

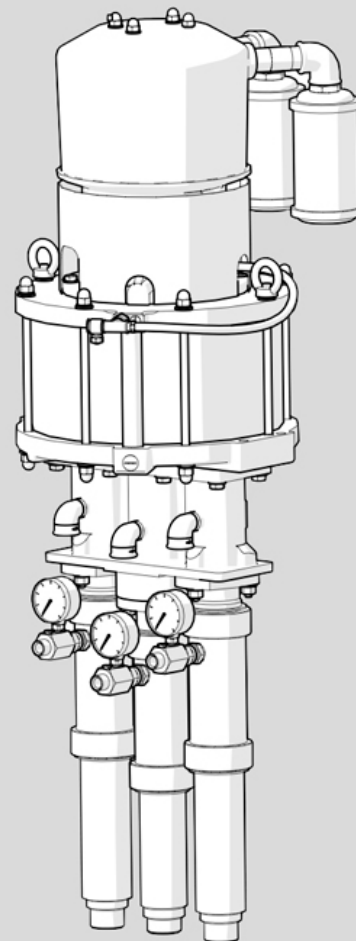
Operation Manual

DUOMIX 300 / 333

Type:

- 300
- 333

Serial-No.



2K-Proportioning pump 333

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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 moving 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

Signals an instruction to wear protective gloves with forearm protection, in order to prevent a risk of burns due to heated material.



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!



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 electricity

Only applies to machines with electrical pressure or metering monitoring and/or auxiliary electrical equipment:



WARNING

In atmospheres containing solvents, the mains cable can become brittle or porous.

- Check the mains cable prior to each start-up for any visible damage.
- Never patch a mains cable.
- A damaged mains cable must be replaced immediately by specialist personnel with an electrical qualification.

2.2.4 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

If the machine becomes contaminated with material during operation, an electrostatic charge may be generated with the increasing coating thickness. Static charges can result in fire and explosions.

- Clean the machine of contaminants immediately.
- Perform the cleaning work outside of EX zones.

2.2.5 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. Localised freezing can arise with contact.


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

2.2.6 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 directive 94/9/EC 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 according to the stipulated guidelines of 94/9/EC, 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.
- Only perform cleaning work when the machine has cooled down.

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 Information signs on the machine

The information signs displayed on the machine indicate possible hazard points and must be observed.

They must not be removed from the machine.

Damaged and illegible information signs must be replaced immediately.

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

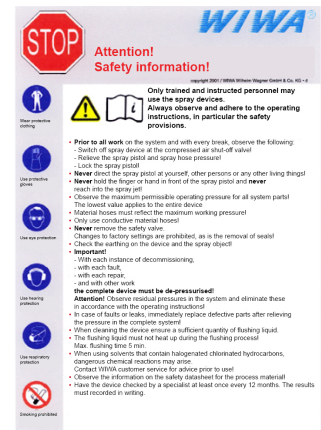


Fig. 1: Safety information

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 valves
- Compressed air shut-off valves
- Ground cable
- Stop or emergency stop buttons (depending on whether your machine is equipped with pneumatic or electrical pressure and metering monitoring)
- Rupture discs
- Overpressure valve - optional
- On/off switch for spray guns - optional

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:

- Seal on the safety valve OK?
- Safety valve externally free of damage?
- Ground cable free of damage?
- Compressed air shut-off valves move freely?

Checklist on the pressurised machine:

- Function of the safety valve OK?
- Function of the compressed air shut-off valves OK?
- Function of the overpressure valve (optional) OK?
- Function of the on/off switch for the spray guns (optional) OK?



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

2.4.1 Safety valves

Safety valves are fitted to the **DUOMIX 300/333**:

- In the air outlet of the maintenance unit for the proportioning pump (see Fig. 2),
- In the air motors of the flushing pump and the optionally available feed pumps.

The safety valves prevent the maximum permissible air intake pressure from being exceeded.

If the air intake pressure for the machine components monitored by the safety valve exceeds the limit value setting, the safety valve installed here discharges.

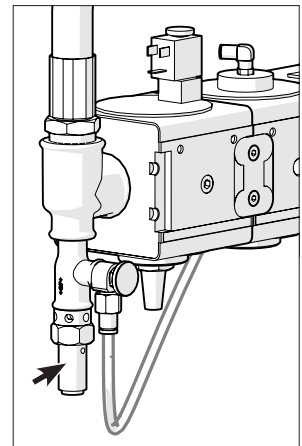


Fig. 2: Safety valve

In order to check the function of a safety valve, briefly increase the air intake pressure on the system components monitored by the safety valve to approx. 10% above the maximum permissible value according to the type plate - the safety valve must discharge.



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 system without safety valves or with defective safety valves!
 - If it is necessary to replace a safety valve, please refer to the machine card for the order number.
 - With new safety valves, please ensure that these are set to the maximum permissible air intake pressure of the machine (see type plate or machine card) and sealed.



Changing the mixing ratio changes the pressure transmission and therefore also the maximum permissible air intake pressure.

In this case the existing safety valve must be replaced following agreement with WIWA.

2.4.2 Compressed air shut-off valves

The compressed air shut-off valve on the maintenance unit interrupts the air supply to the entire machine (see Fig. 3).

Furthermore, the machine is optionally equipped with further compressed air shut-off valves, with which it is possible to interrupt the air supply to individual components, such as the flushing pump, the feed pumps, etc.

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

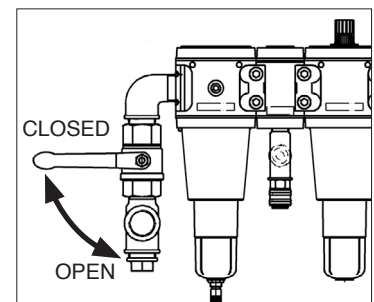


Fig. 3: Compressed air shut-off valve

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



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 Ground cable

The Ground cable serves to prevent an electrostatic charging of the machine.

The Ground cable is already connected to the high pressure filter at the time of delivery.

If the Ground cable is lost or defective, it must be replaced immediately!

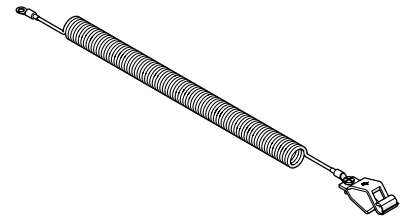


Fig. 4: Ground cable

2.4.4 Stop/emergency stop button

Using the red button on the control cabinet for the pressure and metering monitoring, it is possible to switch the **DUOMIX 300 / 333** off immediately in an emergency (see Fig. 5 and Fig. 6).

As soon as the button is pressed, the compressed air supply is interrupted. In order to relieve the pressure on the material side too, withdraw the spray gun again.

In order to release the locking, pull the button out again.

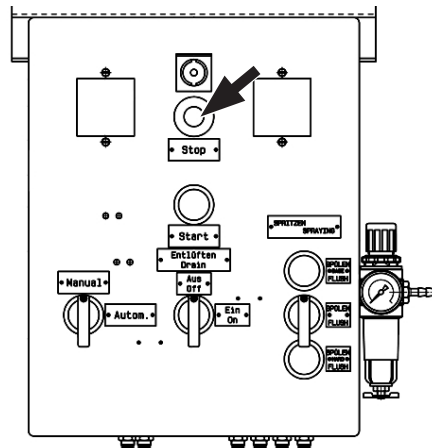


Fig. 5: Stop button on the pneumatic control cabinet

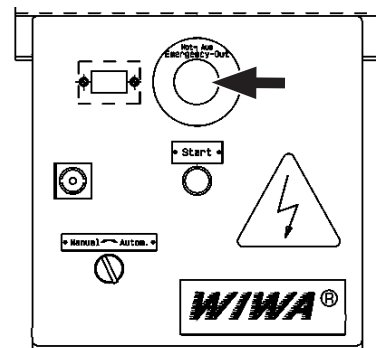


Fig. 6: Emergency stop button on the electrical control cabinet

2.4.5 Rupture discs

The rupture discs prevent a significant exceeding of the permissible operating pressure. They are located in the threaded connection on the high pressure filters.

If a rupture disc is damaged, material from the hose leaks behind the rupture disc and the pump is unable to build up pressure. In this case, the rupture disc must be replaced immediately.

The order data can be found on the machine card.

A new rupture disc is installed with the coloured side facing the pressure.

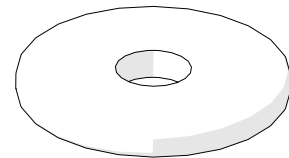


Fig. 7: Rupture disc

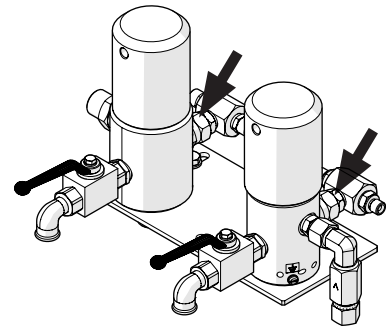


Fig. 8: Installation site of the rupture discs

2.4.6 Overpressure valves (optional)

Overpressure valves are only available if the machine is equipped with feed pumps.

Overpressure valves are located at the material outlet of the feed pumps. These open with increased material pressure. In order to relieve the pressure, the material runs back into the respective material tank.

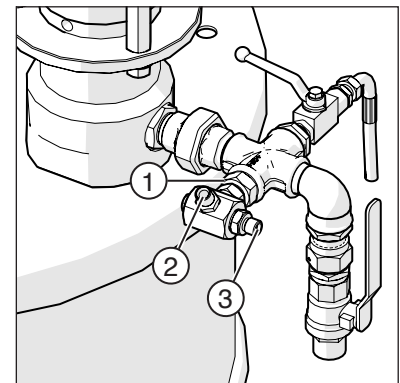


Fig. 9: Outlet distributor of the feed pumps

No.	Designation
1	Overpressure valve
2	Return from the rupture disc device of the DUOMIX 300/333
3	Return into the material tank

2.4.7 Switch for automatic spray gun (optional)

The on/off switch for the spray gun is an optional accessory.

The switch must be set to the "OFF" position with every interruption to work, even very brief interruptions.

This safely interrupts the spray process.

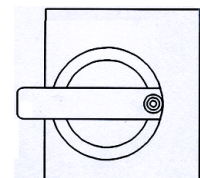


Fig. 10: Switch for spray gun

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 operator

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 antistatic protective gloves. When processing heated materials, protective gloves must be additionally equipped with forearm protection in order to prevent burns.



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 then these must be suitable for the machine - in particular with respect to the operating pressure, the current connection data and the connection variables. **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. Interrupt the energy supply immediately.
 - In the case of versions with electrical pressure and metering monitoring: Switch off the power supply and unplug the mains plug.
 - In the case of versions with pneumatic pressure and metering monitoring: Close the compressed air shut-off valve and turn down the compressed air regulator until it moves easily.
2. Actuate the spray gun briefly once more.
3. Open the relief valve on the high pressure filter, so that no further material pressure is present and the machine has been fully relieved of pressure.



This process is not suitable for decommissioning. The machine is not flushed.

- For controlled decommissioning please observe Chap. 6.6 Decommissioning on page 70.
- After remedying the emergency situation, the machine must be flushed (see Chap. Depending on the type of material supply on your machine, it is necessary to observe various working steps when ending the material supply and readying the cleaning fluid. on page 65. Observe the pot life of the materials used.

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 **DUOMIX 300 / 333** has been designed according to your specific requirements (process material, mixing ratio, output, etc.).

The process material is fed directly to the proportioning pump or via feed systems. The proportioning pump transports both components - correctly metered - to the mixing block, in which the two components converge. The precise metering of the two components is ensured by the fixed mixing ratio. The mixing block may be directly adjacent to the machine or a short distance away, whereby the connection is established by a hose assembly with separate hoses for each component. Because the mixing of the two components only takes place in the mixing block, a very small quantity of cleaning fluid is required. The mixed material finally arrives at the spray gun via the spray hose.

In order to process materials with special characteristics it is possible to equip the machine with optional accessories (e.g. feed pumps, agitators, a range of heating systems, ram presses and many more besides).

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

3.1 Intended use

Using the **DUOMIX 300 / 333** it is possible to apply 2K coatings with mixing ratios of 1 : 1 to 8 : 1 to a surface. It is possible to process low to high viscosity 2K materials that are solvent-free or contain solvents, also with extremely short pot lives (e.g. 30 seconds).

If the machine bears an EX mark, it may be used in potentially explosive areas. Observe the mark on the type plate and on the machine card, as well as the information in Chap. 2.2.6 Explosion protection on page 12.



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 may result in personal injury or property damage.

Erroneous use applies in particular if

- impermissible materials are processed,
- unauthorised modifications or changes are implemented,
- safety equipment is modified, removed or bypassed,
- unsuitable spare or accessory parts are used (see chap. 2.6.1 & 2.6.2),
- machines that are not marked as EX machines are used in potentially explosive areas,
- the machine is operated outside of the operating limits (see type plate).

3.3 Modular machine configuration

A DUOMIX 300 / 333 always consists of the following basic modules:

- Proportioning pump as main module,
- Regulation and control elements,
- Material feed system,
- Mixing unit,
- Flushing pump.

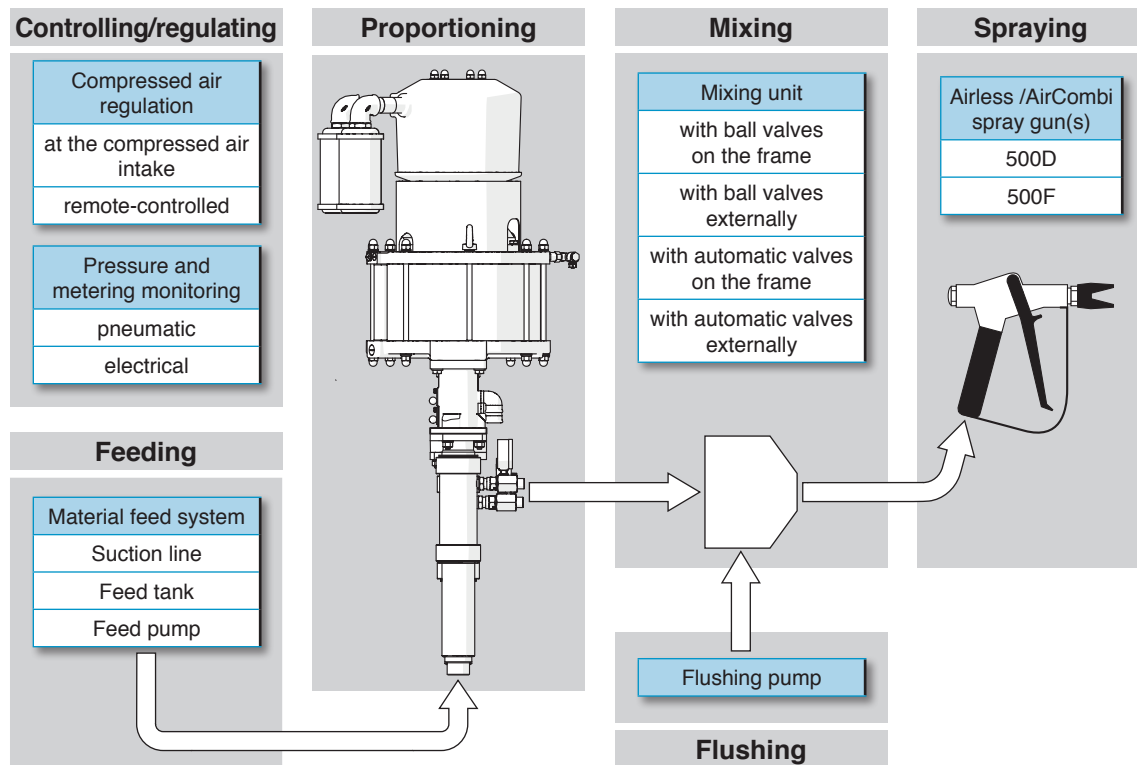


Fig. 11: Basic modules of the DUOMIX 300 / 333

Each DUOMIX 300 / 333 is configured on a customer-specific basis. The machine configuration can vary dramatically due to the various versions of the base modules and the numerous optional expansions and accessories.

3.4 Configuration examples

The figures in this chapter show examples of the numerous possibilities that exist with the machine configuration.

