



Cleaning and Disinfection Guidelines

M1 Modular SCBA System



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1 General

⚠ WARNING!

- 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.
- During the cleaning and disinfection process with water and solutions with recommended detergents, the pressure reducer and the demand valve must be pressurized.
- The MSA recommendations and guidelines must be strictly adhered to.

Failure to follow these warnings can result in serious personal injury or death.

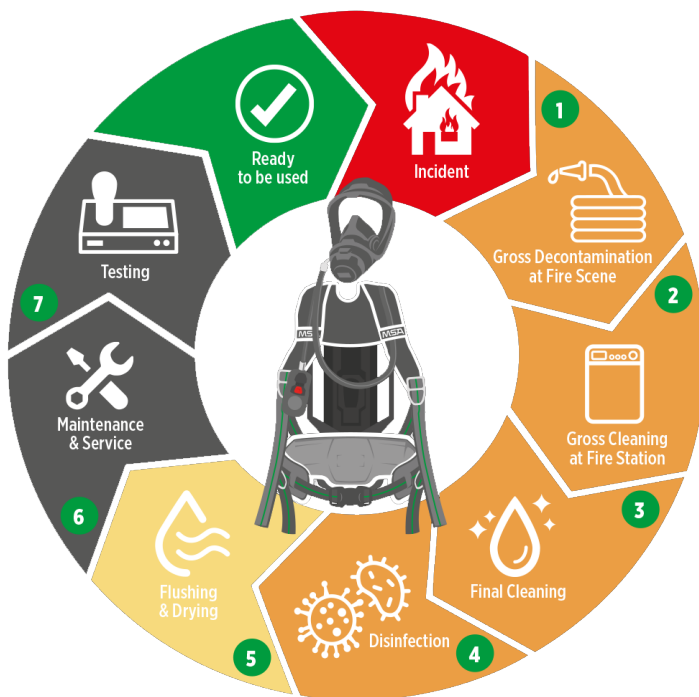


When changing chemistry, it is recommended to consult the manufacturer of the respective successor product in order to exclude possible adverse reactions with the previously used agent. This applies to both the items to be washed and the washing machine itself.

1.1 Usage Cycle

Special attention must be paid to the assessment of decontamination and cleaning to decide if the equipment is safe to use again.

The usage cycle shows the respective steps from operation to readiness for use.



The actions described in this manual refer to the following steps from the cycle:

1. Gross Decontamination at Fire Scene
2. Gross Cleaning at Fire Station
3. Final Cleaning
4. Disinfection
5. Flushing and Drying

2 Manual Decontamination / (Pre-)Cleaning

2.1 General

Manual decontamination can be carried out at the site of the incident, at the fire station or in the fire station workshop. Final cleaning is likely to be required after manual decontamination, according to the cycle of use (see chapter 1.1). Faultless mechanical cleaning is an absolute precondition for disinfection; only totally clean breathing apparatus components can be effectively disinfected.

WARNING!

- During cleaning appropriate personal protective equipment must be worn, e.g. eye, face, hand, body and respiratory protection.
- Ingress of water can cause icing inside the device if not carefully dried.

Failure to follow these warnings can result in serious personal injury or death.

NOTICE

Do not use organic solvents, such as acetone, thinners, nitrous dilution, alcohol, spirits, gasoline, trichloroethylene, petrol, etc, for cleaning, otherwise the device can be damaged.

2.1.1 Decontamination with Wipes

Wipes can be used for rapid (pre-)decontamination at the site of the incident or at the fire station.

MSA recommendation:

- AVET Dry Cleaning Wipe Clara Clean Go SX 100
- Diversey Oxivir Excel Wipe

Use the wipes as recommended by the supplier. A cleaning time of >30 seconds is recommended.

2.1.2 Decontamination with Detergents

For manual decontamination, use lukewarm water ($\leq 30\text{ }^{\circ}\text{C}$) and a mild, pH-neutral detergent. A soft brush can also be used. Follow the corresponding washing instructions for the individual components, if applicable.

MSA recommendation:

- Diversey Suma Light D 1.2 (0.5% concentration)
- Diversey Oxivir Excel detergent (2% concentration)
- Dr. Weigert neoform K plus (1% concentration)



The exposure time for effective decontamination depends on the detergent used, its concentration and the temperature of the ready-to-use solution. For more information, please refer to the data sheet of the respective detergent manufacturer. It is recommended not to exceed a maximum exposure time of 1 hour to avoid an adverse effect of the detergent on the materials.

After manual cleaning rinse equipment thoroughly with plenty of clear, running, lukewarm water ($\leq 30\text{ }^{\circ}\text{C}$) of drinking quality.

2.2 Facepieces

MSA facepieces can be manually pre-cleaned with decontamination wipes and detergents according to chapters 2.1.1 and 2.1.2 . It is possible to use brushes, damp cloth or similar.

If applicable, follow the specific instructions and appropriate cleaning procedures in the respective facepiece operating manuals.

