



because it works

Operation manual

HERKULES PFP



Serial-No.



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1 Foreword

Valued Customer!

We are delighted that you have opted for one of our machines.

These operating instructions are directed at the operating and maintenance personnel. They contain all information required in order to handle this machine.



The machine owner must ensure that the operating and maintenance personnel always have access to a copy of the operating instructions in a language that they understand.

In addition to the operating instructions, further information is also essential for the safety operation of the machine. Read and observe the directives and accident prevention regulations valid in your country.

In Germany, these are:

- ZH 1/406 “Guidelines for liquid jet sprayers (spray devices)” from the Federation of Institutions for Statutory Accident Insurance and Prevention,
- BGR 500, chap. 2.29 “Processing Coating Materials”,
- BGR 500, chap. 2.36 “Working with liquid jet sprayers”, both from the professional association for gas, district heating and water management.

We recommend enclosing all relevant directives and accident prevention regulations with the operating instructions.

Furthermore, always observe the manufacturer’s instructions and processing guidelines for coating or conveyance materials.

If questions should arise, we shall be happy to assist you.

We wish you excellent working results with your machine

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2 Safety

This machine has been designed and manufactured with consideration to all safety aspects. It reflects current engineering practice and the valid accident prevention regulations. The machine left the factory in faultless condition and guarantees a high level of technical safety. However, erroneous operation and misuse result in a risk to:

- the life and limb of the operator or third parties,
- the machine and other property of the owner,
- the efficient function of the machine.

It is fundamentally prohibited to implement all methods of work that have a negative influence on the safety of the operating personnel and the machine. All persons involved in the installation, commissioning, operation, care, repair and maintenance of the machine must have read and understood the operating instructions beforehand – in particular the “Safety” chapter.

Your safety depends on it!

We recommend that the machine owner have this confirmed in writing.

2.1 Explanation of symbols

Safety information warns of potential accident risks and describes the measures required for accident prevention. In the operating instructions from **WIWA**, safety information is highlighted and labelled as follows:



DANGER

Signals a risk of accidents that are very likely to result in serious injuries and even death, if the safety information is not observed!



WARNING

Signals a risk of accidents that may result in serious injuries and even death, if the safety information is not observed!



CAUTION

Signals a risk of accidents that may result in injuries, if the safety information is not observed!



Signals important information for correct work with the machine. A failure to observe this may result in damage to the machine or its environment.

A range of pictograms are used in the safety information for accident risks that may result in injury, depending on the hazard source – examples:



General risk of accident



Risk of explosion due to explosive atmosphere



Risk of explosion due to explosive substances



Risk of accident due to electricity or electrostatic charge



Risk of crushing due to stroke movements



Risk of cutting injuries due to rotating machine parts



Risk of burning due to hot surfaces



Risk of freezing due to cold surfaces

The first line of the safety instructions indicates the personal protective equipment that must be worn. This is also highlighted and labelled as follows:



Wear protective clothing

Signals an instruction to wear the prescribed protective clothing, in order to prevent skin injuries due to spray material or gases.



Use eye protection

Signals an instruction to wear safety goggles, in order to prevent eye injuries due to material spray, gases, vapours or dust.



Use hearing protection

Signals an instruction to wear hearing protection, in order to prevent damage to hearing caused by noise.



Use respiratory protection

Signals an instruction to use respiratory protection, in order to prevent damage to the respiratory tract caused by gases, vapours or dust.



Wear protective gloves

Identifies the requirement to wear protective gloves in order to prevent injuries due to aggressive chemicals, fire injuries when processing heated materials, or freezing due to contact with very cold surfaces.



Wear safety shoes

Signals an instruction to wear safety shoes, in order to prevent foot injuries due to falling, toppling or rolling objects, as well as slipping on slippery floors.



Signals references to directives, work instructions and operating instructions that contain very important information and must be observed.

2.2 Safety information

Always remember that the machine operates in a high pressure process and can cause life-endangering injuries if handled incorrectly!



Always observe and follow all information in these operating instructions and in the separate operating instructions for the individual machine parts or the optionally available auxiliary devices.

2.2.1 Operating pressure



WARNING

Parts that are not designed for the maximum permissible operating pressure may rupture and cause serious injuries.

- It is essential to observe the prescribed maximum operating pressures for all parts. With varying operating pressures, the lowest value always applies as the maximum operating pressure for the complete machine.
- Material hoses and hose connections must comply with the maximum operating pressure including the required safety factor.
- Material hoses must not exhibit leaks, kinks, signs of wear or bulges.
- Hose connections must be tight.

2.2.2 Risks due to the spray jet



WARNING

The material exits the spray gun under very high pressure. The spray jet can cause serious injuries through its cutting action, or by penetrating the skin or eyes.



- Never aim the spray gun at yourself, other persons or animals!
- Never hold the finger or hand in front of the spray gun!
- Never reach into the spray jet!
- Always hold the spray gun tightly in your hands while working since great recoil forces can arise at high working pressures.



WARNING

An unintended ejection of material from the spray gun can cause personal injury and property damage.

- Lock the spray gun with all interruptions to work!
- Prior to each start-up, always check the spray gun lock!

2.2.3 Risks due to electrostatic charging



WARNING

The high flow speeds with the airless spray process can result in an electrostatic charge. Static charges can result in fire and explosions.

- Ensure that the machine is correctly earthed outside of EX zones!
- Also earth the object that is to be coated.
- Always use open containers!
- Never spray solvents or materials containing solvents into narrow-mouthed cans or barrels with a bung opening!
- Set the container down on an earthed surface.
- Use electrically conductive containers.
- Always ensure contact between the spray gun and the container wall.
- Only use electrically conductive material hoses.
All original material hoses from **WIWA** are conductive and designed for our machines.



WARNING

Dirty machines can become electrostatically charged. Fire and explosion can be triggered by severe static discharges.

- Keep the machine clean.
- Always perform the cleaning work outside of EX zones.

2.2.4 Risks due to hot or cold surfaces



CAUTION

When using material heaters, the machine surfaces may become hot. A risk of burns exists.

- When processing heated materials always wear protective gloves with forearm protection!



CAUTION

Air motors become very cold during operation. Local freezing can occur due to contact with very cold surfaces.

- Prior to all work on the machine, heat air motors up to a temperature above 10 °C.
- Wear suitable protective gloves!

2.2.5 Explosion protection



WARNING

Machines that are not explosion-protected must not be used in operating facilities that fall under the explosion protection ordinance!

Explosion-protected machines can be identified by the corresponding  mark on the type plate and/or the ATEX declaration of conformity provided.

Explosion-protected machines fulfil the requirements of the ATEX Directive for the device group, device category and temperature class cited on the type plate or in the declaration of conformity.

The owner is responsible for designating the zoning in accordance with ATEX Directive, Annex II, No. 2.1 -2.3 in accordance with the provisions of the responsible regulatory body. The owner is required to check and ensure that all technical data and labelling comply with the applicable stipulations according to ATEX.