3.4.1 DUOMIX 333 on mobile frame

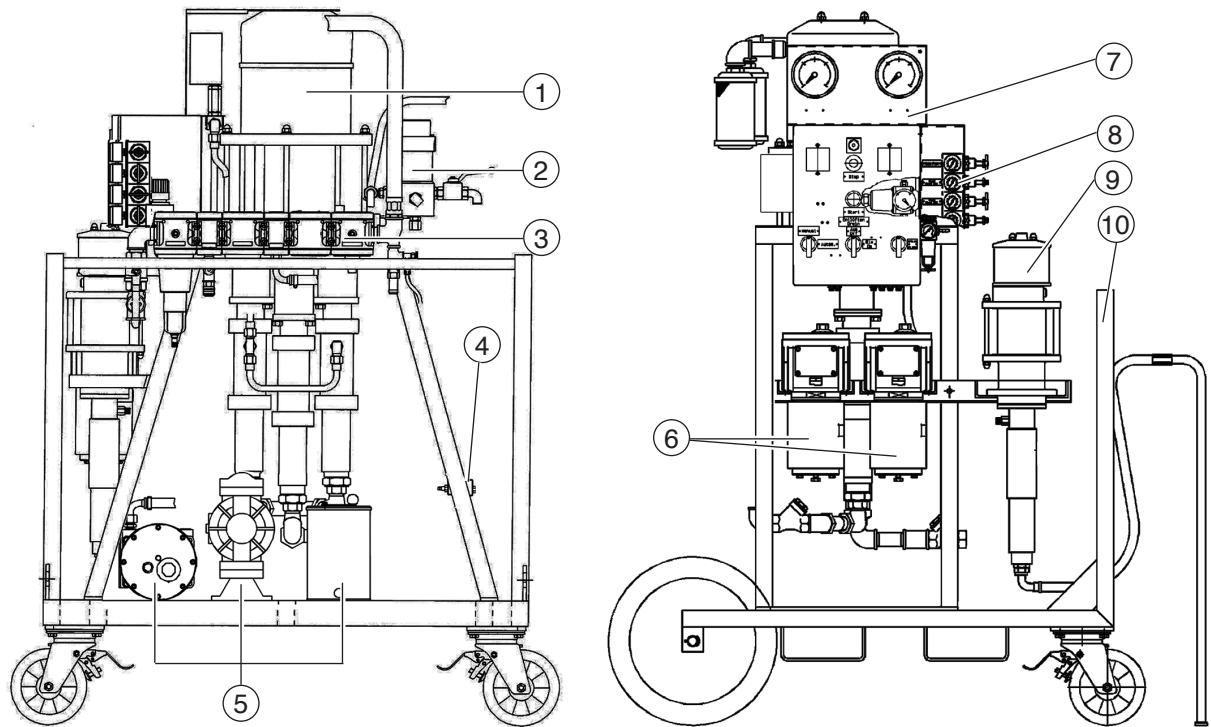


Fig. 12: Example of a DUOMIX 333 on a mobile frame with compressed air regulation unit, Material fluid heaters and hose heating

No.	Designation
1	Proportioning pump
2	Double high pressure filter
3	Maintenance unit without compressed air regulator
4	Intermediate piece
5	Water heating for hose assembly (optional accessory)
6	Material fluid heater (optional accessory)
7	Control cabinet with contact manometers
8	Compressed air regulation unit
9	Flushing pump
10	Frame

3.4.2 DUOMIX 333 on stacker frame with heaters and hose heating

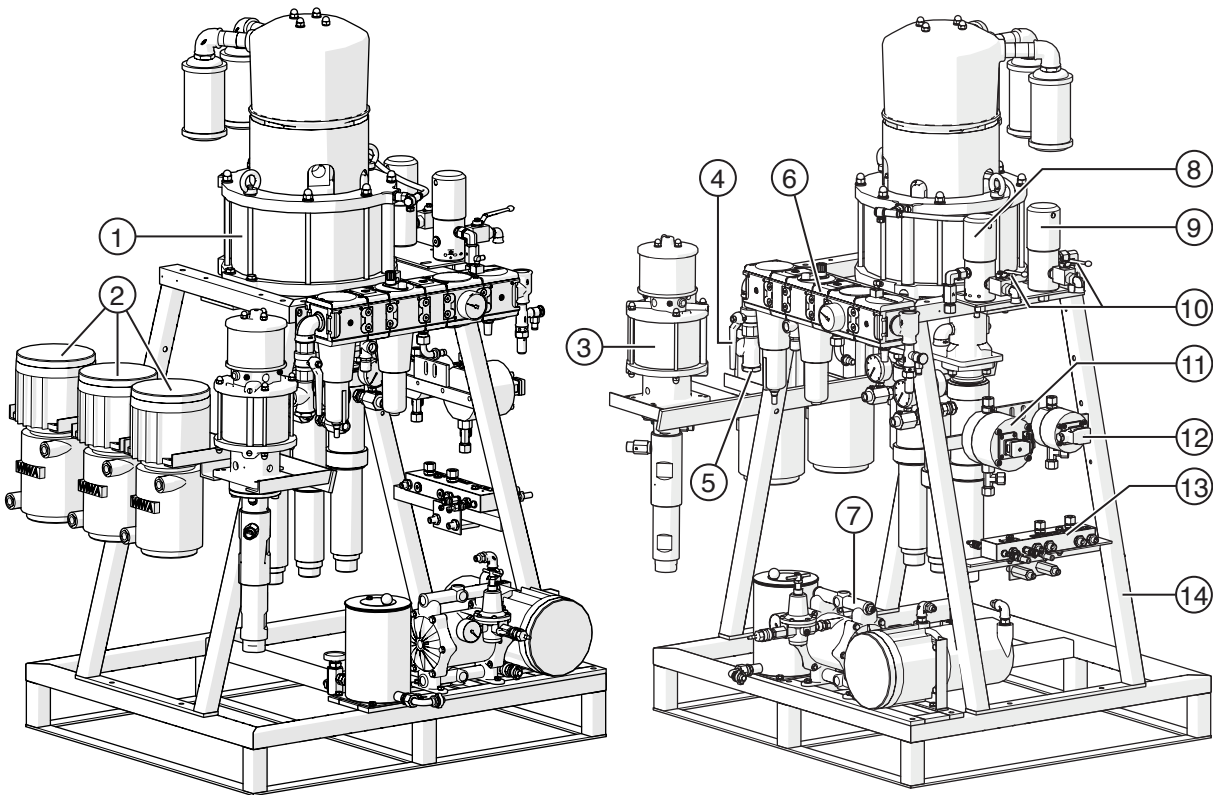


Fig. 13: Example of a DUOMIX 333 on a stacker frame and various accessories (front and rear view)

No.	Designation	For further reading
1	Proportioning pump	Page 27
2	Material fluid heater for the A and B component (optional)	Page 42
3	Flushing pump	Page 38
4	Compressed air shut-off valve	Page 15
5	Compressed air connection	Page 55
6	Maintenance unit	Page 28
7	Hose heating with hot water (optional)	Page 43
8	High pressure filter for the A component	Page 36
9	High pressure filter for the B component	
10	Relief ball valves	Page 69
11	Flow rate transducer for the A component (optional)	
12	Flow rate transducer for the B component (optional)	
13	Intermediate piece for connecting the hose assembly	Page 36
14	Frame	

3.4.3 DUOMIX 333 on mobile frame with heated material tanks

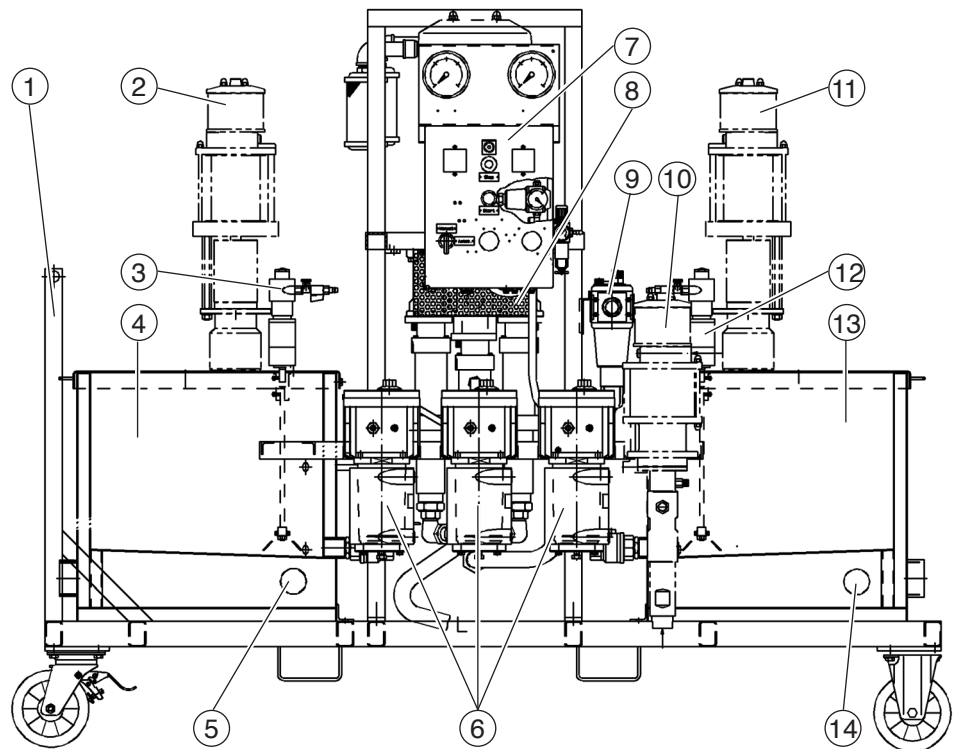


Fig. 14: Example of a DUOMIX 333 on a mobile frame with Material fluid heaters, flushing pump and heated material tanks with feed pumps and agitators

No.	Designation
1	Mobile frame
2	Feed pump for the A component
3	Agitator for the A component
4	Material tank for the A component
5	Tubular heating element for the A component tank heating
6	Material fluid heater (optional accessory)
7	Control cabinet with contact manometers
8	Proportioning pump
9	Maintenance unit with compressed air regulator
10	Flushing pump
11	Feed pump for the B component
12	Agitator for the B component
13	Material tank for the B component
14	Tubular heating element for the B component tank heating

3.4.4 DUOMIX 333 on mobile frame with feed tanks

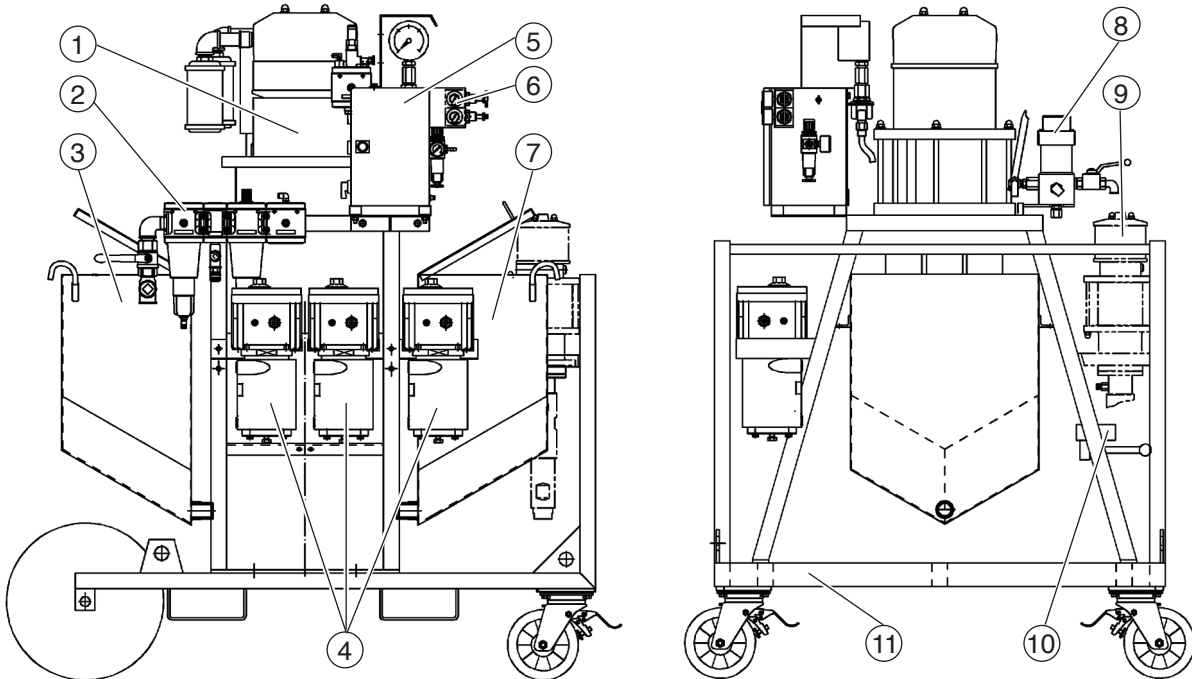


Fig. 15: Example of a DUOMIX 333 on a mobile frame with pressure and metering monitoring for one component and material feed tanks

No.	Designation
1	Proportioning pump
2	Maintenance unit without compressed air regulator
3	Feed tank for the B component
4	Material fluid heater (optional accessory)
5	Control cabinet with pressure and metering monitoring for one component
6	Compressed air regulation unit
7	Feed tank for the A component
8	Double high pressure filter
9	Flushing pump
10	Intermediate piece with ratio check unit
11	Mobile frame

3.5 Proportioning pump

The proportioning pump (see Fig. 16) generally consists of an air motor and 3 material pumps - two for component A and one for component B.

The mixing ratio is the result of the relationship between the pump sizes. Depending on the pump combination, mixing ratios of 1:1 to 8:1 are possible. Machines with a mixing ratio of 1 : 1 are equipped with 2 equally sized material pumps - one for component A and one for component B.

Depending on the material requirements, the mixing ratio can be aligned by exchanging the material pumps. All that you need for this are the right tools and the corresponding material pumps.

Through strong compression of the air and the high flow speeds it is possible that the air motor may freeze up. The optionally available de-icing system limits the freezing of the air motor during operation (only possible in conjunction with a Material fluid heater). The adjusting screw of the de-icing system is located at the air outlet of the maintenance unit for the proportioning pump (see chap. 3.6 on page 28).

No.	Designation
1	Muffler
2	Air motor
3	Manometer for displaying the material pressures (optional)
4	Material outputs of the material pumps
5	Material pumps of the A component
6	Material pump of the B component
7	Material inputs of the material pumps
8	De-icing system

The proportioning pump pumps the material from the material tanks to the mixing unit and from there to the spray gun (spray operation) or back into the material tank (circulation operation) depending on the operating mode selected.

Optional expansions can be interconnected in the material flow.

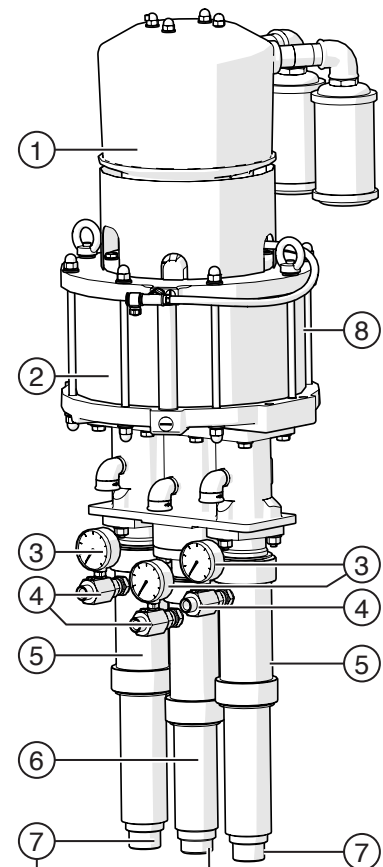


Fig. 16: Proportioning pump

3.6 Maintenance unit

The maintenance unit prevents the penetration of condensate and particles of dirt into the air motor and supplies the compressed air oil for lubrication of the moving parts.

