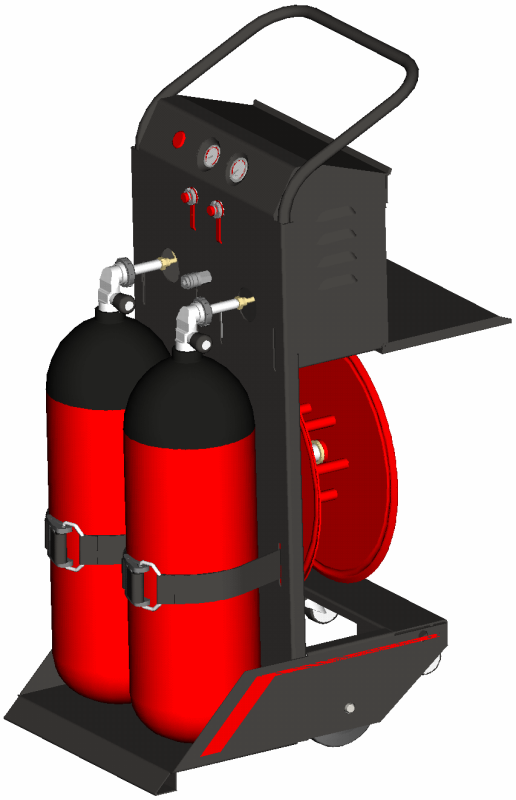
AIRLINE AP/A

DIABLO 8000/2



INSTRUCTIONS FOR USE

INDEX

1. INTRODUCTION

The following instructions are related to the specific use of AIRLINE compressed air breathing apparatus and their purpose is to ensure the proper performance the equipment has been designed for and to prevent any risk associated with improper use. The following instructions must be read by all the personnel who is in charge of compressed air breathing apparatus use and/or maintenance. AIRLINE compressed air breathing apparatus will grant the performance stated in this manual only if it is properly used and maintained. The use of AIRLINE presumes the full knowledge and observance of the following instructions.

Tests on **AIRLINE AP with and without auxiliary connection** according to the related EN standard and certification and authorization for CE marking have been carried out by ITALCERT – Viale Sarca, 336 – 20126 Milano (Notified Body **0426**). ITALCERT also carries out production control in accordance with Annex VIII (Form D) of Regulation (EU) 2016/425.

Diablo 8000/2 is subject to the module B+D procedures of the European Directive 2014/68/UE (Pressure Devices).

Italcert is the Notified Body no. 0426 who carries out the control on the production according to all Directives mentioned in the present instruction manual.

D.P.I. srl, the manufacturer, will not accept liability for any damage caused by improper use of AIRLINE in a configuration other than the one described in this manual, tampering, replacement of components with spare parts which are not original or maintenance carried out by untrained or unqualified personnel for this purpose.

2. BREATHING APPARATUS DESCRIPTION

In its various versions, AIRLINE is an open circuit, compressed air breathing apparatus, completely isolating the operator from the ambient atmosphere and ensuring full protection even in the severest conditions of use. The constant presence of a light positive pressure always prevents external contaminated air from entering the protection device donned by the operator.

This feature is particularly useful in all places where the ambient air is not breathable because of the presence of contaminants that due to their type and concentration are dangerous even in case of a very limited exposure.

The device has been designed and manufactured in order to ensure features and performances complying with the requirements of UNI EN 14593-1 2005.

3. OPERATING PRINCIPLE

Air Line AP is supplied by a compressed air source such as:

I. High-capacity cylinders (8 bar reduced pressure)

II. A medium pressure air compressor (6÷8 bar)

III. A compressed air line system (6 ÷ 8 Bar)

In DIABLO 8000/2 version, the breathable air is contained in two 18 l/220 Bar cylinders or in a 40 l/220 Bar cylinder to be used together with an 18 l/220 Bar cylinder in order to ensure the operator enough breathable air during replacement or recharging of the 40-litre cylinder itself.

In case I, the cylinders must be equipped with a DIABLO PI 8 Bar calibrated pressure reducer; in cases II and III it is necessary to make sure that the pressure reading is 8 Bar and that during use it does not drop under 6 Bar.

In all cases the supply of pure breathable air conforming to UNI-EN 12021 must be ensured.

The air supplied to the operator is ensured by an automatic positive-pressure valve, or demand valve, equipped with a threaded connection to an M45x3 mask, allowing a light positive pressure inside the mask for any breathing intensity over 400l/min of immediate maximum air supply.

The compressed air breathing apparatus can be connected to full face gas masks such as C 607 SP/A and SFERA SP/A.

A switch-over automatic switch valve, connected to the air line, the demand valve and a compressed air escape device, is also available. The operator will be automatically supplied

with breathable air by the compressed air escape device in case of airline failure. A warning device placed on the automatic switch casing informs the operator that he/she is breathing air from the compressed air escape device.

4. DESCRIPTION OF COMPONENTS

AIRLINE AP is made of the following components:

E 400 AP/A POSITIVE PRESSURE LUNG-GOVERNED DEMAND VALVE

E 400 AP/A is a positive pressure lung-governed demand valve compatible with the entire range of Diablo compressed air breathing apparatuses, equipped with M45X3 thread complying with UNI-EN 148/3 norm.