Please note that some parts have their own type plate with separate labelling according to ATEX. In this case, the lowest explosion protection of all labels displayed applies to the entire machine. For applications, whereby a failure of the machine could lead to dangers to personnel, the owner is required to implement appropriate safety measures.

If agitators, heaters or other electrically operated accessories are attached, the explosion protection must be checked. Plugs for heaters, agitators, etc. that do not have explosion protection may only be plugged in outside of areas that fall under the explosion protection ordinance, also if the accessory itself is explosion protected.



WARNING

Heating solvents can lead to an explosion. The consequences may be serious physical injuries and property damage.

- Observe the flashpoint and ignition temperature of solvents.
- Switch all Material fluid heaters off when carrying out the following work: Cleaning, pressure testing, decommissioning, maintenance and repair.

2.2.6 Risks due to the rams



WARNING

While the rams are lifting, the moving components can crush your fingers, hands or other parts of the body.

- Do not reach in between the follow plate and the material container, the traverse and the cover of the pneumatic cylinder or the clamping piece and the cover of the pneumatic cylinder.



WARNING

While the rams are lifting, loose clothing can get between the follow plate or the follow cover and the material drum or catch on other machine parts or be pulled upwards.

- Wear tight-fitting working clothes that are not very tear-resistant, that have tight-fitting sleeves and no protruding parts.



WARNING

While the rams are lifting, the moving components can cause crushing and impact injuries.

- Persons should not remain in the stroke area of the rams while the rams are lifting!



WARNING

Accidental starting of the rams can result in crushing and impact injuries.

- At every interruption, always set the control lever to the “Stop” position.



WARNING

Objects placed on the rams may fall down during a stroke movement and cause injuries.

- Never place any objects on the rams!

2.2.7 Health risks



CAUTION

Depending on the materials being processed, solvent vapours may arise, which could lead to damage to health and property.

- Make sure the workplace is sufficiently ventilated and aired.
- Always observe the processing instructions of the material manufacturer.



When handling paint, solvents, oils, greases and other chemical substances, observe the safety and metering instructions of the manufacturer and the generally applicable regulations.



Only use suitable skin protection, skin cleansing and skincare products for cleansing the skin.

In systems that are closed or under pressure, dangerous chemical reactions may arise, if parts produced from aluminium or galvanised parts come into contact with 1.1.1 - trichloroethane, methylene chloride or other solvents that contain halogenated chlorinated hydrocarbons (CFCs). If you wish to process materials that contain the aforementioned substances, we recommend that you contact the material manufacturer in order to clarify their suitability for use.

A range of machines in rust and acid-resistant designs is available for these types of materials.

2.3 Safety signs

The safety signs attached on the machine, such as for example the safety card (see Fig. 1) indicate possible hazard points and must be observed.

The symbolism on the safety signs corresponds to the labeling of the safety information described in chap. 2.1 on page 6.

The safety signs may not be removed from the machine.

Damaged and illegible safety signs must be replaced immediately.

Also read and observe the safety information in the operating manual!



Fig. 1: Safety card

2.4 Safety equipment



WARNING

If safety equipment is missing or is not fully functional, the operating safety of the machine is not guaranteed!

- Put the machine out of operation immediately if you detect safety equipment defects or any other faults on the machine.
- Only put the machine back into operation once the faults have been fully rectified.

The machine is equipped with the following safety equipment:

- Safety valve,
- Compressed air shut-off valves,
- Grounding wheel (only in the case of version for offshore operation),
- Ground cable.

Check the safety equipment on the machine:

- Prior to starting up,
- Always prior to starting work,
- After all set-up work,
- After all cleaning, maintenance and repair work.

Checklist on the pressureless machine:

- Lead seal on the safety valve still intact?
- Safety valve externally free of damage?
- Function of compressed air shut-off valves OK?
- Grounding wheel clean and free of damage?
- Ground cable free of damage?
- Ground cable connections on machine and conductor in good condition?

Checklist on the pressurised machine:

- Function of the safety valve OK?



When checking further safety equipment observe the operating instructions for the optional accessories.

2.4.1 Safety valve

The safety valve is fitted to the air motor of the machine. The safety valve prevents the maximum permissible air intake pressure from being exceeded. If the air intake pressure exceeds the limit value setting, the safety valve discharges.

In order to check the function of the safety valve, briefly increase the air intake pressure to approx. 10% above the maximum permissible value according to the type plate – the safety valve must discharge.



Fig. 2: Safety valve



WARNING

If the maximum permissible air intake pressure is exceeded, parts may rupture. The consequences may be personal injuries and property damage.

- Never operate the machine without safety valve or with defective safety valve!
- If it is necessary to replace the safety valve, please refer to the machine card for the order number.
- With new safety valve, please ensure that this is set to the maximum permissible air intake pressure of the machine (see type plate or machine card) and sealed.

2.4.2 Compressed air shut-off valves

The compressed air shut-off valve on the maintenance unit (see Fig. 3) interrupts the air supply to the entire machine. Furthermore, the machine is equipped with further compressed air shut-off valves, with which it is possible to interrupt the air supply to individual components, such as the container ventilation.

The functional principle of all compressed air shut-off valves installed on the machine is the same:

- Open ⇔ Position ball valve in the flow direction
- Close ⇔ Position ball valve transverse to the flow direction

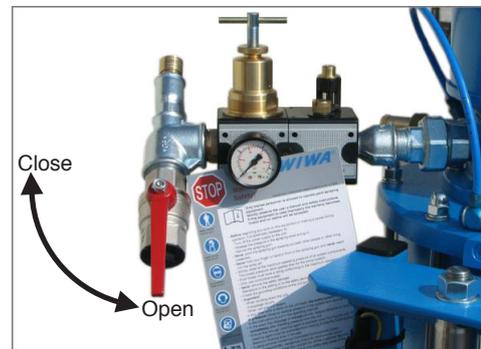


Fig. 3: Compressed air shut-off valve



After shutting off the air, the machine remains under pressure. It is therefore necessary to fully relieve the pressure prior to any maintenance and repair work!

2.4.3 Grounding wheel

In the case of version for offshore operation, a grounding wheel is fitted to the bottom of the machine.

The grounding wheel contacts the machine to the floor in order to discharge static electricity.



Please observe the following notes:

- Check the grounding wheel regularly for dirt and clean it if necessary.
- When moving the machine, make sure that the grounding wheel does not roll towards an obstruction and gets damaged.

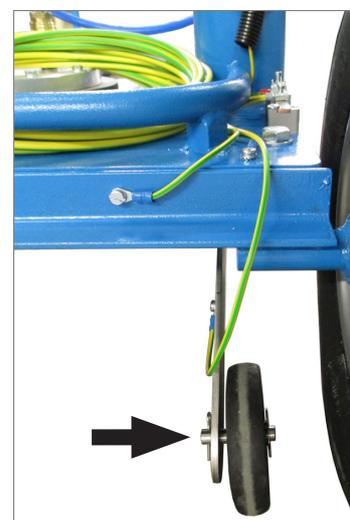


Fig. 4: Grounding wheel

2.4.4 Ground cable

The Ground cable serves to prevent an electrostatic charging of the machine. The Ground cable is already connected to the earthing rail of the machine at the time of delivery (see chapter 4.3.3 on page 24). If the Ground cable is lost or defective, it must be replaced immediately.