Preparing the Facepiece for Cleaning or Disinfection

1. Remove inhalation and exhalation valve discs.
2. Unbutton the nosecup.
3. Remove components that need to be separately cleaned and disinfected according to the relevant instructions for use.

Subsequent to the cleaning or disinfection process:

4. Dry facepiece and components (see chapter 5) and reassemble facepiece in reverse order.
5. Perform tests according to the manufacturer's requirements described in the relevant operating or maintenance manuals.

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

2.3 Breathing Apparatus

SCBA components (backplate, harness, pneumatic) can be manually pre-cleaned with decontamination wipes and detergents according to chapters 2.1.1 and 2.1.2 . It is possible to use brushes, damp cloth or similar.

When using detergent solutions or a water hose to remove rough dirt from the breathing apparatus make sure that the system is pressurized and openings are closed to prevent water ingress, by following these steps.

1. Before connecting the unit to the medium pressure, switch off the lung governed demand valve by pressing the red control button to prevent unintentional air supply (refer to the operating manual of the lung governed demand valve).
2. Fully open cylinder valve of the mounted compressed air cylinder fully.
3. Close the warning signal with a protective cap (10190947-SP)
4. Close the AE / ESA lung governed demand valve with the washing adapter AE / ESA (10200072), the AS lung governed demand valve with the washing adapter AS (10200071).
5. Switch the lung governed demand valve ("ON") to produce a continuous air flow of approx. 5 l/min.

Subsequent to the cleaning or disinfection process:

6. Dry the device completely (see chapter 5).

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

2.4 Lung Governed Demand Valves

MSA lung governed demand valves can be manually pre-cleaned with decontamination wipes and detergents according to chapters 2.1.1 and 2.1.2. It is possible to use brushes, damp cloth or similar.

When using detergent solutions or a water hose to remove rough dirt from the breathing apparatus make sure that the lung governed demand valve is pressurized and openings are closed to prevent water ingress, by following these steps.

1. Before connecting the unit to the medium pressure, switch off the lung governed demand valve by pressing the red control button to prevent unintentional air supply (refer to the operating manual of the lung governed demand valve).
2. Supply the lung governed demand valves with compressed air (breathing air quality) during the complete washing sequence. Pressure range 3 to 8 bar.
3. Close the AE / ESA lung governed demand valve with the washing adapter AE / ESA (10200072), the AS lung governed demand valve with the washing adapter AS (10200071).
4. Switch on the lung governed demand valve to produce a continuous air flow of approx. 5 l/min.

Subsequent to the cleaning or disinfection process:

5. Dry the device completely (see chapter 5).



WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

2.5 Accessories

2.5.1 Electronics

Only some electronic devices are fully washable. Follow the special instructions and suitable cleaning procedures in the respective manuals, e. g. M1 Control Module and SLS 2.0 are fully washable according to the procedures in this manual.



WARNING!

Do not use any organic cleaning material for the cleaning of the individual components, such as nitro thinners, alcohol, white spirit, petrol etc.

Failure to follow this warning can result in serious personal injury or death.

SingleLine SCOUT (SLS)

SingleLine SCOUT devices produced before July 2021:

After each operation and in case of heavy soiling, clean the device components with a damp cloth (lukewarm water) and some detergent. The device should not be removed from the pneumatics for cleaning.

SingleLine SCOUT units produced after July 2021:

Follow instructions for decontamination related to M1 SCBA as per this manual.

M1 Control Module (CM)

NOTICE

Do not remove the device from pneumatics. Always pressurize > 60 bar the device during (hand) washing. Otherwise, ingress of water may damage the system or any components.

The device components should be cleaned after each operation and, if badly contaminated, with a damp cloth (lukewarm water) and a little detergent.

For mechanical washing, follow detailed washing instructions for self-contained breathing apparatus.

The battery must always be connected to the device and the battery U-clip must be in the device.

Use the safety key to mute alarms.

⚠ WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

2.5.2 alphaBELT



There are two alphaBELT generations which differ in the materials used, as described below. It is important to choose the correct washing procedure according to the alphaBELT version used!

- alphaBELT 1 version (first generation, green fabric pads, delivered until 2021)
- alphaBELT 2 version (second generation, M1 coated black pads, delivered since 2021)

alphaBELT 1 version only:

MSA has tested TURBO USONA by ECOLAB and recommends this product.

NOTE: Do not soak the belts, otherwise the labels can peel off.

1. Use lukewarm water ($\leq 30\text{ }^{\circ}\text{C}$) and mild, pH-neutral detergent.

Dosage: 1% TURBO USONA detergent based on the amount of water used.

2. Rinse equipment with clear water after manual cleaning ($\leq 30\text{ }^{\circ}\text{C}$).

Subsequent to the cleaning or disinfection process:

3. Dry the device completely (see chapter 5).
4. Follow the information for maintenance and lubrication of the buckles in the relevant operating manual (10156928).

alphaBELT 2 version only:

The alphaBELT 2 version (M1 coated black pads) is using the same fabrics as the M1 SCBA .

