

Operation Manual
Advantage 400[®]



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Contents

1	Safety Regulations	4
1.1	Correct Use	4
1.2	Liability Information	4
1.3	Safety Instructions	4
2	Use.....	5
2.1	Respiratory protective device.....	5
2.2	Filter replacement	8
2.3	Valve replacement	9
2.4	Strap replacement	9
2.5	Lever replacement	10
3	Filter selection.....	10
3.1	Gas and combination filters	10
3.2	Particle filters	11
3.3	Service time	11
4	Storage, Maintenance and Disposal.....	12
4.1	Half mask	12
4.2	Filter	13
5	Ordering Information	13
5.1	Half Mask according to EN 140	13
5.2	Spare parts	14
5.3	Respiratory protective filters	15
6	Pictograms.....	15

1 Safety Regulations

1.1 Correct Use

Respiratory protective filters [gas filters, particle filters, combined filters] are used together with a face piece [full face mask, half mask or in connection with turbo filtering devices] as filtering devices for respiratory protection if the ambient atmosphere contains hazardous material, i.e. hazardous gases and vapours [toxic gases] as well as particles [dusts, fumes, mists, sprays].

The mask and the filters described in this manual are in accordance with Directive 89/686/EEC and are tested and certified by the Institut für Arbeitsschutz [BGIA, reference number 0121].

It is imperative that this operating manual be read and observed when using the product. In particular, the safety instructions, as well as the information for the use and operation of the product, must be carefully read and observed. Furthermore, the national regulations applicable in the user's country must be taken into account for a safe use.



Danger!

This product is supporting life and health. Inappropriate use, maintenance or servicing may affect the function of the device and thereby seriously compromise the user's life. Before use the product operability must be verified. The product must not be used if the function test is unsuccessful, it is damaged, a competent servicing/maintenance has not been made, genuine MSA spare parts have not been used.

Alternative use, or use outside this specification will be considered as non-compliance. This also applies especially to unauthorised alterations to the product and to commissioning work that has not been carried out by MSA or authorised persons.

1.2 Liability Information

MSA accepts no liability in cases where the product has been used inappropriately or not as intended. The selection and use of the product are the exclusive responsibility of the individual operator.

Product liability claims, warranties also as guarantees made by MSA with respect to the product are voided, if it is not used, serviced or maintained in accordance with the instructions in this manual.

1.3 Safety Instructions

Oxygen content and toxic material concentration

This respiratory protective device does not supply oxygen.

The permitted minimum oxygen concentration of ambient air is governed by national regulations. They have different values for minimum levels of oxygen and this must be taken into account for safe use [typically in the range 17% to 19.5%].

Type and concentration of the hazard in the ambient atmosphere must be known to the extent that use of a filtering device is permissible. In case of doubt use a supplied air breathing apparatus.

Caution must be given in oxygen enriched atmospheres [ignition] or possibly explosive atmospheres [e.g. through solvents].

Hazardous gases that are heavier than air may have a higher concentration near the ground.

Leave contaminated area in case of the following:

- smelling or tasting a contaminant
- you are irritated by the contaminant
- breathing becomes difficult
- dizziness or distress.

Toxic gases without smell recognition

Filters used for toxic gases which do not have smell recognition on the clean air side require special rules of use with reference to the time being used and the use itself. If there is any doubt about the composition of the toxic gases, a supplied air breathing apparatus must be used.

Before use

When using gas filters, ensure that no particle-type toxic substances are present, and, when using particle filters, that there are no toxic gases present. If this is not the case, combination filters must be used.

The filters must be sealed and intact.

Application conditions

Filtering devices must not be used in confined spaces [containers, canals, pits, etc.].

For some applications, an additional protection for eyes and body should be considered.

After and before use, check the mask and filters and if necessary, clean and disinfect the mask and use new filters. Always use only a complete and undamaged respiratory protective device. The user of a filtering device must be qualified and trained in its use. The selected filter and proper face piece must be in faultless condition and suitable for the intended application.

Open flames, metal droplets

The use of filtering devices, during work with open flames and metal droplets [e.g. welding], may cause serious risk due to ignition of the filter media, which may generate acute levels of toxic substances.

2 Use

Applicable **National Regulations** must be observed. For guidance the EN 529:2005 [Recommendations for selection, use, care and maintenance] is available.