2.5 Operating and maintenance personnel

2.5.1 Obligations of the machine owner

The machine owner:

- is responsible for training the operating and maintenance personnel,
- must instruct the operating and maintenance personnel on correct handling of the machine, and on wearing the correct work clothing and protective equipment,
- must make work aids (such as lifting gear for transporting the machine or tank) available to the operating and maintenance personnel,
- must make the user manual accessible to the operating and maintenance personnel and must ensure that this remains constantly available,
- must ensure that the operating and maintenance personnel have read and understood the user manual.

Only then are they permitted to put the machine into operation.

2.5.2 Personnel qualifications

Differentiation is made between 2 groups of personnel, depending on their qualifications:

- Instructed operator has received verified instruction from the machine owner regarding the tasks entrusted to him and the possible risks in the event of incorrect conduct.
- Trained personnel are capable – due to instruction provided by the machine manufacturer – of carrying out maintenance and repair work on the machine, independently recognising possible dangers and avoiding risks.

2.5.3 Authorised operators

Activity	Qualification
Set-up and operation	Instructed operator
Cleaning	Instructed operator
Maintenance	Trained personnel
Repair	Trained personnel



Young persons under the age of 16 are not permitted to operate this machine.

2.5.4 Personal protective equipment



Wear protective clothing

Always wear the protective clothing stipulated for your working environment (e.g. antistatic protective clothing in potentially explosive areas) and also observe the recommendations in the safety datasheet of the material manufacturer.



Use eye protection

Wear safety goggles, in order to prevent eye injuries due to material spray, gases, vapours or dust.



Use hearing protection

Suitable noise protection equipment must be made available to the operating personnel. The machine owner is responsible for compliance with the accident prevention regulation "Noise" (BGV B3). It is therefore necessary to pay particular attention to the conditions at the installation site – for example noise pollution can increase if the machine is installed in or on hollow bodies.



Use respiratory protection

Although the airless spray process minimises the material mist with the right pressure setting and correct method of work, we recommend that you wear a respirator.



Wear protective gloves

Wear anti-static, chemical-resistant protective gloves with lower arm protection in order to prevent injuries due to aggressive chemicals, fire injuries when processing heated materials, or freezing due to contact with very cold surfaces.



Wear safety shoes

Wear antistatic safety shoes, in order to prevent foot injuries due to falling, toppling or rolling objects, as well as slipping on slippery floors.

2.6 Guarantee information



Observe our general terms and conditions of business (T&Cs) at www.wiwa.de.

2.6.1 Spare parts

- When repairing and maintaining the machine, only use original spare parts from **WIWA**.
- If spare parts are used, that have not been produced or supplied by **WIWA** then the guarantee is voided and all liability shall be excluded.

2.6.2 Accessories

- If you use original accessories from **WIWA**, their suitability for use in our machines is guaranteed.
- If you use third-party accessories, these must be suitable for the machine – in particular with respect to the working pressure, the current connection data, the connection variables, and use in Ex-zones, if applicable. **WIWA** shall not be liable for any damage or injuries arising due to these parts.
- It is essential to observe the safety provisions applicable to the accessories. You can find these safety provisions in the separate operating instructions for the accessories.

2.7 Behaviour in an emergency

2.7.1 Bring the machine to a standstill and relieve the pressure

In an emergency you must bring the machine to a standstill immediately and relieve the pressure.

1. Release the trigger and lock the spray gun.
2. Regulate the compressed air pressure regulators for the high pressure pump and the ram fully back.
3. Close the compressed air shut-off valve on the air maintenance unit.
4. Run the the drain hose into a collection container and secure it against slipping out unintentionally.
5. Open the drain valve.

2.7.2 Leaks



WARNING

In case of leaks, material may escape under very high pressure and cause serious physical injuries and property damage.

- Bring the machine to an immediate standstill and relieve the pressure.
- Tighten threaded connections and replace defective parts (must be performed by trained personnel).
- Do not seal leaks at connections and on high pressure hoses with the hand or by wrapping.
- Do not patch material hoses!
- Check hoses and threaded connections for leak-tightness when starting the machine up again.

2.7.3 Injuries

In case of injuries caused by processing material or solvents, always have the manufacturer's datasheet ready to show the doctor (supplier or manufacturer address, their telephone number, material designation and material number).

3 Machine description

The **HERKULES PFP** is a coating machine for insulating layer forming flame retardants. It was designed to meet special customer requirements (material to be applied, mixing ratio, transfer quantity, etc.).

The machine is used for coating steel parts in structural engineering, as well as in the oil and gas industry.

The technical data for your machine can be found on the machine card enclosed, or on the type plate.

3.1 Intended use

The **HERKULES PFP** is intended for the application of insulating layer forming flame retardants in commercial and industrial applications.



Intended use also includes:

- observing the technical documentation and
- complying with the operating, maintenance and servicing guidelines.

3.2 Erroneous use

Any use other than that stipulated in the technical documentation is deemed to be erroneous use and will void the warranty.

Erroneous use applies in particular if

- impermissible materials are processed,
- unauthorised modifications or changes are implemented,
- safety equipment is removed, modified, or bypassed,
- spare parts are installed that were not manufactured or delivered by **WIWA** (see chap. 2.6.1 on page 16),
- accessories are used that are not suitable for the machine (see chap. 2.6.2 on page 17),
- machines without Ex identification are used in potentially explosive atmospheres.
- the machine is operated outside of the operating limits according to the type plate.

3.3 Machine design



Fig. 5: Front view of the HERKULES PFP

No.	Designation
1	Silencer
2	Air motor
3	Overflow elbow with ventilation hole
4	Twin post ram
5	Fluid pump
6	Connection for the spray hose
7	Drain ball valve
8	Drain hose
9	Follow plate
10	Release agent filler neck
11	Release agent drain screw
12	Control lever for the ram
13	Pressure gauge for the ram
14	Compressed air shut-off valve for the container ventilation
15	Connection for the container ventilation

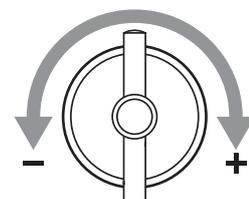


Fig. 6: Rear view of the HERKULES PFP

No.	Designation
16	Maintenance unit
17	Ring screws for safe lifting with hoisting devices
18	Air pressure regulator for the ram
19	Air pressure regulator for the high pressure pump
20	Deicing system
21	Pressure gauge for the air inlet pressure
22	Compressed air shut-off valve
23	Compressed air connection
24	Container ventilation with ball valve
25	Earthing rail with ground cable

The functional principle of all compressed air regulators on the machine is the same:

- In order to increase the pressure, turn them clockwise,
- in order to decrease the pressure, turn them anti-clockwise.