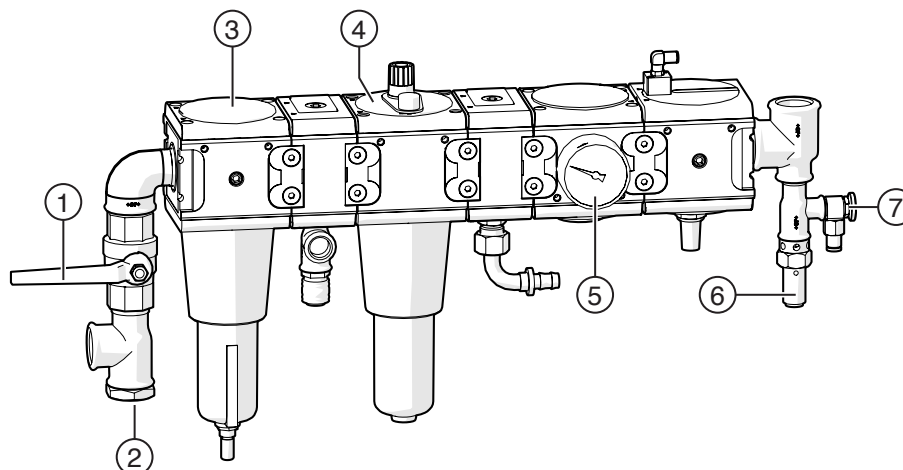


Fig. 17: Maintenance unit

No.	Designation
1	Compressed air shut-off valve
2	Compressed air connection
3	Water separator / filter
4	Oil mister
5	Manometer for displaying the air intake pressure for the proportioning pump (optional)
6	Safety valve for the proportioning pump
7	Adjusting screw for the de-icing system (optional)

The owner's compressed air connection is established at the maintenance unit. The compressed air supply for the entire machine is opened or interrupted with the compressed air shut-off valve.

The air intake pressure is set with a compressed air regulator and can be read off at a manometer. The compressed air regulator and manometer can be externally integrated in a compressed air regulating unit, see Chap. 3.8 Compressed air regulation unit on page 31.

The water separator separates the moisture and particles of dirt contained in the air. The oil mister supplies the compressed air oil to the moving parts for lubrication.

3.7 Control cabinet

The control cabinet elements can be controlled pneumatically or electrically.

The following controls are integrated in the control cabinet:

- Start/stop button
- Selector switch for monitoring the operating limits
- Selector switch for the operating modes "spraying", "flushing" and "draining", depending on the mixing unit used.



Do not adjust the factory settings for the regulator in the control cabinet.

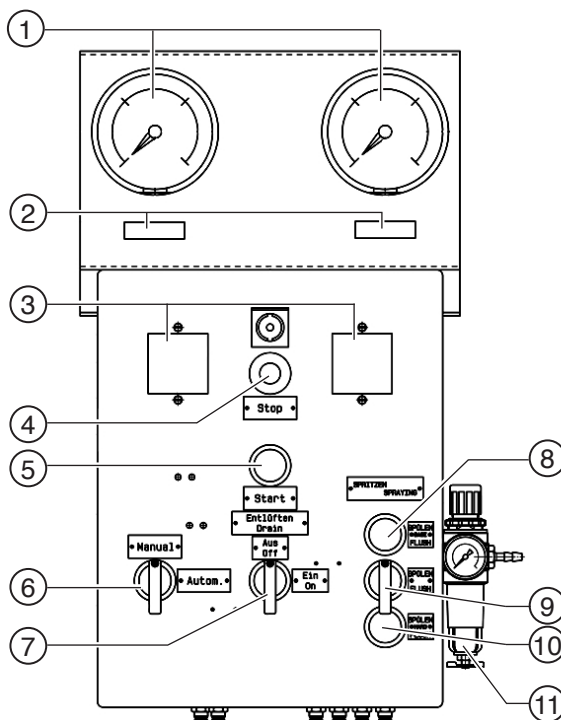


Fig. 18: Control cabinet with pneumatic pressure and metering monitoring

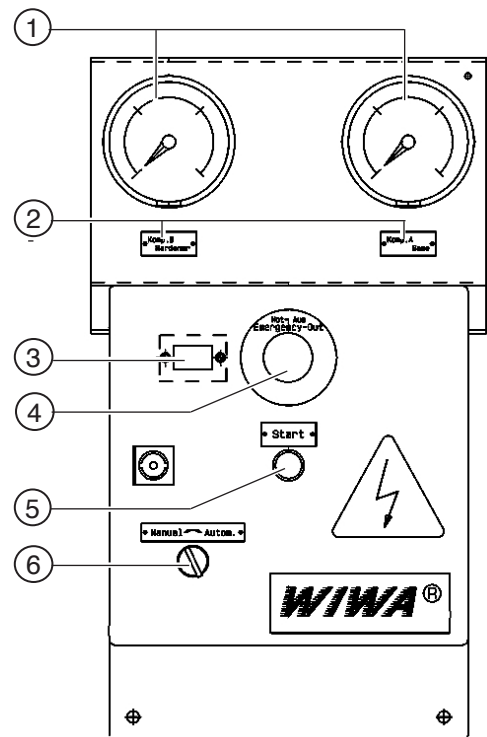


Fig. 19: Control cabinet with electrical pressure and metering monitoring

No.	Description
1	Contact manometer This is where the upper and lower operating limits for the machine are set. In the case of versions with only one manometer, only the B component (hardener) is monitored.
2	Temperature display (optional) for the material temperature (°C) of each component, measured at the high pressure filter.
3	Cycle counter (optional) This is where the strokes implemented during operation are displayed. This allows the operator to draw conclusions regarding the quantity of pumped material.

No.	Description
4	<p>Stop/emergency stop palm button</p> <p>As soon as this button is pressed, the compressed air supply to the air motor of the proportioning pump and feed pump (optional) is interrupted and the machine switches off. After switching off, the machine remains under pressure.</p> <p>For relieving the pressure refer to chap. 6.5 on page 69.</p> <p>The palm button locks in the pressed position. In order to disengage it, pull it out again.</p>
5	<p>Start button</p> <p>Pressing this button starts the machine up again after a switch-off.</p> <p>Turn the air intake pressure to the proportioning pump down fully first!</p>
6	<p>Manual/automatic selector switch for automatic switch-off</p> <p>Using this switch you activate monitoring of the set operating pressures.</p> <ul style="list-style-type: none"> ▶ In the "manual" position, the machine only switches off if the operating limits are exceeded. ▶ In the "automatic" position, an undercutting and exceeding of the operating limits is monitored. <p>Monitoring is carried out via the contact manometer for the respective component. In order to drive the machine up to the desired operating pressure switch to "manual", and whilst spraying to "automatic".</p>
7*	<p>Draining selector switch</p> <p>In this switch position, the material from the material tanks circulates through the machine until it reaches the mixing unit and via the return hoses back into the material tanks. During draining, the switch/lever for "spraying" and "flushing" must be positioned as follows:</p> <p>Version with selector switch "spraying/flushing" to "FLUSH"</p> <p>Version with separate lever for "spraying" and "flushing", both to CLOSED.</p>
8*	<p>Flushing A button (optional)</p> <p>Pressing the button with simultaneous positioning of the selector switch "spraying/flushing" to "flushing" results in optimum flushing of the valve. Actuate this button in alternation with the "Flush B" button.</p>
9*	<p>Spraying/flushing selector switch for selecting the operating mode</p> <p>In the "spraying" switch position the material to be processed is pumped to the spray gun. In the "flushing" switch position, all parts that have come into contact with the mixed material are flushed.</p>
10*	<p>Flushing B button (optional)</p> <p>Pressing the button with simultaneous positioning of the selector switch "spraying/flushing" to "flushing" results in optimum flushing of the valve. Actuate this button in alternation with the "Flush A" button.</p>
11	<p>Compressed air regulator</p> <p>The settings for this regulator and the regulator in the control cabinet are predefined and must not be changed.</p>

)* The switches and buttons may optionally be located on the control cabinet or the associated mixing unit. The operating modes are set on manually actuated mixing units with the help of ball valves at the mixing unit.

3.8 Compressed air regulation unit

A compressed air regulation unit (see Fig. 20) encompasses a compressed air regulator and manometer for remote-controlled regulation of the air intake pressure for various machine modules. The compressed air regulation unit is generally mounted on the side on the machine control cabinet.

The number and arrangement of the compressed air regulators and manometers can vary greatly, because the specification as to which modules should be regulated centrally is specific to the order.

No.	Designation (examples)
1	Compressed air regulator and manometer for the proportioning pump
2	Compressed air regulator and manometer for the flushing pump.
3	Compressed air regulator and manometer for the feed pump, for comp. A
4	Compressed air regulator and manometer for the feed pump, for comp. B

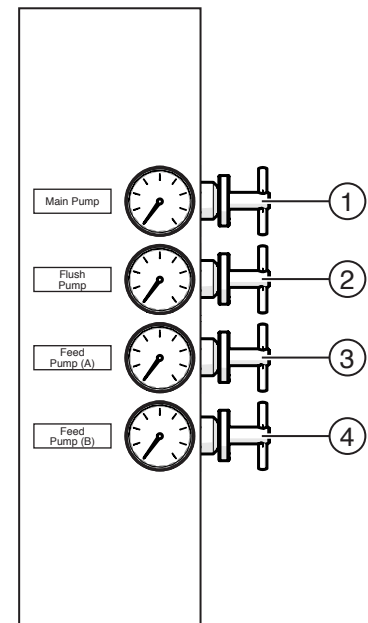
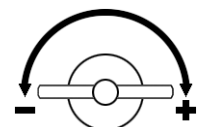


Fig. 20: Compressed air regulation unit (example)

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 anticlockwise.



3.9 Mixing units

The two components of the process material are only combined once in the mixing unit. Actual mixing takes place in the static mixer, which is mounted at the material outlet of the mixing unit. From here the material travels via the spray hose to the spray gun.

It is possible to use different types of mixer on the **DUOMIX 333**, which vary in terms of the type of operation and installation:

- Operation via manually actuated ball valves or pneumatic valves, which are controlled with rotary switches on the control cabinet.
- Mounting on the frame of the **DUOMIX 333** or as an external module, which is connected with the **DUOMIX 333** via an intermediate piece and a hose assembly.

Mixer types			
Operation	Installation	Art. no.	For further reading
manual	on the frame	0646722	Chap. 3.9.1 on page 32
	external	0650946	Chap. 3.9.2 on page 33
pneumatic	on the frame	0642526	Chap. 3.9.3 on page 34
		0654014	Chap. 3.9.4 on page 35
	external	0642663	Chap. 3.9.5 on page 36

3.9.1 Manual mixing unit on the frame

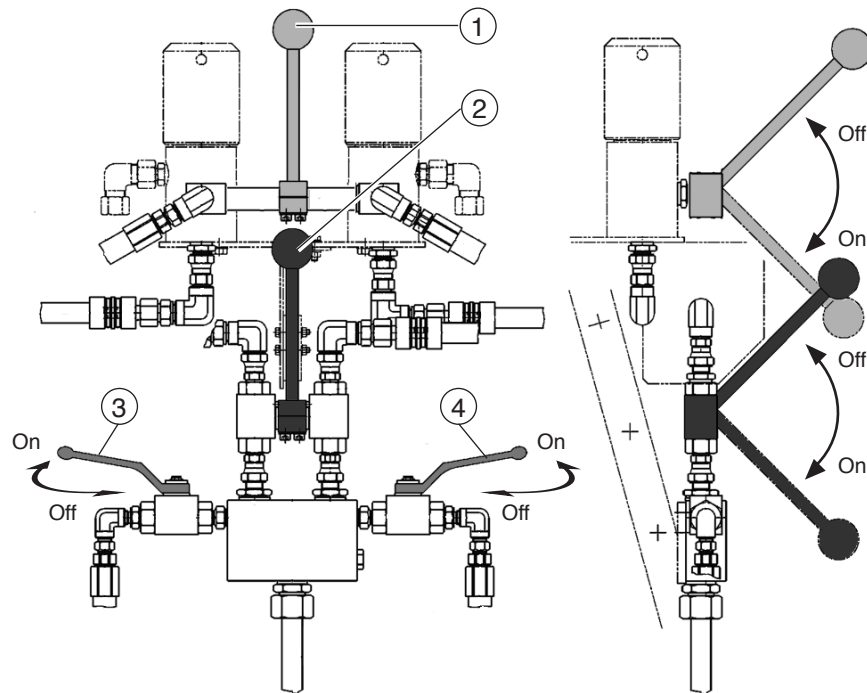


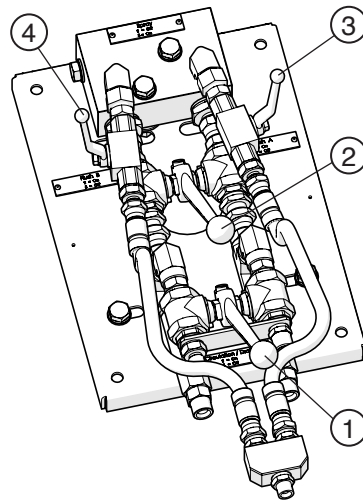
Fig. 21: Manual mixing unit on the frame

No.	Designation
1	Lever "drain / circulation" on / off
2	Lever "spraying" on / off
3	Level "flushing" comp. A on/off
4	Level "flushing" comp. B on / off

Operating mode	Lever 1 Circulation	Lever 2 Spraying	Lever 3 Flush A	Lever 4 Flush B
Spraying	Off	On	Off	Off
Flush A ¹⁾	Off	Off	On	Off
Flush B ¹⁾	Off	Off	Off	On
Flush A+B ¹⁾	Off	Off	On	On
Circulation	On	Off	Off	Off

¹⁾ Open and close the flushing levers multiple times in alternation during flushing, in order to ensure that each component is flushed through separately. Finally, flush with both levers in the flushing position

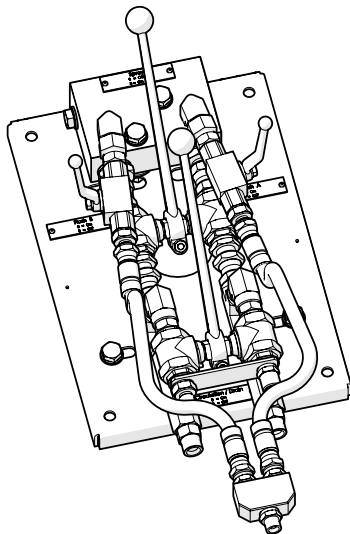
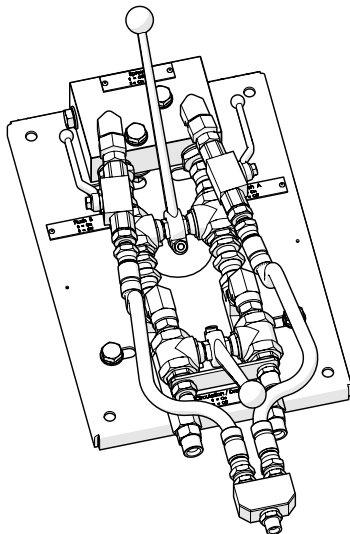
3.9.2 External mixing unit with manual operation



No.	Designation
1	Lever "return on / off" The return is closed in spray and flushing operation (off) and is opened for circulation of the material or machine pressure relief (on).
2	Lever "spraying on / off"
3	Level "flushing comp. A on / off"
4	Level "flushing comp. B on / off"

Fig. 22: External mixing unit with manual operation

Using the levers it is possible to set the operating modes "circulation", "spraying" and "flushing" (A, B and A+B) as follows:

Circulation	Spraying	Flushing
 <p>Fig. 23: "Circulation"</p>	see Fig. 22	 <p>Fig. 24: "Flushing" (A+B)</p>

Operating mode	Lever 1 Return	Lever 2 Spraying	Lever 3 Flush A	Lever 4 Flush B
Spraying	Off	On	Off	Off
Flush A ¹⁾	Off	Off	On	Off
Flush B ¹⁾	Off	Off	Off	On
Flush A+B ¹⁾	Off	Off	On	On
Circulation	On	Off	Off	Off

¹⁾ Open and close the flushing levers multiple times in alternation during flushing, in order to ensure that each component is flushed through separately. Finally, flush with both levers in the flushing position

3.9.3 Pneumatic mixing unit on the frame with 2 flushing valves

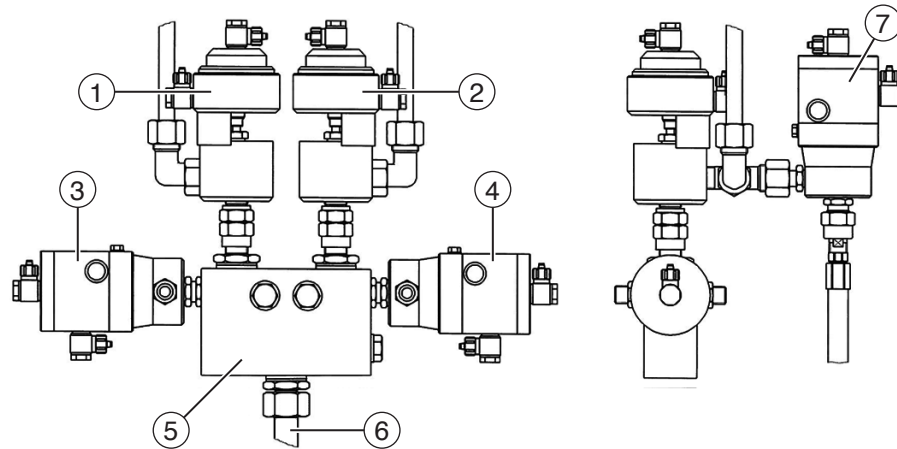


Fig. 25: Pneumatic mixing unit on the frame with 2 flushing valves

No.	Designation
1	Automatic valve "spraying" for the A component
2	Automatic valve "spraying" for the B component
3	Automatic valve "flushing" for the A component
4	Automatic valve "flushing" for the B component
5	Mixing block
6	Static mixer
7	Automatic valve "circulation" for the A component
8	Automatic valve "circulation" for the B component (covered by no. 7)

The automatic valves are controlled on the control cabinet with:

- the on/off switch "drain",
- the selector switch "spraying/flushing",
- the illuminated pushbutton "flush base",
- the illuminated button "flush hard".