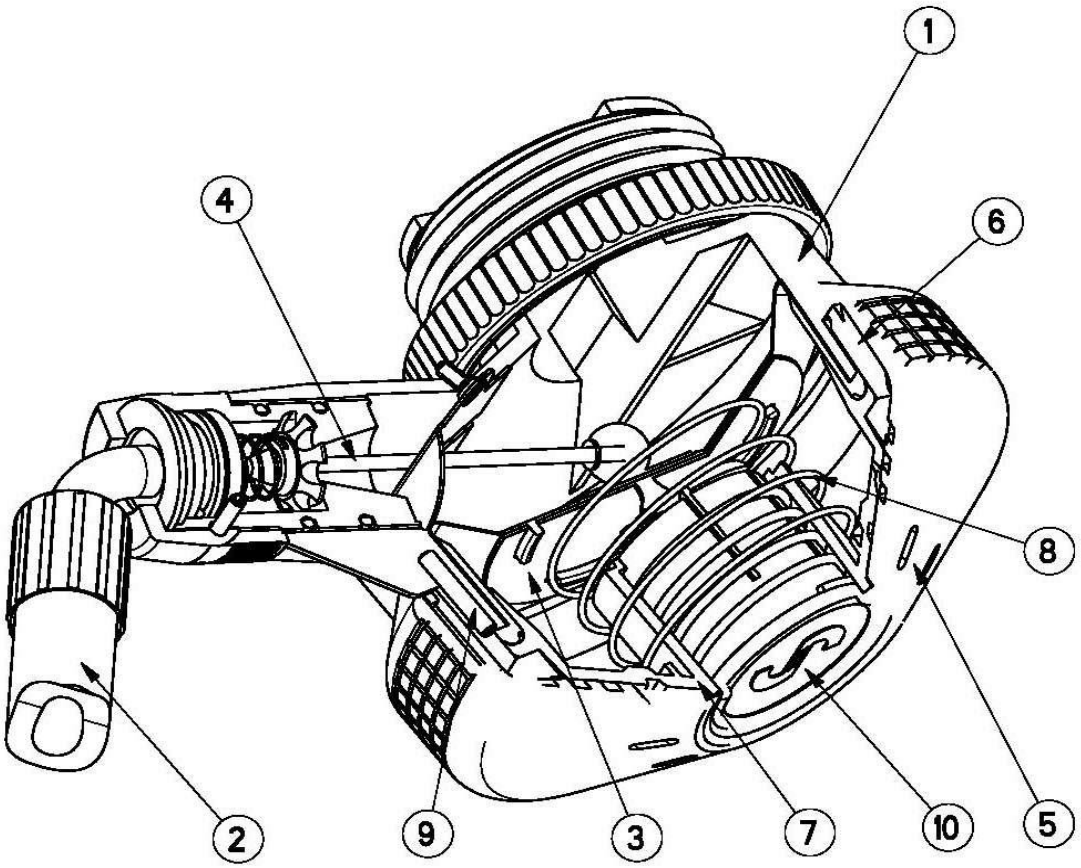
AP/A positive pressure lung-governed demand valve belongs to the most advanced generation of demand valves. As a matter of fact, it automatically switches from stand-by, with no air supply, to full positive pressure with the operator's initial breath. After getting over a barely perceptible initial breathing resistance which will not occur again during operation, the demand valve will switch automatically to positive pressure, with no other intentional procedure to be carried out by the operator who could easily forget about it when busy at work.

After use, it can be switched again to stand-by by pushing the red button at the centre of the demand valve. If the above procedure is not carried out, the result will simply be a loss of air after use.

As regards to the previous models, the fluid dynamics performances of E 400 AP/A lung governed demand valve have been improved allowing a greater air supply to the operator: over 400 l/min of instantaneous positive pressure air supply.

The lung governed demand valve is connected to a medium pressure rubber air line ending with a quick-release plug connector to the air supply system. The connection between the lung governed demand valve and the air supply is fixed to a synthetic woven fabric belt equipped with a quick-release buckle; after adjustment of the belt, the demand valve can be fixed to the waist.

1 – demand valve housing
2 – medium pressure air line supply
3 – demand valve membrane
4 – petal valve with pin
5– rubber protection
6 – screw of demand valve cap
7 – demand valve screw cap
8 – positive pressure spring
9 – anti screw pin



OVERVIEW WITH SECTION OF E400 AP/A DEMAND VALVE FOR AIR-LINE AP

Drawing 1

FULL FACE MASK:

SFERA SP/A

Sfera SP/A is a positive pressure full face mask equipped with an integrally transparent visor allowing an unlimited field of vision and full visibility with no optical aberration. It is also equipped with an efficient sound device allowing distant voice transmission. On the inside, Sfera SP/A is equipped with a rubber half mask; the exhaled air circulation inside the full face mask itself prevents the visor from misting. Two exhalation valves allow a high level of comfort at any breathing intensity.

The rubber harness is equipped with adjustable straps with buckles allowing a quick donning of the full face mask itself. The harness is equipped with a shoulder belt allowing to carry the full face mask before donning it. All the rubber components are made of a rubber mixture ensuring maximum resistance to wear and tear, atmospheric and chemical agents, as well as heat and extremely low temperature. Sfera SP/A is available in both EPDM and silicone. In both models the M 45 x 3 thread complies with UNI-EN 148/3.

C 607 SP/A

C 607 SP/A is a positive pressure full face mask equipped with a visor allowing a wide field of vision. It is also equipped with an efficient sound device allowing distance voice transmission. On the inside, C 607 SP/A is equipped with a rubber half mask; the exhaled air circulation inside the full face mask itself prevents the visor from misting. Two exhalation valves allow a high level of comfort at any breathing intensity.

The rubber harness is equipped with adjustable straps with buckles allowing a quick donning of the mask itself. The harness is equipped with a shoulder belt allowing to carry the mask before donning. All the rubber components are made of a rubber mixture ensuring maximum resistance to wear and tear, atmospheric and chemical agents, as well as heat and extremely low temperature. C 607 SP/A is available in both EPDM and silicone. In both models the M 45 x 3 thread complies with UNI-EN 148/3.

4.1 DIABLO 8000/2

DIABLO 8000/2 is a self contained, open-circuit breathing apparatus equipped with the typical Airline AP components such as full face mask, lung governed demand valve and belt, also including the following:

- N° 2 18 l/220 Bar cylinders or, as an alternative, a 40 l/200 Bar cylinder to be used together with an 18 l/220 Bar cylinder to ensure the operator enough air supply during replacement or refilling of 40 l cylinder;
- Pressure reducer assembly

- Metallic trolley unit complete with airline reel equipped with couplings suitable for a medium pressure 8x17mm line with a total length of 50 m.

