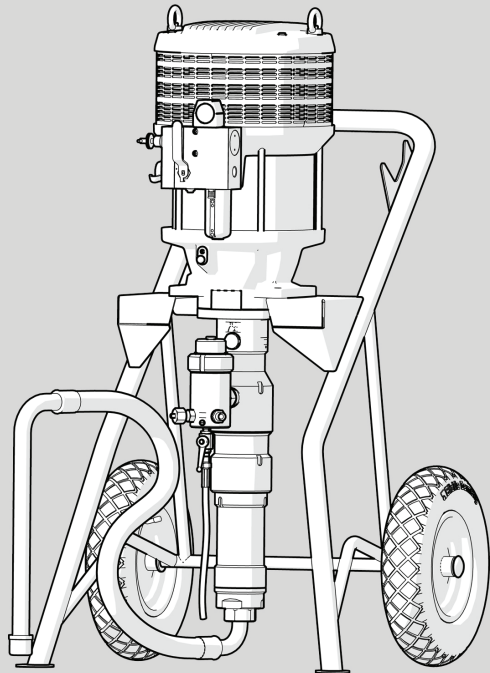




because it works

Operation Manual

AIRLESS 270



Serial number



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1 Foreword

Dear Customer!

We are delighted that you have decided in favour of a equipment made by our company.

This operation manual is intended for the operating and maintenance personnel. It contains all the information required for working with this equipment.



The owner of the equipment must ensure that operators and maintenance personnel always have an operation manual at their disposal in a language that they understand!

Safe and reliable operation of the equipment requires further information in addition to this operation manual. You should have read and understood the guidelines and accident prevention regulations that apply in your country.

In Germany, these are as follows:

- ▶ ZH 1/406 “Richtlinien für Flüssigkeitsstrahler” (Guidelines for Liquid Jets), published by the German “Hauptverband der Gewerblichen Berufsgenossenschaften”;
- ▶ BGR 500, chapter 2.29 “Application of Coating Materials”;
- ▶ BGR 500, chapter 2.36 “Working with Fluid Spraying Equipment” published by the employers liability insurance association for the gas, remote heating and water management sectors.

We strongly recommend adding all relevant guidelines and accident prevention instructions to this operation manual.

Moreover the manufacturer’s instructions and guidelines for coating or feeder materials must be respected at all times.

However, if you have any questions, please do not hesitate to contact us.

WIWA Wilhelm Wagner GmbH & Co. KG. hopes that you have excellent work results using your equipment

2 Safety

This equipment has been designed and manufactured under due consideration of all safety-related aspects. It complies with the current state of the art and the valid accident prevention instructions. The equipment left the factory in perfect condition and guarantees a high level of technical reliability and safety. Nevertheless, there are certain risks that can arise from incorrect operation or misuse:

- to life and limb of the operator or third parties,
- to the equipment and other material assets of the owner,
- to the efficient working capacity of the equipment.

You must refrain from any working methods that could affect the safety of operating personnel and equipment. All the people that are involved in set-up, commissioning, operation, maintenance, repair and servicing of the spray gun must have read and understood the operation manual beforehand, especially the chapter entitled “Safety”.

Your safety is at stake!

We recommend to the owner of this unit to have this confirmed in writing.

2.1 Explanation of symbols

Safety information warns you of potential risks of accidents and tells you the measures that are required to prevent accidents. In **WIWA** operation manuals, safety information is specially highlighted and marked as follows:



DANGER

Indicates danger of accidents; if you ignore the safety notes, there is a high risk of severe injury resulting up to and including death!



WARNING

Indicates danger of accidents; if you ignore the safety notes, severe injury can result up to and including death!



CAUTION

Indicates danger of accidents; if you ignore the safety notes, severe injury can result!



Indicates important information on correct use of the equipment. Ignoring it can result in damage to the equipment or in its vicinity.

In the safety notes about the risk of accidents, different pictograms are shown after each hazard source - examples:



General accident risk



Risk of explosion from explosive atmosphere



Risk of explosion from explosive substances



Danger of injury due to electric voltage or electrostatic charging



Risk of crushing by moving equipment parts



Risk of burning due to hot surfaces

Mandatory safety instructions primarily concern personal protective equipment to be worn. They are particularly highlighted and marked as follows:



Wear protective clothing

Highlights the order to wear the prescribed protective clothing to protect against skin injuries caused by spraying material or gases.



Use eye protection

Indicates the requirement to wear protective goggles to protect against eye injuries caused by gases, fumes or dust.



Wear ear defenders

Indicates the requirement to wear ear defenders to prevent your hearing from being damaged by noise.



Use a respiratory protection mask

Highlights the order to use a respiratory protection mask to prevent your respiratory tract from being damaged by gases, fumes or dusts.



Wear protective gloves

Highlights the order to wear protective gloves with lower arm protection to protect against burn injuries caused by heated materials.



Wear protective footwear

Highlights the order to wear protective footwear to prevent injuries to the feet due to objects that may fall, drop or roll around or to hot or caustic liquids.



Indicates references to guidelines, work instructions and operation manuals that contain important information which you must observe at all times.

2.2 Safety notes

Please remember that the equipment works at high pressure and may cause life-threatening injuries if used inappropriately!



Always observe and follow all instructions in this operation manual and in the separate operation manuals of individual equipment parts and/or the optionally available accessory devices.

2.2.1 Operating pressure



WARNING

Components that do not comply with the maximum permissible operating pressure can burst and cause serious injury.

- The specified maximum operating pressures must generally be complied with for all components. In case of varying operating pressures, the lowest value is always the one to be taken as the maximum operating pressure for the entire equipment.

- Material hoses and hose assemblies must comply with the maximum working pressure, including the required safety factor.
- Material hoses must be leak tight and free of kinks, signs of abrasion or bulges.
- Hose connections must be tight.

2.2.2 Risks caused by the spray jet



WARNING

The material is discharged from the spray gun under very high pressure. Due to its cutting effect the spray jet can cause severe injuries by penetrating the skin or entering into the eyes.

- Never point the spray gun at yourself, other persons or animals.
- Do not hold your fingers or hands in front of the spray gun!
- Do not reach into the spray jet with your hands!



WARNING

Unintentional material release from the spray gun may cause personal injury or damage to property.

- Always secure the spray gun during every work break!
- Always check that the safety mechanism on the spray gun works before each use!

2.2.3 Hazard from electrostatic charging



WARNING

The high flow velocities associated with the Airless spraying method may cause electrostatic charging. Static discharges can cause fire and explosion.

- Ensure that the equipment has been properly grounded outside of explosive atmosphere areas!
- Also ground the object to be coated.

- Always use open containers!
- Never spray solvents or materials containing solvent into cone-top cans or drums with a bung hole!
- Place the containers on a grounded surface.
- Always use electrically conductive containers.
- Avoid contact between spray gun and container wall.
- Use only electrically conductive material hoses.
All original material hoses from **WIWA** are conductive and perfectly adapted to our equipment.
- Use only electrically conductive accessories/accessory parts.



WARNING

If the equipment is contaminated by material during operation, the increased coating thickness can lead to electrostatic charging. Static discharges can cause fire and explosion.

- Clean the equipment immediately to remove any contamination.
- Carry out cleaning work outside areas with explosive atmospheres.

2.2.4 Hazards from hot/cold surfaces



CAUTION

The use of material heaters can cause the surfaces of the equipment to become hot. Risk of burns.