2.1 Respiratory protective device

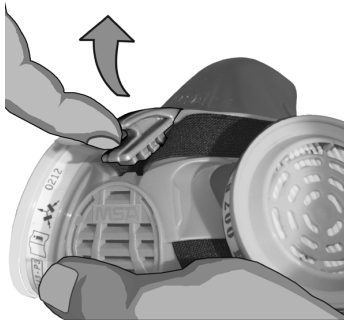


Attention!

Before use, check the mask and filters and if necessary, clean and disinfect the mask and use new filters.

Always use a complete and undamaged respiratory filtering device.

Donning the mask



(1) Open lever.



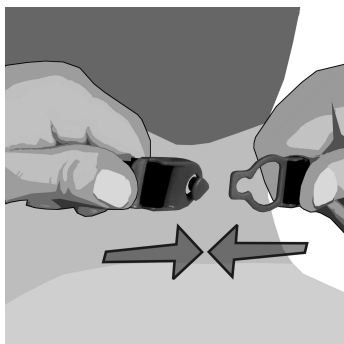
(2) Place cradle on your head and put the face-piece in place.



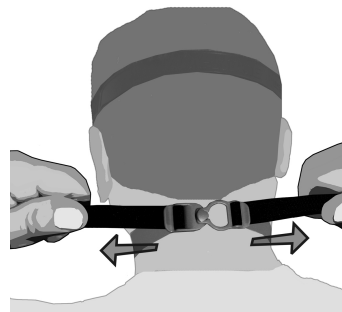
(3) Pull down the front straps until the mask has a snug fit.



(4) Close lever.



(5) Close the buckles at the nape of the neck.



(6) Pull on both straps evenly at the nape of the neck for a comfortable, correct fit.

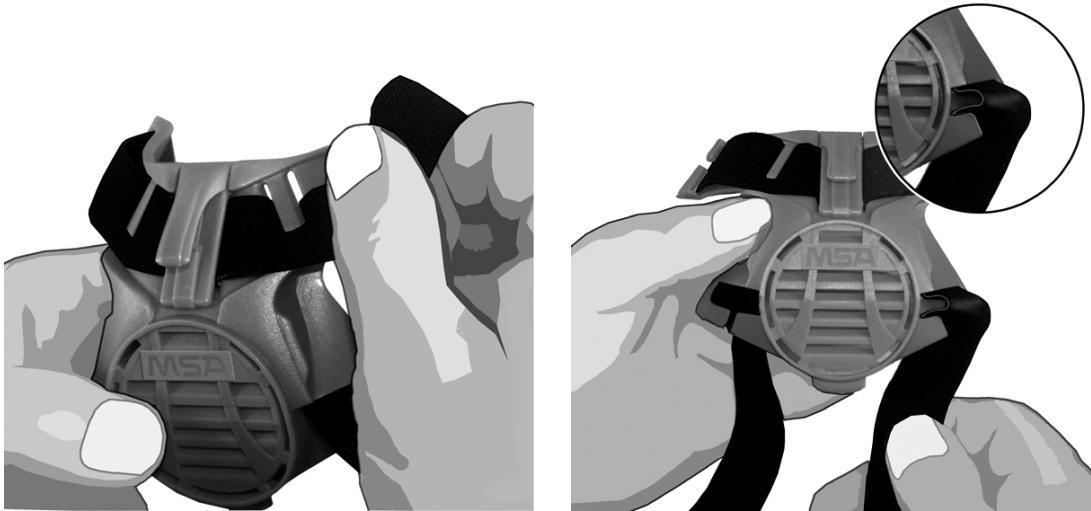


(7) Loosen the straps by pulling the tab back on the latch with your finger.

Non drop-down application

The mask can be worn as a drop-down-mask or as a non drop-down mask, depending on the harness setting.

To wear the mask in a non drop down position, take off the mask after donning it according to "Donning the Mask" on page 6 without opening the lever.



- (1) Detach the yoke from the mask.
- (2) Fix the strap under both upper safety confinements [keep lever closed].
- (3) Pull the strap under both lower safety confinements.
- (4) Re-attach the yoke to the Advantage 400 [there has to be an audible click].
- (5) Don the mask



The lever has no function when the mask is used as a non drop-down application.

Cradle adjustment

An adjustment is necessary according to head sizes. Possible positions are "S" for size "S" and "M/L" for masks in sizes "M" and "L".