1. Clean with the detergents and process according to chapters 2.1.1 and 2.1.2 .

Subsequent to the cleaning or disinfection process:

2. Dry the device completely (see chapter 5).

3. Follow the information for maintenance and lubrication of the buckles in the relevant operating manual (10156928).



WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3 Final Cleaning / Machine Cleaning



WARNING!

- During cleaning appropriate personal protective equipment must be worn, e.g. eye, face, hand, body and respiratory protection.
- Ingress of water can cause icing inside the device if not carefully dried.

Failure to follow these warnings can result in serious personal injury or death.

NOTICE

- Do not use organic solvents, such as acetone, thinners, nitrous dilution, alcohol, spirits, gasoline, trichloroethylene, petrol, etc, for cleaning, otherwise the device can be damaged.
 - Chemical cleaning is not permitted. It can damage the harness or other parts of the SCBA.
-



For the final cleaning a machine cleaning is recommended.

Table 1 MSA washing parameters

Machine type	Cleaning basket system	Dishwasher	For facepieces only! Tumble washing machine
	e.g. MEIKO Topclean M (by MEIKO Maschinenbau GmbH & Co. KG, Germany)	e.g. Solo Rescue® (by RESCUE Intellitech AB, Sweden)	e.g. Miele** (by Miele & Cie. KG, Professional, Germany)
Water softener	Do not use chemical water softener. If necessary use osmosis modules recommended by the machine supplier.		
Cleaning agent(s)	<ul style="list-style-type: none"> EW 80®clean (machine-dependent up to 1% to prevent foaming)* Dr. Weigert neodisher® MediClean Forte (1%) with neodisher Polyklar as rinse agent (0.5 ml/l or 0.05%)* 		<ul style="list-style-type: none"> Dr. Weigert neodisher® MediClean Forte (5 ml/l – 10 ml/l, 0.5 – 1%)*
Cleaning/disinfection agent(s) ***	<ul style="list-style-type: none"> EW 80® mat (1%) with Etolit GT 500 as rinse agent (0.25 ml/l)* Diversey Suma Jade Pur Eco L8 (4 ml/l) with Suma Med Neutral as neutralising rinse agent (0.5 ml/l)* Dr. Weigert neodisher® Dekonta AF (1%) with neodisher Polyklar as rinse agent (0.5 ml/l or 0.05%)* 		<ul style="list-style-type: none"> Ecolab Eltra® (7 g/l)* Dekonta AF (1%)*
Washing procedure/temperature	Decontamination + Disinfection: <ul style="list-style-type: none"> 20 minutes at 45 °C + 5 °C, after the washing cycle/process has been finished MSA recommends a complete bath change (water replacement) machine has to be reprogrammed accordingly 	Decontamination: <ul style="list-style-type: none"> 9 minutes at 45 °C + 5 °C, after the washing cycle/process has been finished MSA recommends a complete bath change (water replacement) 	Decontamination: <ul style="list-style-type: none"> Masks (main wash, 4x rinse) at 55 °C to 60 °C Decontamination + Disinfection: <ul style="list-style-type: none"> Masks (main wash, 4x rinse) at 55 °C to 60 °C Masks with pre-wash (pre-wash, main wash, 4x rinse) at 55 °C to 60 °C For the washing program see "Important Information for Cleaning and Disinfecting of Facepieces with Miele** Washing Extractor" in chapter 4.3.1. Wash ONLY in padded laundry bag or in washing nets

* The dosage has to be adjusted to the water hardness.

** Types: PW 6163, PW 6243, PW 6323, PW 6247, PW 6327, PWM 909, PWM 912, PWM 916, PWM 920

*** Combined cleaning and disinfection of the complete SCBA is technically possible, but is not recommended by MSA. Separate disinfection is always preferable, as it is more process-safe and only those components (e.g. facepieces, LGDVs) are disinfected that require it.

Table 2 MSA recommendation for washing time

Machine type	Lightly soiled	Heavily soiled
MEIKO Topclean M*	10 minutes	20 minutes
Solo Rescue**	9 min	
For facepieces only! Miele***	20 minutes main wash	10 minutes pre-wash + 20 minutes main wash

* Decontamination + disinfection with complete water replacement after each cycle

** Decontamination only with complete water replacement after each cycle

*** Types: PW 6163, PW 6243, PW 6323, PW 6247, PW 6327, PWM 909, PWM 912, PWM 916, PWM 920

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3.1 Facepieces

Follow the cleaning procedures in the respective facepiece manuals.

NOTICE

It is not permitted to machine wash an anti-fog coated lens otherwise the coating will be damaged.

Preparing the Facepiece for Cleaning or Disinfection

1. Remove inhalation and exhalation valve discs.
2. Unbutton the nose cup.
3. Remove components that need to be separately cleaned and disinfected according to the relevant instructions for use.