- Always wear protective gloves with lower arm protection (gauntlet) when working with heated materials!



CAUTION

The air motor becomes very cold during operation. There is a high risk of local frostbite.


- The air motor should warm up to a temperature above 10 °C before starting any work on the equipment.
- Always wear suitable protective gloves!

2.2.5 Explosion protection



WARNING

Equipments and accessories designed without explosion protection must not be used in workshops that come under the explosion protection ordinance!

Whether your equipment or accessories have explosion protection is indicated by the  symbol on the type plate and/or on the enclosed ATEX declaration of conformity.

Explosion-protected equipments meet the explosion protection requirements of Directive 94/9/EC for the explosion group, unit category and temperature class specified on the type plate or in the declaration of conformity.

The operator is responsible for determining the zone allocation according to the Directive of EC 94/9/EC, Appendix II, no. 2.1-2.3 when observing the measures of the responsible inspecting authority. The operator is responsible for checking and ensuring that all technical data and markings according to ATEX correspond with the necessary requirements.

Please note that several components have their own type plate with separate marking according to ATEX. In this case the lowest explosion protection of all attached markings applies for the entire equipment. Applications where the malfunction of the unit can lead to danger to personnel must be provided with respective safety measures by the operator.

However, if agitators, heaters or other electrically accessories are additionally mounted, one must check the explosion protection. 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, even if the accessory equipment as such is explosion protected.



WARNING

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

- Pay attention to the flashpoint and the ignition temperature of the solvent.
- Switch off the material flow heater if you need to perform the following work: Cleaning, pressure testing, decommissioning, maintenance and repair.

2.2.6 Health risks



CAUTION

Depending on the materials being applied solvent vapours may be generated which could cause damage to health and objects.

- ▶ Always ensure sufficient aeration and ventilation at the work-place. Always ensure an air change rate of at least 5.
- ▶ Always observe the processing instructions issued by the material manufacturers.



Follow the safety notes and dosing information of the manufacturer and the generally applicable regulations when handling paints, cleaning agents, oils, greases and other chemical substances.



When cleaning your skin, use only appropriate skin protection, skin cleaning and skin care products.

In closed or pressurized systems dangerous chemical reactions may occur if parts made of aluminium or galvanized parts come into contact with 1.1.1 - trichloroethane, methylene chloride or other solvents containing halogenated hydrocarbons (CFC's). If you want to process materials containing the afore mentioned substances, we recommend to consult the material manufacturer to clarify the usability of such substances.

For these materials, we have available a range of rust- and acid-proof equipments.

2.3 Information signs on the equipment

Information signs attached to the equipment, like safety information (see Fig. 1), refer to possible danger areas and must be strictly observed.

They must not be removed from the equipment.

Damaged and illegible information signs must be replaced immediately.

Apart from this you should also read and follow the safety notes in the operation manual.

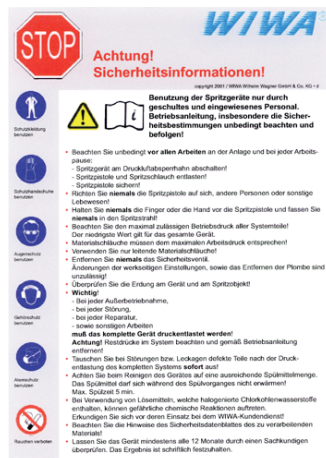


Fig. 1: Safety Information

2.4 Safety features



WARNING

If one of the safety features is missing or not fully functional, the operating safety of the equipment cannot be guaranteed!

- If you discover any faults in the safety features or other deficiencies on the equipment, stop operation of the equipment immediately.
- Only resume operation of the equipment after the fault has been completely eliminated.

Safety features must be checked on the equipment:

- before initial commissioning,
- always before starting work,
- after set-up work,
- after all cleaning, servicing and repair work.

The equipment is equipped with the following safety features:

- Safety valve
- Compressed air shut-off valve
- Ground cable

Checklist

on the depressurised equipment:

- Lead seal on the safety valve still intact?
- Safety valve free of external damage?
- Ground cable free of damage?
- Operability of compressed air shut-off valve correct?

on the pressurised equipment:

- Function of safety valve correct? (function test see chapter 2.2.1 Operating pressure)



Please observe the instructions for use for the optional accessories when testing other safety features.

2.4.1 Safety valve

This equipment is equipped with a safety valve on the air motor behind the maintenance unit.

The safety valve prevents the maximum permissible air inlet pressure from being exceeded. The safety valve will open and vent off air when the air inlet pressure exceeds the set limiting value.

How to check the function of the safety valve:

Briefly increase the air inlet pressure by about 10 % above the maximum permitted pressure as stated on the type plate. –
The safety valve has to discharge.

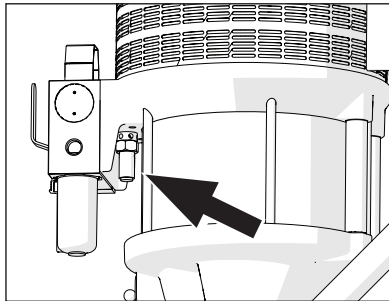


Fig. 2 Safety valve



WARNING

If the maximum permissible air inlet pressure is exceeded, components may burst. This may result in damage to persons and property.

- Never allow the equipment to run without a safety valve or with a defective one!
- If the safety valve needs to be replaced, you can find the corresponding order number on the equipment card.
- With new safety valves, ensure that they have been set to the maximum permissible air inlet pressure of the equipment (see type plate/equipment card) and sealed with a lead seal.

2.4.2 Compressed air shut-off valve

The compressed air shut-off valve on the air maintenance unit interrupts the air supply for the entire equipment. The equipment stops immediately.

Principle of function:

- Open ⇨ in the direction of flow
- Close ⇨ across the direction of flow

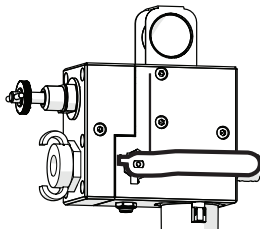


Fig. 3 Compressed air shut-off valve OPEN

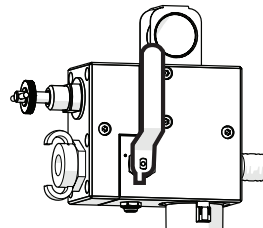


Fig. 4 Compressed air shut-off valve CLOSE



After the air has been shut off the equipment will be vented automatically. However, some pressure may remain in the material. Carry out a complete pressure release before starting any work on the equipment!

2.4.3 Ground cable

The ground cable prevents the electrostatic charge of the equipment.

The ground cable is already connected to the equipment when it is delivered (e.g. on the high pressure filter, the ground bar, etc.).

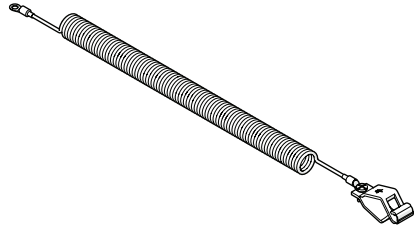


Fig. 5: Ground cable

Replace the ground cable immediately (order no.: 0659675) if it is lost or damaged!