To adjust the cradle:

- (1) Line up the end of the cradle with the desired size.
- (2) Snap the buttons into place.

Tightness test



Attention!

If any leakage is detected, correct before using the respiratory filtering device.
For persons with beards, long sideburns or scars passing under the seal it is unlikely that a tight fit can be achieved.

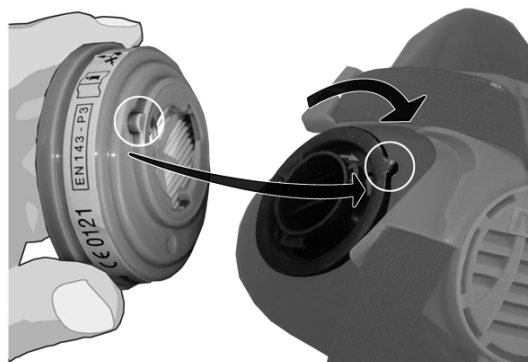
In order to check the facepiece-to-face tightness a leak test must be performed before each use.

Negative Pressure Test [inhalation]**Advantage 420****Advantage 410**

- (1) Cover filter opening[s] with palm[s].
- (2) Inhale and hold breath for approx. 10 s.
- (3) The mask is tight if no ambient air enters [facepiece should collapse slightly].

2.2 Filter replacement**Attention!**

Only use undamaged filters of the same type and class.
Always replace both filters at a time.

Bayonet filters

Remove used filters and align new filters with opening on face piece and turn clockwise until the stops are engaged.

Use of 20 P2-filter: put particle filter in cover, align cover to gas filter and click-on. To remove the filters proceed in reverse order.

Threaded filters: Remove used filters and thread new filters carefully. Hand tighten slowly to seal filter.

2.3 Valve replacement

Advantage 410

The valve disc of the exhalation valves and the valve disc and gasket of the inhalation valve can be exchanged. The Maintenance Valve set 410 [10097882] and the Advantage 410 Maintenance Kit [10097885] contain all necessary valves.

- (1) Remove the filter.
- (2) Pull off the protective caps of the exhalation valves.
- (3) Pull out the old inhalation valve [gasket and valve disc].
- (4) Snap-in the new valve gasket and check the correct fit of the valve gasket from inside.
- (5) Button in the new valve disc on the valve gasket.
- (6) Remove the old exhalation valve discs.
- (7) When attaching the new valve discs, they have to audibly and visibly snap into place.
- (8) Re-attach the valve protection caps.



Note the correct position of the valve protection caps, they only fit in one position.

Advantage 420

The valve disc of the exhalation valve and the valve discs of the inhalation valves can be exchanged. The Maintenance Valve set 420 [10097883] and the Advantage 420 Maintenance Kit [10097886] contains all necessary valves.

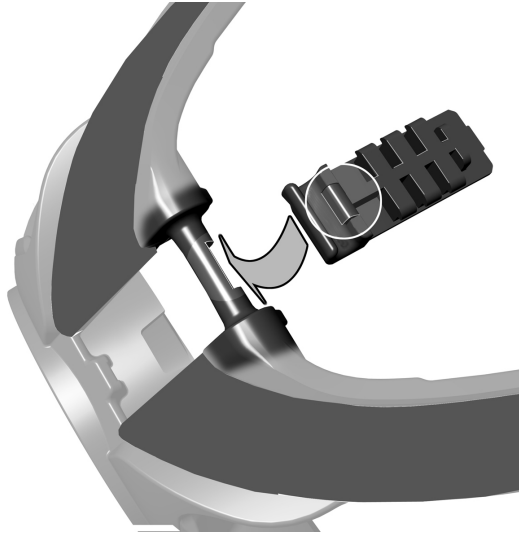
- (1) Remove the filters and pull off the yoke.
- (2) Remove the old exhalation valve.
- (3) When attaching the new exhalation valve, check the correct fit of the valve disc from inside, it has to audibly and visibly snap into place.
- (4) Remove the old inhalation disc valves and button in the new ones from inside.

2.4 Strap replacement



When replacing the straps, make sure to thread them correctly for either drop-down or non drop-down use.

2.5 Lever replacement



The lever can only be replaced if in a certain position. Bring the catch of the lever in a position where the notch can be clicked onto the yoke.

3 Filter selection

Applicable National Regulations must be observed. For guidance the EN 529:2005 [Recommendations for selection, use, care and maintenance] is available.

