



**Mobile System for Compressed
Breathable Air Supply**



MASS series

EN 14593

Instructions for use



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WARNING !

Like any piece of complex equipment the product will do the job it is designed to do only if it is used and serviced in accordance with manufacturer's instructions. This manual must be carefully read from all individuals who have or will have responsibility for using or servicing the product.

The warranties made by MSA with respect to the product are voided if the product is not used and serviced in accordance with the instructions in this manual.

Please protect yourself and your employees by following them.

Before choosing and using this product, please make sure that it is suitable for the required application.

Selection and use are beyond the control of MSA. Therefore, liability of MSA covers only the steady quality of this product. What above mentioned does not alter statements regarding the warranties and conditions of sale and deliveries of MSA.

Instructions concerning mask, lung governed valve and Air-Line System combined with the trolley system are to be considered as integral part of present instructions.

*MSA trolley systems - models MASS, MASS 50 I and MASS 50 II - are supplied with certification and EC-marking in accordance with 89/686/EEC directive and with 97/23/EC directive, such as PPE of 3rd category and meet fully the technical requirements provided by standard EN 14593-1:2005
The EC-certificate has been issued by ITALCERT – Viale Sarca, 336 Milan – Italy
Notified Body 0426*

The certification validity is limited to the use of a hose with a maximum length according to what mentioned in the following instructions for use.

1. VERSIONS

Model	Part Number
MASS trolley system , consisting of: A trolley for cylinder holder suitable for placing two cylinders with a maximum capacity of 9 litres and a maximum operating pressure of 300 bar or 200 bar, high pressure hoses, pressure reducer and a coil with hose for the remote supply of breathable air (standard length: 40 meters)	M0018642
MASS 50 I trolley system , consisting of: A trolley for cylinder holder suitable for placing one cylinder with a capacity of 50 litres having a maximum operating pressure of 300 bar or 200 bar, high pressure hoses, pressure reducer and a coil with hose for the remote supply of breathable air (standard length: 40 meters)	M0023267
MASS 50 II trolley system , consisting of: A trolley for cylinder holder suitable for placing two cylinders with a capacity of 50 litres having a maximum operating pressure of 300 bar or 200 bar, high pressure hoses, pressure reducer and two coils with hoses for the remote supply of breathable air (standard length: 40 meters each)	M0023268

The above systems can be used with the following models of compressed breathable air cylinders:

Description of cylinder	Part Number
MASS trolley system:	
Composite cylinder (PET) 9 litres/300 bar, charge	0102077
Composite cylinder 9 litres /300 bar, charge	0102088
Composite cylinder (PET) 6,8 litres /300 bar, charge	0102075
Composite cylinder of 6,8 litres /300 bar with charge	0102074
Steel cylinder 6 litres/300 bar, charge	0102073
Steel cylinder 6 litres /200 bar, charge	0102071
Steel cylinder 7 litres /200 bar, charge	0102072
MASS 50 I and MASS 50 II trolley system:	
Steel cylinder 50 litres /300 bar, empty	0110454

MASS systems have been tested with cylinders corresponding to MSA above mentioned Part Numbers. The use of cylinders other than those above mentioned should be authorized by the manufacturer (MSA).

The trolley system complete with cylinder/s is suitable for operating with one of the following AIR-LINE models; Demand type or Positive pressure type.

Hereunder the available combinations of Air-Line/ Full-face mask /Lung governed demand valve are shown:

Demand type version:

AIR-LINE D/3S/LA 96-N	242225
AIR-LINE D/3S/AutoMaXX-N	M0019125
AIR-LINE D/Ultra Elite/LA 96-N	M0019126
AIR-LINE D/Ultra Elite/AutoMaXX-N	M0019127

Positive pressure version:

AIR-LINE P/3S-PF/LA 96-AE	242226
AIR-LINE P/3S-PF/AutoMaXX-AE	M0019128
AIR-LINE P/3S-PS-MaXX/AutoMaXX-AS	M0019129
AIR-LINE P/Ultra Elite-PF/LA 96-AE	M0015568
AIR-LINE P/Ultra Elite-PF/AutoMaXX-AE	M0019130
AIR-LINE P/Ultra Elite-PS-MaXX/AutoMaXX-AS	M0019131

MASS and MASS 50 I systems are supplied complete with a coiler with 40 meters of air supply hose, while MASS 50 II system is supplied complete with two coilers with 40 meters of hose each.

Lower measures of hoses can be supplied on specific request for any particular needs. Furthermore it is possible to connect more hoses between each other of various length according to what hereunder mentioned:

MASS trolley system with Air-Line D (several versions)	Admissible maximum length: 60 meters
MASS trolley system with Air-Line P (several versions)	Admissible maximum length: 100 meters
MASS trolley system simultaneously with Air-Line D (several versions) and Air Line P (several versions)	Admissible maximum length: 60 meters

The maximum number of hoses that can be connected between each other **in addition to** the one provided on the coiler installed on the trolley, in order to obtain the above mentioned length, is 3 hoses on the line combining the hose connection and each operator.

MASS system has been tested and certified for the supply of breathable air up to a **maximum of 4 operators** who **at the same time** make use of MSA Air-Line Systems according to what above mentioned and to limitations shown at point 3.

The use of hoses with a length longer than what above mentioned is not admitted.

The use of hoses with a length longer or with a higher number of users than what above mentioned should be considered as an improper use and the warranty of functionality given by MSA can no longer be considered as valid.