Subsequent to the cleaning or disinfection process:

4. Dry facepiece and components (see chapter 5) and reassemble facepiece in reverse order.
5. Perform tests according to the manufacturer's requirements described in the relevant operating or maintenance manuals.

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3.2 Breathing Apparatus

MSA recommendation:

1. Before connecting the unit to the medium pressure, switch off the lung governed demand valve by pressing the red control button to prevent unintentional air supply (refer to the operating manual of the lung governed demand valve).
2. Open cylinder valve of the mounted compressed air cylinder fully.
 - a. Close the warning signal with a protective cap (10190947-SP).
 - b. Close the AE / ESA lung governed demand valve with the washing adapter (10200072), the AS lung governed demand valve with the washing adapter (10200071) and switch it on ("ON") to produce a continuous air flow of approx. 5 l/min.
3. Remove rough dirt from breathing apparatus with water hose before placing the device in the machine (see chapter 2.3).
4. Start the washing procedure.

MSA recommendation for pre-cleaning:

- Use cleaning/disinfection agent at the appropriate concentration listed in the table (see Table 1).
 - Temperature: 45 °C + 5 °C.
 - Washing is depending on the machine type and the degree of soiling (see Table 2).
5. After washing, close the cylinder valve(s) of the assembled breathing air cylinder(s) completely. Vent air from the device with the lung governed demand valve and remove the protective caps and wash adapter.

For complete and secure drying proceed according to the specification in chapter 5.3.2 .

If the cleaning is not successful, restart the entire process. For a better result the breathing apparatus can be disassembled as follows before restarting:

1. Remove compressed air cylinder.
2. Disconnect lung governed demand valve.
3. Separate cylinder cover from cylinder .
4. Remove harness parts from the slots of the backplate.
5. Harness assembly and cylinder cover can be cleaned in a washing extractor at 45 °C + 5 °C with the same cleaning agents.

MSA recommendation:

The use of padded washing nets is a basic requirement for the safe care and decontamination of the harness and belts. These nets must have a multi-layer construction to prevent metal applications from hitting the inner drum. Firefighting suits of similar construction, for example, can be used as filling material in the drum.

NOTE: Do not submerge the pressure reducer in water without the above mentioned protective cap. Pressurize the pressure reducer and seal the warning signal.

For complete and secure drying proceed according to the specification in chapter 5.3.2 .

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3.3 Lung Governed Demand Valves

If the lung governed demand valve is mounted on the M1 SCBA, it can be cleaned together with it (see 2.4). Otherwise, the lung governed demand valve can be cleaned and disinfected separately (see chapter 4.3.2).

1. Before connecting the unit to the medium pressure, switch off the lung governed demand valve by pressing the red control button to prevent unintentional air supply (refer to the operating manual of the lung governed demand valve).
2. Supply the lung governed demand valves with compressed air (breathing air quality) during the complete washing sequence. Pressure range 3 to 8 bar.
3. Close the AE / ESA lung governed demand valve with the washing adapter AE / ESA (10200072), the AS lung governed demand valve with the washing adapter AS (10200071).
4. Switch on the lung governed demand valve to produce a continuous air flow of approx. 5 l/min.

Subsequent to the cleaning or disinfection process:

5. Dry the device completely (see chapter 5).

For further disinfection procedures, proceed according to the specification (see chapter 4).

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3.4 Accessories

3.4.1 Electronics

Only some electronic devices are fully washable. Follow the special instructions and suitable cleaning procedures in the respective manuals, e. g. M1 Control Module and SLS 2.0 are fully washable according to the procedures in this manual.

WARNING!

Do not use any organic cleaning material for the cleaning of the individual components, such as nitro thinners, alcohol, white spirit, petrol etc.

Failure to follow this warning can result in serious personal injury or death.

SingleLine SCOUT (SLS)

SingleLine SCOUT devices produced before July 2021:

After each operation and in case of heavy soiling, clean the device components with a damp cloth (lukewarm water) and some detergent. The device should not be removed from the pneumatics for cleaning.

SingleLine SCOUT units produced after July 2021:

Follow instructions for decontamination related to M1 SCBA as per this manual.

M1 Control Module (CM)

NOTICE

Do not remove the device from pneumatics. Always pressurize > 60 bar the device during (hand) washing. Otherwise, ingress of water may damage the system or any components.

The device components should be cleaned after each operation and, if badly contaminated, with a damp cloth (lukewarm water) and a little detergent.

For mechanical washing, follow detailed washing instructions for self-contained breathing apparatus.

The battery must always be connected to the device and the battery U-clip must be in the device.

Use the safety key to mute alarms.

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

3.4.2 alphaBELT

The alphaBELT is a personal protective device and requires trained and competent personnel to handle the washing.

There are two alphaBELT generations which differ in the materials used, as described below. It is important to choose the correct washing procedure according to the alphaBELT version used!