Using these switches and buttons it is possible to set the operating modes "circulation", "spraying" and "flushing" (A, B and A+B) as follows:

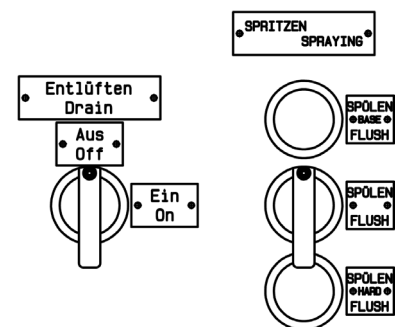


Fig. 26: Mixing unit controller

Operating mode	On/off or selector switch		Illuminated pushbutton	
	Draining	Spraying / flushing	Flush base	Flush hard
Spraying	Off	Spray	Off	Off
Flush A	Off	Flush	On	Off
Flush B	Off	Flush	Off	On
Flush A+B	Off	Flush	On	On
Circulation	On	Flush	Off	Off

3.9.4 Pneumatic mixing unit with one flushing valve

This mixing unit is used in particular with coatings in pipes.

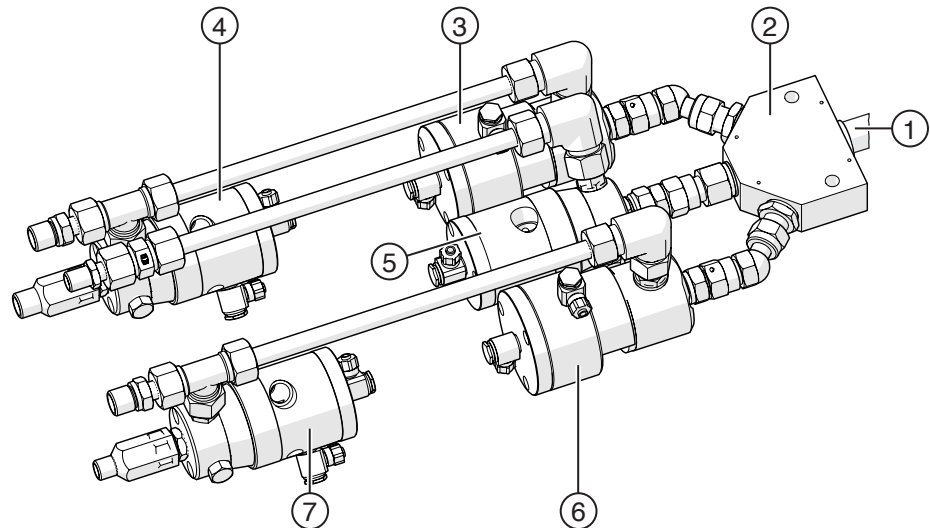


Fig. 27: Pneumatic mixing unit with one flushing valve

No.	Designation
1	Static mixer
2	Mixing block
3	Automatic valve "spraying" for the A component
4	Automatic valve "circulation" for the A component
5	Automatic valve "flushing"
6	Automatic valve "spraying" for the B component
7	Automatic valve "circulation" for the B component

The automatic valves are controlled on the control cabinet with:

- the on/off switch "drain",
- the selector switch "spray/flush".

Using these switches it is possible to set the operating modes "circulation", "spraying" and "flushing" as follows:

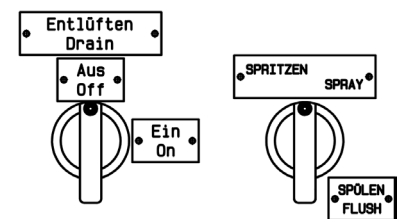


Fig. 28: Mixing unit controller

Operating mode	On/off switch draining	Selector switch spraying/flushing
Spraying	Off	Spray
Flushing	Off	Flush
Circulation	On	Flush

3.9.5 External pneumatic mixing unit

The external pneumatic mixing unit corresponds in terms of the basic configuration with the pneumatic mixing unit on the frame with 2 flushing valves, as shown in chap. 3.9.3 on page 34. However, the parts of the mixing unit are installed in a control cabinet. The switches and illuminated pushbuttons for controlling the mixing unit are located on the control cabinet.

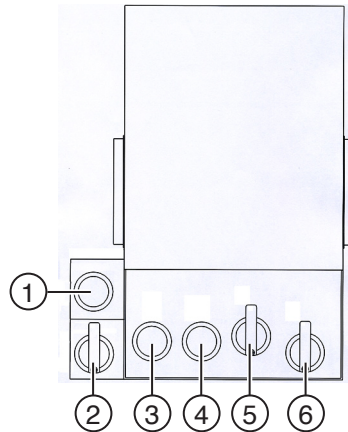


Fig. 29: Front view
(switches and buttons)

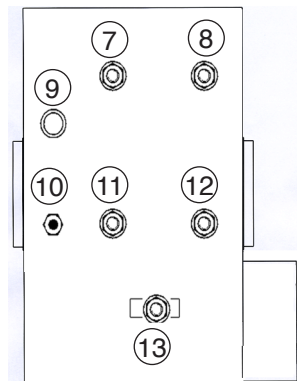


Fig. 30: Rear view (connections)

No.	Description
1	Compressed air regulator for spray gun atomiser air (optional)
2	Switch "spray" on/off for spray gun (optional)
3	Button "flush" comp. A
4	Button "flush" comp. B
5	Selector switch "spray/flush"
6	Selector switch "drain" open/ON - closed/OFF
7	Connection for the compressed air line to the mixing unit
8	Connection for the time switch signal
9	Connection for the return, comp. B
10	Connection for the return, comp. A
11	Connection for the supply, comp. B
12	Connection for the supply, comp. A
13	Connection for the flushing line

3.10 Intermediate pieces

An intermediate piece is used with an external mixing unit. The hose assembly is connected to the intermediate piece, which serves as a material and - with a pneumatic mixing unit - also as a compressed air connection to the mixing unit.

The following may optionally also be located on the intermediate piece:

- a lever for opening and closing the circulation or the ratio check unit, or
- temperature display for A and / or B component
- Connections for the hose heating

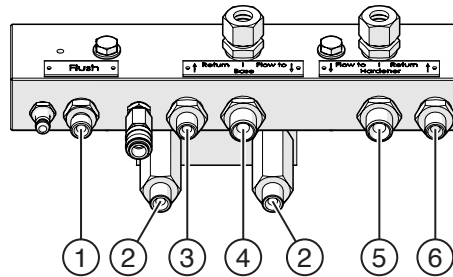


Fig. 31: Intermediate piece with pneumatic mixing unit

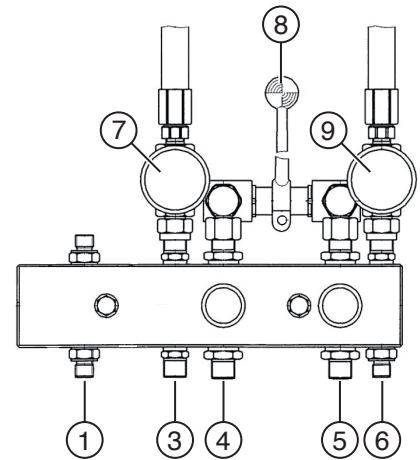


Fig. 32: Intermediate piece with manually actuated mixing unit

No.	Connection
1	Flushing
2	Hose heating (optional)
3	Return, A component
4	Supply, A component
5	Supply, B component
6	Return, B component
7	Temperature display comp. A (optional)
8	Lever for opening and closing the circulation or the ratio check unit (optional)
9	Temperature display comp. B (optional)

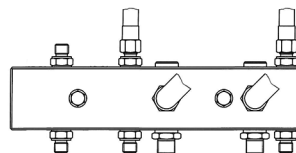


Fig. 33: Pneumatic connections on the intermediate piece

Item	Colour	Operating mode
D1	yellow	"Spraying" open / ON - "Flushing" closed / OFF
D2	green	"Spraying" closed / OFF - "Flushing" open / ON
D3	red	"Draining" open / ON
D4	black	"Draining" closed / OFF
D5	blue	"Flushing" open / ON - "Spraying" closed / OFF comp. A
D6	black / red	"Flushing" open / ON - "Spraying" closed / OFF comp. B

3.11 Flushing pump

When processing 2-component materials it is essential to use a flushing pump. With the help of this pump, all parts of the machine that have come into contact with the mixed material are flushed.

During the flushing process, the flushing pump pumps the flushing media out of the flushing media tank through the intermediate piece, the hose assembly and the mixing unit to the spray gun.

No.	Designation
1	Compressed air regulator with manometer
2	Air motor
3	Material pump
4	Sound damper
5	Material outlet
6	Suction intake

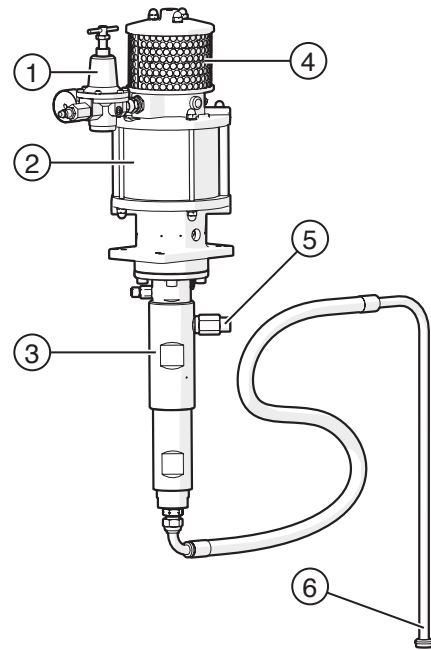


Fig. 34: : Flushing pump

If the mixing unit is equipped with 2 ball valves/buttons for the separate flushing of component A + B, the flushing media line branches off before the mixing unit.

The flushing pump can be mounted directly on the frame of the **DUOMIX 300/333** or externally, e.g. on a wall bracket.

3.12 Material supply

The material to be processed can be fed to the proportioning pump in the following way:

- via suction lines (see Fig. 35),
- from feed tanks (see Fig. 36),
- with feed pumps (see Fig. 37),
- with extrusion pumps (see Fig. 86).

Selection of the feed system takes place on a customer-specific basis, depending on the characteristics of the material to be processed.

Suction lines comprising a suction line with suction pipe and suction screen are connected at the material intake of the material pumps. The suction pipe is placed directly in the material tank.

Feed tanks are connected directly at the material intake for the material pumps. The process material is fed into the feed tanks. The material flow from the feed tank to the material pump can be interrupted by a shut-off valve. In order to clean the feed tanks and during a material change it is possible to drain the residual material out of the feed tanks via the drainage valves.

Feed pumps are used for pumping material from barrels or containers. These support the proportioning pump with the pumping of highly viscose materials. Feed pumps are connected with the compressed air supply via a pressure distributor and are controlled via a separate compressed air regulator. It is possible to use piston pumps or membrane pumps as feed pumps. The feed pumps are generally mounted on the barrel lids, which are set on the material tanks.

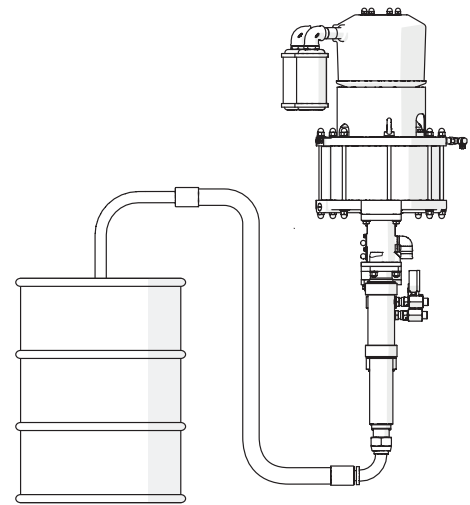


Fig. 35: Material supply with suction line

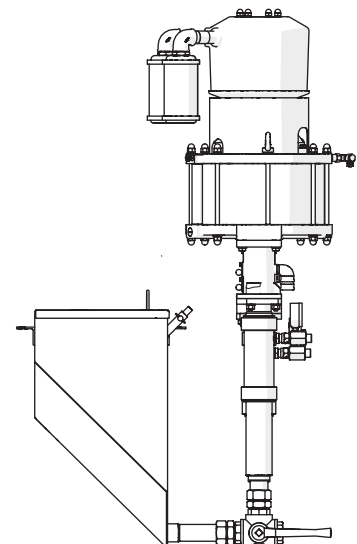


Fig. 36: Material supply with feed tank

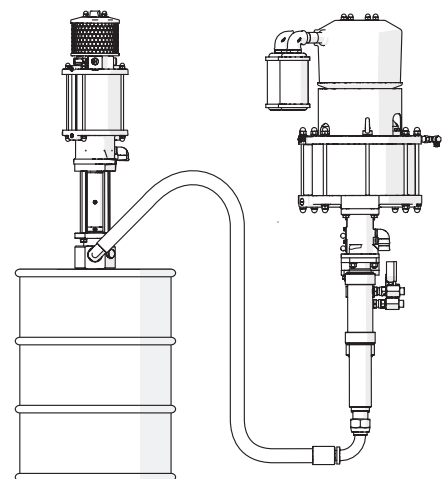


Fig. 37: Material supply with feed pump

With the aid of optionally available **lifts**, the feed pumps can be driven in and out of the material tanks by compressed air.

Lifts are compressed-air driven lifting devices for lifting and lowering barrel lids. It is possible to mount a pump (piston or membrane pump) and further accessories (agitator, level sensor, etc.) on the barrel lid. The barrel lid is connected with the cross beam via 4 pressure rods. The cross beam is mounted on 2 pistons, which executed the lifting movements.

The lifting movements are controlled at the lift controller.

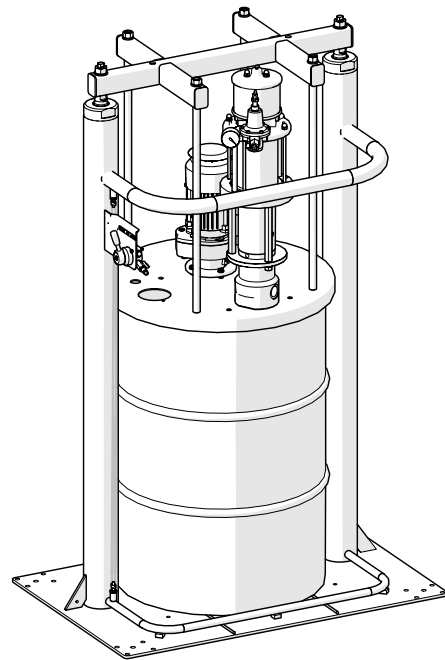


Fig. 38: Feed pump on two-column lift



When operating lifts, rams and the optional accessories (agitator, level sensor, etc.) observe and comply with the corresponding separate operating instructions.

4 Optional expansions and accessories

WIWA offers a comprehensive range of accessories for the optimum preparation and processing of spray materials. The accessories required are configured on a customer-specific basis for each machine.

The following list contains just some of the most common accessories and expansions.

You can find the detailed accessory catalogue at www.wiwa.de. For further information and order numbers, you can also contact an approved **WIWA** dealer or **WIWA** customer service.

