation and Description		Order Code
PA92	Standard Harness G5/8 DIN Connection	**33 39920**
PA92	Standard Harness Italian Connection	**33 39922**
PA92	Standard Harness French Connection	**33 39923**
PA92	Standard Harness JIS Connection	**33 39925**
PA93	Professional Harness (Plastic Buckles) G5/8 DIN Connection	**33 39910**
PA93	Professional Harness Italian Connection	**33 39912**
PA93	Professional Harness French Connection	**33 39913**
PA93	Professional Harness JIS Connection	**33 39915**
PA94	Professional Harness (Metal Buckles) G5/8 DIN Connection only	**33 39917**

Order List

PA90 Series A Push-In Connection Positive Pressure	
Designation and Description	**Order Code**
Demand Valve A	**33 39400**
Panorama Nova Facepiece A (Neoprene)	**R 52972**
Panorama Nova Facepiece A (Neoprene) Acrylic Visor	**R 50092**
Panorama Nova Facepiece A (Silicone)	**R 53070**
PA90 Series AE M45 Screw-In Positive Pressure	
Demand Valve AE	**33 39405**
Panorama Nova Facepiece AE (Neoprene)	**R 51492**
Panorama Nova Facepiece AE (Silicone)	**R 52355**
PA90 Series N M40 Screw-In Normal Demand	
Demand Valve N	**33 39408**
Panorama Nova Facepiece N (Neoprene)	**R 27420**
Panorama Nova Facepiece N (Silicone)	**R 28480**
Valved Cylinders	
An extensive range of valved cylinders are available to suit all user requirements, including composite materials. For further details contact Drager Customer Services Department.	

Order List

Accessories	
Designation and Description	**Order Code**
Connecting Piece 'Y' Piece for two cylinder (2 x 4 L / 200bar) G5/8 DIN Connection only	**R 50675**
Miscellaneous	
Wipex Cloths (Pack of 50)	**33 80375**
1 Litre Safety Wash and Dispenser	**33 80164**
1 Litre Safety Wash Refill	**33 80165**
5 Litre Safety Wash and Dispenser	**33 80166**
5 Litre Safety Wash Refill	**33 80167**

Note: *The following are recommended for use, water and liquid soap e.g.*
EW 80 (Firma Tremonia Chemie, Kernebachstr, 95, D-6400 Dortmund 1)
Incidur (Firma Henkel KGaA, Henkelstr, 67, D-4000 Dusseldorf 13)
Tegodor F (Firma Goldschmidt AG, Goldschmidtstr, 100, D-4300 Essen 1)

Spare Parts List

Description	SPL No.
PA90 Series Compressed Air Respiratory Protection Equipment Basic Units PA92, PA93, PA94	**E 1284.0**
PA90 Series Pneumatic Arrangement	**E 1284.1**
PA90 Series Two Stage Lung Governed Demand Valves PA90A, PA90AE, PA90N	**E 1284.2**
PA90 Series Pressure Reducers	**E 1284.3**

Notes

These Instructions for Use apply only to PA90 Series with Serial Numbers:

Backplate..... BREH - 0002 /92 .....

PressureReducer..... BREH - 0002 .....

DemandValve.....

Without entry of at least one Serial Number by Draeger, these Instructions for Use are provided for general information only and are not to be used with a specific apparatus.

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