2.5 Operating and maintenance personnel

2.5.1 Equipment owner's duties

The equipment owner:

- is responsible for the training of the operating and maintenance staff,
- must instruct the operating and maintenance staff in correct handling of the equipment as well as in wearing the correct work clothing and personal protective equipment,
- must provide tools to the operating and maintenance personnel such as e.g. lifting equipment for transporting the equipment or containers,
- must make the user manual available to the operating and maintenance staff and ensure that it always remains available,
- must ensure that the operating and maintenance staff have read and understood the user manual.

Only then may the equipment be brought into service.

2.5.2 Personnel qualification

A differentiation is made between two groups of people in dependence on their qualifications:

- Instructed operators have been verifiably instructed by the equipment owner in the activities they are tasked with and the potential risks connected with them in the case of incorrect

behaviour.

- ▶ Trained personnel have been instructed by the equipment builder such that they are capable of carrying out maintenance and repair work on the system and recognising potential risks on their own initiative and of avoiding these risks.

2.5.3 Authorized operating personnel

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



Young persons under the age of 16 are not allowed to operate this equipment.

2.5.4 Personal protective equipment



Wear protective clothing

Always wear the protective clothing specified for your work environment (e.g. antistatic protective clothing in areas subject to explosion hazards) and also follow the recommendations in the safety data sheet issued by the material manufacturer.



Use eye protection

Wear protective goggles to protect against eye injuries caused by material splatter, gases, fumes or dust.



Wear ear defenders

Operating personnel should be provided with suitable noise protection equipment. The equipment operator is responsible for adhering to the accident prevention regulation “Noise” (BGV B3). For this reason, pay special attention to the conditions at the installation location – the noise burden, for example, will increase if the system is installed in or on hollow bodies.

**Wear a respiratory protection mask**

We strongly recommend that you wear a respiratory protection mask, even though the paint mist has been minimized in the airless spray painting method given a correct pressure setting and correct working methods.

**Wear protective gloves**

Wear antistatic protective gloves. When processing heated materials, you must wear lower arm protection in addition to protective gloves to prevent burns.

**Wear protective footwear**

Wear antistatic protective footwear to prevent injuries to the feet due to objects that may fall, drop or roll around and to prevent slipping on a slippery floor.

2.6 Notes on warranty



Please note our Terms and Conditions at www.wiwa.de.

2.6.1 Conversions and alterations

- Unauthorized conversions or alterations should not be undertaken on safety grounds.
- Protective equipment should not be dismantled, converted or bypassed.
- The equipment must only be operated within the specified limiting values and equipment parameters.

2.6.2 Spare parts

- Only use **WIWA** original spare parts when carrying out maintenance and repair work.
- Use of components which have not been manufactured or delivered by **WIWA** renders any warranty null and void.

2.6.3 Accessories

- Using original accessories from **WIWA** which are designed for the operating pressure ensures suitability for our equipments.
- If you use third-party accessories, they must be suitable for the equipment – particularly with regard to the operating pressure, the electrical connection data and the connection sizes. **WIWA** accepts no liability for damage or injuries resulting from the use of these parts.
- You must observe the safety regulations of the accessories. These safety regulations are found in the separate operating instructions for the accessories.

2.7 Emergency procedures

2.7.1 Stop the equipment and release the pressure

In an emergency, immediately shut down the equipment and release the pressure.

1. Close the compressed air shut-off valve.
2. Briefly actuate the spray gun again.
3. Open the drain valve on the high pressure filter to relieve any residual material pressure, ensuring full pressure release for the equipment.



This procedure is not suitable for decommissioning. The equipment has not been flushed.

- For controlled decommissioning please see Chapter 5.6 Work breaks /decommissioning on page 38.
- After remedying the emergency, the equipment has to be flushed (see Chapter 5.3 Flushing on page 35). Pay attention to the potlife of the material used.

2.7.2 Leakages



WARNING

In case of leakages material can escape under very high pressure and cause serious bodily injuries and material damage.

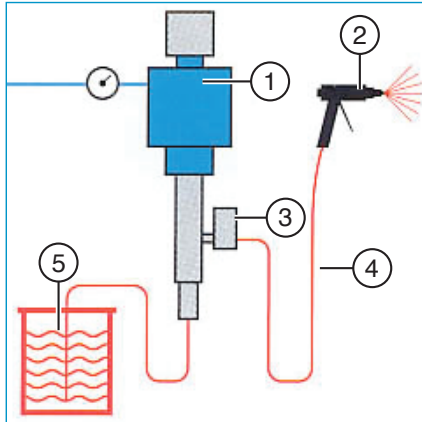
- ▶ Stop the equipment immediately and release the pressure.
- ▶ Re-tighten any screw fittings and replace defective components (only by trained personnel).
- ▶ Do not try to seal leaks on the connections and high pressure hoses with the hand or by wrapping fabric around them.
- ▶ Do not repair material hoses!
- ▶ Before recommissioning the equipment, check the hoses and screw fittings for leaks.

2.7.3 Injuries

If injured by processing materials or cleaning agents, always have available the safety data sheet (address, phone number, material designation and material number of the supplier or manufacturer) for the attending physician.

3 Equipment description

Airless describes a spray method where the spraying material is applied to the surface with high pressure and without the addition of air. The spraying material is atomised only through the material pressure and the nozzle in the spray gun.



No.	Description
1	Airless spraying equipment
2	Airless spray gun
3	High pressure filter
4	Spraying hose
5	Container with spraying material

Fig. 6: Flow chart for airless operation

The technical data of your equipment can be found on the attached equipment card or on the type plate.

3.1 Intended use

The WIWA Airless equipments are only suitable for airless spraying of coating and ancillary materials for surface treatment.



Any other use is considered to be unintended. If you intend to use the equipment for other purposes or with other materials and thus not for the purpose for which it is intended, you must ask **WIWA** for permission – otherwise the warranty will be invalidated.



Intended use also includes compliance with the technical documentation and adherence to the prescribed operating, servicing and maintenance guidelines.