2. DESCRIPTION and USE

The MSA MASS trolley systems are an insulating and non-autonomous Personal Protective Equipment (as it depends on a hose supplying breathable air to the user) for respiratory protection, independent from the environmental atmosphere. Air for breath is supplied to the operator by cylinders of compressed air (whose capacity changes according to the model of chosen cylinders, so that many autonomies are admitted) through a pressure reducer, a supply line at medium pressure, a lung governed demand valve (see Instructions for use of lung governed demand valve) and finally a full-face mask complying with EN 136, class 3 (see Instructions for use of Full Face Mask).

Attention *The compressed air contained in cylinders must be of breathable type according to what prescribed by the EN 12021.*

The exhaled air is expelled through the mask exhalation valve directly into the environmental atmosphere.

The hose for supply of breathable compressed air complies with basic requirements, as provided by EN 14593-1:2005 and it also meets antistatic requirements (S-marking) and heat resistance (H-marking). Hoses for compressed air are equipment used for breath in environments where there is gas or air, whose respirability is not guaranteed and are not suitable for the underwater use.

MASS trolley systems of MSA can be used in all places where the air in the environment following to the presence of harmful substances for human is no more considered to be breathable, as it can't be purified with absolute certainty or because the filtering equipment can't be any longer used because of lack of oxygen.

The mobile systems for breathable air supply can be also used, when another equipment for the respiratory protection, like for example an self contained breathing apparatus or a filtering equipment can't be used because of a limited autonomy or unfavourable conditions of place of work that do not allow wearing a similar equipment or whose weight would worsen the usual conditions of use, by reducing its efficiency.

In combination with suitable MSA Auer self contained breathing apparatus BD 96 Mini, BD Mini or BD 96 (in standard versions S, Z and S-Z), having the function of further air supply and by the use of a 3-way valve (ASV), the mobile Air-Line systems of MSA - MASS series - become an autonomous respirator.

The mobile respirators of MASS series can be easily used also for maintenance and repair operations in tanks, containers, underground passages and so on (confined spaces).

The main uses for which it is recommended the use of these mobile PPE are the following:

- Works inside tanks,
- Cleaning of basins containing sewage sludge,
- Works inside sewers
- Protection of plants in case of an emergency, for example by allowing remaining inside a panel room in a heating plant for the setting at safety of plants with the possibility of using the self contained breathing apparatus to let in uncontaminated air again.
- Firemen for rescue interventions in contaminated environments, for example in tunnel, ships, wells, to the aid of people unable to move, by using them, if necessary, as air supply with anti-contamination overalls provided with a air supply hose.

3. LIMITATIONS of USE

- a) This device **cannot** grant proper protection in high harmful atmospheres if concentration of toxic substances exceeds 1000 times the TLV value using an AIR-LINE model "P" (with lung governed demand valve and mask with positive pressure), or if concentration exceeds 400 times the TLV using an AIR-LINE model "D" (with lung governed demand valve and mask) .
- b) It is necessary to make sure that the air supplied to the user is good for breathing in compliance with the norm EN 12021:2000 (Controls regarding quality of breathable air can be quickly carried out with portable devices such as AIR TESTER HP or AIR TESTER MP – contact MSA for further details).
- c) At temperatures lower than 4°C the contents of humidity of breathable air should be checked within the limits of EN 12021, in order to prevent any freezing of the equipment.
- d) Cylinders should not be loaded with oxygen or air enriched with oxygen.
- e) Before starting with the working activity the operator should check that cylinders are enough charged to carry out the activity and that the lung governed demand valve supplies air regularly (see Instructions for use of lung governed demand valve).
- f) Before accessing to a confined space, it is necessary to check the environment (explosiveness, lack of oxygen, toxicity), in order to highlight any further factors of risk which were not previously taken into account and confirm the proper PPE selection.
- g) An assistant should be always available in the proximity of trolley system to inform the users about the activation of warning signals and therefore of carrying out the operations necessary for the correct performance of the operating activity.
 - If the assistant is not able to see and hear the users of MASS system, it is necessary that at least a member of the team is equipped with a communication system allowing a permanent contact with the assistant standing close to the compressed air supply system.
 - If the operating activity foresees that the operator should disconnect from the line of air supply, it is necessary to use MASS system in combination with a **3-way valve (ASV)** and an **self contained breathing apparatus**
- h) This equipment has not been designed for underwater use
- i) The number of operators making use concurrently of the same MASS system must correspond to what mentioned at point 1 of these Instructions

- j) The maximum length of air supply hose used with MASS system must correspond to what mentioned at point 1 of these Instructions
- k) The maximum number of hoses that can be connected between each other in addition to the standard one installed on the coiler must correspond with what mentioned at point 1 of these Instructions
- l) EN 14593-1 standards, shown at point 5.14.1, foresees that the warning device is activated, when the residual volume of breathable air is lower than 300 litres for every user. Therefore MASS systems can be used with the following restrictions:

MASS trolley system with cylinders of 6, 6.8 and 7 litres. The two cylinders should be used at the same time	1 operator
MASS trolley system with cylinders of 9 litres. With the use of a single cylinder at one time	1 operator
MASS trolley system with cylinders of 9 litres. With the concurrent use of two cylinders	2 operators
MASS 50 I trolley system	4 operators
MASS 50 II trolley system (also with the use of a single cylinder at one time)	4 operators

For particular applications it is allowed the employment of a second operator for MASS system with cylinders of 6, 6.8 and 7 litres under conditions of emergency, provided that both operators are provided with a self contained breathing apparatus and 3-way valve (ASV).

The equipment must not be used outside the temperature range specified in the norm EN 14593.1:2005: minimum temperature: -30°C, maximum temperature: + 60°C.