4 Transport, installation and assembly

The machine left the factory in faultless condition, packaged correctly for transport.



Check the machine at the time of receipt for any transport damage and for completeness.

4.1 Transport

In case of machine transport observe the following information:

- When loading the machine ensure sufficient load-bearing capacity of the lifting gear and lifting accessories. The dimensions and weight of the machine can be found on the machine card and the type plate.
- The machine must be lifted exclusively at the intended attachment points for lifting accessories.
- Attention! Risk of tipping! Ensure the load is evenly distributed, in order to prevent the machine from tipping.
- When lifting or loading the machine, do not transport other objects simultaneously (e.g. material tanks) with the machine.
- Never stand beneath suspended loads or in the loading area. There is a risk of death here!
- Secure the load on the transport vehicle to prevent sliding and falling.

If the machine has previously been in operation, please observe the following:

- Disconnect the entire energy supply to the machine – also for short transport distances.
- Empty the machine prior to transport – residual liquids may still leak out of the machine during transport.
- Remove all loose parts (e.g. tools) from the machine.

4.2 Installation site

Ambient temperature	minimum		maximum	
	0 °C	32 °F	40 °C	104 °F

The machine can be installed inside or outside spray booths. However, in order to avoid contamination an external installation is preferable.



WARNING

If the machine is used outdoors, a life-endangering situation may arise for the operating personnel due to lightning!

- Never operate a machine outdoors during a storm!
- The machine owner must ensure that a machine that is outdoors is equipped with suitable lightning protection equipment.



Position the machine horizontally on floor that is level, firm and free of vibrations. The machine must not be tilted or tipped. Make sure that all controls and safety devices are easy to reach.

Safety measures at the installation site:

- For safe operation of the machine, stability and sufficient free space must be guaranteed.
- Fasten the machine to its installation site, in order to secure it against unintended movement. To do this, engage the wheel brakes on the swivel rollers (see Fig. 7).
- Keep the working area clean, in particular all running and parking surfaces. Remove any spilled material and solvents immediately.
- In order to prevent harm to health and damage to property, ensure sufficient ventilation and airing of the workplace. At least 5-times air exchange per hour must be guaranteed.
- Always observe the processing instructions of the material manufacturer.
- Although no legal regulations apply to the low-mist airless spray process, dangerous solvent vapours and paint particles must be extracted.
- Protect all items neighbouring the spray object against possible damage due to material mist.



Fig. 7: Wheel brake

4.3 Installation



WARNING

If untrained personnel carry out assembly work, they endanger themselves and others, as well as risking the operational safety of the machine.

- Electrical and electronic parts must be installed exclusively by specialist personnel with an electrical qualification – all other parts, e.g. the spray hose or spray gun, must be installed exclusively by trained personnel.



WARNING

During installation work ignition sources may arise (e.g. due to mechanical sparks, electrostatic discharge, etc.).

- Carry out all assembly work outside of potentially explosive areas.

Prior to start-up, correctly refit any parts or equipment items removed for transport purposes, as required for the intended use.

4.3.1 Open the ventilation hole

When being used for the first time, the sticker with the text „remove before use“ and the sealing plug is to be removed from the ventilation hole.

The ventilation hole is located in the overflow elbow.

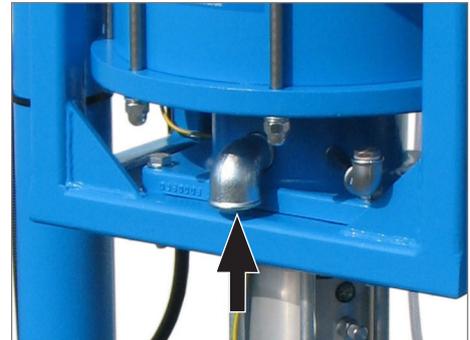


Fig. 8: Ventilation hole in the overflow elbow

4.3.2 Connecting the spray hose and the spray gun



WARNING

Parts that are not designed for the maximum permissible operating pressure of the machine may rupture and cause serious injuries.

- Prior to installation check the maximum permissible operating pressure of the spray hose and the spray gun. The operating pressure must be greater than or equal to the maximum operating pressure cited on the type plate.

Fit the spray hose to the material outlet of the fluid pump (see Fig. 9).

Connect the spray hose to the spray gun as described in the operating manual for the spray gun.



Fig. 9: Connection for the spray hose

4.3.3 Ground the machine



WARNING

The high flow speeds with the airless spray process can result in an electrostatic charge. Static charges can result in fire and explosions.

- Ensure that the machine is grounded outside of EX zones!
- Also ground the object that is to be coated.

The ground cables for all components for which grounding is required are merged into the earthing rail.

In order to ground the unit, connect the main ground cable first to clamp 1 of the earthing rail and then to an electrically conductive object outside the hazardous area.

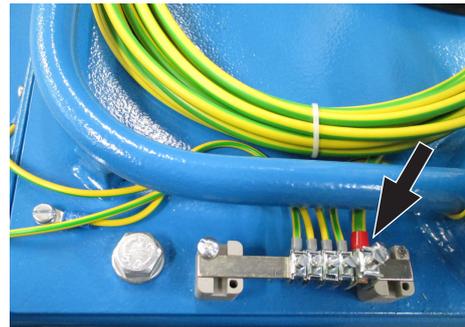


Fig. 10: Earthing rail

4.3.4 Connect the compressed air supply



CAUTION

Lines laid on walking surfaces are a tripping hazard capable of causing injuries to the operating personnel.

- Place the compressed air line so that a tripping hazard cannot result to the operating personnel.



To ensure that the required quantity of air is guaranteed, the compressor output must comply with the air requirement of the machine and the diameter of the air supply hoses must match with the connections.



Operation with contaminated or moist compressed air leads to damage in the machine's pneumatic system.

- Only use air that is dried, and free of oil and dust!

1. Make sure that
 - all compressed air shut-off valves are closed and
 - all air pressure regulators have been fully regulated back.
2. Connect the compressed air supply hose to the maintenance unit.

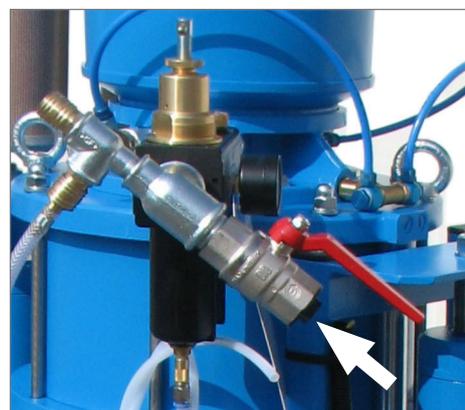


Fig. 11: Compressed air connection

5 Operation

Prerequisites:

- The machine must be correctly erected and fully assembled.
- Only put the machine into operation if you are equipped with the prescribed personal protective equipment. Details on this can be found in Chap. 2.5.4 on page 16.
- The spray material must be available in sufficient quantity.