- alphaBELT 1 version (first generation, green fabric pads, delivered until 2021)
- alphaBELT 2 version (second generation, M1 coated black pads, delivered since 2021)

alphaBELT 2 version only:

If the alphaBELT 2 version is mounted on the M1 SCBA, it can be cleaned with it, according to the specifications (see chapter 2.1). Otherwise, the alphaBELT 2 version has to be cleaned separately as described in the chapter.



MSA recommends that cleaning be carried out in a specialized commercial laundry.

It is also possible to decontaminate or wash the alphaBELT 1 and 2 version with a machine cleaning process and to dry it with the aid of a machine.

Basic requirements:

- Always use padded washing nets for safe care and decontamination of belts.
- The washing nets must have a multi-layer structure to prevent metal applications on the inner drum.
- As filling material in the drum, e.g. fire fighter suits of similar structure can be used.

WARNING!

The washing instructions must be followed. Any deviation of the procedure(s) can lead to deterioration or failure of the device.

Failure to follow this warning can result in serious personal injury or death.

Washing Detergent

Lanadol Aktiv by Kreussler is approved as washing detergent. The dosage is 5 ml/l.

Washing Program

The following washing program is given by the industrial washing machine type "Girbau HS6017" with 17 kg load capacity. Total program time is approx. 44 minutes:

- main wash bath at 40 °C, high level 1:3,5 - gentle wash;
- bath time 20 minutes;
- intermediate spinning (approx. 600 - 800 rpm), 2 minutes each time the bath is changed;
- two rinsing baths without additives, level 1:4, 3 minutes each, gentle wash;
- final spinning (approx. 600 - 800 rpm) 5 minutes

Dry the device completely, for alphaBELT version 2 (see chapter [5](#)).

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

Maintenance

Follow the information for maintenance and lubrication of the buckles in the relevant operating manual (10156928) .

4 Disinfection

Definition: Destruction or deactivation of micro-organisms - bacteria, fungi, spores on and in infected objects and areas.

All apparatus components that have come into contact with the saliva or exhalation air of the user must be disinfected (usually the full face mask and the lung governed demand valve).



To minimize the impact of cleaning and disinfecting chemicals on components, MSA does not recommend the disinfecting procedure for other SCBA components (e.g., back plate, harness, pneumatics) unless required.

Before disinfection, decontamination (pre-cleaning) or, in the case of basin disinfection, cleaning of the equipment must be carried out, to ensure the best possible and most effective disinfection.

For pre-cleaning see chapter 2 .

A combined procedure, machine cleaning and disinfection, is also possible. Use suitable cleaning detergents for this application (see chapter 3).

4.1 Manual (Basin) Disinfection



WARNING!

- Follow the instructions in the operating manual and the safety data sheet for the cleaning and disinfection detergent used.
- When dosage equipment is used follow the correct adjustment of the dosage systems according to the chemistry manufacturer.
- The combination of maximum temperature, concentration and duration is indicated in the instructions for use to be found usually on the disinfectant packaging. The specified data must always be adhered to. Arbitrary and uncontrolled addition of disinfectants can be as harmful to the user's life and to the device itself.
- During disinfection appropriate personal protective equipment must be worn, e.g. eye, face, hand, body and respiratory protection.

Failure to follow these warnings can result in serious personal injury or death.

MSA recommendation:

- Diversey Oxivir Excel detergent (2% concentration)
- Dr. Weigert neoform K plus (1% concentration)

Follow the disinfectant supplier's instructions regarding the disinfection duration.

For manual disinfection, use lukewarm water (20 °C to 30 °C).

No detergent must be added to the disinfectant, as this can lead to undesired effects or even loss of disinfection performance.



The exposure time for effective disinfection depends on the disinfectant used, its concentration and the temperature of the ready-to-use solution. For more information, please refer to the data sheet of the respective disinfectant manufacturer. It is recommended not to exceed a maximum exposure time of 1 hour to avoid an adverse effect of the disinfectant on the materials.

The disinfectant solution must be rinsed thoroughly with plenty of clear, running, lukewarm water of drinking quality. The disinfectant solution must be renewed at regular intervals to ensure the effectiveness of the disinfection process. The number of cycles until renewal depends, among other things, on the dirt ingress. Follow the instructions and recommendations of the chemistry manufacturer.

After disinfection and rinsing, follow the drying procedure (see chapter 5).

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

4.2 Machine Disinfection

WARNING!

- Follow the instructions in the operating manual and the safety data sheet for the cleaning and disinfection detergent used.
- When dosage equipment is used follow the correct adjustment of the dosage systems according to the chemistry manufacturer.
- Follow the instructions in the operating manual of the cleaning machine and/or disinfection device.

Failure to follow these warnings can result in serious personal injury or death.

 For the final cleaning a machine cleaning is recommended.

For machine disinfection follow the instructions for machine cleaning. Machine disinfection can also be done in combination with machine cleaning, depending on the degree of contamination of the equipment. Always prepare the equipment before disinfection.