4. STRUCTURE and OPERATION

4.1 Trolley

The MSA MASS trolley system consists of a metallic structure mounted on two wheels in order to allow an easy carry. Two cylinders filled with breathable compressed air (complying with the norm EN 12021:2000) are fixed on it.

Cylinders are connected to a distributor group through proper high pressure flexible hoses. A pressure reducer is mounted on it.

A supply hose is mounted on the structure. The flexible hose is winded up on it and it feeds the air-line of the user if connected to the pressure reducer.

A housing for the storage of the Air-Line system is fixed on the metallic structure.

The structure is prearranged for the fixture of a second housing that can be supplied as an optional accessory.

4.2 Compressed air cylinders

MASS trolley system permits the use of cylinders having different capacity and different filling pressure (for the max. filling pressure see the label on each cylinder and/or its certificate).

MASS 50 I trolley system allows the use of a cylinder with a capacity of 50 litres and with an operating pressure of 300 bar or of 200 bar

MASS 50 II trolley system allows the use of two cylinders with a capacity of 50 litres and with an operating pressure of 300 bar or of 200 bar

ATTENTION: MASS and MASS 50 II systems must be always used with two cylinders having the same operating pressure: 200 bar or 300 bar. It is not allowed the use of cylinders having a different operating pressure.

According to the type of cylinders used, the MASS trolley system, **considering an average consumption of 40 l/minute**, grants max. autonomy of operation equal to 135 minutes for one user only (with two cylinders of 9 l. at 300 bar).

For **MASS 50 II** version, **considering an average consumption of 40 l/minute**, the autonomy of maximum process is equivalent to 375 minutes for two operators (with two cylinders of 50 litres at 300 bar) By changing the number of operators, the type of cylinders and their value of charge, it will be also modified the theoretical autonomy supplied by the system.

The autonomy of operation indicated does not include the air reserve (see at point 4.3)

4.3 Pressure reducer with warning device

The pressure reducer with its brass casing has been designed for a nominal working pressure of 300 bar, therefore it is possible to use cylinders charged at 200 or 300 bar.

Two gauges are mounted on the pressure reducer, one indicating the high pressure value, that is the pressure in the cylinder, and the other indicating the medium pressure, that is the pressure coming out from the reducer. The pressure reducer is also equipped with an acoustic warning device and a safety valve.

It is possible to observe the operator's regular respiratory activity in the manometer at medium pressure. The reducer is adjusted in such a way that the pressure of cylinder is reduced to a value of about 7 bar.

The integrated safety valve is calibrated to be activated when the medium pressure should rise to over 12÷14 bar due to a possible malfunction of reducer.

The warning signal is calibrated to emit an acoustic signal when the pressure of cylinder goes below 50 ± 10 bar (The signal remains constant up to the almost exhaustion of the air in the cylinders. The warning system will work even with high humidity in the air or with water sprays because it does not have the nozzle)

4.4 Flexible air supply hose

Trolley systems are provided, in the standard version, with one or two coils with 40 meters of flexible hose. Furthermore hoses in standard lengths of 5,10 and 20 meters are available.

Hoses are provided with safety couplings and can be connected between each other.

The maximum recommended length of hose depend to the type of Air-Line used

(see at what mentioned at point 1 of these Instructions both for the maximum length of hose and for the number of hoses connected between each other)

The safety couplings can be connected even under pressure without any problem.

The operating pressure of these hoses for compressed air supply ranges between 6.5 and 7.5 bar.

The flexible hose which is resistant to combined compressive and bending stress, as well as it is heat-resistant. It has antistatic features and is suitable to be used in applications with a higher risk of inflammability. The hose complies with tests provided by EN 14593-1:2005 standards and is marked as the following: **H** =heat-resistance, **S** = antistatic and **F** = suitable for applications with a higher risk of flammability.

The maximum operating pressure of air supply hose is 20 bar

4.5 Belt with connection

A connection group is mounted on the belt. It is used to connect the air supply flex. hose to the line of a lung governed valve connected to the full face mask.

The quick connection safety valve mounted on the belt connection (short type) is different to the one on the air supply hose (long type).

This difference is necessary in order to avoid that the hose of the lung governed demand valve can be directly connected to the air supply line causing, in case of strange traction applied to the hose, the partial detachment from the face, with following loss of tightness of the full face mask.

4.6 Lung governed demand valve

See at instructions for the use of lung governed demand valve.

4.7 Full-face mask

See at instructions for the use of full-face mask.

4.8 3-way valve

The 3-way valve – in case of malfunctioning or detachment of the air supply hose – automatically selects the air feeding to the operator from the trolley system line to the one of the self-breathing apparatus. After this selection, the acoustic warning signal on the valve is activated informing that the air coming from the main supply or from the mobile system is no longer available.

5 COMPRESSED AIR SUPPLY

Attention : The breathable compressed air contained in cylinders must comply with the norm EN 12021. A high rate of humidity in the air can cause working failures (freezing) of the equipment at temperatures below 4°C.

Compressed air cylinders

Cylinders for breathable compressed air, in compliance with the list at point 1 of these instructions, should be used only if they have the PED certificate and only for the working pressure which they have been tested for; if the inspection certificate is expired, cylinders can no longer be used.

6. TECHNICAL DATA

- Cylinders working pressure: 200/300 bar
- Medium pressure of air supply: about 7 bar
- Pressure to activate the warning signal of reducer 50 ± 10 bar
- Pressure to activate the safety valve $12 +2$ bar

7. PREPARATION for USE

Warning: : *Before using it make sure that all checks have been carried out according to what specified in point 9 of these instructions.*

Before making the trolley system MASS available for use, make sure that:

Cylinders are properly positioned and fixed; you are using the same type of cylinders (same working pressure) their inspection test has not been expired and no failures are visible.