3.2 Equipment design

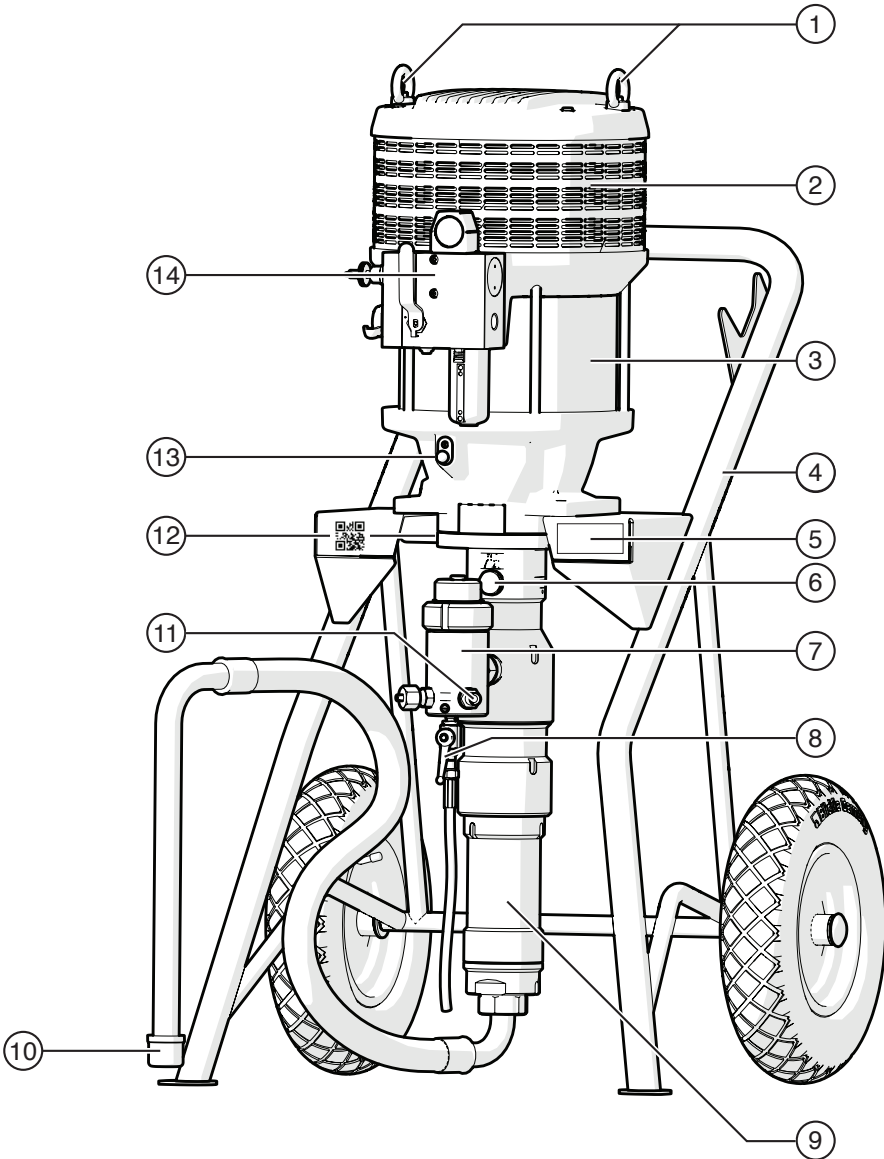


Fig. 7 Airless LM 270 (here on cart)

No.	Designation
1	Crane lifting eyes
2	Muffler
3	Air motor
4	Cart
5	Type plate
6	Sight glass for release agent
7	High pressure filter
8	Drain valve with hose
9	Material pump
10	Suction strainer
11	Material hose connection
12	QR code
13	Filler hole for release agent
14	Maintenance unit

3.3 Optional expansion parts and accessories

The following section lists only some of the most common accessories and expansion parts.

The detailed accessory catalogue can be found at www.wiwa.de. More information and order numbers can also be obtained from an authorised WIWA dealer or the WIWA service department.

3.3.1 Spraying accessory kits

The spraying accessories are not part of the standard scope of delivery as the variety of the materials used and the applications is too great. Select the spraying accessories that are best suited to your application to create a spraying accessory kit.

The spraying accessory kits contain

- Airless spray gun
- Spraying hose
- Standard or reversing nozzle



Observe and follow the separate operating instructions for the spray gun.

3.3.2 Material flow heater

Material flow heaters can optionally be used as:

- Heaters for the spraying material
- Auxiliary heaters for long hoses
- Heating the spraying air for Air Combi spraying (see separate operating instructions)
- Heating the air for the air motor to prevent icing over



Observe and follow the separate operating instructions of the material flow heater.

3.3.3 Agitator

As many coating materials contain solids, it can be practical to use an agitator to create as much homogeneity as possible in the supplied container.

The agitators are as varied and diverse as the actual coating materials.



Observe and follow the separate operating instructions of the agitator.

4 Transport, installation and assembly

The equipment left the factory in flawless condition and was appropriately packed for transportation.



Check the equipment on receipt for any damage in transit and for completeness.

4.1 Transportation

Please follow these notes when transporting the equipment:

- Ensure sufficient load bearing capacity of lifting gear and lifting tackle when loading the equipment. The dimensions and weight of the equipment can be found on the equipment card or on the type plate.
- To lift the high pressure pump, attach suitable lifting gear to the lifting eyes supplied (see Fig. 7 no. 1). The lifting eyes are only designed for the weight of the high pressure pump. Do not use them to lift the entire equipment (including accessories, hoses or frame)!
- Secure the equipment (high pressure pump including frame and/or other accessories) properly for lifting and loading the equipment.
- Do not transport any unsecured objects (e.g. material containers, tools) with the equipment.
- Never stand under suspended loads or inside the loading area. There is a risk of death!
- Secure the load on the transport vehicle against slipping and falling off.

If the equipment had already been in operation, please observe the following:

- Disconnect the entire system power supply – even for short transportation distances.
- Empty the equipment before transportation – fluid residues may escape during transportation despite this measure.
- Remove all loose components (e.g. tools) from the equipment.

4.2 Installation location

The equipment can be installed inside and outside spray booths. However, outdoor installation should be preferred in order to avoid contamination.



WARNING

If the equipment is used outside during a thunderstorm, a lightning strike can cause a life-threatening situation for the operating personnel.

- Do not operate a equipment out of doors during a thunderstorm!
- The equipment owner must ensure that the equipment is equipped with suitable lightning protection equipment..



Set the equipment up horizontally on a foundation that is flat, firm and vibration-free. The equipment must not be tipped or on an incline. Ensure that all the operating elements and safety features are easy to reach.

Safety measures at the place of installation:

- This equipment requires a solid base and sufficient free space for safe operation.
- Always keep the working area, especially all walkways and standing areas, clean and tidy. Immediately remove any spilled material and cleaning agent.
- Always ensure adequate ventilation at the work place to avoid damage to health and material objects. Always ensure an air change rate of at least 5.
- Always observe the processing instructions issued by the material manufacturers.
- Even though there are no legal directives for low-mist Airless spraying methods, all hazardous solvent vapours and paint particles must be extracted.
- Protect objects adjacent to the spraying object against possible damage caused by the material mist.

4.3 Assembly



WARNING

If assembly work is carried out by people who have not been trained for this work, you endanger yourself and other people and impair the safety and reliability of the equipment.

- Electrical components must only be mounted by trained time-served electricians – with all the other components, e.g. the spray hose and the spray gun being assembled by trained personnel only.



WARNING

Sources of ignition may result from assembly work (e.g. through mechanical sparks, electrostatic charge, etc.).

- Carry out all assembly work outside of areas with explosive atmospheres.
- Assemble the parts or fittings dismantled for transport purposes before start up and in compliance with the intended use of the system.

4.3.1 Mounting the wall bracket

The equipment can optionally be mounted on a wall bracket.

Observe the weight of the equipment (see Technical data) and select suitable fastening materials, taking into account the wall structure.

Ensure a sufficient distance between suction elbow and floor of at least 10 cm.

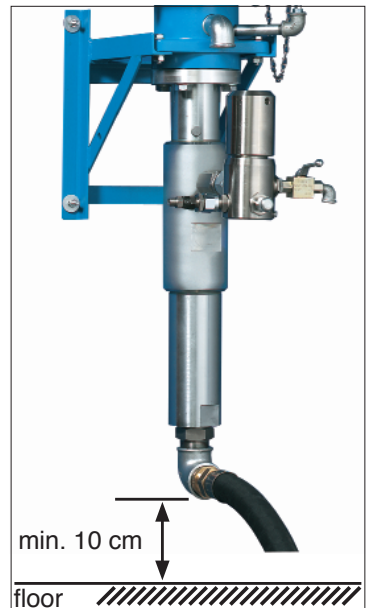


Fig. 8 Mounting the wall bracket

4.3.2 Assembling spray hose and spray gun



WARNING

Components that do not comply with the maximum permitted operating pressure of the equipment can burst and cause serious injury.