Advantage 410: Respiratory filters according to EN 14387 or EN 143:2000 with standardised connector EN 148-1 may be used. The maximum weight of the filter is 300 g.

Advantage 420: Dedicated MSA Respiratory Filters according to EN 14387 of EN 143:2000 of Series Advantage, TabTec or FLEXIfilter may be used [→ 5.3].

3.1 Gas and combination filters

Respiratory protective filters are classified according EN 14387, EN 143:2000/A1:2006 and marked with the filter type [code letter and code colour] and filter class [code number]. The filter type, filter class and referenced standard are marked on each filter.

Filter type	Colour	Application
A	Brown	Vapours from organic compounds with a boiling point higher than 65°C.
AX	Brown	Vapours from organic compounds with a boiling point lower than 65°C.
B	Grey	Inorganic gases and vapours, e.g. chlorine, hydrogen sulphide, hydrogen cyanide
E	Yellow	Sulphur dioxide, hydrogen chloride, acid gases
K	Green	Ammonia and derivatives of ammonia
P	White	Against particles of hazardous materials with a negligible vapour pressure

For maximum concentrations of contaminants and other limitations see the instructions for use of the gas filters.



In any case applicable National Regulations must be observed, especially to determine maximum allowable concentrations of toxic gases when using filters in conjunction with half or full face masks.

Always the lowest concentration applies.

3.2 Particle filters

Particle filters are classified according to EN 143:2000 in 3 classes: P1, P2, P3 in ascending order of the filter performance.



In any case applicable National Regulations must be observed, especially to determine maximum allowable particle concentrations when using particle filters in conjunction with half or full face masks.

Always the lowest concentration applies.



Attention!

When using particle filters against radioactive substances, micro organisms [virus, bacteria, fungi and spores thereof] and bio chemically active substances [enzymes, hormones], only P3 filters with full face masks must be used.

The filters must be used only once.



The higher particle filter class includes the protective range [retention capability] of the lower particle filter class when using in conjunction with the same facepiece. Pre-filters may be used to prevent premature clogging through large particles [e.g. when paint spraying], therefore a more frequent re-placement of the Pre-filters may be necessary, if the breathing resistance increases.

The additional marking with "R" [reusable] means, additional tests according to EN 143:2000/A1:2006 were done to verify, that the particle filter or the particle part of combination filters is qualified for usage after an exposure against aerosols and may be used for more than one shift. Filter marked with "NR" [not reusable] must only be used for a single shift only against particles.

3.3 Service time

The service time of respiratory protective filters depends on the conditions of use. The end of service time of gas filters or the gas filter part of combined filters, most of the time can be detected by odour on the clean air side. The filter must then be replaced.

The end of service time of particle filters or the particle filter part of combined filters, most of the time can be noticed by an increase in breathing resistance. The filter must then be replaced.

Particle filters that have been used against radio active substances, micro organisms or bio-chemically active substances must only be used once!

4 Storage, Maintenance and Disposal



Attention!

For disposal of filters applicable National Regulations must be observed.

4.1 Half mask

Cleaning and Care:	Clean and disinfect mask after every use. To clean the mask remove the filters [cleaning the filters is not possible]. Inhalation and exhalation valves are cleaned separately and reassembled only after drying. Use a mild detergent [e.g. Disinfectant AUER 90, Part No. D2055765] in lukewarm water and rinse with clear water and dry air [max. 50°C].
Spare parts:	For a list of available spare parts see chapter 5.2.
Storage:	Only undamaged mask must be stored for further use. When not in use, store respiratory protective device in cool, dry and clean ambient air.
Shelf life:	The manufacturing date of the mask is marked inside. For an example see chapter 6.

Maintenance and Tests

Operations required on mask	Intervals			
	Before use	After use	Semi annually	Every 2 years
Cleaning and disinfection		X	X ¹	
Function test	X		X ¹	X
Exhalation Valve disc replacement				X
Leak test Excess and/or negative pressure, check by user	X			

¹ Only random sample of units that are stored airtight

Recordings of inspections and valve dish replacements are recommended.