Valves of the cylinders are not damaged, neither dirt nor humidity on the threaded connection to the high pressure line are present.

Make sure that cylinders are filled at the right filling pressure.

Check the the medium pressure supply line to find out any damages or wear.

8. USE

8.1 Quick connections working principle

- Connection : push the quick connection in the valve till it is completely inserted with following activation (release) of the bush for blocking the valve.
- Disconnection : push the quick connection in the valve and then push back the bush of the valve. After having unblocked the bush, you can remove the quick connection

Attention : *When the hose is in pressure, especially for very long hoses, keep the side of the quick connection firmly since the air coming out could cause the hose flapping.*

8.2 Condensed check of the system before use

8.2.1 Tightness check

The tightness check of the system can be carried out only if the lung governed valve is connected (see instruction for use of the lung governed valve). The test can be carried out also when wearing the equipment.

Please perform the check by operating according to the hereunder mentioned sequence:

- Connect the demand valve (in «stand-by» position) to the medium pressure belt connector.
- Connect the flexible hose, mounted on the coiler of MASS, to the medium pressure belt connector.
- Open the valve of cylinder
- Let the pressure stabilize inside the hose for at least two minutes. Then read the pressure on the high pressure gauge.
- Close the cylinder valve.
- The system should be considered as tightness, if the pressure drop after a minute doesn't exceed 10 bar.

8.2.2 Check of warning device

- After the tightness test, with the cylinder valve always closed and system in pressure, slowly activate the lung governed valve by pressing the flushing button.
- At the same time check the high pressure gauge.
- The acoustic warning signal should be activated, before pressure drops to around 40 bar.

8.3 Use with AIR-LINE system

REMARK : Make sure that the used Air Line system complies with versions foreseen at point 1 of these Instructions.

- Open the cylinder of the trolley system
- Wear the belt with a medium pressure hose coupling on the left side.
- Connect the lung governed demand valve to the belt coupling
- Connect the feeding line from the coiler to the hose coupling on the belt (check the max. admitted length of the flexible hose according to the type of Air-Line used, see point 1).
- Hang the full-face mask round the neck by using the suitable strap
- Wear the mask, adjust the head strap and carry out a leak test with the palm of the hand (see Instructions for use of the mask).
- Connect the lung governed demand valve to the mask (see Instructions for the use of lung governed demand valve); breath deeply many times to check if there is enough air at disposal.

The system is ready to be used.

8.3.1 During the use

- During the use of equipment it is necessary to check from time to time the tightness of connection between the mask (see Instructions for the use of the suitable mask) and the lung governed demand valve (see Instructions for the use of the suitable lung governed demand valve). The air supply to the user should be controlled by another man through the medium pressure gauge of the pressure reducer.
- An assistant should be always available in the proximity of trolley system to inform the users about the activation of warning signals and therefore to carry out the operations necessary for the correct performance of the operating activity. If the assistant is not able to see and hear the users of MASS system, it is necessary that at least a member of the team who operates internally is in radio contact with the assistant standing in the proximity of trolley system.

8.3.2 Use by many operators

MASS trolley systems are suitable to supply breathable air to more operators at the same time.

When more than an operator have to be supplied, it is necessary to split the supply line through a Y piece, equipped with a quick connection and two quick connection safety valves.

In this way the second operator can disconnect at any time from the system, without creating any problem to the supply line.

MASS trolley systems are suitable to supply till a maximum of four operators at the same time by complying with the maximum lengths of hose mentioned at point 1 and point 3 of these instructions.

In order to guarantee a higher safety for the many different operators it is recommended to use the system with more operators/users when these have to work one close to the other.

Attention: The increase in number of users reduces the autonomy of system. Make sure that the autonomy of available air is enough to carry out the related operations.

8.3.3 After use

- Disconnect the lung governed demand valve from the mask (see Instructions for the use of the suitable lung governed demand valve) and, for the positive pressure demand valve, stop the air flow.
- Remove the full-face mask (see Instructions for the use of the suitable mask).
- Close the valve of compressed air cylinder.
- Activate the flushing function of the lung governed valve till the air is exhausted; in this way the whole system is depressurized.
- Loosen the belt e and remove the equipment. Do not throw it to the ground! Lay it down carefully.

8.4 Use of MASS system with self-contained breathing apparatus

In order to use the trolley system MASS series combined with a self-contained breathing apparatus as extra air stock, it is necessary to use the **3-way valve** code no. D4066700; with this system it is possible to work in a confined space or where there is the risk of immediate danger for the user.

- Wear the self-contained breathing apparatus: see Instructions for use of the breathing apparatus.

REMARK : The system is certified for the use of the following self-contained breathing apparatus :

MSA Auer BD 96 Mini, MSA Auer BD Mini and MSA Auer BD 96 (versions: Basic, S, Z, S-Z)

- Wear the belt with a 3-Way valve instead of the belt with connector, put on the left side.
- Connect the self-breathing apparatus to the 3-way valve (see Instructions for use of the 3-way valve).
- Connect the lung governed demand valve to the 3-Way valve.
- Wear the mask, adjust the strap and carry out a leak test with the palm of the hand (see Instructions for use of the mask).
- Open the cylinder of the self-breathing apparatus. The alarm signal on the 3-way valve starts working in order to warn that there is no pressure on the main line.
- Connect the lung governed valve to the mask (see Instructions for use of the lung governed valve); breath deeply many times in order to make sure there is enough air.
- Connect the feeding air hose from the trolley system to the 3-way valve.
- The acoustic warning signal stops working.
- Breath deeply some times in order to check the proper air flow.
- Close the self-breathing apparatus cylinder.
- The acoustic warning signal of the reducer on the self-breathing apparatus starts working to inform that the cylinder valve is closed.
- Open again the valve of the cylinder. The warning signal stops working.