- ▶ Check the maximum permitted operating pressure of the material hose and the spray gun before assembly. It must be greater than or equal to the maximum operating pressure of the equipment as specified on the type plate.



- ▶ Only use conductive material hoses. All original material hoses from **WIWA** are conductive and perfectly adapted to our equipment.

1. Connect the spraying hose to the material outlet on the high pressure filter (see Fig. 9).

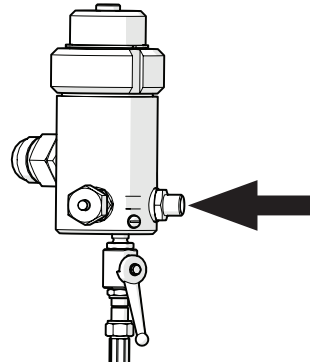


Fig. 9 Connecting spraying hose to high pressure filter

2. Connect the other end of the spraying hose to the spray gun (see Fig. 10).

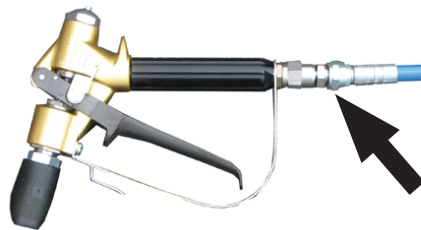


Fig. 10 Spraying hose to gun (example)

4.3.3 Grounding the equipment



WARNING

The high flow velocities associated with the Airless spraying method may cause electrostatic charging. Static discharges can cause fire and explosion.

- Ensure that the equipment has been properly grounded outside of explosive atmosphere areas!
- Also ground the object to be coated.

1. Connect the ground cable of the equipment to an electrically conductive object outside explosive atmosphere areas.
2. Ensure proper grounding of the object to be coated.

4.3.4 Connect compressed air



The compressor capacity must match the air requirements of the equipment and the diameters of the air supply hoses must match the connections such that an adequate air supply is ensured.



Operation with contaminated or moist compressed air causes damage to the equipment's pneumatic system.

- Use only dry dust- and oil-free air!

1. Make sure that
 - the compressed air shut-off valve is closed,
 - the air regulator has been turned down fully.
2. Attach a coupling piece which is suitable for your compressed air system to the compressed air intake (G 1") of the maintenance unit.
3. Connect the air hose.

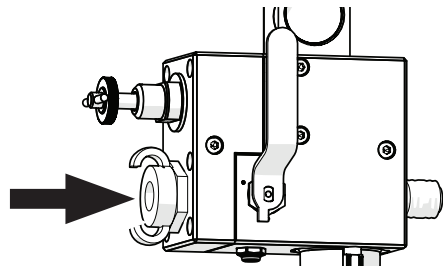


Fig. 11 Connecting compressed air (coupling is an example, not included)

5 Operation

- The equipment must have been set up correctly and completely assembled.
- Do not start commissioning the equipment unless you have the specified protective equipment. For more details, refer to Chapter 2.5.4 Personal protective equipment on page 19.
- A sufficient quantity of the spraying material has to be available.



Please observe the safety data sheet from the material manufacturer.

- You will need:
2 collecting vessels for excess material. These containers are not included in the scope of delivery.



WARNING

If material pumps run dry, the generated friction heat can cause fire or an explosion.

- Always make sure that the material drums do not run dry during operation. Never leave the equipment running unattended.
- However, should this happen, stop the corresponding pump immediately and feed material.

5.1 Put the equipment into operation

- Ensure proper grounding of the equipment and the object to be coated (see chapter 4.3.3 on page 31).
- Check whether all safety features are installed and fully operational (see Chapter 2.4 Safety features on page 15).
- Check the level of release agent on the pump and top up if necessary (see Chapter 6.4.2 Fill in release agent and check the fill level on page 44). On Airless equipments on wall brackets, release agent has to be added during first commissioning.
- Flush the equipment (see Chapter 5.3 Flushing on page 35) to remove the factory test medium (for first operation) or any residue of previous spraying material.
- During commissioning (flushing), check whether all equipment parts are tight and re-tighten the connections if required.

5.2 Spraying

The following steps for commissioning have to be completed before spraying (see Chapter 5.1 Put the equipment into operation on page 32).

1. Place the suction pipe into the spraying material.
2. Open the compressed air shut-off valve.
3. Regulate the air inlet pressure such that the pump runs slowly.
4. Unlock the spray gun and operate it until clean spraying material free from bubbles is emitted.
The pump and the hoses are now completely filled with material.
5. Release the trigger and secure the spray gun.
The pump should stop when the trigger is released.
6. Close the compressed air shut-off valve.
7. Release the pressure in the equipment (see Chapter 5.5 Relieve pressure on page 38).
8. Install a spray nozzle suitable for the material used and the tip guard.



Pay attention to the operation manual for the spray gun. It contains a table for selecting the spray nozzle and explanations for correct installation.

9. Open the compressed air shut-off valve and set the spraying pressure at the air regulator of the pump (see Chapter 5.2.1 Adjusting the spraying pressure on page 34).

5.2.1 Adjusting the spraying pressure

Please observe the following information when adjusting the spraying pressure:

- Optimal spraying pressure is indicated by a uniform application of material with fading out peripheral zones.
- Operate the equipment only with an air pressure as high as necessary, to achieve good atomisation at the recommended spraying distance of approx. 30-40 cm.
- Excessive spraying pressure causes increased material consumption and paint mist.
- Insufficient spraying pressure results in the appearance of stripes and differences in the coating thickness.

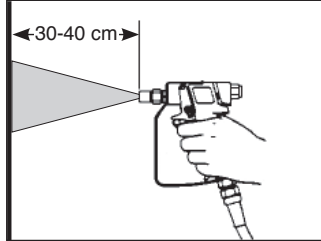


Fig. 12: Spraying distance



Pay attention to the operation manual for the spray gun. It contains more useful information for optimising the spraying result.

5.2.2 Hints for achieving good coating results

- Hold the spray gun at a right angle (90°) to the area to be coated. If the spray gun is held at a different angle, the coating becomes irregular and blotchy (see Fig. 13).
- Ensure an even speed and move the spray gun parallel to the area to be coated. Waving the spray gun causes irregular coating (see Fig. 14).

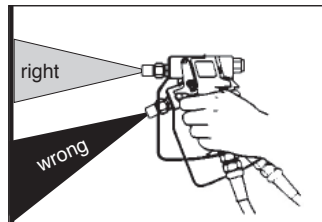


Fig. 13: Spray angle

- Move the spray gun with your arm and not with your wrist.
- Already move the spray gun before pulling the trigger. That way, you will achieve perfect, soft and smooth overlapping of the spray jet and avoid excessively thick application of material at the beginning of the spraying process.
- Release the trigger before stopping the movement.
- Replace the spray nozzle before it is worn.

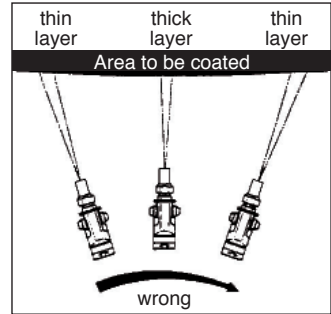


Fig. 14: Do not wave!