Diablo 8000/2 main features are the following:

Model	Full face mask	Cylinder capacity (l)	Pressure (bar)	Air supply (l)	Autonomy (with an average rhythm of breathing of approx. 30 l/min) min.
DIABLO 8000/2	Sfera EPDM Sfera Silicone C607 EPDM C607 Silicone	18 litres x 2 40 litres (+ 18 l stand by cylinder)	220	7920 8000 (+ 3960 stand-by cylinder)	265 265 (+132 stand-by cylinder)

Size and weight

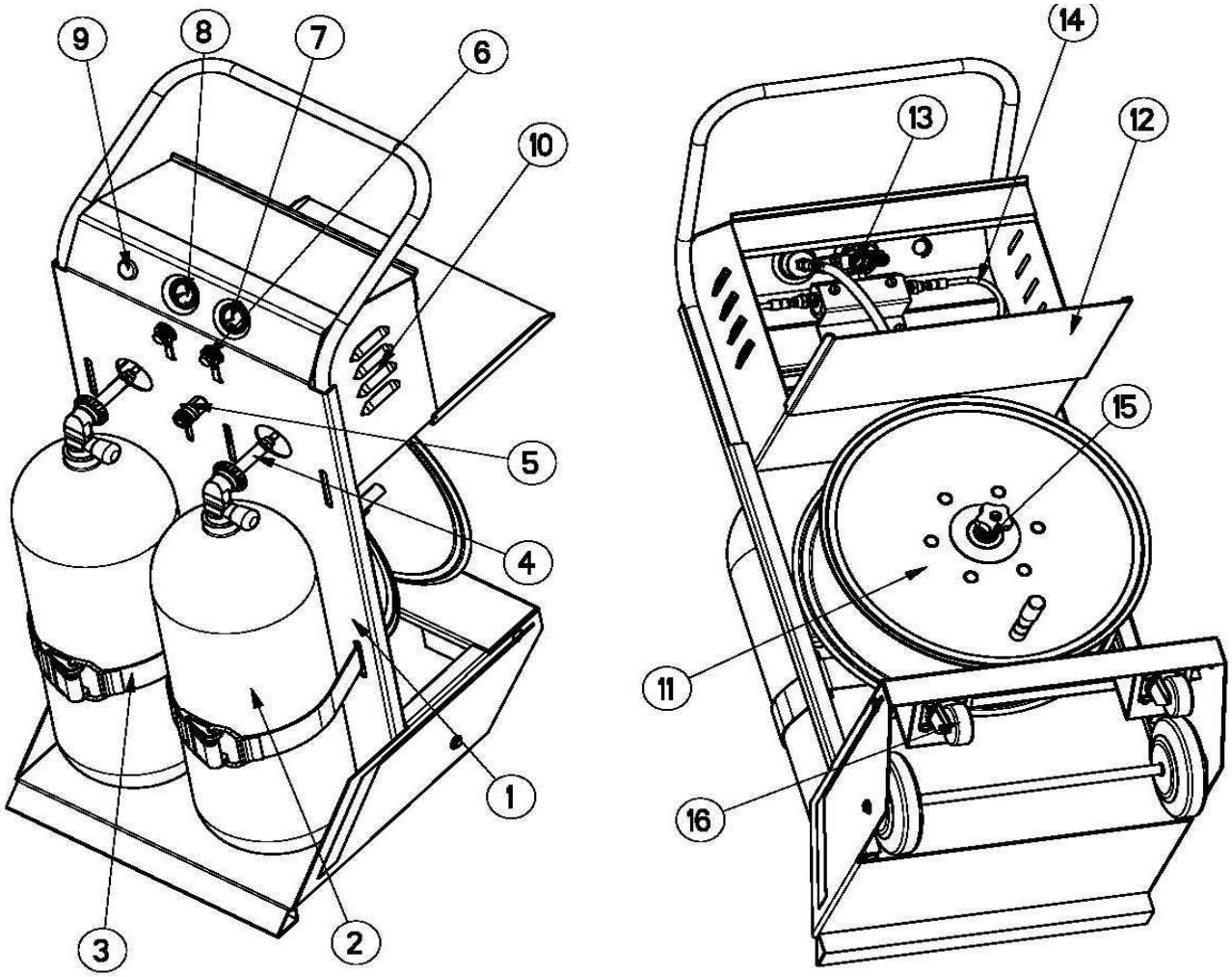
Height (mm)	Width (mm)	Depth (mm)	Total weight (Kg)	Diameter of cylinder (mm)
1180 1700*	480	600	100**	216±3

* Height with 40 l cylinder, valve included

** the weight refers to the trolley unit reel complete with 50m airline hose and empty 18lx220 bar cylinders.

REMARKS: Diablo 8000/2 complies with Directive PED and therefore cylinders of this respirator must be submitted to periodic inspections/tests according to the applicable National Laws.

1 – Trolley unit
2 – cylinder
3 – strap for cylinder
4 – connection to cylinder
5 – coupling for 2nd connection
6 – cleaning push-button
7 – medium pressure gauge
8 – high pressure gauge
9 – outlet cap for 40 l cylinder
10- side openings for warning signal
11- air line reel
12- mask storage door
13– pressure reducer assembly
14- high pressure air line
15– friction system preventing accidental hose unrolling
16- pivoting rear wheels



OVERVIEW OF DIABLO 8000/2 WITH 18 lx 220 bar cylinders

Drawing 2

TROLLEY UNIT

DESIGN:

The trolley unit has an elegant design and is entirely made of folded thin metal plate, with handle made of a folded metal tube and welded to the unit. It is equipped with two main wheels with metallic protection and two small pivoting wheels allowing the trolley to be perfectly balanced on four points.
All the pneumatic components, except the cylinder connections, are totally protected inside the mask storage space; the front board is equipped with high and medium pressure gauges both directly connected to the pressure reducer and placed in an inclined position allowing an easier reading.

Technical features:

- Flexible high pressure circuit made of a rigid manifold and two flexible metallic high-pressure connections (no.14, drawing 2);
- Possibility to connect an 18 l and a high capacity cylinder (40 l) at the same time;
- Cleaning push-buttons (no.13, drawing 2) connected to the manifold by means of an EN 144/2 thread in order to allow cylinder refilling both with and without need of removing it from the trolley;
- Perfect weight balance of trolley, airline reel and cylinders thanks to the support due to the four wheels, two main wheels and two small pivoting ones, allowing perfect overall balance.
- Possibility to tilt the trolley allowing the operator to work with the trolley placed horizontally and to carry out all the needed procedures on the high pressure circuit, particularly the replacement of the cylinder in an horizontal position with no need to lift it.
- Airline reel (no. 6 drawing 2), with 50m air line, equipped with a friction system preventing accidental air line unrolling from the reel slideway when unwinding;
- In order to allow the trolley to be used on uneven ground, a special equipment made of an axle and two large-size wheels, suitable for that kind of ground and easy to hook to the trolley itself, is also available.