8.4.1 During use

- During the use of equipment it is necessary to control from time to time the tightness of the connection between the mask (see Instructions for use of the suitable mask) and lung governed demand valve (see Instructions for use of the suitable lung governed demand valve). Furthermore, make sure that the pressure indicated by the gauge of the self-breathing apparatus remains the same on the initial value. The air supply to the user should be checked by another person through the medium pressure gauge of the reducer.

8.4.2 After use

- Disconnect the lung governed demand valve from the mask (see Instructions for use of the suitable lung governed demand valve) and – for positive pressure lung governed valve s – stop the flow of the air.
- Remove the full-face mask (see Instructions for use of the suitable mask).
- Close the valve of the compressed air cylinder of the self-breathing apparatus.
- Start the flushing function of the lung governed valve till the air is exhausted, in this way the whole system is depressurized.
- Loosen the belt e and remove the equipment. Do not throw it to the ground! Lay it down carefully.

9. SERVICE, MAINTENANCE , CHECK and STORAGE

To be sure your equipment is always ready for use, it is necessary to carry out periodic control and maintenance operations which grant the right working of the PPE during its use.

If these operations are not periodically carried out, this can result in an improper functioning of the system and as a consequence in the lapse of warranty for the product functionality.

9.1 Periodical Maintenance

The following table lists intervals for the required Service, Maintenance and Controls. If necessary these operations can be carried out at intervals closer than those shown in the table.

For controls before use see section 8.2. Controls with mask and lung governed valve s should be carried out on the complete self-breathing apparatus (min. cylinders pressure: 120 bars).

Component	Operation to carry out	Minimum maintenance intervals					
		before delivery for use	before use	after use	every 6 months	every year	every 6 years
Pressure reducer	Warning device	X			X		
	Replacement of high pressure gaskets					X	
	Basic overhaul						X ⁴⁾
	Check of gauges indication					X	
High and medium pressure components	Check of wear conditions of medium pressure line	X			X		
	Tightness check of high and medium pressure components	X			X		
Compressed air cylinders	Filling	X					
	Control of the cylinder valve	X					
	Control of filling pressure		X				
	Technical expert test ³⁾						
Complete Unit	Cleaning of the complete unit			X		X	
	Operational check and leak test	X					
	Condensed check of the unit by the user		X		X ¹⁾	X ²⁾	
Mask	(see Instructions for use of mask)						
Lung governed demand valve	(see Instructions for use of lung governed demand valve)						

- 1) For units being used
- 2) For units stored
- 3) For the inspection of cylinders follow the national regulation relevant to the used cylinders
- 4) Only by the manufacturer or by authorized centres

Rubber components are subject to ageing and should be regularly controlled. When an excessive wear or defects are found, the relevant components should be replaced.

9.2 Full-face mask

(see Instructions for use of the suitable mask)

9.3 Lung governed demand valve

(see Instructions for use of the suitable lung governed demand valve)

9.4 Pressure reducer

9.4.1 Warning device

- Open the cylinder valve
- Cylinder pressure indicated on the gauge should be at least 120 bars
- Close the cylinder valve again.
- Start the flushing of the lung governed valve slowly till the air is exhausted.
- Check the high pressure gauge, the warning signal should start before the pressure reaches 40 bar.

9.4.2 High pressure gaskets

Check the O-Ring conditions on the connection between pressure reducer and cylinder (visual check), if damaged, replace it. Replacement of the gasket is suggested at least once every 12 months.

9.4.3 Overhaul

Overhaul should be carried out every six years and any repairs should be performed directly by the manufacturer or at authorized centres of MSA/AUER in case of functioning defects. During the overhaul all rubber parts and components subject to wear have to be replaced.

Attention ! If the pressure reducer is open or loses its setting, the warranty given by MSA should not be considered as valid and the whole system should not be used any longer.

9.5 Control of high and medium pressure components leaks

- Open the cylinder valve.
- The cylinder pressure should be at least 180 bar.
- Close the cylinder valve and wait for two minutes till the pressure stabilizes. Then read the pressure on the high pressure gauge. The pressure drop after a minute should not be higher than 10 bar.

10. COMPRESSED AIR CYLINDERS

10.1 MASS model, disassembly of cylinders

In order to remove cylinder/s from the MASS trolley system follow the below procedure:

The system has been arranged to allow replacement of one cylinder at a time, continuing to supply air to the user with the one left. In this way, with more cylinders or a refilling system, the autonomy of operation of the MASS system is not limited.

- Position the MASS so that cylinders are in horizontal position.
- Close the compressed air cylinder to be replaced.
- Discharge pressure left on the high pressure flex. hose by opening the relevant air valve under the block for the air distribution.
- Unscrew the locking ring of the unit to the cylinder.

Attention : if the pressure inside the system has not been completely discharged, it will not be possible to loosen the locking ring.

- Close the vent valve on the high pressure line.
- Release the buckle of belt for the cylinder to be removed and the cylinder retaining gets loosen so that the cylinder can be removed. When a new cylinder should be installed with the same sizes, it's not necessary to loosen further the belt.
- Remove the cylinder

10.2 MASS model, assembly of cylinders

In order to mount new cylinders on the trolley systems MASS, after having filled them, carry out operations contrary to those for demounting them.