Table 3 MSA recommendation for machine disinfection

Machine type	For facepieces and LGDV only!	For facepieces only!
	Cleaning basket system, e.g.: MEIKO Topclean M (by MEIKO Maschinenbau GmbH & Co. KG, Germany)	Tumble washing machine, e.g.: Miele** (by Miele & Cie. KG, Professional, Germany)
Water softener	Do not use chemical water softener. If necessary use osmosis modules recommended by the machine supplier.	
Cleaning /disinfection agent(s)	<ul style="list-style-type: none"> EW 80® mat (1%) with Etolit GT 500 as rinse agent (0.25 ml/l)* Diversey Suma Jade Pur Eco L8 (4 ml/l) with Suma Med Neutral as neutralising rinse agent (0.5 ml/l)* Ecolab Sekumatic® FDR (10 ml/l, 1%) with Etolit ET500 as rinse agent (0,25 ml/l)* Dr. Weigert neodisher® Dekonta AF (1%) with neodisher Polyklar as rinse agent (0.5 ml/l or 0.05%)* 	<ul style="list-style-type: none"> Ecolab Eltra® (7 g/l)* Ecolab Sekumatic® FDR (10 ml/l, 1%)* EW 80® mat (1%)* Diversey Suma Jade Pur Eco L8 (4 ml/l)* Dekonta AF (1%)*
Washing Procedure/ temperature	Disinfection: <ul style="list-style-type: none"> 5 minutes at 55 °C to 60 °C with EW 80® mat 5 minutes at 55 °C to 60 °C with Ecolab Sekumatic® FDR 5 minutes at 55 °C to 60 °C with Diversey Suma Jade Pur Eco L8 5 minutes at 50 °C with Dr. Weigert neodisher® Dekonta AF 	Disinfection: <ul style="list-style-type: none"> 5 minutes at 55 °C to 60 °C with Ecolab Eltra® 5 minutes at 55 °C to 60 °C with Ecolab Sekumatic® FDR 5 minutes at 55 °C to 60 °C with Diversey Suma Jade Pur Eco L8 5 minutes at 50 °C with Dr. Weigert neodisher® Dekonta AF

After the disinfection cycle/process has been finished a complete bath change (changing the water) is recommended.

* The dosage has to be adjusted to the water hardness.

** Types: PW 6163, PW 6243, PW 6323, PW 6247, PW 6327, PWM 909, PWM 912, PWM 916, PWM 920

WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

4.3 Preparation of Equipment

4.3.1 Facepieces

Preparing the Facepiece for Cleaning or Disinfection

1. Remove inhalation and exhalation valve discs.
2. Unbutton the nose cup.
3. Remove components that need to be separately cleaned and disinfected according to the relevant instructions for use.

Subsequent to the cleaning or disinfection process:

4. Dry facepiece and components (see chapter 5) and reassemble facepiece in reverse order.
5. Perform tests according to the manufacturer's requirements described in the relevant operating or maintenance manuals.



WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

Important Information for Cleaning and Disinfecting of Facepieces with Miele* Washing Extractor

Preparation	See 4.3 Preparation of Equipment
Loading	<ol style="list-style-type: none"> 1. Place the disassembled facepieces in the protective bag for washing and close the protective bag. 2. Place the respective small components into a separate container (e.g. additional bag) or wash it separately. 3. Place facepieces loosely in the washing drum, do not squeeze.
Concentration/Duration	<ul style="list-style-type: none"> • According to the requirements of the detergent manufacturer the detergent will be dosed either manually or automatically. • 1% solution with Sekumatic® FDR: Application time 5 minutes at 55 °C to 60 °C for every cleaning and disinfecting stage of the washing program. • The dosage is carried out automatically through a dosing station (optional accessory) into the machine in exactly the required amount (as a liquid).
Washing program	<p>Miele special washing program for facepieces:</p> <ol style="list-style-type: none"> 1. Pre-wash at 30 °C for 10 minutes (for heavily soiled facepieces only) 2. Cleaning and disinfection at 55 °C to 60 °C for 20 minutes 3. Purging cold for 8 minutes 4. Purging cold for 8 minutes 5. Purging cold for 8 minutes 6. Purging cold for 8 minutes
Removal	<ol style="list-style-type: none"> 1. Open the chamber door once the washing program is finished. 2. Take out the facepiece bag, remove the facepiece and shake water residues out of the facepieces after removal. 3. Close door of the chamber.
Drying	Dry facepieces at max. 60 °C.
Post-treatment	If applicable remove detergent residues.
NOTE:	<ul style="list-style-type: none"> • Follow the instructions in the operating manual and safety data sheets of the cleaning and disinfection detergent. • Follow the correct adjustment of the dosage systems according to the detergent manufacturer. • Follow the instructions in the operating manual of the washing machine. • Follow the instructions in the operating manual of the facepiece. • Perform a functional check, visual check and leak test on each facepiece after reassembly. • Check facepiece and components, especially the valves and valve seats for detergent residue and if necessary, rework affected parts. • After each cleaning and disinfection, the facepiece and components must be checked for material changes. If necessary, affected parts must be replaced.