Worn nozzles cause higher material consumption and have a negative effect on the quality of coating.

5.3 Flushing

Flushing the equipment is necessary:

- At initial commissioning
The equipment has to be flushed with a cleaning agent to ensure that the spraying material is not negatively affected by the test medium that was used at the factory to test correct functioning.
- When changing materials
- For work interruptions and at decommissioning
in the case of an interruption in spraying to flush spraying material out before it sets.



Take note of the potlife of the materials used, particularly when using two-component materials.



WARNING

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

- Before flushing the equipment, switch off the material flow heater (optional) and leave it to cool completely.

➤ You will need:

- at least 5 l of benzine or cleaning agent which is suitable for the processed material and is recommended by the material manufacturer, in an open container
- an additional, conductive collecting vessel for the flushed out cleaning agent

These containers are not included in the scope of delivery.

1. Close and secure the spray gun.
2. Regulate the compressed air pressure controller down all the way. The pressure gauge has to show 0 bar.
3. Close the compressed air shut-off valve.
4. Hold the drain hose into the collecting vessel.
5. Briefly open the drain valve to release the pressure.



CAUTION

If parts of the equipment (e.g. spray nozzle, material filter on the spray gun, material hose, high pressure filter, suction strainer, etc.) are clogged the pressure cannot be fully released. Material may escape under high pressure and cause injuries when releasing screw fittings.

- Cover the screw fitting with a rag during releasing to protect yourself against sudden release of material.
- Release the screw fittings very carefully and release the pressure slowly.
- Remove the obstructions. Note the fault table (Chapter 7 Rectification of faults on page 48).

6. Remove the nozzle from the spray gun.
Observe and follow the notes in the user manuals for the spray gun.
7. Remove the filter element from the high pressure filter (see Chapter 6.4.4 Cleaning the filter element on page 44).
8. Remove the suction pipe from the material container.
Remove any paint residue on the suction pipe and the strainer.
9. Place the suction pipe and strainer into the container with the cleaning agent.
10. Open the compressed air shut-off valve.
11. Set the air regulator to a low operating pressure so that the pump runs slowly.
12. Open the drain valve on the high pressure filter until pure cleaning agent is emitted.
13. Close the drain valve.
14. Hold the spray gun laterally against the inner wall of the collecting vessel.
15. Open the spray gun until pure cleaning agent is emitted.
16. Close and secure the spray gun.

5.4 Material change

1. Clean the equipment as described in Chapter 5.3 Flushing on page 35.
2. Drain the equipment by removing the suction pipe from the cleaning agent and opening the spray gun until air is emitted.
3. Close and secure the spray gun.
4. Fully reduce the air inlet pressure (0 bar).
5. Release the pressure in the equipment (see Chapter 5.5 Relieve pressure on page 38).
6. Check the filter element in the high pressure filter (see Chapter 6.4.4 Cleaning the filter element on page 44).
7. After finishing the task you can start spraying a new material (see Chapter 5.2 Spraying on page 33).

5.5 Relieve pressure

1. Close the compressed air shut-off valve.
The equipment will vent automatically.
2. To release pressure from the material as well, insert the drain hose into a container and open the drain valve.
3. Operate the spray gun until all pressure has been released.
Secure the spray gun.



CAUTION

If parts of the equipment (e.g. spray nozzle, material filter on the spray gun, material hose, high pressure filter, suction strainer, etc.) are clogged the pressure cannot be fully released. Residual pressure could be released during disassembly work and cause severe injuries.

- Cover the screw fitting with a rag during releasing to protect yourself against sudden release of material.
- Release the screw fittings very carefully and release the pressure slowly.
- Remove the obstructions (see fault table in Chapter 7 Rectification of faults on page 48).

5.6 Work breaks/decommissioning

Always secure the spray gun, even for shortest work breaks. Secure the spray gun for short work breaks.



Take note of the potlife of the materials used, particularly when using multi-component materials.

The system has to be flushed and cleaned completely with the stipulated cleaning agent within the potlife indicated by the manufacturer. Please note:

- Curing time is reduced at higher temperatures.
- Allow the cleaning agent to circulate for a while.
- No paint residue may remain in the pump or in the filter.

5.7 Decommissioning

If you want to decommission the system for a longer period of time, proceed as follows:

1. Flush the equipment as described (see Chapter 5.3 Flushing on page 35).
2. Do not drain the pump fully.
Turn down the operating pressure fully (0 bar) as soon as clean solvent is emitted from the spray gun or the drain hose on the high pressure filter.
3. Close the compressed air shut-off valve.
4. Hold the spray gun laterally against the inner wall of the collecting vessel and open it again.
5. Hold the drain hose into the collecting vessel and open the drain valve briefly to release the pressure.

The cleaning agent which is still in the equipment remains in the equipment until recommissioning to prevent the equipment parts from sticking.

For longer idle times the equipment has to be filled with a release oil as the cleaning agent will evaporate over time.

5.8 Disposal

- Rests of spraying material, cleaning agent, oils, greases and other chemical substances must be collected in accordance with statutory provisions concerning recycling and waste disposal. The official local waste water laws are valid.

At the end of use, you must shut down and dismantle the equipment and dispose of it in accordance with legal regulations.

- Clean the equipment thoroughly of all material residues.
- Dismantle the equipment and separate all materials – dispose of metal together with scrap metal; plastic parts can be disposed of as domestic waste.

6 Maintenance



WARNING

If maintenance and repair work is carried out by persons who have not been trained for this work you endanger yourself, other persons and impair the safety and reliability of the equipment.

- ▶ Maintenance and repair work on electrical components must only be carried out by trained electricians – any other maintenance and repair work must be performed by **WIWA** customer service or by specially trained personnel.



WARNING

Sources of ignition may result from maintenance work (e.g. through mechanical sparks, electrostatic charge, etc.).

- ▶ Carry out all maintenance work outside of areas with explosive atmospheres.



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

Before maintenance and repair work:

1. Close the air pressure shut-off valve and disconnect the compressed air hose.
2. Completely depressurise the equipment.



WARNING

If parts of the equipment (e.g. spray nozzle, material filter on the spray gun, material hose, high pressure filter, suction strainer, etc.) are clogged the pressure cannot be fully released. Residual pressure could be released during disassembly work and cause severe injuries.

- ▶ Cover the screw fitting with a rag during releasing to protect yourself against sudden release of material.
- ▶ Release the screw fittings very carefully and release the pressure slowly.
- ▶ Remove the obstructions (see fault table in chapter see chapter 7 on page 48).

After completing the maintenance and repair work, check the function of all safety features and the correct functioning of the equipment.

6.1 Regular inspections

The has to be examined and serviced by an expert regularly:

- before initial commissioning,
- after the modification or repair of parts of the system, which could affect safety,
- after work breaks longer than 6 months,
- but at least every 12 months.

For decommissioned equipments, the inspection can be postponed until the next commissioning.

The inspection results must be recorded in writing and kept until the next inspection. The inspection report or a copy of it must be available at the place of use of the equipment.

6.2 Maintenance plan



The information in the maintenance plan are recommendations. The intervals may vary depending on the condition of materials used and outer influences.