10.3 MASS 50 I and MASS 50 II models, disassembly of cylinders

In order to remove cylinder/s from the MASS trolley system follow the below procedure:

The system has been arranged to allow replacement of one cylinder at a time, continuing to supply air to the user with the one left. In this way, with more cylinders or a refilling system, the autonomy of operation of the MASS system is not limited.

- Position the MASS so that cylinders are in a vertical position.
- Close the compressed air cylinder to be replaced.
- Discharge pressure left on the high pressure flex. hose by opening the relevant air valve under the block for the air distribution.
- Unscrew the locking ring of the unit to the cylinder.

Attention : if the pressure inside the system has not been completely discharged, it will not be possible to loosen the locking ring.

- Close the vent valve on the high pressure line
- Release the safety clamp of the cylinder to be removed; open the cylinder safety clamp and proceed to remove the cylinder.

REMARK: considering the cylinder weights it is recommended to carry out the operation of cylinders replacement asking the help of another operator.

10.4 MASS 50 I and MASS 50 II models, assembly of cylinders

In order to mount new cylinders on the trolley systems MASS, after having filled them, carry out operations contrary to those for demounting them.

10.5 Cylinders recharge

Before operating on compressed air cylinders, read and follow carefully what indicated in Instructions for use of different cylinders models (steel and composite versions).

The compressed air cylinders should be filled with breathable air as indicated in the norm EN 12021, through portable units for checking the quality of breathable air, such as the AIR-TESTER HP or the AIR TESTER MP, it is possible to check if what required in the norms is observed (contact MSA to get more information).

Compressed air cylinders should be certified and marked according to the Directive 97/23/EC or 99/36/EC. Follow rules regarding start-up periodic tests of the different cylinders models.

Cylinders with inspection certificate expired cannot be refilled.

Refilled compressed air cylinders should be checked to make sure that nominal pressure remains the same after the environment temperature has been reached. If necessary, cylinders should be refilled again till the filling nominal value is reached.

Compressed air cylinders can be re-filled if:

- Inspected by legally recognized bodies.
- Equipped with valves complying with what foreseen in the EN 144-2:2002.
- Provided with the regular Conformity Declaration issued by the manufacturer.
- The validity date of the start-up is not expired
- They do not have failures causing dangerous situations (e.g. detective valve, indentations)

Compressed air cylinders completely empty (depressurized) should be dried up. This is necessary to avoid the formation of an intolerable humidity inside cylinders.

They can be dried, for example, after being recharged twice at operating pressure with dry compressed air coming from a suitable compressor and then depressurized slowly (it is recommended a minimum discharge time of about 30 minutes to avoid any possible formation of humidity inside the cylinder).

10.6 Use

To prevent any formation of condensate, observe following indications:

- Do never discharge completely cylinders, if it is not specifically required.
- After use, always close cylinders valve.
- Keep cylinders valve closed after having disconnected them from the trolley system.
- Protect the threads of the valve with a proper plastic/metallic cap.

10.7 Transport and storage of cylinders not connected

During the transport and storage cylinders should be protected against impacts.

Please make reference to the current ADR rules for the transport of charged cylinders.

For hand carriage, cylinders should be kept with both hands. Don't grasp the handwheel, but the housing only.

During the storage cylinders should be placed in such a way that they can neither overturn, nor fall down or change their position.

11. CLEANING OF EQUIPMENT

Clean carefully dirty parts of equipment after its use. As for masks and lung governed demand valve are concerned, please make reference to the relevant Instructions for the Use. If necessary wash the equipment with lukewarm water or with a suitable cleanser/disinfectant (MSA recommends the use of Lachisan disinfectant code 0503443 - please make reference to the instructions mentioned in the package about the concentrations to be used). Remove the residual humidity by drying at a maximum temperature of 50/60° C (see Instructions for the Use of relevant components - Mask, Lung governed demand valve). Not individual masks should be disinfected after their washing (see Instructions on the relevant mask).

Do not use any organic solvents, such as alcohol, spirit, gasoline, trichloroethylene and so on to clean.

12. STORAGE

Trolley systems of series MASS, complete with a mask and lung governed demand valve, should be stored in dried environments without dust and dirtiness at a room temperature of about 20° C, by avoiding the direct exposure to the sunlight.