CYLINDER

(no. 2 drawing 2) Light-weight stainless steel alloy complying with UNI 35 Mo4 equivalent of Din 17200. M25x2 thread. On the outside, the cylinder is oven-baked painted in SEKUR red with epoxy paint; on the inside, it is sandblasted and phosphate-coated. The outlet cap is enamelled in black and white alternate 90° stripes in accordance with the regulations in force (UNI EN 1089-3). The cylinder is supplied with its test certificate proving it is suitable for use. All the information related to the cylinder identification which is required by law have been printed on the cap of the cylinder itself (UNI EN 1089-1).

The cylinder is equipped with an A.P. valve with M25x2 (EN 144/1) cylindrical thread made of hot-pressed brass, chromium-plated externally, with rubber-coated control wheel ensuring a steady grip.

The control wheel requires a maximum of three turns from closed to fully open. The cylinder valve is available both with “Italia”-type thread, 14 threads with 30 mm diameter X 1 according to D.M. dated 12/9/1925 Article 17 (UNI 11144-2005) and UNI EN 144-2 thread for 220 bar cylinders.

PRESSURE REDUCER ASSEMBLY (no.13 drawing 2)

The pressure reducer is made of hot-pressed chromium-plated brass, chromium-plated inside, synthetic resins and rubber. The pressure reducer is directly connected to the manifold receiving air from the cylinders through two flexible high pressure connectors with external metallic plait.

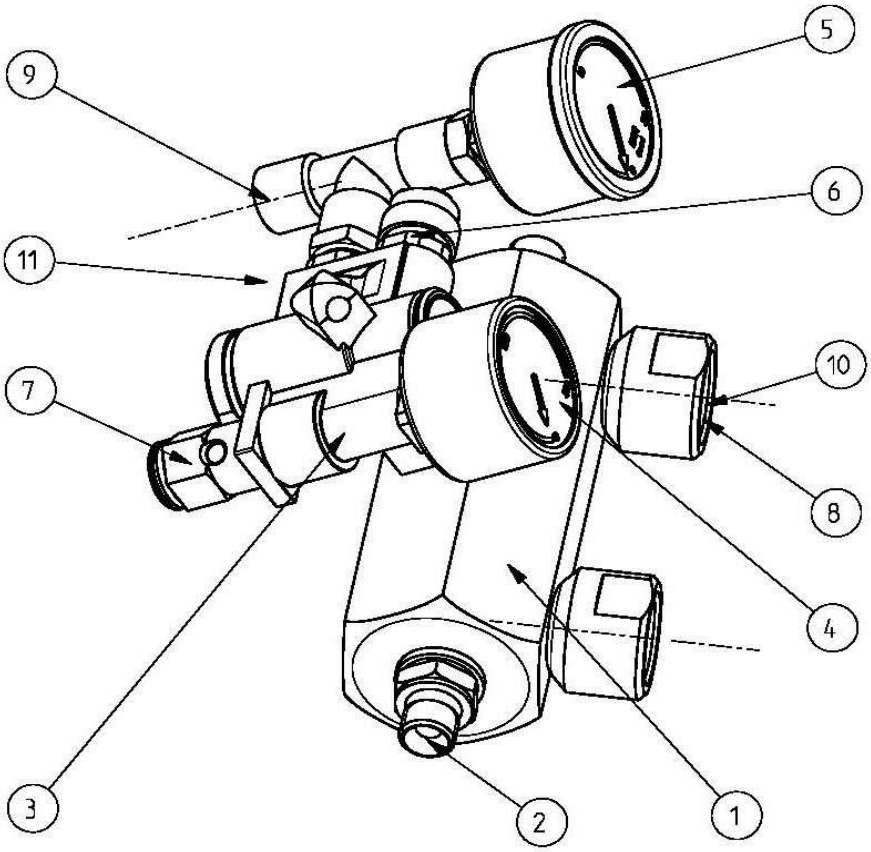
- The C2000/2 reducer (no. 2 drawing 3) is of the compensated type, that is it supplies a following constant static reduced pressure throughout all the operation, equal to the initial calibration pressure (8 bar) for any reading in the cylinder up to 20 bar. On the pressure reducer are assembled the following devices: a medium pressure air line connected to the airline reel (no.11 drawing 2), a high pressure gauge (no. 8 drawing 2), a medium pressure gauge (no. 7 drawing 2), a warning device (no. 7 drawing 3) and a safety valve (no. 6 drawing 3) that prevents the medium pressure air lines from being exposed to too high pressure in case of malfunctioning.

- The medium pressure air line supplying air from the pressure reducer to the demand valve is made of particularly thick synthetic resin allowing use in the severest conditions. It is complete with safety quick connecting couplings to separate the demand valve from the device.

- The high and medium pressure gauges, even if well protected by the conic housing on the front panel, are equipped with metallic casing and the high pressure gauge dial is phosphorescent, allowing accurate reading in any light condition. On the pressure reducer, where it is placed the connection with the above air line, it is also placed a calibrated hole allowing an air escape not over 25 l/min at a 200bar pressure, in case of gauge removal or malfunctioning.

- The warning device (no. 7 drawing 3) is made of chromium plated brass, stainless steel and synthetic resins and it is assembled directly on the pressure reducer assembly (no.2 drawing 3). It starts operating by emitting a shrill warning sound higher than 90 dB with a frequency between 2000 and 4000 Hz, when the air pressure in the cylinder reaches the calibration reading of the device, corresponding to a red sector on the gauge dial. The side openings on the storage space protecting the pneumatic circuit (no.10 drawing 2) allow to reach a sound intensity of 90 dB at a distance of 1m.

- The pressure reducer is equipped with a safety valve (no. 6 drawing 3) preventing the pressure from increasing above 15 bar inside the medium pressure air lines, thus jeopardizing the safety of both air lines and demand valve. In case of a reduced pressure reading higher that the above, the valve opens discharging air until the normal reading of 8 bar is restored.