One collection container is also required for surplus material. This container is not included in the scope of supply.



Observe the safety data sheet of the respective material manufacturer when processing and storing spraying materials.



WARNING

If material pumps run dry, this can lead to fire or an explosion due to the resultant friction heat.

- During operation ensure that the tanks never run empty.
- Never leave the machine running when unattended.
- If this should occur, bring the respective pump to an immediate standstill, trace the material and vent the machine.

5.1 Putting the machine into operation

Before starting work, check:

- Are all the safety features present and fully functional (see chapter 2.4 on page 13)?
- Are all machine components tight? If required, tighten up these connections.
- Is there enough lubricant in the fog oiler's oil container (see chapter 6.3.1 on page 36)?
- Is there enough release agent in the high pressure pump?

Overview of the work sequence for commissioning:

1. Perform pressure check.
2. Flush residues of the test medium (only during initial commissioning).
3. Adjust the deicing system.
4. Prepare the material to be applied.
5. Fill the machine with material and bleed it.

5.1.1 Performing pressure check

1. Make sure that
 - all compressed air shut-off valves are closed,
 - all air pressure regulators have been fully regulated back,
 - the ram control lever is set to position "Stop",
 - the spray gun is locked.
2. Open the compressed air shut-off valve on the air maintenance unit.
3. Increase the air inlet pressure with the air pressure regulator for the high pressure pump slowly to the maximum permissible value given on the type plate.

4. Check that all parts of the machine are tight.
5. Increase the air inlet pressure for a short time by about 10% above the maximum permissible value. The safety valve must discharge.
6. Regulate the air pressure regulator for the high pressure pump fully back.

5.1.2 Flushing residues of the test medium

After assembly, this unit was factory tested for flawless function by means of a test substance. The unit must be flushed with a flushing agent during initial commissioning so that the material to be sprayed is not affected by the test medium.

1. Remove the nozzle from the spray gun.
2. Unscrew the follow plate.



Take care that the seal between the follow plate and the fluid pump is not lost.

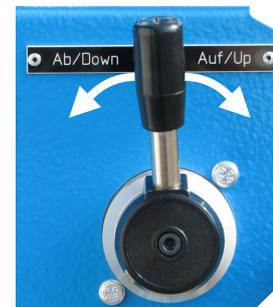


Fig. 12: Ram control lever

3. Regulate a pressure of 1.5 - 2 bar on the air pressure regulator for the ram.
4. Set the ram control lever to position "Up", to move the ram up.
5. Once there is sufficient space under the high pressure pump for the flushing agent container, set the ram control lever to "Stop" (middle position as shown in Fig. 12).

6. Place a drum with with 10-15l flushing agent below the pump.
7. Set the ram control lever to position "Down" and move the ram down until the suction of the high pressure pump immersed into the flushing agent.
8. Hold the drain hose into the collecting vessel (see Fig. 13).
9. Open the drain ball valve.



Fig. 13: Entlastungsschlauch

10. Regulate the air inlet pressure on the air pressure regulator for the high pressure pump so that the pump runs slowly.
11. Allow the flushing agent, soiled with the test medium, to run out of the drain hose into the collecting vessel for at least 10 seconds.
12. Close the drain ball valve.
13. Hold the spray gun into the collecting vessel.
14. Unlock the spray gun and spray for approx. one minute against the inner wall of the container.



WARNING

Heating up flushing agents can cause an explosion. This may result in serious injury to persons and damage to property.

- In order to avoid the danger of explosion caused by heating up the flushing agent, it must not be pumped longer than 5 minutes.

15. Release the trigger and lock the spray gun.
16. Set the ram control lever to position “Up”, to move the ram with the high pressure pump up.
17. Once there is sufficient space for removing the flushing agent container, set the ram control lever to position “Stop”.
18. Remove the flushing agent container.
19. Screw on the follow plate with seal.

5.1.3 Adjust the deicing system

1. Turn the adjusting screw for the deicing system at the air motor slowly counter-clockwise – minimum one and maximum three turns.

Exact settings should be made individually and as required because the degree of icing depends on various factors, such as e.g. pressure, number of double strokes per minute, air humidity, ambient temperature.



Fig. 14: Adjusting screw for the deicing system



When interrupting work or in case of decommissioning the adjusting screw of the deicing system remains open.

5.1.4 Preparing the material to be applied



Observe the technical notes of the respective material manufacturer.

1. If necessary, heat up the containers of the A and B component to the processing temperature recommended by the material manufacturer.
2. If permissible for the material used, mix some solvents into the A component using the hand mixer.
3. Mix the B component into the A component using the hand mixer.
4. Clean the hand mixer with solvent and leave it standing in the container with solvent. This work is best done by a second person so that there is no loss of working time for the mixed material.



Fig. 15: Mixing of material

5.1.5 Fill the machine with material and bleed it

1. Place the material drum centered below the follow plate.

2. Regulate a pressure of 2 - 3 bar on the air pressure regulator for the ram.
3. Open the ventilation ball valve at the follow plate (see Fig. 16).
4. Set the ram control lever to position "Down" to move the ram down.
5. Once all air has escaped from the material container, close the ventilation ball valve on the follow plate.
6. Hold the drain hose into the collecting vessel.
7. Open the drain ball valve.
8. Regulate the air inlet pressure on the air pressure regulator for the high pressure pump so that the pump runs slowly.
9. Close the drain valve again as soon as the processing material exits the drain hose.
10. Hold the spray gun into the collecting vessel.
11. Unlock the spray gun and trigger it until the processing material exits the spray gun.
12. Release the trigger and lock the spray gun.



Fig. 16: Ventilation ball valve

The machine is ready for operation. You can start coating.

5.2 Coating

Prior to coating, the unit must be commissioned.

1. Clean the spray gun outlet.
2. Screw the nozzle back into the spray gun.
3. Adjust the optimal spraying pressure using the air pressure regulator for the high pressure pump (see chapter 5.2.1).

5.2.1 Set spray pressure

Observe the following information when setting the spray pressure:

- The optimum spray pressure has been attained when an even material application is obtained, with fading edge zones.
- Only operate the machine with the air pressure required, in order to attain good atomisation at the recommended spray distance of approx. 30-40 cm (12"-16").
- An overly high spray pressure leads to increased material consumption and paint mist.
- If the spray pressure is too low then this leads to streaking and varying coating thicknesses.

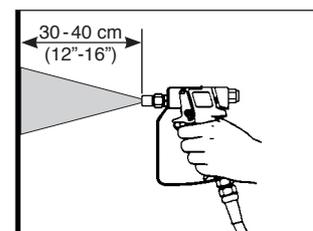


Fig. 17: Spray distance



Observe the operating instructions for your spray gun. They contain further tips for the optimisation of the spray pattern.