Avoid the storage in environments with temperatures exceeding the range 0 ÷ 40°C

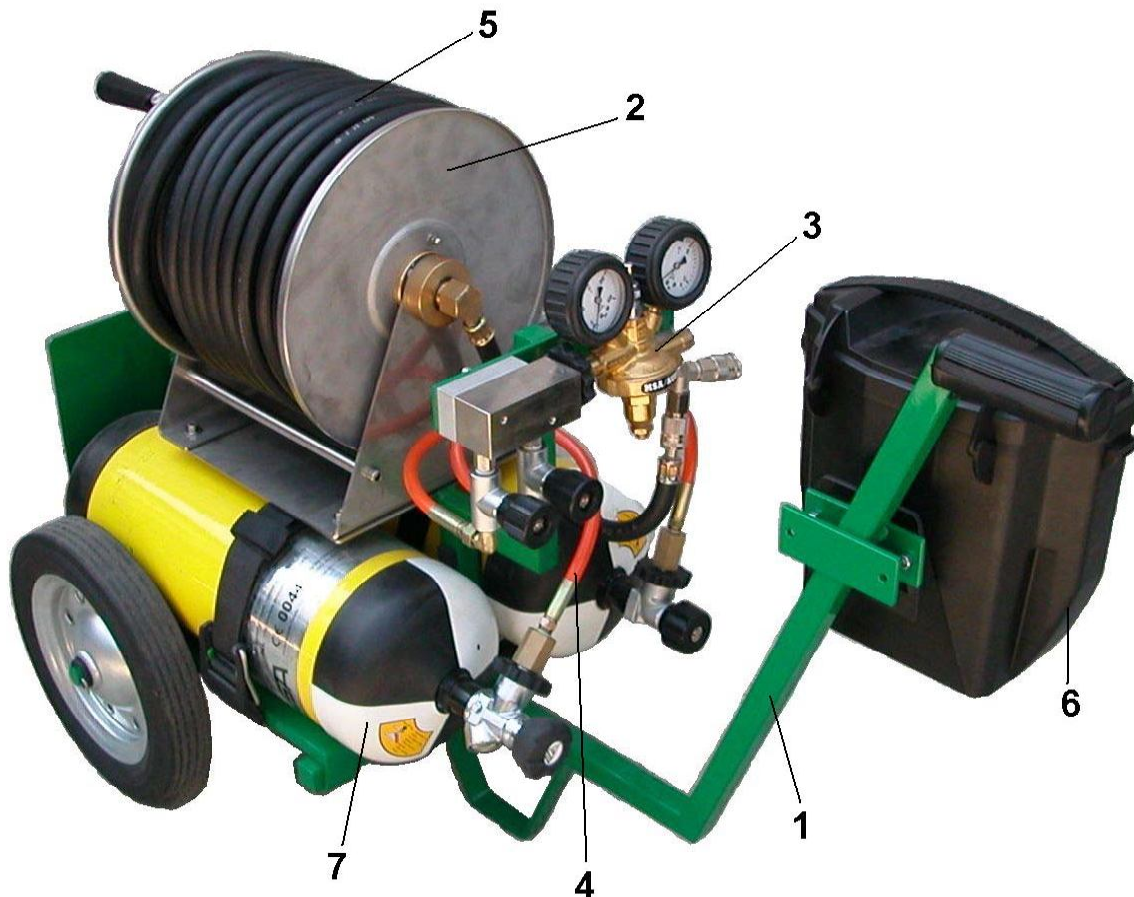
13. FAILURES

In view of the fact that life of the user depends on the proper operation of the equipment, in case of malfunctioning (inhalation/exhalation resistance, leaks, variation in the pressure value from the reducer and so on.), the equipment should be checked either by MSA Italiana or by a repair centre authorized by MSA.

14 SPARE PARTS

14.1 MASS

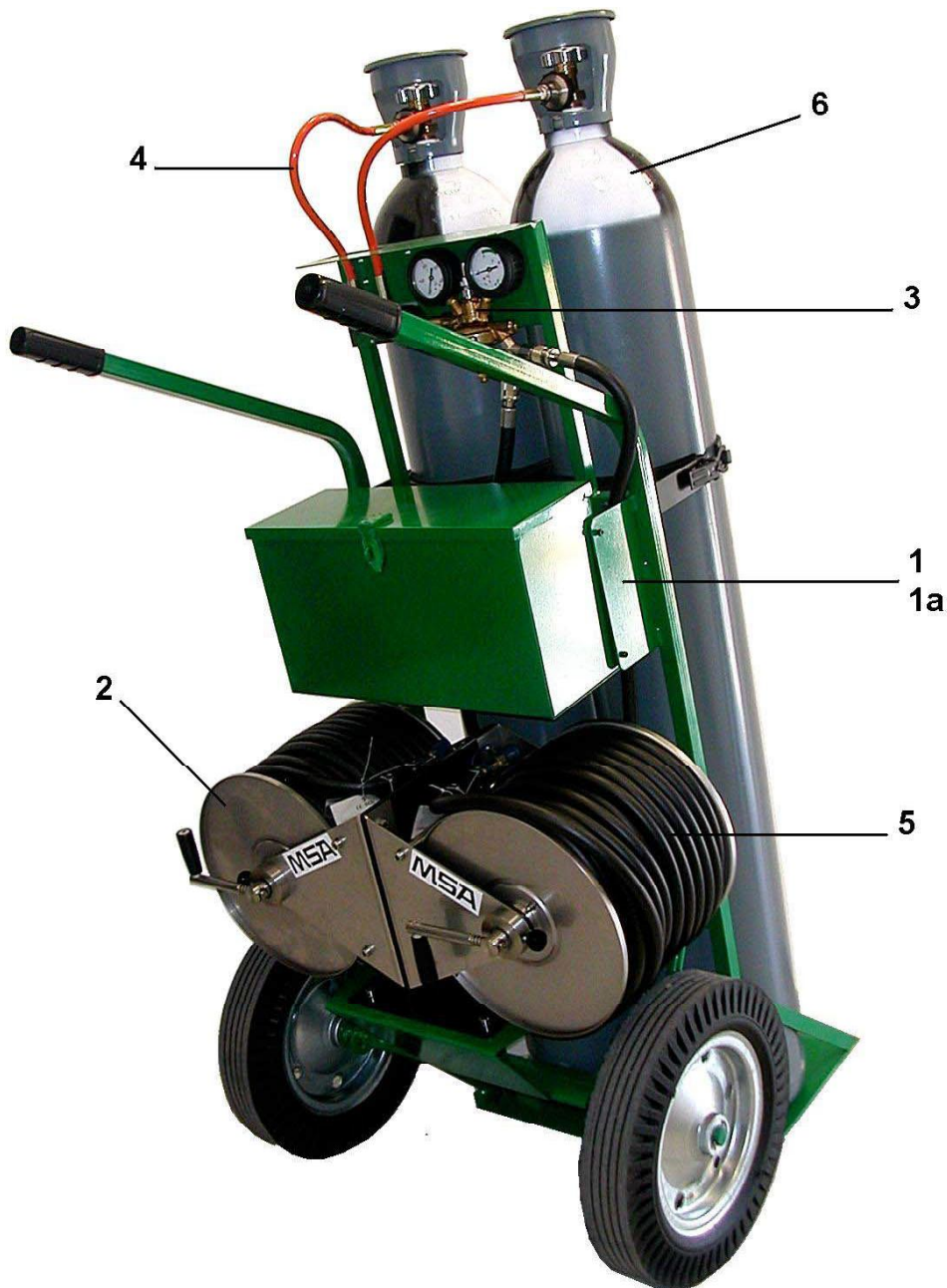
Pos.	Description	Catalogue no.
1	MASS trolley assembly, complete with supply air hose 40 m.	M0018642
2	Hose coiler without flexible hose	M0018644
3	EN Pressure reducer assembly with two outlets	M0018645
4	High pressure flex hose 300 bar, cm 50	M0017892
5	Supply air hose with connection 40 m	0110478
6	Rigid container for mask	10026179
7	Full composite cylinder (PET) 9 litres/300 bar, filled	0102077
7a	Composite cylinder 9 litres /300 bar, filled	0102088
7b	Full composite cylinder (PET) 6,8 litres /300 bar, filled	0102075
7c	Composite cylinder 6,8 litres / bar, filled	0102074
7d	Steel cylinder 6 litres/300 bar, filled	0102073
7e	Steel cylinder 6 litres /200 bar, filled	0102071
7f	Steel cylinder 7 litres /200 bar, filled	0102072