4.1 Material warming and heating systems

Many spray materials only achieve their optimum flowing and processing characteristics through warming. Precise temperature maintenance of the spray materials over an extended period enables consistent working results. Temperature adjustment takes place on the devices themselves.

The spray material can be heated by:

- Material fluid heater,
- Barrel floor heater,
- Barrel heating tape and heating sleeves,
- Screw-in heating element.

4.1.1 Material fluid heater

Material fluid heaters can be used in the low pressure range (upstream of the proportioning pump) and in the high pressure range (downstream of the proportioning pump). They are equipped with an open cable end for direct connection to the owner's power supply.

The temperature controller is located on the top of the material fluid heater.

The spray material can be heated by the material fluid heater to a maximum 80 °C / 176 °F.

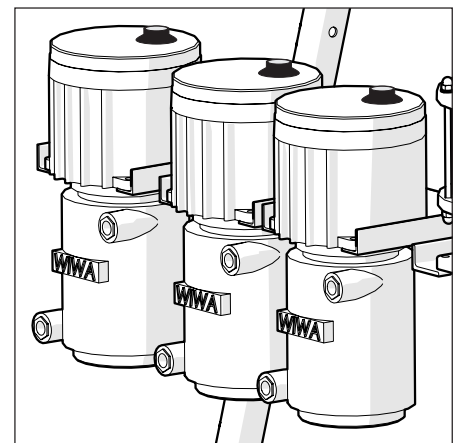


Fig. 39: Material fluid heater



Observe and adhere to the separate operating instructions for the material fluid heater.

4.1.2 Barrel floor heater

A barrel floor heater is an electrical hot plate that is placed on a 200 l metal barrel.



Fig. 40: Barrel floor heater



Observe and adhere to the separate operating instructions for the barrel floor heater.

4.1.3 Barrel heating tape and heating sleeves

Barrel heating tape and heating sleeves are placed around the outer tank wall and fastened, e.g. with lashing straps and/or Velcro fasteners.

Barrel heating tape and heating sleeves are available for various tank sizes.



Fig. 41: Barrel heating tape



Observe and adhere to the separate operating instructions for the barrel heating tape and heating sleeves.

4.1.4 Screw-in heating element

The electrical screw-in heating element is inserted in a double-walled material tank, which is filled with water.

The temperature controller is located on the connection housing, on which the electrical supply is also installed.

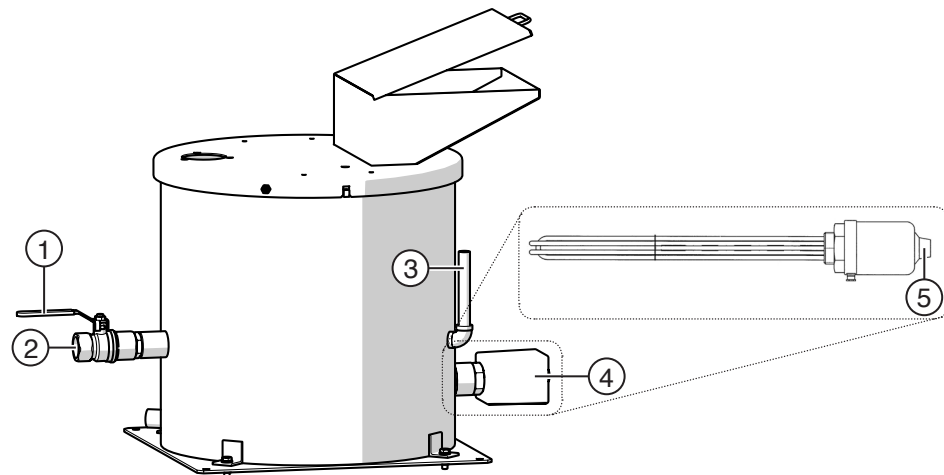


Fig. 42: Double-walled material tank with screw-in heating element

No.	Designation
1	Ball valve for draining the material
2	Nozzle for draining the heating water
3	Nozzle for filling the heating water

No.	Designation
4	Screw-in heating element
5	Temperature controller on the screw-in heating element



Observe and adhere to the separate operating instructions for the screw-in heating element.

4.2 Hose heating

Hose heating is used with machines with an external mixing unit to ensure that the spray material in the hose assembly is kept at the desired processing temperature.

4.2.1 Hose heating with hot water circulation

In the case of hose heating with hot water circulation, a hose is laid in the hose assembly through which the heated water circulates. The water is circulated with a membrane pump and heated by a Material fluid heater.

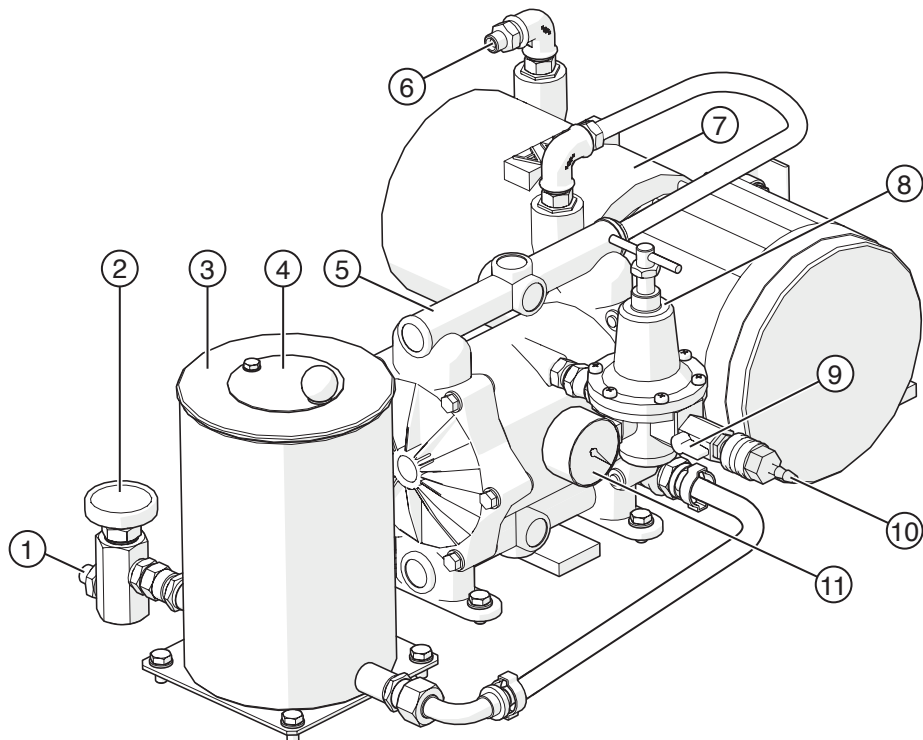


Fig. 43: : Hose heating with hot water circulation

No.	Designation
1	Return from the hose assembly
2	Display of the return temperature
3	Expansion tank
4	Inspection hole with closure
5	Membrane pump
6	Supply in the hose assembly

No.	Designation
7	Material fluid heater
8	Compressed air regulator for the membrane pump
9	Shut-off valve for the compressed air supply to the membrane pump
10	Connection for the compressed air supply to the membrane pump
11	Manometer for the air intake pressure to the membrane pump



Always observe and adhere to all information in the separate operating instructions for the Material fluid heater and the membrane pump.

4.2.2 Hose heating with heating coil

With the hose heating with a heating coil, an electric heating coil is coiled around the material hoses in the hose assembly. The temperature controller and temperature display are located in a separate control unit, which is generally mounted on the control cabinet of the **DUOMIX 300/333**.



Fig. 44: Control unit for the hose heating with heating coil



Observe and adhere to the separate operating instructions for the hose heating.

4.3 Agitators

Agitators ensure the even distribution of heat and consistency of the spray material, not by stirring up the material from the bottom but rather from the wall to the centre of the tank.

Pneumatic or electrical agitators are optionally used, which are mounted on a barrel lid or on the lid of a feed tank. The barrel lid itself can in turn be mounted on a lift.

Pneumatic agitators are supplied with compressed air via the maintenance unit of the **DUOMIX 300/333**, or if a lifting device is used then via its control unit.

The speed of rotation is controlled with the adjusting screw on the air intake of the agitator.

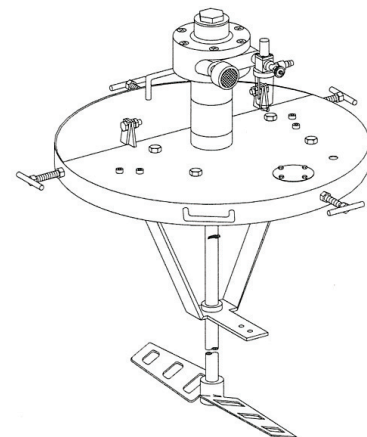


Fig. 45: Pneumatic agitator

Electrical agitators are connected to the local power supply.

The speed of rotation is defined by the key data for the (gear) motor used. It cannot be changed.

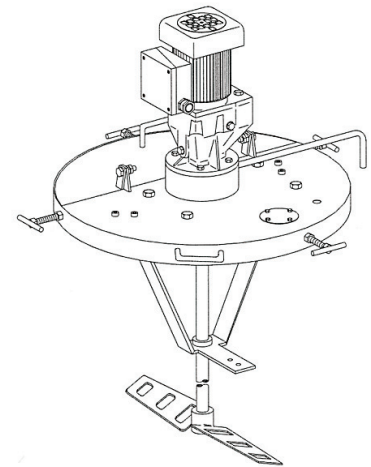


Fig. 46: Electric agitator



Observe and adhere to the separate operating instructions for the agitators.

4.4 Level monitoring

Level monitoring is used for controlling the material level in a container, and for monitoring the material supply with a barrel-to-barrel filling process. Its use prevents any undesirable air intake with empty material tanks.

A sensor measures the actual fill level in the container and issues an acoustic signal with "container almost empty" depending on the design. Furthermore, the feeding pump is switched off as soon as the lowest level is reached and no further material flows. Conversely, a signal releases the pump again when the container is full once more.

The level monitoring is available in the following versions:

- electrical (e.g. radar sensors)
- pneumatic

4.5 Ratio check unit

It is possible to check the mixing ratio between the A and B component at the ratio check unit.

A ratio check unit is usually mounted on the machine if toothed wheel flowmeters are present for measuring the flow. Wearing of the flowmeter results in deviations between the target and actual mixing ratio, which can be determined through ratio check (note chap.6.1.11 on page 62).

Selection of the ratio check unit is dependent on the type of mixing unit.

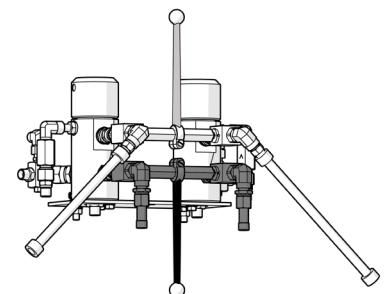


Fig. 47: Ratio check unit on the high pressure filter

- If the machine is equipped with a mixing unit on the frame, the ratio check unit is either fitted at the high pressure filter (see Fig. 47) or at the mixing unit (see Fig. 48).
- If the machine is equipped with an external mixing unit and/or flowmeters for the flow rate measurement, the ratio check unit is mounted on the intermediate piece (see Fig. 49).

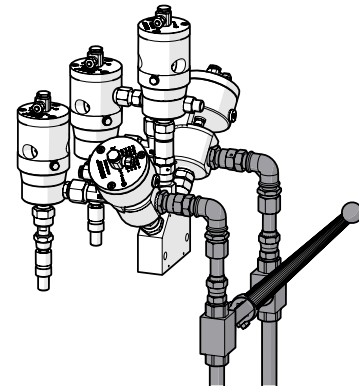


Fig. 48: Ratio check unit on the mixing unit

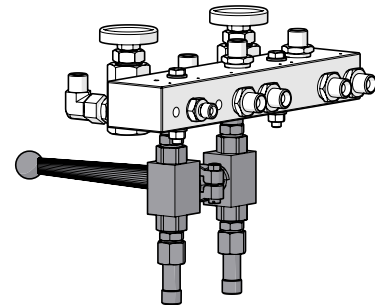


Fig. 49: Ratio check unit on the intermediate piece

4.5.1 Flow rate measuring device

In order to determine the actual amount of material issued and simultaneously monitor the mixing ratio, the **DUOMIX 300/333** can be equipped with an electrically operated flow rate measuring device in conjunction with material flowmeters.

On the control cabinet of the flow rate measuring device it is possible to call up the actual material flow rate for each component, per coated pipe, per day and/or the total quantity of material issued.

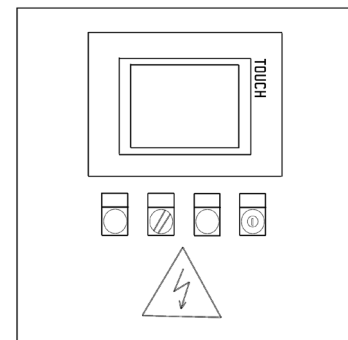


Fig. 50: Control cabinet of the flow rate measuring device

Monitoring takes place in automatic mode. As soon as the mixing ratio exceeds or undercuts the permissible tolerance of the previously entered target value, the machine is switched off automatically. Acoustic and light signals indicate the fault.



Observe and adhere to the separate operating instructions for the flow rate measuring device.

4.5.2 Cycle counter

Cycle counters record the double strokes for one component executed during operation. In order to determine the quantity of material issued, multiply this value by the (theoretical) pump volume per double stroke (see type plate).

The cycle counters are installed on the control cabinet for the pressure and metering monitoring (see Fig. 51).

Differentiation is made between 2 types of cycle counter:

- **incremental:** All double strokes executed are counted up, starting from zero. If necessary, the cycle counter can be reset to zero, e.g. with a container or material change.
- **decremental:** All double strokes executed are counted down, started from a pre-set value. Upon reaching zero and/or if necessary, e.g. with a container or material change, it is possible to re-enter the starting value.

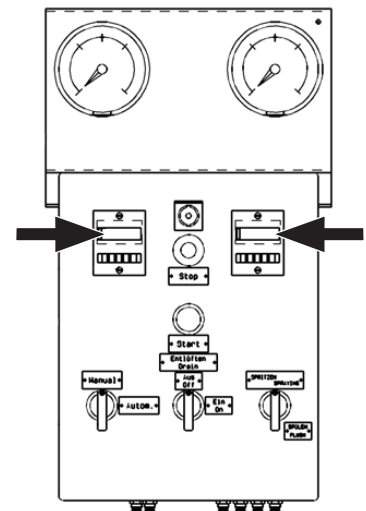


Fig. 51: Cycle counter

4.5.3 Internal pipe coater

If a wheel blast device is to be connected to the machine for internal pipe coating, a separate control unit is located on the control cabinet or optionally on the external mixing unit for the wheel blast device (see Fig. 52).

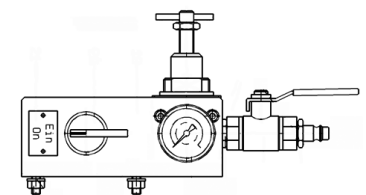


Fig. 52: Control unit for the wheel blast device



Observe and adhere to the separate operating instructions for the wheel blast device.

4.5.4 Distributor for spray guns

Using a distributor for spray guns it is possible to connect multiple pistols to the machine simultaneously.

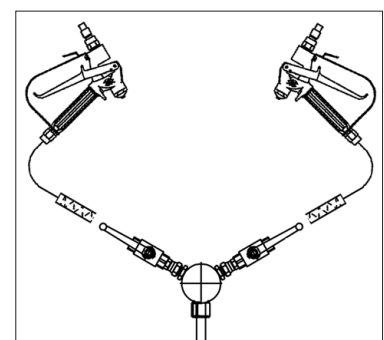


Fig. 53: Example with a 2-fold distributor

5 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.

5.1 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 type plate.
- The machine must be lifted exclusively at the intended attachment points for lifting accessories.
The number of transport lugs (see Fig. 54) and stacker eyes (see Fig. 55) is dependent on the size of the machine. Ensure the bearing cables hang freely. If necessary, additionally use a yoke as a lifting aid. Fasten the lifting accessories securely to all transport lugs.
- In the case of versions with crane eyes, ensure the bearing cables hang freely. The transport cables must be at least 3 m in length. Fasten the crane eyes securely to all fastening struts.
- When using a forklift truck ensure sufficient length of the truck forks. Each of the truck forks must be guided through the two stacker mounts located opposite each other on the frame.
- When transporting with a forklift truck drive the forks as far apart as possible, in order to keep the tipping moment to a minimum.
- Ensure the load is evenly distributed, in order to avoid the system 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.