* Types: PW 6163, PW 6243, PW 6323, PW 6247, PW 6327, PWM 909, PWM 912, PWM 916, PWM 920

4.3.2 Lung Governed Demand Valves

WARNING!

- Follow the instructions in the operating manual and the safety data sheet for the cleaning and disinfection detergent used.
- When dosage equipment is used follow the correct adjustment of the dosage systems according to the chemistry manufacturer.
- Follow the instructions in the operating manual of the MEIKO TopClean M cleaning and/or disinfection device.
- Follow the instructions in the operating manual of the lung governed demand valves.

Failure to follow these warnings can result in serious personal injury or death.

The lung governed demand valves of MSA listed below can be cleaned and disinfected in the cleaning and disinfection device TopClean M of MEIKO Maschinenbau GmbH & Co. KG using the liquid cleaning and disinfection detergent(s), see [Table 3](#).

The lung governed demand valves must be supplied with compressed air (breathing air quality) during the whole washing sequence. Pressure range 3 to 8 bar.

Positive pressure series of LGDV

Before connecting the device to medium pressure, in order to prevent accidental air delivery, push the red operating button to switch off the lung governed demand valve (according to the operating manual of the lung governed demand valve).

To protect the hose connection from disconnecting during cleaning, the standard LGDV cover can be replaced with a cover without a flush button:



- M1 LGDV: P/N 10184430-SP (10 pieces)
 - AutoMaXX LGDV: P/N 10018053-SP (10 pieces)
-

Disinfection

Necessary Concentration

According to the requirements of the chemistry manufacturer the concentration will be automatically dosed, see [Table 3](#).

The dosage is carried out automatically, electronically steered and monitored. The cleaning and disinfection device MEIKO TopClean M generates an error message as soon as a shortage of the disinfection detergent occurs. As long as no disinfection detergent will be detected by the level indicator, no washing program can be started.

Disinfecting with MEIKO TopClean M

The cleaning and disinfection of the lung governed demand valves is carried out in washing program 3 with 12 minutes run-time at 55 °C to 60 °C and an application time of 5 minutes.

1. Disassemble diaphragm (according to the operating manual of the lung governed demand valve).
2. Position lung governed demand valves and disassembled parts in the lung governed demand valve cage, which was designed for this purpose, and connect these to the compressed air couplings of the cage (according to the operating manual of the cleaning and disinfection device).
3. Insert cage, connect compressed air supply of the cage to the compressed air supply of the MEIKO TopClean M and close door of the chamber.
4. Choose and start washing program 3 (with a total running time of 12 minutes at 55 °C to 60 °C).

The program sequence will be displayed in the operation display. During the program sequence the door of the chamber is locked.

- a. Cleaning and disinfection: The minimum contact time of the detergents at 55 °C to 60 °C specified by the detergent manufacturer to achieve the defined spectrum of activity: 5 minutes. The extension of the cleaning time for more heavily soiled regulators: approx. 6 minutes.

NOTE: The temperature in the wash liquor is automatically monitored. If the specified 55 °C to 60 °C is not reached for at least 5 minutes, the machine automatically extends the treatment process in order to ensure the required disinfection result.

- b. Draining: The cleaning and disinfection solution remaining on the regulator can partially drip into the tank by itself: 5 seconds.
 - c. Pumping off: The complete wash liquor (11 l) is pumped off: 50 seconds.
 - d. Clear rinsing: The lung governed demand valves are rinsed clear with 4.2 l at 55 °C to 60 °C, i.e. the remaining cleaning and disinfection detergents are rinsed off: approx. 10 seconds.
 - e. The rinse agent in the appropriate concentration is automatically dosed in the rinse cycle.
5. Open door of the chamber when washing program is finished.
 6. Shake out water residues from lung governed demand valves consecutively.
 7. Blow out water residues from the lung governed demand valves by using the flush button or bypass and disconnect afterward.
 8. Disconnect the compressed air of the empty lung governed demand valve cage from the compressed air supply of the MEIKO TopClean M.
 9. Take out the lung governed demand valve cage and put it aside.
 10. Close door of the chamber.
 11. Let the lung governed demand valves dry completely at max. 50 °C.
 12. If applicable, remove detergent residues.

After Disinfecting



WARNING!

After each successful decontamination, cleaning and disinfection the product/component must be tested/checked according to the manufacturer's requirements described in the relevant operating or maintenance manuals before the product/component is put back into service.

Failure to follow this warning can result in serious personal injury or death.

1. Check the lung governed demand valves for detergent residues and, if necessary, rework affected parts.
2. After each cleaning and disinfection the lung governed demand valves and their components must be checked for material changes. If necessary, affected parts have to be replaced.
3. Perform a functional check, visual check and leak test according to the manufacturer's requirements described in the relevant operating or maintenance manuals.