For additional spare parts, please contact MSA

14.2 MASS 50 I and MASS 50 II trolley


Pos.	Description	Catalogue no.
1	Trolley MASS 50 I without cylinders with one coiler with 40 m hose	M0023267
1a	Trolley MASS 50 II without cylinders with two coilers with 40 m hose each	M0023268
2	Hose coiler without flexible hose	M0018644
3	EN Pressure reducer assembly with two outlets	M0018645
4	High pressure flex hose 300 bar, cm 50	M0017892
5	Supply air hose with connection 40 m	0110478
6	Steel cylinder of 50 litres/300 bar, empty	0110454



For additional spare parts, please contact MSA

14.3 Accessories for MASS trolley

Supply air hose with connection 5 m	242228
Supply air hose with connection 10 m	242229
Supply air hose with connection 20 m	242230
Supply air hose with connection 30 m	0110475
Supply air hose with connection 40 m	0110478
Supply air hose with connection 50 m	242231
Belt complete with connection couplings	242236
3-Way Valve	D4066700
Y-connection for line splitting	0110504
Air-Line D/3S/LA 96-N	242225
Air-Line D/3S/AutoMaXX-N	M0019125
Air-Line D/Ultra Elite/LA 96-N	M0019126
Air-Line D/Ultra Elite/AutoMaXX-N	M0019127
Air-Line P/3S-PF/LA 96-AE	242226
Air-Line P/3S-PF/AutoMaXX-AE	M0019128
Air-Line P/3S-PS-MaXX/AutoMaXX-AS	M0019129
Air-Line P/Ultra Elite-PF/LA 96-AE	M0015568
Air-Line P/Ultra Elite-PF/AutoMaXX-AE	M0019130
Air-Line P/Ultra Elite-PS-MaXX/AutoMaXX-AS	M0019131
Lachisan disinfectant liquid (1 litre package)	0503443
Tickopur R 33 cleaning agent liquid (5 litres package)	0503441

	Scheda di controllo sistema carrellato MASS Checklist of mobile air supply system MASS	Codice Modulo	Data Rev.
		MD.VB.33 - Rev 3.doc	20-06-07

Numero codice / Part-No.:

Numero di serie / Serial-No.:

Bombola Tipo / Cylinder Type :

Numero codice / Part-No.:

Numero di serie / Serial-No.:

Sistema Air Line / Air Line system

Controllo/Inspection	Valore nominale Nominal data	Controllato Checked
Tenuta alta pressione / HP tightness Caduta di pressione in 1 min. a pressione nominale 300 bar / Pressure drop in 1 min at nominal pressure of 300 bar	≤ 10 bar	
Tenuta media pressione / MP tightness Caduta di pressione in 1 min. a pressione nominale tra 6 e 7 bar / Pressure drop in 1 min at nominal pressure between 6 e 7 bar	≤ 0,5 bar	
Pressione d'intervento e qualità sonora del dispositivo d'allarme. Operating pressure and quality sound level of warning device	50 ± 10 bar	
Controllo manometro alta pressione Check of high pressure gauge	(300 ± 10) bar (200 ± 10) bar (100 ± 10) bar (60 ± 10) bar	
Verifica Media pressione con pressione di alimentazione di 200 bar Medium pressure check with supply pressure of 200 bar	≥ 6,0 bar + ≤ 7,5 bar	
Variazione media pressione ammissibile tra 6,0 e 7,5 bar in 1 min. Deviation of pressure between 6,0 and 7,5 bar in 1 min.	- 0,3 bar + 0,5 bar	

Annotazione: Risultati di controllo entro i valori nominali, sopra indicati, vengono confermati con "OK".

Note: Test results within nominal values, above mentioned, get an "OK".

.....
Data/Date

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Controllato da CT/ Checked by CT