Fig. 54: Transport lug

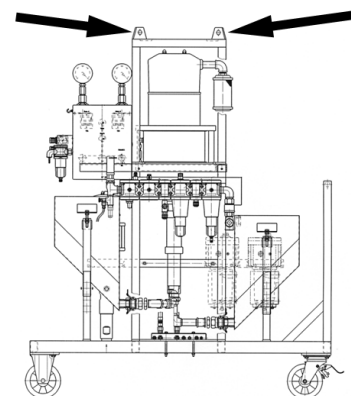


Fig. 55: Crane eye



Fig. 56: Stacker mount

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.

5.2 Installation site

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 during a storm, a life-endangering situation may arise for the operating personnel in the event of lightning!

- Never operate a machine outdoors in a storm!
- The machine owner must ensure that the machine is equipped with suitable lightning protection equipment and that the entire system is protected with lightning protection measures.



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. In the case of the mobile machine variant, apply the parking brake.
- 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. It is necessary to guarantee at least 5-times air exchange.
- 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.

5.3 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.



During assembly, ensure correct component assignment.

Observe the pump and hose assignment at all times, throughout operation of the machine.

The material hoses are colour-coded:
 Component A (base component) => blue
 Component B (hardener) => red

The compressed air connections cannot be interchanged due to the connection size and configuration of the couplings and nipples.



Observe the assembly information in the operating instructions for the optional attachment devices.

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

The assembly work required is dependent on the machine version. Skip the chapters that do not reflect your machine's equipment.



If, due to the respective agreement, components are not included in the scope of supply that are required for the correct operation of the system then the owner is responsible for procuring and installing these prior to commissioning the machine!

Before commencing assembly work ensure - with the machine and optional accessories - that:

1. the compressed air shut-off valve is closed.
2. the compressed air regulator is turned down fully.
3. all material shut-off valves are closed.

5.3.1 Installing the hose assembly

If the machine is equipped with an external mixing unit, a hose assembly is used in order to connect the intermediate piece on the **DUOMIX 300/333** with the external mixing unit.

The hose assembly contains a supply and return hose for each component, as well as a flushing hose.

If the external mixing unit is pneumatically controlled, the compressed air lines for the mixing unit and for control of the time switch are additionally integrated in the hose assembly.



WARNING

If the connections for the hose assembly are subjected to strain, these may be torn out. The escaping material under high pressure may cause injuries and damage to property.

- If tensile forces are anticipated on the hose assembly connections (for example due to the positioning of the mixing unit) then it is necessary to utilise strain relief.



If the hose assembly is too tightly curved, the hoses in the hose assembly may become kinked.

- Do not undercut the minimum bending radius of 30 cm (11.8 inch)!

1. Connect the hose assembly to the intermediate piece.

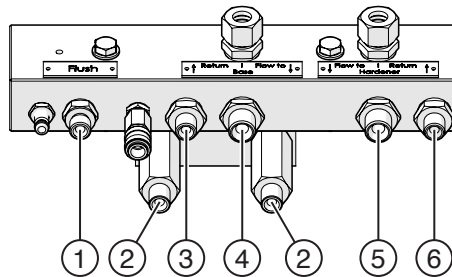


Fig. 57: Intermediate piece with pneumatic mixing unit

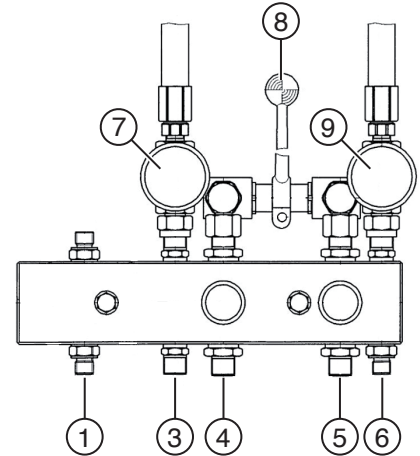


Fig. 58: Intermediate piece with manually actuated mixing unit

No.	Connection
1	Flushing
2	Hose heating (optional)
3	Return, A component
4	Supply, A component
5	Supply, B component
6	Return, B component
7	Temperature display comp. A (optional)

No.	Connection
8	Lever for opening and closing the circulation or the ratio check unit (optional)
9	Temperature display comp. B (optional)

2. Connect the hose connections at the other end of the hose assembly to the external mixing unit.

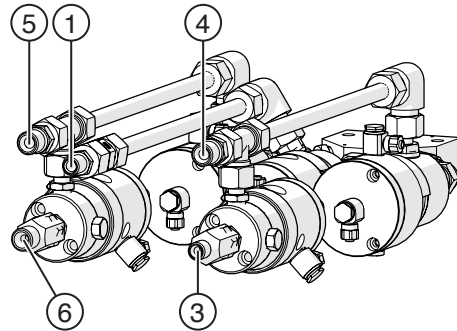


Fig. 59: Connection with external pneumatic mixing unit

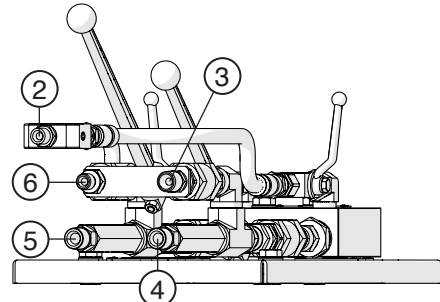


Fig. 60: Connection with external manual mixing unit

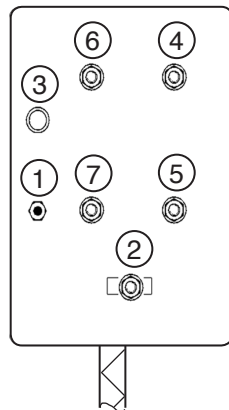


Fig. 61: Connection with external pneumatic mixing unit with hood

5.3.2 Connect the spray hose and spray gun

The spray hose is the connection between the static mixer on the mixing unit 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.

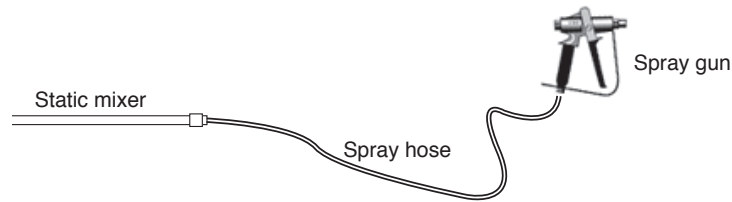


Fig. 62: Connect the spray hose and spray gun



Observe and adhere to the separate operating instructions for the spray gun.

5.3.3 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.

An ground cable is already connected to the machine at the time of delivery.



1. Connect the machine's ground cable to an electrically conductive object outside of EX zones.
2. Ensure correct grounding of the object to be coated.

5.3.4 Insert filter inserts in the high pressure filter

Insert a filter insert in the high pressure filter that is appropriate for the process material. Further information on this can be found in Chap. 7.6 High pressure filter on page 76.

5.3.5 Connect flushing pump

The flushing pump is generally fully installed at the time of delivery.

If the pump has been separately packaged for transport purposes, perform the following working steps:

1. Make sure that the compressed air regulator is turned down fully and that the compressed air shut-off valve (optional) is closed.
2. Connect the material hose directly to the mixing unit or to the intermediate piece of the machine (depending on the version).
3. Connect the compressed air line to the compressed air connection on the flushing pump.

5.3.6 Connect feed pumps

If you are using feed pumps for the material supply from external material tanks, connect these as follows:

1. Make sure that the compressed air regulator is turned down fully at each feed pump and that the compressed air shut-off valve (optional) is closed.
2. Connect the material shut-off valve downstream of each feed pump.
3. Fit the material feed hoses to the material outlet of the feed pump and to the proportioning pump suction.
4. Run the return hoses from the outlet distributor into the material tanks and secure these against slipping out unintentionally.
5. Connect the compressed air line to the compressed air connection on the feed pump.

5.3.7 Connect the owner's optional expansions and attachment devices

If, in accordance with the agreement, the scope of supply does not include components that are required for the normal operation of the machine, the owner is responsible for installing these correctly prior to starting up the machine!

5.3.8 Establish the mains connection



WARNING

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

- The mains connection must be established exclusively by specialist personnel with an electrical qualification!



Observe the EX zones at your place of work. In potentially explosive areas, the connection must be explosion-protected!

If electrical modules or accessories are available, these must be connected to the local power supply, e.g.:

- Electrically-powered pressure and metering monitoring,
 - Material fluid heater,
 - Barrel heating tape,
 - Barrel floor heater,
 - Tubular heating elements for tank heating,
 - Electrically-powered agitators,
 - Flow rate measuring device.
1. Check that the conditions at the installation site comply with the power connection data for the machine. The power connection data for the control cabinet/attachment devices can be found on the associated type plate.
 2. Check that the site power supply is active.
 3. Make sure that the temperature setting for the heating elements used has been turned right down.
 4. In the case of versions with Material fluid heater:

The Material fluid heater is equipped with a permanent connection line with open end.
Connect the connection cable according to the wiring diagram supplied.



Observe and adhere to the separate operating instructions.

5. In the case of versions with agitators:
When connecting the agitators observe their direction of rotation - if the connection cable is correctly connected, the direction of rotation complies with the direction of the arrow on the agitator housing.



Observe and adhere to the separate operating instructions.

6. In the case of versions with mains plug:
Plug the mains plug into a suitable power supply.

5.3.9 Connect compressed air supply



In order 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 regulators are turned down fully and that the compressed air shut-off valve is connected to the maintenance unit.
2. Close the compressed air lines for the optional accessories at the compressed air distributors for the machine (generally behind the maintenance unit).
3. Run the on-site compressed air line to the compressed air connection on the maintenance unit.

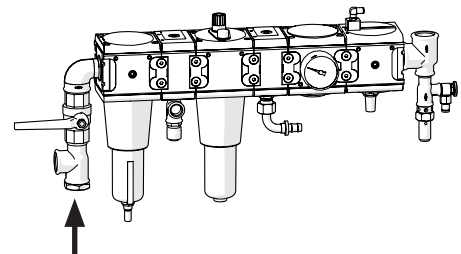


Fig. 63: Compressed air connection at the maintenance unit

6 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 Personal protective equipment on page 18.
- The processing and cleaning materials must be available in sufficient quantities.



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.
- Suction systems must never be blocked, kinked or defective.
- If this should occur, bring the respective pump to an immediate standstill, trace the material and vent the machine.



The pressures cited in this chapter are guidelines values only and it may be necessary to adjust these depending on the viscosity of the material or the hose length used.



All sprayed materials must be supplied with information regarding viscosity, processing temperatures, mixing ratio, etc. If this is not the case, request this data from the respective machine manufacturer.



Keep the cleaning fluids recommended by the material manufacturer and compatible with the material available in sufficient quantities for flushing and cleaning the machine.



Observe the safety datasheet of the material manufacturer.



Observe and adhere to the information in the user manuals for the optionally used attachment devices, such as the material heater and agitators, etc.

You require 2 collection containers for surplus material. These containers are not included in the scope of supply.

6.1 Putting the machine into operation

- Check that all safety devices are present and fully functional.
- Check the lubricant level in the oil tank for the maintenance unit and top up if necessary.

- ☑ Check the release agent level in the proportioning pump and top up if necessary (see chap. 7.4.2 on page 76).
- ☑ Check the release agent level in the feed pumps (if available) and top up if necessary.
- ☑ Ensure the machine and the object to be coated are correctly grounded (see chap. 5.3.3 on page 53).
- ☑ During commissioning (flushing) check that all machine parts are leak-tight and tighten the connections if necessary.

6.1.1 Overview of the working steps during commissioning

1. Start the machine
2. Put the flushing pump into operation
3. Clean the machine
4. Ready the processing material
5. Fill machine with processing material and vent
6. (optional) Set the de-icing system
7. Clean and fill hose assembly and spray gun
8. (optional) Put the heating systems into operation
9. (optional) Put hose heating into operation with hot water
10. (optional) Calibration — check the mixing ratio
11. Set spray pressure
12. Setting the pressure and metering monitoring

6.1.2 Start the machine

Before starting the machine, check:

- ☑ Are all compressed air shut-off valves closed?
 - ☑ Are all compressed air regulators turned down fully?
 - ☑ Are all optional accessories switched off?
 - ☑ Is the spray gun locked?
1. Open the compressed air shut-off valve on the maintenance unit.
 2. Switch the machine to "manual" mode at the control cabinet.
 3. Press the start button on the control cabinet.

6.1.3 Put the flushing pump into operation



The flushing pump must always be ready for operation during work, in order that all parts that have come into contact with the mixed material can be flushed at any time within the specified pot life!

1. Place the suction intake for the flushing pump in the flushing media tank.
2. Set the flushing pump to a pressure of 3-6 bar at the compressed air regulator, depending on the length of the material hose.

6.1.4 Clean the machine

Following assembly, the machine was tested in the factory for faultless function with a test medium. During first commissioning it is therefore necessary to fully clean the machine, in order to flush out the remaining test medium. You can find the process for thorough cleaning in Chap. 6.3.3 Clean the machine thoroughly on page 67.

6.1.5 Ready the processing material



Assign the processing materials correctly. Each component must come into contact with the intended system parts exclusively. Base component (A) = BLUE / Hardener (B) = RED.

Depending on the type of material supply on your machine, it is necessary to observe various working steps when readying the processing material.

in case of machines with suction line:

1. Insert the suction pipes directly in the respective material tanks for the A or B component.
2. Secure the suction lines against slipping out unintentionally.

in case of machines with feed tanks:

1. Make sure that the material drainage valves on the feed tanks are closed.
2. Add the material to the feed tank.

in case of machines with feed pumps:

1. Position the feed pump in the material tank such that the suction intake is flush with the tank bottom, in order that the tank can be optimally emptied – either
 - in the bung hole with the use of lifting gear
 - or with the aid of a lift mounted on the feed pump.



Observe and adhere to the separate operating instructions for the lift.

in case of machines with extrusion pump on a ram:

1. Position a material tank under the ram.
2. Drive the follower plate/follower lid in with the extrusion pump.



Observe and adhere to the separate operating instructions for the ram.

6.1.6 Fill machine with processing material and vent

1. Disassemble the nozzle from the spray gun.
2. Open all material shut-off valves on
 - the material intakes for the proportioning pump,
 - the feed pumps (if available),
 - the feed tanks (if available).
3. Open the compressed air shut-off valve on
 - the maintenance unit of the machine,
 - the feed pumps (if available).
4. Run the return hoses for components A and B into separate collection containers and secure these against slipping out unintentionally.
5. Switch on the optional devices:
 - Heating systems, e.g. barrel floor heater, barrel heating tape and/or tubular heating elements for tank heating:
 - Set the desired temperature at the thermostat for the heating element.
 - Agitators:
 - Observe the separate operating instructions.
 - In the case of pneumatically-driven agitators, set the desired rotation speed with the adjusting screw at the air intake.
6. Set the machine to "vent / circulation".
The operating modes "spray" and "flush" must be switched off.
7. Open the compressed air shut-off valve at the maintenance unit.
8. In the case of versions with feed pumps:
Set a pressure of approx. 3-5 bar (43.5-72.5 psi) at the compressed air regulator for the feed pumps.
9. Disengage the stop/emergency stop button at the control cabinet.
10. Press the start button.
11. Set the compressed air regulator for the proportioning pump such that the proportioning pump runs slowly (approx. 0.5-1 bar / . 7.25-14.5 psi).
12. Pump the remaining cleaning fluid in the machine via the return hoses into an empty, open tank until the process material runs out.
13. Turn the compressed air regulator for the proportioning pumps down fully.
14. Remove the return hoses from the collection containers and run these back into the material tanks. Secure the return hoses against slipping out unintentionally.
15. Set the compressed air regulator for the proportioning pump such that the proportioning pump runs slowly (approx. 0.5-1 bar / . 7.25-14.5 psi).
16. Allow the material to pump slowly via the return hoses, until the entire system has been vented.



If necessary, switch on the material heater in the material circuit (see Chap. 6.1.9 Put the heating systems into operation on page 61).

The material heats evenly due to the circulation.

The machine has now been filled with the process material to the mixing unit and vented.

17. Turn down the compressed air regulator for the metering and feed pumps fully.
18. Set the machine to "Off" or "flush".
19. Actuate the stop/emergency stop button on the control cabinet.
20. Close the compressed air shut-off valve on the maintenance unit.