5.2.2 Tips for good coatings

- Hold the spray gun at a right angle (90°) to the surface to be coated. As soon as you hold the spray gun at a different angle, the coating will become uneven and patchy (see Fig. 18).
- Ensure an even speed and guide the spray gun parallel to the coating surface. Weaving with the spray gun leads to an uneven coating (see Fig. 19).
- Move the spray gun with the arm and not with the wrist.
- Move the spray gun prior to activating the trigger. In this way you will achieve a faultless, soft and smooth overlapping of the spray jet and avoid an excessively thick material application at the start of the coating process.
- Release the trigger before stopping the movement.
- Change the spray nozzle before this becomes worn.

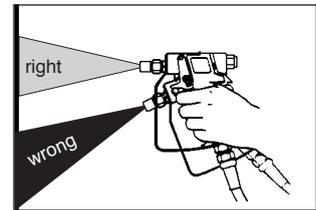


Fig. 18: Spray angle

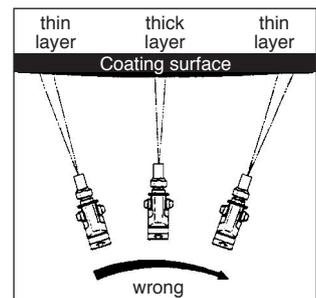


Fig. 19: Spray gun guidance



Worn nozzles lead to excessively high material consumption and adversely affect the quality of the coating.

5.2.3 Changing material drum

Exchange the material drum when it is empty.



After processing of 6 material drums, the high pressure pump must be flushed intermediately in order to remove material deposits and prevent a blockage of the pump (see chapter 5.2.4).

1. Regulate the air inlet pressure of the high pressure pump completely back.
2. Set the ram control lever to "Stop".
3. Open the compressed air shut-off valve for the container ventilation.
4. Set the ram control lever to position "Up", to move the ram up.
5. Once the sealing lip of the follow plate reaches the top of the material drum, close the compressed air shut-off valve for the container ventilation.
6. Once there is sufficient space for removing the material drum, set the ram control lever to position "Stop".
7. Remove the old material drum.
8. Place the new material drum centered below the follow plate.
9. Open the ventilation ball valve at the follow plate.
10. Set the ram control lever to position "Down" to move the ram down.
11. Once all air has escaped from the material container, close the ventilation ball valve on the follow plate.
12. Adjust the optimal spraying pressure using the air pressure regulator for the high pressure pump.

5.2.4 Intermediate flushing

1. Regulate the air inlet pressure of the high pressure pump completely back.
2. Set the ram control lever to “Stop”.
3. Open the compressed air shut-off valve for the container ventilation.
4. Set the ram control lever to position “Up”, to move the ram up.
5. Once the sealing lip of the follow plate reaches the top of the material drum, close the compressed air shut-off valve for the container ventilation.
6. Once there is sufficient space for removing the material drum, set the ram control lever to position “Stop”.
7. Remove the material drum.
8. Unscrew the follow plate.



Take care that the seal between the follow plate and the fluid pump is not lost.

9. Clean the follow plate thoroughly.



The black rubber seal is not solvent resistant. Do not soak in solvent, but only wipe the seal clean.

10. Place a drum with with 10-15 l flushing agent below the high pressure pump.
11. Set the ram control lever to position “Down” and move the ram down until the suction of the high pressure pump immersed into the flushing agent.
12. Hold the drain hose into the collecting vessel.
13. Open the drain ball valve.
14. Regulate the air inlet pressure on the air pressure regulator for the high pressure pump so that the pump runs slowly.



Do not trigger the spray gun during the intermediate flushing to prevent mixing of the solvent with the material in the spray hose.

15. Allow the pump to run until the solvent runs out of the drain hose.
16. Hold the drain hose into the flushing agent drum and allow the machine to run for 2-3 minutes, so that all remaining material is flushed out of the high pressure pump.
17. Move the ram up.
18. Remove the flushing agent drum.
19. Screw on the follow plate with seal.
20. Place the (new) material container under the pump and fill the pump with material. Collect the remaining solvent that exits the drain hose, in a container for waste material.
21. Close the drain valve as soon as the processing material exits the drain hose.
22. Proceed with coating work.

5.3 Decommissioning

Overview of the work sequence for decommissioning:

1. Flush the unit completely.
2. Shut down and depressurise the machine.
3. Disassemble and clean the fluid pump.
4. Assemble the fluid pump.

5.3.1 Complete flushing



If working with dual component materials, the pot life must be observed. The machine must be flushed and completely cleaned with the appropriate solvent within the pot life given by the material manufacturer.

1. Flush the pump at first through the drain hose, as described in chapter 5.2.4 on page 30 (work steps 1-16).
2. Lock the spray gun and remove the nozzle.
3. Clean the nozzle by hand.
4. Hold the spray gun into the collecting vessel.
5. Trigger the spray gun until clean flushing agent appears.
6. Hold the spray gun into the flushing agent drum and allow the pump to circulate flushing agent via the spray gun for 2-3 min.
7. Exchange the flushing agent drum for a clean one with new flushing agent and repeat the complete flushing procedure (via the drain hose and the spray gun).
8. Release the trigger and lock the spray gun.

5.3.2 Relieving the pressure

1. Regulate the air inlet pressure of the high pressure pump and the ram completely back.
2. Close the compressed air shut-off valve on the air maintenance unit.
3. Run the the drain hose into a collection container and secure it against slipping out unintentionally.
4. Open the drain valve.



WARNING

If parts of the machine are blocked, it is not possible to fully relieve the pressure. During disassembly work, residual pressures may escape and cause serious injuries.

- Protect yourself against the sudden emergence of material by covering threaded connections with a cloth whilst loosening.
- Loosen threaded connections particularly cautiously and allow the pressure to escape slowly.
- Eliminate the blockages.

5.3.4 Disassembling and cleaning the fluid pump



CAUTION

The parts of the fluid pump are heavy. At best, work in pairs and position a soft mat to catch falling parts.

1. Unscrew the material outlet and the drain hose.
2. Drain the release agent into a catch container.
3. Unscrew the nuts on the 6 threaded bolts (see Fig. 20).
4. Pry the pressure cylinder from the spring housing using a pry bar or screwdriver (see Fig. 21).



Fig. 20: Work step 3



Fig. 21: Work step 4



Fig. 22: Work step 5

5. Pry the spring housing from the HP-head (see Fig. 22).
6. Lower the dual piston to its lowest position using brief increases and decreases in the air inlet pressure.
7. Pry the intermediate body from the air motor. It will be caught by the dual piston.
8. Unscrew 2-3 of the threaded bolts to allow removal of the HP-head and the dual piston from the coupling (see Fig. 23).
9. Clean the piston, piston valve, bottom valve, pressure cylinder, intermediate body, spring housing, threaded bolts and nuts thoroughly using solvent.



Fig. 23: Work step 8



Take care that the dual piston, packings, seals and threads are not damaged.

5.3.5 Assembling the fluid pump



The drawing in the spare parts list can be very helpful for assembling the fluid pump (Order No. 0641416).

1. Place the counter ring on the dual piston (note correct direction!), followed by the intermediate body (don't forget the seal!).