5 Drying

WARNING!

Make sure that no cleaning residues remain and that the components, especially the valves, are completely dry after drying process before assembly. Ingress of water can cause icing inside the device if not carefully dried.

Failure to follow this warning can result in serious personal injury or death.



Higher temperatures and longer duration than recommended may cause the plastic and rubber materials to age more quickly, shortening the service life of the equipment.

5.1 Air Drying (Drying in the Ambient Atmosphere)

The devices can be dried by natural means:

- in normal climate free of pollutants
- protected from direct sunlight
- protected from UV light
- protected from heating of more than $45\text{ °C} \pm 5\text{ °C}$ for more than 1 h

Make sure that the temperature does not exceed 50 °C . Make sure that no detergent residues remain and that the devices, especially the valves, are completely dry after drying process.

5.2 Drying in Drying Cabinet / Drying Chamber

For accelerated drying, a drying cabinet can be used (e.g. by Podab TS4) at a drying temperature of $45\text{ °C} \pm 5\text{ °C}$ for no longer than 60 minutes.

5.3 Preparation of Equipment

5.3.1 Facepieces

After drying reassemble facepiece in reverse order (see chapter 4.3). Make sure all parts are not damaged, clean and dry.

After reassembling perform all required tests according to the dedicated operating or maintenance manuals.

5.3.2 Breathing Apparatus

Drying of the Pressure Reducer

1. Remove the cap seal ring from the pressure reducer.



2. Blow out remaining humidity from the pressure reducer with an air gun. Blow out pressure reducer via ventilation bore holes. Use compressed air with breathing air quality according to EN 12021. One of the bore holes has to show downwards. Blow out in-depth and dry completely.

3. Dry the device completely. When using a drying cabinet the temperature shall not exceed $45\text{ °C} \pm 5\text{ °C}$ (no longer than 1 h).
4. Refit the cap seal ring on the pressure reducer.

Drying and Care of the Harness

- **Drying:** The harness can be dried in a drying cabinet with circulating air at a temperature of $45\text{ °C} \pm 5\text{ °C}$.
- **Dryer:** possible.
- **Ironing:** If necessary, the pull straps can be ironed at low temperature.

Air Drying of the Entire Device

1. Remove the cap seal ring from the pressure reducer.



2. Blow out remaining humidity from the pressure reducer with an air gun. Blow out pressure reducer via ventilation bore holes. Use compressed air with breathing air quality according to EN 12021. One of the bore holes has to show downwards. Blow out in-depth and dry completely.

3. Refit the cap seal ring on the pressure reducer.
4. Dry the device completely:
 - in normal climate free of pollutants
 - protected from direct sunlight
 - protected from UV light
 - protected from heating of more than $45\text{ °C} \pm 5\text{ °C}$ for more than 1 h

5.3.3 Lung Governed Demand Valves

The lung governed demand valves can be dried at a temperature of $45\text{ °C} \pm 5\text{ °C}$. Make sure that no cleaning residues remain and that the lung governed demand valve is completely dry.

5.3.4 Accessories

Only some electronic devices are fully washable. Follow the special instructions and suitable cleaning/ drying procedures in the respective manuals.

M1 control module and SLS 2.0 are fully washable according to the procedures described in this manual. The same drying process can be applied.

Air Drying of the Entire Accessories

Dry the device completely:

- in normal climate free of pollutants
- protected from direct sunlight
- protected from UV light
- protected from heating of more than $45\text{ °C} \pm 5\text{ °C}$ for more than 1 h

See also chapter [5.2](#).

alphaBELT

WARNING!

The harness must be dried by natural means, not exposed to direct sunlight and not close to a fire or other sources of heat.

Failure to follow this warning can result in serious personal injury or death.

For accelerated drying, the belts can be placed in a drying cabinet (e.g. by Podab TS4) at a drying temperature of $45^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for not longer than 60 minutes.

6 Using Other Machines

MSA accepts no liability in cases where the products have been cleaned / disinfected inappropriately or not as intended. The selection and use of other detergents than recommended in this manual are the exclusive responsibility of the individual operator. Product liability claims, warranties also as guarantees made by MSA with respect to the products are voided, if it is not used, serviced or maintained in accordance with the instructions in this manual.

WARNING!

The described washing process must be followed. Any deviation of the procedure(s) can lead to deterioration or failure of the device.

The use of machines other than those recommended above is considered safe provided the following parameters are met:

- The mechanical load must not be greater than that of the recommended machines.
- The specified temperatures, residence and washing times are maintained consistently.
- The specified concentrations are kept constant. This applies to the cleaning detergents, disinfectants and rinse aids.
If the consistent adherence is not demonstrably secured, a complete water change must be carried out with each wash cycle.
- Water softeners are not allowed.
- An osmosis plant for water softening can be used.
- The pressure of the water jet should not be different from the recommended washing machines when using the recommended process.

Failure to follow this warning can result in serious personal injury or death.