6.1.7 Set the de-icing system

In order to set the de-icing system (if available), slowly turn the adjusting screw for the de-icing system in an anticlockwise direction at the air outlet for the maintenance unit - at least one and no more than three revolutions.

Implement the precise setting during operation according to requirements, because the degree of icing depends on various factors such as the pressure, number of double strokes per minute, humidity and ambient temperature.



The adjusting screw of the de-icing system remains open with an interruption to work or decommissioning.

6.1.8 Clean and fill hose assembly and spray gun

During this process the spray hose is filled with the process material to the spray gun. If cleaning fluid or air are still in the spray hose, these are forced out.

1. Set the machine to "spray".
The operating modes "vent / circulation" and "flush" are switched off or set to flush.
2. Slowly set a lower pressure at the compressed air regulator for the proportioning pump.
3. In the case of versions with a distributor for the spray guns:
At the distributor, open the material shut-off valve for the spray gun that you wish to work with.
4. Unlock the spray gun and spray the ejected material into an open tank until clean process material emerges.

The hose assembly will slowly fill with material. It may be necessary to adjust the air intake pressure for the proportioning pump, in order to overcome the resistance with a long hose assembly for example.



Observe the pressure display for both components at the contact manometers. Both manometers should display roughly the same pressure. In case of greater deviations observe the fault table in Chap. 8 Eliminating operational faults on page 85ff.

5. Close and lock the spray gun.
6. In the case of versions with a distributor for the spray guns:
 - Close the material shut-off valve for the cleaned spray gun at the distributor.
 - Repeat working steps 3-6 of this chapter at the other spray guns.



If the machine is to be used for internal pipe coating, observe and adhere to the information in the separate operating instructions for the internal pipe coater.

6.1.9 Put the heating systems into operation

Heating systems include, e.g.:

- Barrel floor heaters and barrel heating tape
- Material fluid heaters
- Electrical hose trace heating
- Heated material tanks



WARNING

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

- Only switch the heating systems on once the solvent has been fully pumped out of the system leaving no residue.



Observe and adhere to the information in the separate operating instructions.

1. Switch the heating systems on.
2. Set the desired temperature.
3. Allow the material to continue circulating in the system until the desired process temperature has been reached (observe recommendations of the material manufacturer).

6.1.10 Put hose heating into operation with hot water

1. Fill the expansion tank for the hose heating up to 5 cm below the edge with a mixture of 3 parts water to 1 part antifreeze.
2. Open the shut-off valve on the compressed air intake for the membrane pump.
3. Set the membrane pump to a pressure of 2-3 bar at the compressed air regulator, depending on the length of the hose assembly.
4. Vent the hose heating. To do so, top up the expansion tank for the hose heating if necessary and allow the mixture of water and antifreeze to circulate through the hose assembly until it runs out of the return hose free of bubbles.
5. Switch on the water heating at the control cabinet.
6. Set the hose heating to the desired temperature at the Material fluid heater.

7. Allow the water to continue circulating in the hose assembly until it has reached the desired temperature.

6.1.11 Calibration — check the mixing ratio

Calibration is only possible with machine versions with:

- A ratio check unit or
- Flow rate measuring device.

It is possible to check the mixing ratio between the A and B component through calibration. Deviations between the target and actual mixing ratio arise if the toothed wheel flowmeters for the flow measurement exhibit wear. Furthermore, the K-factors (=number of measuring pulses of the volumetric counter per litre) are determined with calibration.

In the case of versions with a flow rate measuring device:



Calibrate the machine with the flow rate measuring device every time prior to starting work!



Observe and adhere to the information in the separate operating instructions for the flow rate measuring device. The precise calibration procedure with this device is described here.

In the case of versions with a calibration device:

1. Set all operating modes to "Off" or "flush" at the control cabinet/mixing unit.
2. Position an empty container under each drainage valve of the filling unit.
3. Open the ball valve of the ratio check unit.
4. Increase the air intake pressure with the compressed air regulator for the proportioning pump, in order to overcome the counter-pressure at the filling unit.
5. Catch the cleaning fluid that remains in the filling unit, until the process material runs out clean and without bubbles.
6. Close the ball valve of the ratio check unit.
7. Replace the collection containers with clean, empty measuring beakers.
8. Repeat working steps 3-6.
9. Turn the compressed air regulator for the proportioning pump down fully.
10. Check the mixing ratio (A : B) on the basis of the material quantities in the measuring beakers.

6.2 Spraying

Prior to spraying, the machine must have been put into operation (see chap. "6.1 Putting the machine into operation" on page 56 ff).

1. Switch on the attachment devices for material preparation, such as the material heater and agitators, if these are not already in operation.
2. Set the required nozzle in the spray gun.
3. Set the compressed air regulator for the feed pumps to approx. 2-3 bar.
4. Set the machine to the operating mode "spray" at the control cabinet/mixing unit. The operating modes "vent / circulation" and "flush" are switched off or set to flush.
5. In the case of versions with a distributor:
 - Open the material shut-off valve for the spray gun that you wish to work with at the distributor.
 - In the case of simultaneous work with multiple spray guns, a higher air intake pressure may be necessary, in order to achieve an optimum spray pattern. Observe the information in Chap. 6.2.1 Set spray pressure on page 64.
6. Unlock the spray gun and disengage it until the process material runs out cleaning and evenly.
7. Slowly set the optimum spray pressure at the compressed air regulator for the proportioning pump. You can find tips on this in Chap. 6.2.1 Set spray pressure on page 64.
8. Set the operating limits of the components for the actual coating at the contact manometers. This process is described in Chap. 6.2.2 Setting the pressure and metering monitoring on page 64
9. Switch the machine to "automatic" mode at the control cabinet.



in case of pneumatic machines with automatic valves:

As soon as the machine is in the operating mode "spray" and the selector switch "manual/automatic" is set to "manual", a timer is activated in the control cabinet.

After a max. 3 minutes set "automatic" on the control cabinet, otherwise the system will switch off automatically after this time.

If this occurs, turn the pressure on the proportioning pump down, actuate the start button and set the previous spray pressure anew.

10. In the case of versions with a flow rate measuring device:
Switch the flow rate measuring device to "automatic" mode, so that the machine's metering is monitored.

6.2.1 Set spray pressure



Direct the spray gun at a test surface during the setting process.

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 system with the air pressure required, in order to attain good atomisation at the recommended spray distance of approx. 30 - 40 cm.
- 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.

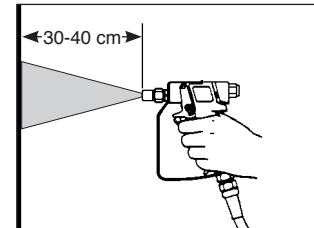


Fig. 64: Spray distance



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

6.2.2 Setting the pressure and metering monitoring

The black pointer on the manometer indicates the actual pressure. The two red pointers are used to set the operating limits for the actual working process after setting the optimum spray pressure as follows:

1. Slide the key provided into the contact manometer.
2. Using the guide needle, turn the bottom red drag indicator to a value approx. 20 bar below the minimum pressure, which is displayed with the spray gun open.
3. Using the guide needle, turn the top red drag indicator to a value approx. 20 bar above the maximum pressure, which is displayed with the spray gun closed.
4. Remove the key.

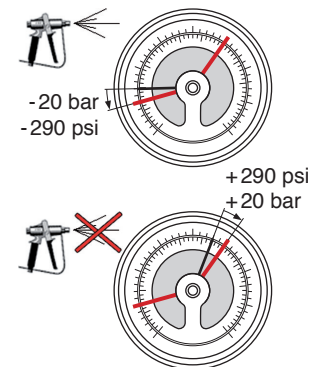


Fig. 65: : Operating limits



After each change in the spray pressure it is necessary to reset the pressure and metering monitoring. If the pointer of the contact manometer does not move or only moves insufficiently, the system must not be put into operation due to the risk of erroneous mixing!

6.2.3 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. 66).
- 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. 67).
- 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.

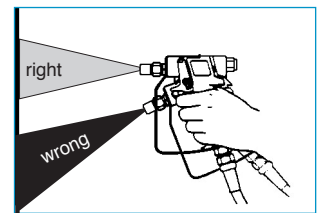


Fig. 66: Spray angle

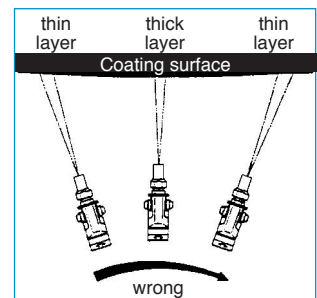


Fig. 67: Spray gun guidance



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

6.3 Flushing

Flush mixing unit and spray gun (Chap. 6.3.2) with

- Work interruption

Clean the machine thoroughly (Chap. 6.3.3) with

- First commissioning
in order that the spray material is not adversely affected by the test medium that was used to test the faultless function of the machine in the factory, the machine must be flushed with a suitable cleaning fluid.
- Material change
- Decommissioning
in order to flush spray material out of the machine with an interruption to the spray operation, before this hardens.

6.3.1 End material feed and ready cleaning fluid

Depending on the type of material supply on your machine, it is necessary to observe various working steps when ending the material supply and readying the cleaning fluid.

in case of machines with suction line:

1. Remove the suction pipes from the material tanks.
2. Scrape the paint residue off the suction pipe and screen.
3. Place the suction pipes for the A and B component in separate containers with cleaning fluid.

4. Secure the suction lines against slipping out unintentionally.

in case of machines with feed tanks:

1. Place a container under each of the material drainage valves for the feed tanks, in order to catch the material for reuse.
2. Open the material drainage valves.
3. When the feed tanks are empty, close the material drainage valves.



If it is not possible to empty the feed tanks via the material drainage valves due to the material viscosity, you must scoop out the material and empty the residue via the spray gun (operating mode "spray") into a collection container if necessary.

in case of machines with feed pumps:

1. Lift the feed pump out of the material tank (using suitable lifting gear or with the aid of a WIWA lift).
2. Scrape off the remaining paint.
3. Place the feed pump in a container with cleaning fluid.



Observe and adhere to the separate operating instructions for the lift.

in case of machines with extrusion pump on a ram:

1. Drive the ram up, in order to lift the extrusion pump out of the material tank.
2. Scrape off the residual paint and clean the follower plate/follower lid.
3. Position a container with cleaning fluid under the ram.
4. Lower the extrusion pump into the container.



Observe and adhere to the separate operating instructions for the ram.

6.3.2 Flush mixing unit and spray gun

In case of an interruption to work, flush all parts that have come into contact with the mixed material within the pot life stipulated by the manufacturer.

Mixed material is located in the hoses from the mixing unit to the spray gun. This must be flushed out before it becomes increasingly hard. The material inside the machine upstream of the mixing unit can remain in the machine because this will not harden.

1. Set the machine to "flush".
The operating modes "spray" and "vent / circulation" are switched off.
2. In order to also guarantee earthing with flushing, hold the spray gun at the side against the internal wall of a conductive collection container.

3. Spray out the material mixture until clean cleaning fluid runs out.
In case of a spray gun distributor, always flush each spray gun individually and not all at the same time.
4. With a pneumatic mixing unit with separate flushing buttons for both components or a manually actuated mixing unit with separate flushing levers for each component:
Actuate the flushing lever / flushing buttons multiple times in alternation during flushing, in order to ensure that each component is flushed through separately. Finally flush with both levers / buttons in the flushing position.
5. Relieve the pressure in the machine.
6. Close and lock the spray gun(s).
7. In order to allow the material to circulate in the machine, set the machine to "MANUAL" mode and "vent / circulation".
 - Control cabinet
 - Flow rate measurement (if available)

The operating modes "spray" and "flush" are switched off or set to flush.
8. Set the compressed air regulators for the proportioning pump and feed pumps to a low pressure, so that the pumps run slowly. The feed pumps should only run slowly to support the circulation.

Circulation keeps the material at operating temperature and the material cannot settle.

6.3.3 Clean the machine thoroughly



WARNING

Explosive gases may develop due to flushing media evaporating and these may ignite on hot heat sources.

- If the machine is equipped with material heaters then you must switch these off prior to cleaning and allow the machine to cool down.
You can achieve faster cooling by circulating the material in the machine (max. 20 min).
First check whether the viscosity of the material still permits circulation when cooled, by observing the information of the material manufacturer.



Both components must also be kept strictly separate during cleaning. Use a separate collection container for each component, in order to prevent material reactions and damage to the machine.

1. Relieve the pressure in the machine (see Chap. 6.5 Relieve pressure on page 69).
2. Remove the return hoses from the material tanks and place these in an empty collection container.
3. Replace the process material with the corresponding cleaning fluid.
Depending on the type of material supply on your machine, it is necessary to observe various working steps here. Observe Chap. 6.3.1 End material feed and ready cleaning fluid on page 65.

4. Open the material shut-off valves on the feed pumps or the material tanks.
5. Switch the machine to "manual" mode at the control cabinet.
6. Set the compressed air regulator for the feed pumps to approx. 2-3 bar.
7. Turn the compressed air regulator for the proportioning pump down fully.
8. Disengage the stop/emergency stop button on the control cabinet and press the start button.
9. Set the machine to "vent / circulation".
The operating modes "spray" and "flush" are switched off or set to flush.
10. Set the compressed air regulator for the proportioning pumps such that the proportioning pumps run slowly.
11. As soon as clean cleaning fluid runs out of the return hoses, you can run the return hoses back into the container with the cleaning fluid, in order to save cleaning fluid.
Allow the material in the system to pump round for approx. 20 min.
12. Also flush via the ratio check unit (if available).
 - Turn the compressed air regulator for the proportioning pump down.
 - Open the ball valve at the ratio check unit.
 - Increase the air intake pressure at the compressed air regulator for the proportioning pump.
 - Continue to flush via the ratio check unit until clean cleaning fluid runs out.
13. Turn the compressed air regulators on the feed pumps and flushing pump down fully.
14. End the cleaning fluid supply.
Depending on the type of material supply on your machine, it is necessary to observe various working steps here. Observe Chap. 6.3.1 End material feed and ready cleaning fluid on page 65.
15. Relieve the pressure in the machine according to Chap. 6.5 Relieve pressure on page 69.
16. Set the machine to "Off" or "flush".

6.4 Material change



The machine has been specially configured for your application case. It is necessary to check compatibility of the materials used with other materials in each individual case. WIWA shall be happy to assist you in determining the suitability of your machine for other materials and in the selection of suitable packing.

1. Clean the complete machine (see Page 67).
2. Check and clean the filter insert in the high pressure filter (see Page 76).
3. In some cases, e.g. when changing from PU to EP material, it is necessary to additionally disassemble and clean the material pumps, high pressure filter and dirt trap.
4. After completing the work, you can Fill machine with processing material and vent (see Page 59) and spray (see Page 63).

6.5 Relieve pressure

1. Press the stop/emergency stop button on the machine's control cabinet or fully turn down the compressed air regulators for the metering, feed and flushing pump.
2. Close the compressed air shut-off valves on the maintenance unit for the proportioning pump and feed pumps, in order to prevent an unintended machine start.
3. Set the machine to "vent / circulation". The operating modes "spray" and "flush" are switched off.
4. Actuate the spray gun briefly once more.
5. Open the relief valves on the high pressure filters, in order to allow the pressure to release. Catch the escaping material in containers.
6. Close the two relief valves again.
7. In order to relieve the pressure in the feed pumps, hold the relief hose at the outlet distributor for each component in a material collection container.
8. Open the relief valve for each feed pump, in order to allow the pressure to release.
9. Close the relief valves again.

6.6 Decommissioning

In the event of extended decommissioning, e.g. at the end of work, all parts that have come into contact with the mixed material must be flushed. All heating systems must be switched off, the machine must be de-pressurised and switched off.

1. Switch all attachment devices off.



Observe and adhere to the information in the separate operating instructions for the attachment devices.

- In the case of versions with material heaters:
 - Turn the temperature controllers on all material heaters down fully.
 - If equipped with a circulation pump for the heating water, turn the compressed air supply down fully and interrupt the compressed air supply.
 - In the case of versions with pneumatic agitators:
 - Turn the compressed air supply down fully.
 - Interrupt the compressed air supply and/or power supply to all attachment devices.
2. Clean the complete machine thoroughly (see Chap. 6.3.3 Clean the machine thoroughly on page 67).
 3. Turn down the compressed air regulator for the flushing, feed and proportioning pumps fully.
 4. Set all operating modes to "Off" or "flush" at the control cabinet/mixing unit.
 5. Actuate the stop/emergency stop button on the control cabinet.
 6. Close the compressed air shut-off valve on the maintenance unit for the proportioning pump.
 7. To relieve the pressure, actuate the spray gun(s) once more, in order to be certain that no further pressure is present.
 8. Close and lock the spray gun(s).
 9. In the case of versions with a flow rate measuring device:
 - Switch off the flow rate measuring device at the main switch.
 - Disconnect the device from the power supply.