Interval	Activity	Reference
before each commissioning	check level of release agent on the high pressure pump, top up release agent if required	see chapter 6.4.2 on page 44
once per week	check and clean the water separator	see chapter 6.3.1 on page 43
	visual inspection of the compressed air and material hoses	
every 50 oper. hrs	check release agent of the high pressure pump for material residue	see chapter 6.4.3 on page 44
every three years	inspection of the compressed air and material hoses by an expert and replacement if necessary	

oper. hrs. = operating hours

6.3 Maintenance unit

The maintenance unit prevents condensation water and dirt particles from entering the equipment.

The maintenance unit is equipped with the following maintenance elements:

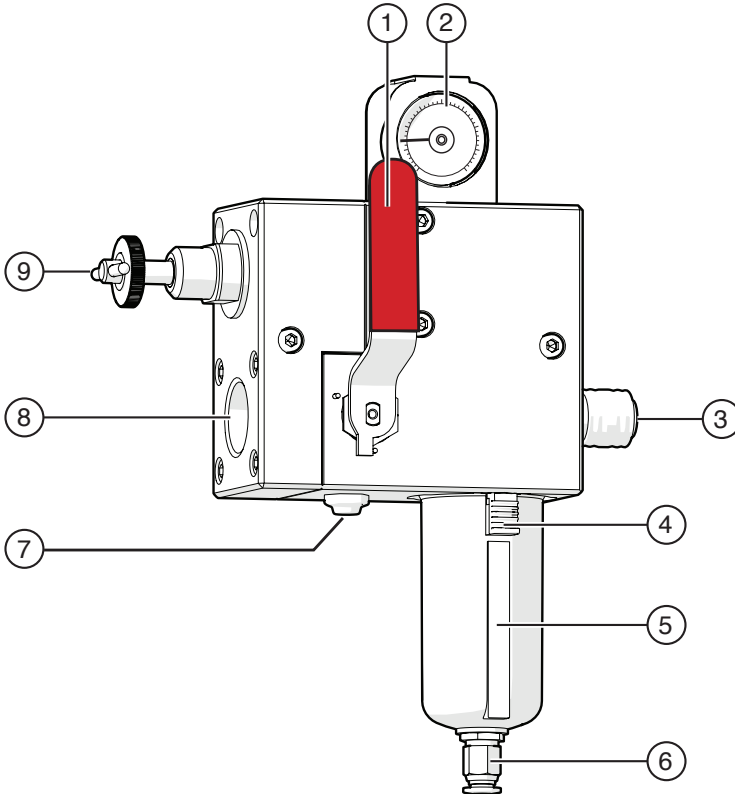


Fig. 15 Maintenance elements

No.	Designation
1	Compressed air shut-off valve with automatic venting function / EMERGENCY STOP
2	Pressure gauge for displaying the air inlet pressure
3	Compressed air plug coupling DN 7.2 (for optional external devices)
4	Slide for opening the water separator

No.	Designation
5	Container of water separator
6	Semi-automatic drain valve
7	Air outlet for automatic venting
8	Compressed air connection / inlet (G 1")
9	Compressed air regulator

6.3.1 Checking the water separator and cleaning the container

The accumulated condensation water is drained off through the drain valve semi-automatically.

- Hold the hose into an empty collecting vessel.

The drain valve opens as soon as the compressed air shut-off valve has been closed.

- Check the container (see Fig. 15, no. 5) for dirt residue regularly and clean as required.

6.4 High pressure pump

6.4.1 Checking release agent for material residue

Drain a small amount of release agent (see Fig. 16).

If the release agent is found to be contaminated with material residues, you must assume that the packing of the material pump in question is worn.

In this case, have the pump packing replaced as soon as possible.

After the examination, top up the amount of fresh release agent through the filler openings. We recommend using release agent from **WIWA** (order number 0163333).

6.4.2 Fill in release agent and check the fill level

Before each start-up check the release agent level as far as possible. Top up with release agent if necessary.

The total filling capacity is approx. 120 ml.

No.	Description
1	To fill in release agent, slide the flap in front of the filler hole to the side and inject release agent using the dosing bottle.
2	The ideal fill level is when the release agent reaches the middle of the sight glass.
3	Unscrew the screw to drain release agent.

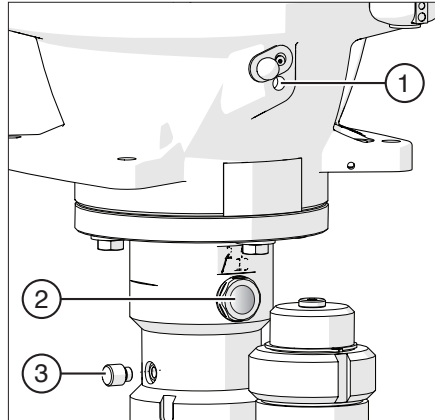


Fig. 16 Filling, checking, draining release agent

6.4.3 High pressure filter

6.4.4 Cleaning the filter element

The cleaning interval for the filter elements in the high pressure filters depends on the type and cleanliness of the material. Clean the filter elements at least once a week and after each material change.



WARNING

If the equipment was not depressurised when opening the high pressure filter, material may escape under very high pressure and cause serious injuries.

- Depressurise the equipment fully before opening the high pressure filter (see Chapter 5.5 Relieve pressure on page 38)!

1. Open the release ball valve (1) and quickly operate the gun to verify that the equipment is fully depressurised.
2. Use the enclosed hook spanner to release the box nut (2) on the cap and remove the cap (3) of the high pressure filter.
3. Loosen the nut (4) and remove the filter element (5).
4. Clean the filter element with solvent. If the filter element is damaged it should be replaced with a new filter element.
5. Place the filter element back on the threaded bolt (6) and retighten the nut (4).
6. Screw the cap (3) with the box nut (2) onto the high pressure filter and tighten it with the hook spanner.

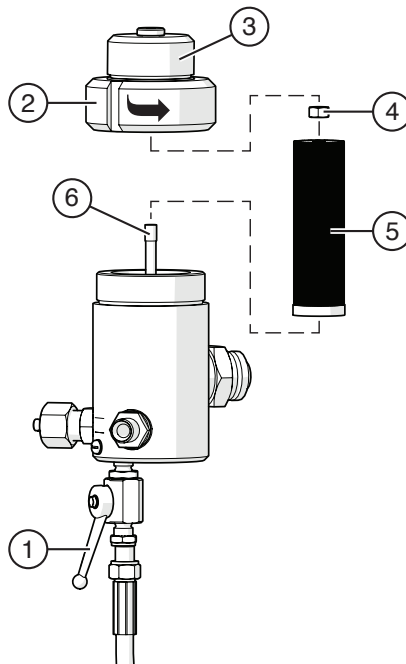


Fig. 17 Removing filter element

No.	Designation
1	Discharge ball valve
2	Retaining nut
3	Cap
4	Nut
5	Filter element
6	Threaded bolt

6.4.5 Filter elements for high pressure filters

Insert the filter elements suitable for the spraying material and the spraying nozzle into the high pressure filter. The mesh size should always be slightly finer than the bore of the nozzle used:

Filter element	Nozzle size		WIWA order no.
M 200 (white)		up to 0.23 mm/.009"	0659107-200
M 150 (red)	> 0.23 mm/.009"	up to 0.33 mm/.013"	0659107-150
M 100 (black)	> 0.33 mm/.013"	up to 0.38 mm/.015"	0659107-100
M 70 (yellow)	> 0.38 mm/.015"	up to 0.66 mm/.026"	0659107-070
M 50 (orange)	> 0.66 mm/.026"		0659107-050
M 30 (blue)			0659107-030
M 20 (green)			0659107-020



Do not use a filter element when applying coarsely pigmented or fibre filled materials. The standard suction strainer should remain in the filter housing or be replaced by a wider mesh screen. In the case of a material change, you must clean or replace both the filter element in the high pressure filter and the material screen in the suction system if necessary.