1- Manifold
2- Air intake from cylinder
3- Pressure reducer
4- High pressure gauge
5- Reduced pressure gauge
6- Safety valve
7- Warning device
8- UNI EN 144-2 thread for refilling
9- Reduced pressure connection
10- Direction of assembly for refilling compressor coupling
11- Reduced pressure outlet to airline reel

DIABLO 8000/2
PRESSURE REDUCER OVERVIEW

Drawing 3

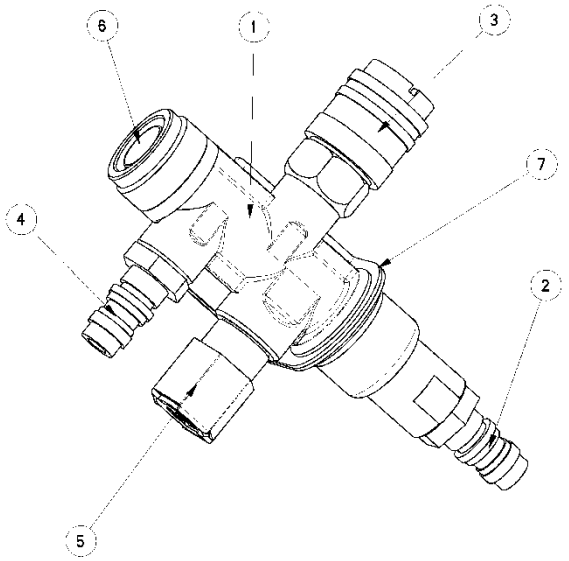
MANIFOLD

It is the device allowing to connect the pressure reducer with the two cylinders; its main feature is the possibility to replace the cylinders one at the time during the apparatus ordinary operation. For this purpose, on its two sides it is equipped with two buttons, one for the cylinder, allowing to depressurize the section between the manifold itself and the valve of the cylinder that needs to be replaced.

The depressurization button is screwed on a UNI EN 144-2 threaded connector and allows the cylinder refilling without removing it from the trolley as well as during use.

The high pressure circuit consists of two high pressure air lines connecting the manifold to the cylinder valve. This feature is particularly useful because it allows the use of the trolley with a 40/l cylinder, by means of a longer high pressure air line, and at the same time it avoids dangerous stress between the cylinder valve and the manifold.

4.2 SWITCH-OVER AUTOMATIC SWITCH VALVE



1- SWITCH-OVER ASSEMBLY
2- AIR LINE INTAKE
3- AIR OUTLET OF DEMAND VALVE
4- Sekur Navy Mask AIR INTAKE
5- WARNING DEVICE
6- SAFETY BUTTON
7- ANCHOR CLAMP OF SWITCH VALVE

3D VIEW OF **SWITCH-OVER AUTOMATIC SWITCH VALVE**
Drawing 4

The switch-over automatic switch is a device attached to the waist belt connecting the lung governed demand valve of the Air-Line system to the Sekur Navy Mask escape device, cutting out the air line supply thus supplying the demand valve with the emergency air supply from the Sekur Navy Mask in case of lack of air from or failure of the air line itself. A warning device on the automatic switch assembly alerts the operator that the escape device is in use.

Drawing 4 shows the switch-over assembly and highlights the air intake from the air line (2), the demand valve supply (3), the connection to the escape device (4) and the warning device (5). The safety button (6), to be activated manually, ensures activation even in case of switch-over malfunctioning.

4.3 AUXILIARY FITTING

In the case of AirLine AP-A with main supply 6-8 bar, there is a version with an 'auxiliary fitting'. This fitting is quick-acting valve mounted on the 'T' joint inserted before the device inlet.

5. APPLICABLE STANDARDS

AIR-LINE AP compressed air breathing apparatus complies with UNI EN 14593-1/2005.

C 607 SP/A and SFERA SP/A full face masks comply with UNI EN 136/2000, whereas the switch-over automatic switch relates to references provided for by UNI EN 402:2004.

AIR-LINE AP compressed air breathing apparatus complete with full face mask with/without Diablo 8000/2 is CE marked according to

1) in accordance with Annex VIII (Form D) of Regulation (EU) 2016/425. (Personal Protection Devices – category III).

2) European Directive 2014/68/UE (PED)

6. OPERATION

The 8 Bar compressed air from the air line, from compressor or high capacity cylinders gets to the demand valve through a medium pressure air line. The lung governed demand valve, correctly attached to the waist belt, supplies the demanded air up over 400 l/min ensuring that a light positive pressure is kept inside the mask in order to prevent external contaminated air from getting into the mask itself. The exhaled air is discharged from the mask thanks to the positive pressure exhalation valves. In DIABLO 8000/2 the air pressure from the cylinders is reduced to medium pressure by the pressure reducer assembly above described. The air line reel allows to store the whole airline in a limited space as well as to easily unreel it during operation.

7. USE AND RELATED INSTRUCTIONS

AIR-LINE AP compressed air breathing apparatus must be used in all places where the ambient air is polluted and not breathable and in case of the following conditions:

- the type and/or concentration of the contaminants in the air is not known;
- it is not certain that the amount of oxygen in the air is at least 18%;
- when the filtering devices are not certain to ensure an adequate protection due to the type and/or concentration of contaminants.
- when the type of work to be carried out requires a long duration exceeding the breathing apparatus operating range.

The compressed air line limits the operator's field of action and movement and therefore this type of equipment is particularly suitable for work in tight work space as well as in case of long duration work such as repair and maintenance or facilities involving stationary machineries (sandblast work, paint spray, dusty packing, etc.).

The purity of the air supplied has to comply with UNI EN 12021 at a working pressure of 8 bar, with a tolerated minimum of 6 bar.

In case of use of a compressor or of a compressed air line, always use a purifying filter able of supplying at least 400 l/min at the minimum required pressure.

The rubber air line meets the following requirements:

operating pressure:	20 Bar
burst pressure:	at least 54 Bar
length:	50-metre limit

As per the protective full face masks (C 607 SP/A, SFERA SP/A) to be used with the AIRLINE version, it is advisable to read carefully the instructions for use related to each item.

The compressed air breathing apparatus has not been designed for underwater use: nevertheless, it is waterproof and a limited immersion in water does not jeopardize its good functioning.

Moreover, the compressed air breathing apparatus has not been designed for use in areas with danger of explosion and in presence of risk related to fire exposure, therefore the apparatus is not "F" marked and the medium pressure air line has not been tested for resistance to heat and electrical properties.

The breathable air supply system, Diablo 8000/2, supplies a first operator through a 50-metre air line and, at the same time, a second operator connected directly by means of a second connection placed on the unit front panel or through an air line with a maximum length of 30 metres.

NOTICE: the equipment must be used only by properly trained and qualified personnel.