4.2 Filter

Filter	Proper Storage
Factory sealed gas or combined filters:	<ul style="list-style-type: none"> - -5 to 35°C, max. 60 % relative humidity for long-term storage - Storage life: See information on the filters [pictogram "Hourglass"]
Opened gas or combined filters that are to be reused:	<ul style="list-style-type: none"> - In a closed plastic bag - 5 to 35°C, max. 60 % relative humidity - Storage life: replace 6 months after first use at the latest!
Factory sealed particle filters:	<ul style="list-style-type: none"> - -5 to +50 °C, max. 90 % relative air humidity [see pictograms] - Storage life: See information on the filters [pictogram "Hourglass"]
Particle filters that have been used against radio active substances, micro organisms or bio chemically active substances:	<ul style="list-style-type: none"> - Single use only, do not reuse! - No further storage.



Factory sealed and properly stored MSA respiratory filters are maintenance free.

5 Ordering Information

5.1 Half Mask according to EN 140

Description	Part No.
Advantage 410 S [small]	10102276
Advantage 410 M [medium]	10102277
Advantage 410 L [large]	10102278
Advantage 420 S [small]	10102273
Advantage 420 M [medium]	10102274
Advantage 420 L [large]	10102275

5.2 Spare parts

Description	Part No.
Harness assembly	10097807
Contents: Cradle [10090437], Buckles [10095914, 10095915], Straps [2 x 10090438]	
Yoke 410	10097809
Contents: Yoke 410 [10090441], Lever [10090443]	
Yoke 420	10097810
Contents: Yoke 420 [10090442], Lever [10090443]	
Lever [10090443 set of 5]	10097881
Maintenance Valve set 410	10097882
Contents: Inhalation Valve [10094869], Exhalation Valve 410 [2 x D2033151], Spider-Gasket [10025292]	
Maintenance Valve set 420	10097883
Contents: Exhalation Valve 420 [2 x 10095094] Inhalation Valve [10094869]	
Neck strap buckles	10097884
Contents: Buckles [10095914, 10095915] [set of 5 pairs]	
Advantage 410 Maintenance Kit	10097885
Contents: Cradle [10090437], Buckles [10095914, 10095915], Straps [2 x 10090438], Inhalation Valve [10094869], Exhalation Valve 410 [2 x D2033151], Spider-Gasket [10025292]	
Advantage 420 Maintenance Kit	10097886
Contents: Cradle [10090437], Buckles [10095914, 10095915], Straps [2 x 10090438], Exhalation Valve 420 [10095094] Inhalation Valve [2 x 10094869]	
Storage plastic bag [10097893]	10097887
Inhalation valve discs [10094869 set of 10]	10097888
Exhalation valve discs 410 [D2033151 set of 20]	D2055731
Spider gasket [10025292 set of 10]	10097890
Exhalation valve discs 420 [10095094 set of 10]	10097891

5.3 Respiratory protective filters


Attention!

Only use undamaged filters of the same type and class.
On the Advantage 420, always replace both filters at a time.

Filter	Description	Filter type	Part No.
20 P2	particle [pre-]filter	EN 143:2000 P2 R	10011347
200 P3	particle filter	EN 143:2000 P3 R	430375
201 A	gas filters	EN 14387:2004 A2	430371
201 ABEK	gas filters	EN 14384:2004 A2, B2, E1, K1	430373
202 A-P3	combination filters	EN 14387:2004 A2 P3 R	430372
202 ABEK-P3	combination filters	EN 14387:2004 A2, B2, E1, K1 P3 R	430374
TabTec A1	gas filters	EN 14387:2004 A1	10030510
TabTec A2	gas filters	EN 14387:2004 A2	10030511
TabTec A2B2E1K1	gas filters	EN 14387:2004 A2, B2, E1, K1	10038476
FLEXIfilter P2	particle filter	EN 143:2000 P2 R	10027699
FLEXIfilter P2-OR	particle filter	EN 143:2000 P2 R	10027698
FLEXIfilter P3	particle filter	EN 143:2000 P3 R	10027639
FLEXIfilter P3-OR	particle filter	EN 143:2000 P3 R	10027697
Adapter for TabTec/ FLEXIfilter [pair]			10030514

6 Pictograms

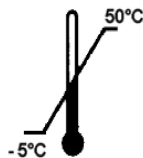


See information supplied by the manufacturer



End of shelf life / year and month [for filters only]

YYYY/MM



Temperature range of storage conditions



Maximum humidity of storage conditions

08	●	●	●	●
09	●			
10				
11				
12				

This date code show the manufacturing date quarterly. The date code shown here is the first quarter of 2009.

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