6.5 Recommended operating materials

Only user original operating materials from **WIWA**:

Operating materials	WIWA order number
Release agent, yellow (0.5 l) ¹ (used as standard)	0163333
Release agent, red (0.5 l) ¹ (e.g. for isocyanate for PU)	0640651
Anti-freeze agent (0.5 l) ²	0631387
Pneumatic oil (0.5 l) ²	0632579

¹ Plasticizer to fill into the release agent cups of the main pump and the feed pumps

² for maintenance unit

Materials required for cleaning and repair work (see information in spare parts lists)

The release agent and the pneumatic oil are available in large containers on request.

6.6 Special tools

The following special tools for maintenance and repair work are included with delivery:

- ▶ Hook spanner for opening the high pressure filter

Spanner size	Art.no.
80/90 mm	0613959
135/145 mm	0633579

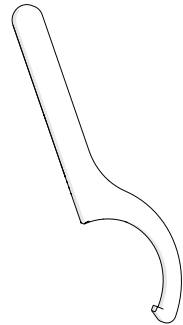


Fig. 18: Hook spanner

7 Rectification of faults

Fault	Possible cause	Remedy
Pressure release not possible (compressed air shut-off valve closed)	<ul style="list-style-type: none"> - Drain hose or ball valve clogged. - High pressure filter clogged. 	<ul style="list-style-type: none"> ▶ Carefully release screw fittings and cover with a rag ▶ Remove hardened material with solvent if possible, if necessary soak parts in solvent or remove with other mechanical means or replace ▶ Contact WIWA service if necessary
Pump does not start, despite operation of spray gun or opened drain valve (on high pressure filter).	<ul style="list-style-type: none"> - Compressed air shut-off valve closed. - No air inlet pressure (air regulator at 0 bar) - Spray gun clogged - Drain hose or ball valve clogged. - Air motor defective. 	<ul style="list-style-type: none"> - Open the compressed air shut-off valve. - Increase air inlet pressure - Check nozzle and filter element, replace if required. - Clean drain hose or ball valve, replace if required. - Repair air motor by following the spare parts list – if necessary call the customer service for assistance. - Clean strainer and replace if necessary - Replace the hose.
Pump runs but no spraying material is transported to the nozzle.	<ul style="list-style-type: none"> - Suction strainer clogged. - Suction hose clogged. 	

Fault	Possible cause	Remedy
(continued) Pump runs but no spraying material is transported to the nozzle.	<ul style="list-style-type: none"> - Ball of bottom valve does not lift off (stuck). 	<ul style="list-style-type: none"> - Open the spray gun without nozzle. - Open the relief ball valve on the high pressure filter. - Slightly knock the bottom valve from the side (hammer). - Unscrew the suction system and loosen the ball of the bottom valve from below with a pin or a screwdriver
The pump delivers material but does not stop when the spray gun is closed.	<ul style="list-style-type: none"> - The bottom valve does not close. - Packing or valve worn. 	<ul style="list-style-type: none"> - Unscrew the bottom valve, thoroughly clean ball and seat. - Replace parts.
The pump runs uniformly, but the required spraying pressure is not reached.	<ul style="list-style-type: none"> - The air pressure is too low or there is not enough air. - Spraying nozzle (new) too big. - Spraying nozzle (worn) too big. - Air motor iced (runs too slowly). 	<ul style="list-style-type: none"> - Increase the air pressure on the pneumatic regulator or check the air line for correct cross-section. - Install a smaller nozzle or use a bigger pump. - Install a new nozzle. - If possible reduce the air inlet pressure.

Fault	Possible cause	Remedy
<p>The pump runs irregularly (can be noticed by differences in up and down stroke speeds) and does not reach the required pressure.</p>	<ul style="list-style-type: none"> - The viscosity of the spraying material is too high (suction losses). - Suction system leaking (fluctuations in spray jet). 	<ul style="list-style-type: none"> - Dilute the spraying material. - Use a bigger pump. - Check the packings on all screw fittings of the suction pipe or the suction hose, replace if necessary (see spare parts list for suction line or direction suction).
<p>Material escapes from the overflow on the air motor.</p>	<ul style="list-style-type: none"> - Bottom valve leaking (pump only stops in upward stroke when the spray gun is closed). - Piston valve leaking (pump only stops in downward stroke when the spray gun is closed). - Bottom or top packing leaking (wear) - Packing worn. 	<ul style="list-style-type: none"> - Unscrew the bottom valve, thoroughly clean ball and seat, if necessary replace ball or valve seat. - Clean ball and valve in the double piston, replace ball and valve seat as necessary. - Replace the packing. - Replace the packing. Note: Do not close off the overflow!

8 Technical information

8.1 Technical data

Type	28088
Article No.	0659730
Pressure ratio	88 : 1
Max. free-flow output (l/min)	28
Delivered volume per double stroke (ccm)	153
Max. air inlet pressure (bar)/safety valve	5.5
Max. permissible operating pressure (bar)	484
Air consumption (l / DH)	14.77
Piston diameter of the air motor (mm)	270
Piston stroke of the air motor (mm)	120
Air inlet (maintenance unit)	Nominal size 25
Material outlet (high pressure filter)	3/8 NPSM / 1/2" G
Dimensions (L×W×H in mm) approx.	800 × 755 × 1320
Weight (kg) approx.	approx. 110 kg

Emitted sound pressure level at the work place

was determined in accordance with the DIN EN ISO 3744, DIN EN 31200, DIN EN 31201 and DIN 45635-20 standards

Sound pressure level at 15 DH with 8 bar L_p	84 dB(A)
Sound power level L_w	95 dB(A)

8.2 Equipment card

The equipment card contains all important and safety relevant data and information about the equipment:

- Exact designation and manufacturer data
- Technical data and limit values
- Equipment and test certificate
- Purchasing data
- Equipment identification (equipment components and supplied accessories with item numbers and spare part numbers).
- List of supplied documentation

8.3 Type plate

The type plate is located at the front of the carriage (see Fig. 7).

It contains the most important technical data for the equipment.

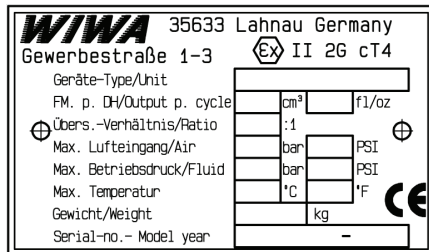


Fig. 19: Example of a type plate



Please check that the data on the type plate is identical to the specifications on the equipment card. Please notify us immediately in case of discrepancies or if the type plate is missing.

8.4 QR code

The QR code is located at the front of the carriage (see Fig. 7) and contains a link which leads to the equipment support for your equipment type on the WIWA website.

This provide more information on your equipment, e.g. electrics lists, repair instructions, etc.

- ▶ Scan the QR code with the camera of your mobile equipment (e.g. smartphone, tablet).

You will need a QR code reader for decoding the QR code. This is available as an app.



because it works

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