7.1 **Preliminary procedure before use**

It is necessary to check the operating pressure of the air supply and drain the condensation that could be present in the air line filters. It is also advisable to check the efficiency of the filter placed immediately before the point of supply; the outgoing air must be dry and odourless according to the requirements of UNI EN 12021. If necessary, remove the internal components of the filter and replace them in order to ensure a long-time, constant and adequate filtering performance and air quality.

7.2 Assembling Cylinders on the Diablo 8000/2 Unit.

For the assembly of the cylinders on the unit, the instructions in the photos illustrated below must be respected. Especially:

1 2 cylinders 18lX220bar. This is the basic configuration and the assembly must be done according to photo number I.

2 Cylinder 40lX220bar. This cylinder, to be used only in addition to one of the other cylinders allowed and already described in this manual, must be mounted on the right side by passing the metal supply pipe through the hole drilled on the right side of the

front panel of Diablo 8000/2 mobile unit. For the connection of the 40lX220bar cylinder to the unit, an appropriate fitting must be used that connects the end of the metal pipe with the cylinder valve. The configuration is illustrated in fig II, which also shows the connection of the cylinder 40lx220bar in case of the assembly of a 40lX220bar cylinder, an additional cylinder-stop band must be used to be placed in the appropriate slots already present in the trolley (see figure II).

3 Cylinders 6l, 6,8l and 9l mounted individually next to one of the two cylinders described in points 1 and 2.
The cylinder can be mounted as shown in Figure III. In particular, it is necessary that the composite cylinder tube describes the geometry clearly visible in photo III since this position is the optimal one for the protection of the connection from external grips as well as from the tensions of the pipe due to the position assumed by the pipe itself.

4 Cylinders 6l, 6,8l and 9l mounted in pairs. Figure IV shows how to mount the two cylinders. In this case the particular type of mounting is optimal because it protects the connections from external grips and at the same time reduces the tensions acting on the metal pipes.

N.B: if the second user is connected too, the only cylinders that can be used are 18lX220 bar ones or alternatively a 18lx220 bar cylinder coupled with a 40Lx220bar cylinder and this to allow the two operators simultaneously connected to the air reserve to have sufficient time to leave the place of intervention when the acoustic signal of the pressure reducer of the Diablo 8000/2 mobile unit comes into operation.

Fig. I

Fig. II

Fig. III

Fig. IV

7.3 Donning

In order to properly don the breathing apparatus, adjust the waist belt and place the quick connecting piece preferably on the left hip. After adjusting the waist belt as above, don the full face mask already equipped with the lung governed demand valve according to the related manual instructions. In case the breathing apparatus is equipped with Switch-Over automatic switch, the connecting piece has to be placed on the operator's right hip. In this case it is necessary to don the Sekur Navy Mask escape device on the operator's left hip and connect the medium pressure air line of the escape device itself to the switch-over automatic switch on the connecting piece as shown in drawing 4 on page 16 of this manual.

7.4 Operation checkout

Connect the donned apparatus to the breathable air intake by means of the medium pressure rubber air line by using the provided quick connections.

At the operator's first inhalation, the lung governed demand valve will switch automatically to positive pressure. Breathe deeply several times in order to check the smooth and regular operation of the apparatus.

When using Diablo 8000/2 it is necessary to check the cylinder filling.

7.4.1 Operation and filling indicator checkout for Diablo 8000/2

After checking the connections between the cylinder and the pneumatic circuit housed in the trolley unit are correct,

- Slowly open the valve of one of the two cylinders in case of two 18 l cylinders or open the valve of the 18l cylinder in case of use of the 40 l cylinder.
- Check the pressure readings from the high pressure gauge (no.8 drawing 2), checking the filling level of the cylinder, and from the medium pressure gauge (no.7 drawing 2) checking that the reading is between 8 bar $\pm$ 0,5 bar;
- Close the cylinder valve and press the red button (no. 10 drawing 1) of the lung governed demand valve until the high pressure gauge reading is slightly under 55 bar;
- Check that the audible signal of the warning device is loud and clear, therefore perfectly audible;
- Keep the red button pressed on until the pneumatic circuit is totally empty;
- Open the valve of the second cylinder (the 40l cylinder), checking the level of filling by the high pressure gauge reading (no.8 drawing 2);
- Place the trolley unit in horizontal position with the air line reel facing downwards. As an alternative the ready-for-use unit can be left in a vertical position.

7.5 Use

After carrying out the above procedures, the operator can start using the device that will ensure him/her a safe and natural breathing even in case of long duration work. Nevertheless, it is advisable to keep in mind the following precautions:

- In case an excessive dryness of the upper respiratory tract is felt, it is advisable to momentarily suspend any working activity
- In case an increase of respiratory resistance is felt, stop working immediately. In case of use of a switch-over automatic switch an increase of the respiratory resistance is felt, it is necessary to press the red button placed on top of the switch-over itself. An audible signal from the warning device connected to the switch-over will warn that the air from the Sekur Navy Mask escape device is being supplied. However, it is necessary to cease operations and leave immediately the work area because of the limited air filling in the cylinder of the Sekur Navy Mask escape device.

7.6 Use of second cylinder during operations (for DIABLO 8000/2)

It is important to underline that the procedures related to the cylinder replacement during operation must be carried out by an external operator. He/she is expected to be in close proximity of the device and therefore to be able to hear the warning signal of the device when it starts indicating the air exhaustion in the cylinder in use. Therefore, the external operator will have to carry out the following procedure:

- Open the valve of the filled cylinder. In this case the flash back check valve assembly inside the manifold will exclude the empty cylinder from the pressure reducer, which will then operate with the air contained in the filled cylinder;
- Check the reading on the high pressure gauge (no.7 drawing 2) in order to make sure that the cylinder is filled;
- Close the valve of the empty cylinder;
- Press the depressurization button (no.6 drawing 2) closer to the empty cylinder;
- Unscrew the ring of the cylinder valve from the trolley shank (no.4 drawing 2)
- Replace the cylinder.

Following the above procedure, the duration of the Air-Line AP / Diablo 8000/2 system is in theory limitless.

7.7 Cleaning and disinfection

The full face mask

The full face mask must be cleaned after each use as well as disinfected in case it has been polluted or in case it has to be used by another operator.

7.7.1 Washing:

1) When using an ultrasonic tank, immerse the whole face piece or its disassembled components completely and switch it on after setting the temperature control on a maximum temperature of 40°C. Rinse with lukewarm water and dry in the air or using a dryer at low temperature.