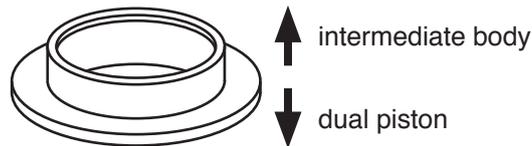


Fig. 24: Counter ring

2. Push the dual piston sideways into the coupling on the air motor.
3. Screw in the threaded bolts.
4. Place the counter ring onto the lower packing, followed by the spring.
5. Place the spring housing (material outlet towards the top) loosely over the spring onto the pressure cylinder.
6. Place the 2nd spring in the top of the spring housing.
7. Lower the ram carefully until the dual piston slides through the spring housing into the pressure cylinder. All threaded bolts must pass sufficiently through the connecting ring to avoid damaging the threads.
8. Place the washers on the bolts and screw on the nuts.
9. Tighten the nuts step-wise in a crossing pattern to pull the pump evenly together. Torque finally to 110 Nm and add the lock nuts.
10. Screw on the follow plate with seal.

5.4 Storage

Store the machine in a place where it is protected against dirt, moisture, frost and heat.

Storage temperature	minimum		maximum	
	0 °C	32 °F	40 °C	104 °F

5.5 Disposal



It is necessary to collect residues of spray material, cleaning fluids, oil, greases and other chemical substances according to the legal regulations for recycling or disposal. The official local waste water protection laws apply.

At the end of the machine's use it must be put out of use, disassembled and disposed of according to the legal regulations.

- Thoroughly clean the machine of material residues.
- Disassemble the machine and separate the materials – metals must be taken to a scrap metal depot, plastic parts can be disposed of with household waste.

6 Maintenance



WARNING

If untrained personnel carry out maintenance and repair work, they endanger themselves and others, as well as risking the operational safety of the machine.

- Maintenance and repair work on electrical parts must be carried out by specialist personnel with an electrical qualification – all other maintenance and repair work must be carried out by **WIWA** customer service or specially trained personnel.



WARNING

During maintenance work ignition sources may arise (e.g. due to mechanical sparks, electrostatic discharge, etc.).

- Carry out all maintenance work outside of potentially explosive areas.



Observe the maintenance information in the operating instructions for the optional accessories.

Prior to maintenance and repair work:

1. Shut off the compressed air supply.
2. Completely de-pressurise the machine.



WARNING

If parts of the machine are blocked (e.g. spray nozzle, material filter for the spray gun, material hose, high pressure filter, suction screen, etc.), it is not possible to fully relieve the pressure. During disassembly work, residual pressures may escape and cause serious injuries.

- Protect yourself against the sudden emergence of material by covering threaded connections with a cloth whilst loosening.
- Loosen threaded connections particularly cautiously and allow the pressure to escape slowly.
- Eliminate the blockages.

After completing maintenance and repair work, check the function of all safety devices and the faultless function of the machine.

6.1 Regular testing

The machine must be tested and maintained regularly by a specialist:

- prior to first commissioning,
- after changes to / the servicing of parts of the installation that affect safety,
- after an interruption to operation lasting more than 6 months,
- although at least every 12 months.

In the case of machines that have been put out of use, the test can be delayed until the next time commissioning takes place.

The results of the tests must be recorded in writing and stored until the next test. The test certificate or a copy of this must be available at the machine's place of use.

6.2 Maintenance schedule

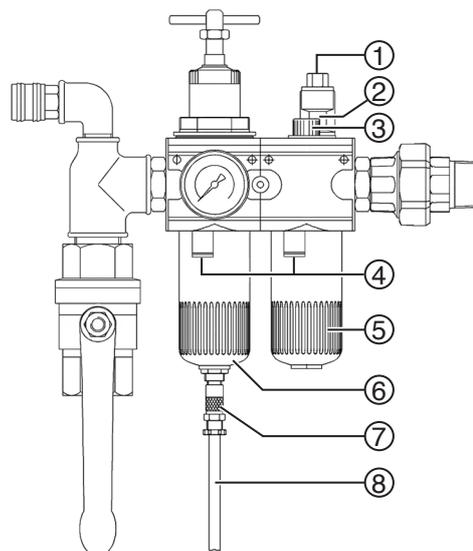


The information in the maintenance schedule constitutes recommendations only. The time frames may vary depending on the characteristics of the materials used, as well as external influences.

Time frame	Activity	For further reading
Prior to each start-up	Check lubricant level in the oil mister	Chap. 6.3.1 on page 36
	Check release agent level at the fluid pump	Chap. 6.4.1 on page 37
1 time per week	Check and adjust the oil mister	Chap. 6.3.2 on page 36
	Check and clean the water separator	Chap. 6.3.3 on page 36
	Visual inspection of the compressed air and material hoses	
Every 50 operating hours	Check release agent at the fluid pump for material residues	Chap. 6.4.2 on page 37
Every 3 years	Have the compressed air and material hoses checked by a specialist and replace if necessary	

6.3 Maintenance unit

The compressed air must be treated for the functional safety and service life of the machine. For this purpose, a water separator and oil mister are integrated in the maintenance unit, which must be maintained regularly.



No.	Designation
1	Adjusting screw for the oil mister
2	Inspection glass
3	Oil filling screw
4	Safety slide
5	Oil tank
6	Water separator
7	Drainage valve
8	Drainage hose

Fig. 25: Maintenance unit

6.3.1 Check lubricant level in the oil mister

The oil mister on the maintenance unit supplies the compressed air pneumatic oil to the moving parts for lubrication.



The machine must only be put into operation if sufficient pneumatic oil is present in the oil tank for the oil mister. In case of high humidity levels, use antifreeze for lubrication in place of pneumatic oil in order to prevent icing up of the air motors.

Check the lubricant level daily as follows:

1. Push up the safety slide on the oil tank and unscrew the oil tank anticlockwise.



Be aware of the O-ring that is used to seal the oil tank. It may slip during disassembly, or even fall out.

2. Check that the O-ring is correctly seated – insert it correctly if necessary.
3. Check that sufficient lubricant is present – with maximum filling, the lubricant lies approx. 2 cm below the top edge of the oil tank.
4. If necessary, top up the lubricant. We recommend using pneumatic oil (order number 0632579) or antifreeze (order number 0631387) from **WIWA**.
5. Firmly screw the oil tank back onto the oil mister.

6.3.2 Check and adjust the oil mister

1. Allow the high pressure pump to run slowly under load.
2. At the inspection glass for the oil mister, check whether compressed air is fed with 1 drop of lubricant after 10 to 15 double strokes of the air motor respectively.
3. If this is not the case, set this metering rate with a screwdriver at the adjusting screw of the oil mister.

6.3.3 Check and clean the water separator

The water separator separates moisture and particles of dirt ($> 5 \mu\text{m}$) from the compressed air. This prevents condensate from penetrating the machine, as well as the static charging of the pneumatic hoses.

Any condensate that occurs is automatically drained off via the drainage valve. For this purpose, run the hose into an empty collection container.

Check the container for dirt residues regularly and clean it if necessary (disassembly and assembly like the oil tank).