2) If an ultrasonic tank is not available, it is advisable to disassemble the face piece and immerse both the rubber and the plastic components in a lukewarm, light detergent solution removing dirt mechanically. Rinse thoroughly with lukewarm water and dry as advised above.

7.7.2 Disinfection:

Disinfection must be carried out when the mask is particularly dirty or when it has to be used by another operator. In this case, immerse the full face mask or its components in a disinfectant solution for the time indicated in the disinfectant instructions for use. Rinse thoroughly and dry as advised above.

The lung governed demand valve

Although the full face masks used with Air-Line AP are equipped with inhalation valve, it is necessary to clean and disinfect the components of the demand valve that can get in contact, even if indirectly, with the operator's saliva or sweat from his/her face and forehead. The components of the demand valve to be disinfected include only the low pressure chamber in contact with the air coming from the medium pressure air line. The demand valve can be manually cleaned as follows:

- Remove the rubber protection (no.5 drawing1)
- Unscrew the demand valve cap (no.6 drawing1) after lifting the metallic pin (no.9 drawing 1) preventing accidental unscrewing.
- Remove the membrane (no.3 drawing1) and delicately clean it on both sides;
- Remove the metallic deflector after unscrewing the two screws;
- Clean the internal part of the demand valve assembly (no. 1 drawing 1) manually, taking care not to damage the petal valve pin (no.4 drawing 1); in case of disinfection, apply the disinfectant and leave it working for the time indicated in the disinfectant instructions for use, paying attention not to spill the disinfectant into the medium pressure chamber beyond the petal valve (no.4 drawing1).
- Rinse with lukewarm water and dry in the air or using a dryer at low temperature;
- Reassemble the demand valve in the following order: fasten the metallic deflector, assemble the positive pressure spring (no.8 drawing 1) inside the demand valve cap (no.7 drawing 1), insert the membrane with the plastic mushroom-shaped component

facing the spring and pushing it in order to allow the membrane to hook the red button springs, insert the assembled components in the demand valve casing; lower the screw pin (no.9 drawing 1) and assemble the rubber protection.

7.8 Cylinder refilling after use:

After operation and cleaning, the cylinders can be refilled by unscrewing from the cylinder (no. 2 drawing 2) the metal ring of the connection to the pneumatic circuit of the trolley (no.4 drawing 2) and sending the cylinder to a filling station.

The cylinders used with Diablo 8000/2 can be refilled without removing them by simply unscrewing the cleaning push-button and then connecting in its place the connector (UNI EN 144-2 200 bar) of the compressor coupling for cylinder refilling up to 200bar. During refilling, to be carried out on one cylinder at the time, the pressure reducer emits an audible signal until the cylinder exceeds the calibration pressure (55bar). It is advisable to carry out the above refilling procedure when the cylinder has not been completely emptied during operation, in order to avoid the nuisance of the audible signal due to long-lasting refilling procedures.

8. STORAGE

Before storing the respiratory device, carry out scrupulously the above instructions; keep the device in a cool, dry place at a temperature between +2°C and +55°C, safe from heat and dust. Avoid to distort or make creases to the air lines.

9. MAINTENANCE

The following check procedures must be carried out at any use and if they reveal readings or conditions different from those indicated ensuring the apparatus is ready and fit for use, it is necessary to carry out appropriate maintenance procedures. Maintenance and servicing must only be performed by authorized, specialized and properly trained personnel.

Moreover, in case the breathing apparatus is not in use for a long time, checks must be carried out at least once every six months.

The following table schedules the maintenance procedures related to the various components of the breathing apparatus Air-Line and Diablo 8000/2 if present.

SCHEDULE OF CHECK AND MAINTENANCE PROCEDURES RELATED TO THE COMPONENTS OF AIR-LINE A.P. AND DIABLO 8000/2 (if present) BREATHING APPARATUSES

Part of device	Action to be carried out	Before every use	After every use	Every six months	Every year	Every three years	Every six years
Facepieces	As per related manuals						
Complete AIRLINE apparatus	Cleaning Disinfection Leak test Operation test	 X X	X X	X	X X		
	Check cylinder connection O-Ring	X					

C2000/2 pressure reducer (for Diablo 8000/2)	Replacement of cylinder connection O-Ring				X		X
	Replacement of filter on connecting piece						X
	Check (reduced) medium pressure				X		
	Check pressure gauge accuracy						X
	High pressure tightness test	X			X		
	Check warning device calibration	X			X		
	Complete checkout						X
Demand valve	Check demand valve calibration						X
	Check demand valve membrane				X		
	Membrane replacement					X	X
Compressed air cylinder	Overhauling (test)						
Compressed air filter	Replacement of filter cartridge	Before consumption					

10. LIMITATIONS

The performance of Air-Line compressed air breathing apparatus and Diablo 8000/2 trolley unit system strictly depends on a proper use of the devices themselves; the operators must be informed about the correct donning of the apparatus and the proper procedures to be carried out in relation to the system pressurization and operation as indicated in this manual. The above breathing apparatuses have been designed to allow work in an hazardous environment which is in any case compatible with the operator's physical resistance.

Air-Line AP compressed air breathing apparatus, full face mask included, works perfectly in the interval of reduced pressure readings between 6÷8 bar. In case of pressure readings outside this range, in terms of overpressure and air flow the breathing apparatus performance is not ensured.

Notwithstanding its high performance in terms of overpressure, even at high breathing rates, E400AP/A lung governed demand valve could show one or more negative pressure peaks in the breathing-related diagrams. This could happen in case of very high or over the range breathing rates even in an estimated ordinary working activity. Such a condition, however, does not imply any limitation in the air flow that the demand valve is able to supply.

Since the Air-Line system supplies the operator with breathable air from a supply located outside the working area, it is advisable to check on a regular basis the air quality supplied to the demand valve, and therefore to the facepiece. Particularly, the level of humidity and the maximum concentration of components not useful to breathing must be checked in order to ensure that the air quality complies with the requirements provided for by UNI EN 12021 (as well as to prevent the system from freezing under particular conditions).

Diablo 8000/2 trolley unit system has been designed to house an air line of 50-metre maximum length for a first operator and a connection for a second operator's demand valve

(no.5 drawing 2) directly to the medium pressure second connection or below a medium pressure air line of 30-metre maximum length. The air line connecting the demand valve to the trolley air line reel has been designed for an operating pressure of maximum 20 bar. This pressure cannot be reached or exceeded since the pressure reducer is equipped with a safety valve which opens in case of pressure readings between 11bar and 14 bar, thus ensuring the outflow of air in excess.

The device described in this manual must not be used with oxygen or oxygen-enriched air.

When Air-Line compressed air breathing apparatus is connected to high capacity cylinders, such as Diablo 8000/2, it is necessary to plan in advance the time length of the work to be carried out and provide oneself with the proportionate air supply needed for the planned operation.

Finally, according to the instructions for use of Diablo 8000/2 as provided for by the manufacturer and certified by the notified body, an external operator must stand by in close proximity of the air supply mobile unit. The above operator will have to intervene in order to replace the empty cylinder when needed.

11. MALFUNCTIONING

Since the operator's health and safety at work depends on the correct operation of the breathing apparatus, the instructions for use and maintenance of this manual must be carefully read, understood and followed.

Any malfunctioning, leak and/or blocking of the device must be immediately checked and taken care of by personnel authorized by the manufacturer.

The following table lists a number of possible malfunctions with probable causes and solutions.

MALFUNCTION	PROBABLE CAUSE	SOLUTION
The facepiece leaks	*missing or damaged gasket *the exhalation valves leak *the harness is loose	*replace the missing gasket *clean and remove possible dirt otherwise replace *adjust harness properly
Leaks on high pressure	*ORing missing or damaged on the cylinder connection	*fix in place or replace
Air flow from the medium pressure safety valve	*pressure reducer failure	*send to overhauling
Feeble sound from the warning device	*dirt on whistle	*clean

In order to identify or prevent possible malfunctioning, the maintenance procedures contained in this manual must be strictly followed.

12. ORDERING CODES AND SPARE PARTS

Maintenance and repair must be carried out using original spare parts only.

Complete disassembly of components is only allowed to specialized personnel owning the correct equipment and the necessary technical knowledge.

In order to make the above procedures and the request of spare parts easier, always use the exploded drawings of the pneumatic circuit components. Refer to the drawings (provided by the manufacturer to the customers after attending an appropriate training course related to the product maintenance) when indicating the ordering code related to every component. The manufacturer will not accept liability for any device repaired by personnel who is not trained and qualified for this purpose.

ORDERING INFORMATION

DESCRIPTION	ORDERING CODES
Diablo 8000/2 C607 N 2x18L D200	43421067
Diablo 8000/2 C607 S 2x18L D200	43421068
Diablo 8000/2 SFE N 2x18L D200	43421069
Diablo 8000/2 SFE S 2x18L D200	43421070
Diablo 8000/2 C607 N 40+18L D200	43421075
Diablo 8000/2 C607 S 40+18L D200	43421076
Diablo 8000/2 SFE N 40+18L D200	43421077
Diablo 8000/2 SFE S 40+18L D200	43421078
Diablo 8000/2 C607 N 2x18L D300	43421067
Diablo 8000/2 C607 S 2x18L D300	43421068
Diablo 8000/2 SFE N 2x18L D300	43421069
Diablo 8000/2 SFE S 2x18L D300	43421070
18 l/ 220 Bar steel cylinder complete with outlet cap and valve (UNI EN 144-2)	43430820
40 l/200 Bar steel cylinder complete with outlet cap and valve (UNI EN 144-2)	43420603
Sfera SP/A EPDM full face mask	43333004
Sfera SP/A Silicone full face mask	43333001
C 607 SP/A EPDM full face mask	43333007
C 607 SP/A Silicone full face mask	43333008
PG7 CEJN 344-10 valve	43431028
PG7 CEJN 344-1250 (aux fitting valve)	
PG7 CEJN 344-50 quick connection	43431027
Flameproof belt	43430803
E 400 AP/A Air Line lung governed demand valve	42000851
Switch-Over automatic switch with SNM backup	43442040

NOTICE: the facepiece spare parts are listed in the related manuals, whereas the spare parts for the pneumatic circuit (pressure reducer, manifold and demand valve) are indicated in the related exploded drawings as provided by the manufacturer after attending a training course in the D.P.I. premises in Rome.

13. ACCESSORIES

Ordering Codes	Description
43442032	- Airline filtering device for air line or compressor (max. 12 Bar)
43442033	- Series of spare filters for Airline filtering device
43431063	- Medium pressure air line hose (20 Bar): 8X17 diameter, 30-metre length with quick coupling connection (Diablo 8000/2)
42002060	Axle with two tyres and pins (Diablo 8000/2)

14. MARKING

The marking on the components of Air Line AP system and on Diablo 8000/2 are listed and explained as follows:

Full face mask:

See related manual

E 400 AP/A lung governed demand valve

External surface

Outside

E 400	=	identification code
4343.0580	=	ordering code of spare part

Inside

M1188	=	mould number of rubber covering

Membrane

	=	trade mark logo of line of products
	=	name of the breathing apparatus manufacturer
M 1200	=	mould number of rubber covering

Date stamp manufacture	=	a pointer indicates month and last two figures of the membrane year of
E 400	=	identification code of demand valve
4343.2188	=	ordering code of demand valve

Demand valve casing

$	=	trade mark logo of line of products
E 400 AP/A	=	identification code of demand valve type (M45x3)
4343.0005	=	ordering code of demand valve assembly
MADE IN ITALY	=	marking of place of origin
06ER0011	=	serial number of demand valve with 06 = year of manufacture; ER = demand valve identification 0011= serial number

Metallic belt connecting piece for Air-Line (with or without switch-over)

The belt connecting piece carries the following information:

UNI EN 14593-1:2005	= Norm of reference;
PROD. 2007	= Year of manufacture;
D.P.I.	= Manufacturer's name;
CE 0426	= Identification of Notified Body;
Tsmax=60°C-Tmin=-30°C	= Operation temperature limit

C2000/2 (Diablo 8000/2) pressure reducer

C2000	=	identification code of Diablo pressure reducers of the compensated type

Red disk protecting calibration seal of warning device:

	=	identification of version 2 of C2000 pressure reducer
06RI1120 (example)	=	serial number of pressure reducer with 06 = year of manufacture; RI = pressure reducer identification 1120 = pressure reducer serial number