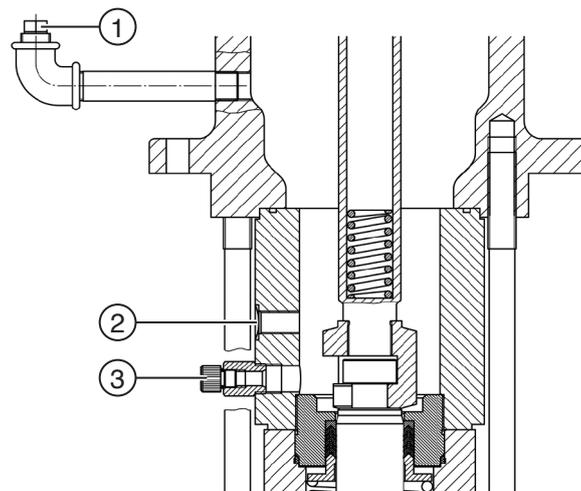


Only use water, soap or a similar neutral product for cleaning the container.

6.4 High pressure pump

In order to avoid damaging the high pressure pump due to material hardening, the release agent chambers of the fluid pump is filled with release agent as a material plasticiser.

Depending on the characteristics of the process material, signs of wear will appear on the fluid pump packing after a certain time in operation. The material may be pressed by the packing in this case, and may then harden. Packing wear can be discerned by discolouration of the release agent or by release agent leaking out at the overflow elbow.



No.	Designation
1	Release agent filler pipe
2	Inspection glass
3	Release agent drain screw

Fig. 26: Fluid pump

6.4.1 Checking the release agent level

Check the amount of release agent before every start-up. The release agent level must be at least half the inspection glass. If required, top up the amount of release agent through the filler pipe. We recommend using release agent from **WIWA** (order number 0163333).

6.4.2 Check release agent for material residues

In order to check the release agent for material residues you must drain off a small amount of release agent from the drain screw.

If the release agent is found to be contaminated with material residues, you must assume that the packing of the fluid pump is worn. In this case, have the pump packing replaced as soon as possible by **WIWA** customer service or by specially trained personnel.

After the examination, top up the amount of fresh release agent through the filler pipe.

6.4.3 Replacing the seals on the follow plate

You must replace seals on the follow plate when they are worn. You find the order numbers of the seals in the spare parts list.

No.	Designation
1	Fastening screws
2	Seals
3	Clamping ring

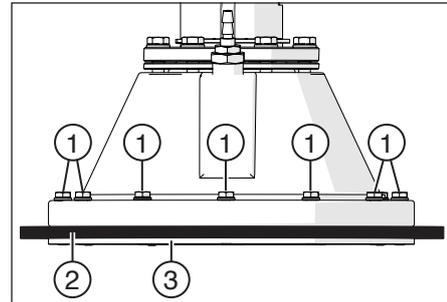


Fig. 27: Seals on the follow plate

1. Loosen all screws which fasten the seals and the clamping ring on the follow plate.
2. Take off the clamping ring and the old seals.
3. Slightly wet the first thread pitches of the fastening screws with a screw retention agent.
4. Turn the clamping ring with the new seals on to the follow plate.

6.5 Recommended operating fluids

Only use original operating fluids from **WIWA**:

Operating fluid	WIWA order number
Release agent (0.5 l / 0.13 gallons) ¹	0163333
Release agent for isocyanate (0.5 l / 0.13 gallons) ¹	0640651
Antifreeze (0.5 l / 0.13 gallons) ²	0631387
Pneumatic oil (0.5 l / 0.13 gallons) ²	0632579
Safety agent (50 ml / 0.1 gallons) ³	0000015
Lubricant (acid-free grease, 0.4 kg / 0.88 lbs) ³	0000025
Lubricant for stainless steel ³	0000233

¹ Plasticiser for filling the release agent vessels of the high pressure pump

² for the maintenance unit

³ Substances required during maintenance and repair work (see information in the spare parts lists)

The release agent and pneumatic oil are also available in larger containers on request.

7 Troubleshooting

Fault	Possible cause(s)	Elimination
The high pressure pump does not cycle whether the spray gun is triggered or the drain valve is opened.	The compressed air shut-off valve is closed.	Open the compressed air shut-off valve.
	The air motor is defect.	Repair the air motor – contact customer service if necessary.
The high pressure pump runs but no material is encouraged.	Bottom valve ball does not rise (stuck).	Hit the bottom valve lightly from the side (hammer). If that does not help, press on the ball from below using a peg or screwdriver until loose.
	Bottom valve does not close.	Remove the bottom valve and clean the ball and seat thoroughly.
The high pressure pump cycles but does not stop when the spray gun is closed.	Packing or valve worn.	Replace parts.
The high pressure pump cycles evenly but the required operating pressure can not be reached.	Air supply/pressure is too low.	Increase the inbound air pressure with the regulator and check the diameter of the inbound air hose.
	Spray nozzle is too big.	Use a smaller spray nozzle.
	Spray nozzle is worn.	Replace the spray nozzle.
	Air motor is frozen (runs too slow).	If possible, reduce the inbound air pressure. Fill the the oil mister with anti-freeze (Glystantine) and adjust it.
The high pressure pump cycles unevenly (different stroke speeds on the upward and downward stroke) and the required spray pressure can not be reached.	The viscosity of the coating material is too high (suction loss).	Dilute or warm up the coating material.
	Bottom valve leaks (high pressure pump only stops on the upwards stroke when the spray gun is closed).	Remove the bottom valve and clean the ball and seat thoroughly, replace the ball and seat if necessary.
	Piston valve leaks (pump only stops on the downwards stroke when the spray gun is closed).	Clean the ball and seat in the dual piston and replace if necessary.
	Upper or lower packings leak (wear).	Replace packings.
Coating material spills out of the air motor ventilation hole.	Packings are worn.	Replace packings. Note: Do not close or block the ventilation hole!

8 Technical data

You can find the technical data for your machine on the machine card enclosed or on the type plate.

8.1 Machine card

The machine card contains all important and safety-relevant data and information regarding the machine:

- precise designation and manufacturer's data,
- technical data and limit values,
- equipment and test confirmation,
- procurement data,
- machine identification (machine components and accessories supplied with article and spare parts numbers),
- a list of the supplied documentation.

8.2 Type plates

The type plate for the machine is located on the traverse of the ram. It contains the most important technical data for the machine:

- the marking according to ATEX Directive 94/9/EC,
- the equipment type,
- the supply rate per cycle,
- the pressure ratio,
- the maximum air inlet pressure,
- the maximum operating pressure,
- the maximum material processing temperature and
- the serial number and the year of production.



Fig. 28: Example of a type plate



Please ensure that the data on the plate matches with the information on the machine card. In case of irregularities or a missing type plate, please inform us immediately.

Furthermore, some machine components have a separate type plate, such as:

- the air motor,
- the fluid pump,
- the twin post ram.

These type plates contain the technical data and serial numbers for the corresponding machine components.



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