6.7 Putting out of use

If the machine is to be put out of use, it must be emptied and thoroughly cleaned. The machine must be de-pressurised, switched off and disconnected from the compressed air and power supply.

1. Clean the machine according to Chap. 6.3.3 Clean the machine thoroughly on page 67.
2. Turn the compressed air regulator for the flushing pump down fully.
3. Close the compressed air shut-off valve on the maintenance unit for the proportioning pump.

4. Fully relieve the pressure in the complete machine according to Chap. 6.5 Relieve pressure on page 69.
5. Interrupt the power supply to the machine.
 - Disconnect the owner's compressed air connection at the maintenance unit.
 - Unplug the mains plug (if available).

6.8 Storage

Store the system 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

6.9 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.

7 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. Disconnect the power supply (if available).
3. 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 (see fault table in Chap. 8 Eliminating operational faults on page 85).

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

7.1 Regular testing



According to the accident prevention regulation "Working with liquid jet sprayers" BGR 500, chap. 2.36, the machine must be tested and maintained regularly by a specialist.

The machine must be tested:

- 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.

7.2 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 first commissioning	Stop/emergency stop button	Chap. 7.3 on page 73
prior to each start-up	Check release agent level at the proportioning pump	Chap. 7.4.1 on page 76
	Check lubricant level in the oil mister	Chap. 7.3.1 on page 73
	Disassemble and clean the dirt trap	Chap. 7.8 on page 79
	Clean the high pressure filter	Chap. 7.6 on page 76
1-time weekly	Check and adjust the oil mister	Chap. 7.3.2 on page 74
	Check and clean the water separator	Chap. 7.3.3 on page 75
	Clean static mixer, replace if necessary	
	Visual inspection of the compressed air and material hoses	
1-time monthly	Clean mixing block in the mixing unit	
	Clean inlet and outlet distributor	
	Clean safety valve	
	Clean connection hoses	
every 50 operating hours	Check release agent for material residues	Chap. 7.4.2 on page 76
every 3 years	Have the compressed air and material hoses checked by a specialist and replace if necessary	

7.3 Maintenance unit

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

7.3.1 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.

No.	Designation
1	Adjusting screw
2	Inspection glass
3	Oil filling screw
4	Safety slide
5	Oil tank



The system 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, or an optional de-icing system 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 back of 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.

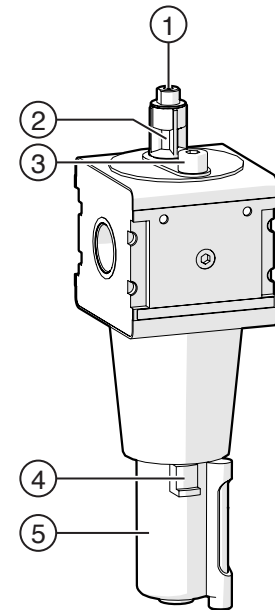


Fig. 68: : Oil mister

7.3.2 Check and adjust the oil mister

1. Allow the proportioning 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 15 to 20 double strokes of the air motors respectively.
3. If this is not the case, set this metering rate with a screwdriver at the adjusting screw of the oil mister.

7.3.3 Check and clean the water separator

The water separator separates moisture and particles of dirt (>5µm) from the compressed air. This prevents condensate from penetrating the machine, as well as the static charging of the pneumatic hoses.

No.	Designation
1	Safety slide
2	Container
3	Drainage valve
4	Drainage hose

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).

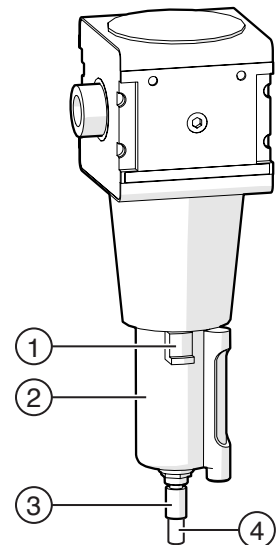


Fig. 69: Water separator



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

7.4 Proportioning pump

In order to avoid damaging the proportioning pump due to material hardening, the release agent chambers of the material pumps are filled with release agent as a material plasticiser.

Depending on the characteristics of the process material, signs of wear will appear on the material 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 valves.

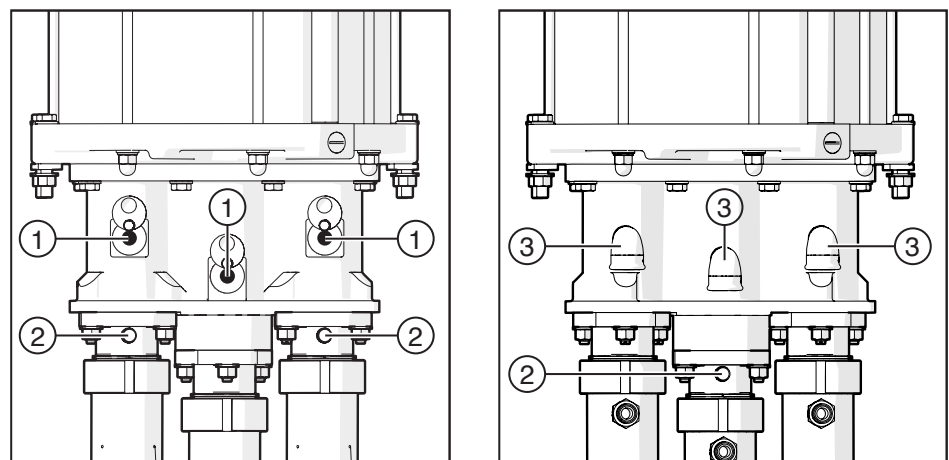


Fig. 70: Filler openings, drainage screws and overflow valves for the release agent

No.	Designation
1	Filler openings for the release agent
2	Drainage screws for the release agent
3	Overflow valves for the release agent

7.4.1 Check the release agent level

Prior to every start-up, check the release agent level.

In order to check the release agent level, add fresh release agent through the filler openings. As soon as release agent leaks out of the overflow valves, the release agent chambers have been filled to the maximum level (approx. 100 ml).

7.4.2 Check release agent for material residues and top up

In order to check the release agent for material residues, drain off a small amount of release agent at the drainage screws in turn.

If material residues are apparent in the release agent, you must assume that the packing for the respective material pump has become worn. In this case, have the pump packing replaced as quickly as possible.

After performing the check, add an appropriate quantity of fresh release agent through the filler openings.

7.5 Feed pumps

In order to avoid damage to the feed pumps due to material hardening, the adjusting vessels for the feed pumps are filled with release agent as a material plasticiser. The top packing is adjustable and only requires replacement if material leaks out at the adjusting vessel for the feed pump and it is no longer possible to adjust the packing.

7.5.1 Check the release agent level

Prior to each start-up, check the release agent level in the feed pumps and top up with release agent if necessary.

With a maximum fill level, the release agent lies at the bottom edge of the filler opening. The adjusting vessels must be topped up at least halfway.

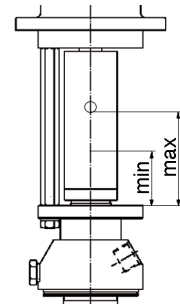


Fig. 71: Release agent level of the feed pumps

7.6 High pressure filter

7.6.1 Clean filter insert

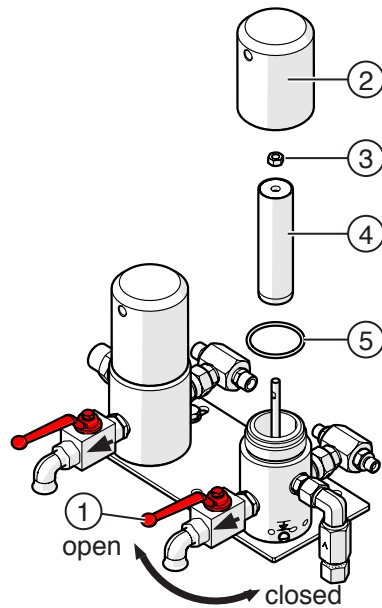
The cleaning interval for the filter inserts in the high pressure filters is dependent on the type and cleanliness of the material. Clean the filter inserts at least 1x per week and with every material change.



WARNING

If the machine's pressure is not relieved when a high pressure filter is opened, material can escape under very high pressure and cause serious injuries.

- Fully relieve the machine pressure before opening a high pressure filter!
- Blockages may result in residual pressures in the machine. Open the high pressure filter cautiously!



No.	Designation
1	Relief ball valve
2	Cap
3	Nut
4	Filter insert
5	O-ring

Fig. 72: Remove filter insert

1. Open the relief ball valve.
2. Unscrew the cap on the high pressure filter using the pin spanner.
3. Unscrew the nut on the filter insert with an open-ended wrench and remove the filter insert.
4. Clean the filter insert. Only use cleaning fluid that is compatible with the processed material. If the filter insert is damaged, replace it.
5. Check the O-ring - if damaged, replace it.
6. Fit the high pressure filter in accordance with working steps 1-3 in reverse order.
7. Repeat this process with the other high pressure filter.

7.6.2 Filter inserts for high pressure filters

Insert a filter insert in the high pressure filter that is appropriate for the spray product and fits the spray nozzle. The mesh size should always be somewhat finer than the hole in the nozzle used:

Filter insert	Nozzle size	
M 200 (white)		up to 0.23 mm/.009"
M 150 (red)	over 0.23 mm/.009"	up to 0.33 mm/.013"
M 100 (black)	over 0.33 mm/.013"	up to 0.38 mm/.015"
M 70 (yellow)	over 0.38 mm/.015"	up to 0.66 mm/.026"

Filter insert	Nozzle size
M 50 (orange)	over 0.66 mm/.026"
M 30 (blue)	
M 20 (green)	



Do not use a filter insert with coarse pigmented or fibre-filled materials. The suction screen installed as standard must remain in the screen housing or be replaced with a coarse-meshed screen. In the case of a material change, the filter insert of the high pressure filter and the material screen of the suction system must be cleaned or replaced if necessary.

7.7 Silica gel filter

The silica gel filter is a moisture filter that prevents crystallisation with moisture-sensitive process material.

It is screwed into the barrel lid of the material tank with the ventilation system.

With moisture saturation the granulate changes colour from orange to colourless.

In order to maintain the filter function, the granulate must be dried regularly.

During operation, the ball valve on the silica gel filter must be open.

Only close the ball valve when the machine is put out of operation for an extended period, in order to prevent moisture from penetrating via the filter.

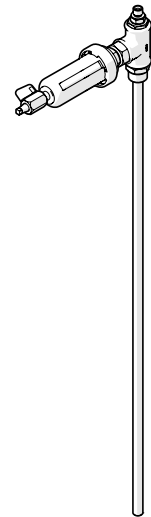


Fig. 73: Ventilation system with silica gel filter

7.7.1 Disassemble silica gel filter

1. Put the machine out of operation and relieve the pressure.

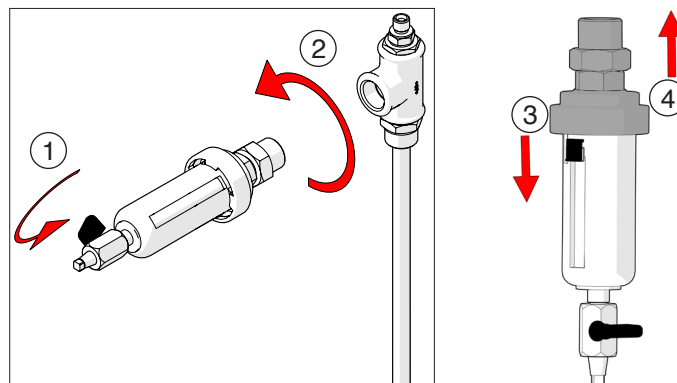


Fig. 74: Disassemble silica gel filter

2. Close the ball valve (item 1 Fig. 74) on the silica gel filter.

3. Unscrew the silica gel filter with double nipple (item 2 Fig. 74) from the barrel/T-piece.
4. Push the safety slide (item 3 Fig. 74) on the cover down and draw the lid with double nipple (item 4 Fig. 74) up and off.
5. Shake the granulate into a collection container to dry.

7.7.2 Drying the granulate



Only heat the granulate. Heating the complete filter can lead to the housing being destroyed.

- Drying required: With colour change from orange to colourless
- Drying temperature: approx. 130 - 160 °C / 266 - 320 °F
- Renewed adsorption capability: After the colour changes from colourless to orange

7.7.3 Fit silica gel filter

1. Fill the silica gel filter container with dried or new granulate (65 g / 0.14 lbs).
2. Perform working steps 4-1 in reverse order Chap. 7.7.1 Disassemble silica gel filter on page.
 - Make sure the O-ring is seated correctly! Ensure no granulate has become stuck in the threaded connection!
 - When screwing in the double nipple use thread locker or Teflon tape.

7.8 Clean dirt trap



WARNING

Blockages in parts that transport the material can result in very high pressures building up in the machine. If the machine's pressure is not relieved when a dirt trap is opened, material can escape under very high pressure and cause serious injuries.

- Fully relieve the machine pressure before opening a dirt trap!
- Open the dirt trap cautiously!

1. Put the complete machine out of operation and relieve the pressure.
2. Close the ball valve at the material intake (optional) for each material pump.
3. Close the shut-off valves (optional) at each feed pump.
4. Vent the system for 30 - 60 sec, in order to empty the area around the inlet/outlet distributor.
5. Turn the compressed air supply down to 0 bar / 0 psi.

6. Close the compressed air shut-off valve on the maintenance unit, in order to prevent an unintended system start.
7. Unscrew and remove the screw plug from the dirt trap and take out the screen.
8. Clean the screen, as well as the seal and thread surfaces on the sealing plug and pipe nipple.
9. Place the screen back in the pipe nipple.
10. Set the seal in the pipe nipple and finally screw in with the sealing plug. Ensure firm seating.
11. Open the optionally available ball valves upstream of the material pumps and downstream of the feed pumps.
12. Open the compressed air shut-off valve on the maintenance unit.



Fig. 75: Dirt trap

7.9 Replacing the material pumps

Your DUOMIX 300/333 has a fixed mixing ratio (see type plate). However, in order to adjust the mixing ratio it is necessary to replace one or more material pumps.

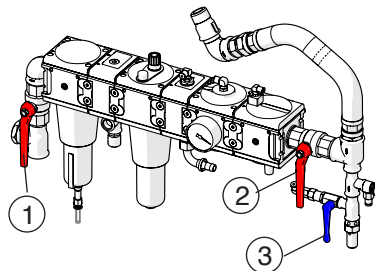


Fig. 76: Balls valves on the maintenance unit

No.	Designation
1	Main compressed air shut-off valve
2	Safety ball valve (optional)
3	Ball valve for controlling the material pumps (optional)

All of the following numbers cited in this chapter relate to Fig. 76.

7.9.1 Disassemble material pump(s)



WARNING

If the machine's pressure is not relieved when a high pressure filter is opened, material can escape under very high pressure and cause serious injuries.

- Fully relieve the machine pressure before disassembling the material pumps!

1. Put the complete machine out of operation and relieve the pressure.
2. Close the ball valve at the material intake (optional) for each material pump.
3. Close the shut-off valves (optional) at each feed pump.
4. Vent the system for 30 - 60 sec, in order to empty the high pressure filter.

5. In the case of versions without item 2+3:
 - Turn the compressed air supply down to 0 bar at the maintenance unit.
 - Close the compressed air shut-off valve, item 1.

In the case of versions with item 2+3:

 - Close the safety ball valve at the maintenance unit, item 2, in order to avoid an unintended start-up of the machine.
6. Disassemble the suction distributor from the material pumps.
7. Release the material hoses at the material intake and outlet for the material pump to be changed.
8. Release the screws that act to fasten the pump to the air motor.
9. In the case of versions without item 2+3:
 - Open the compressed air shut-off valve at the maintenance unit, item 1.
 - Set a very low pressure at the compressed air regulator for the proportioning pump.

In the case of versions with item 2+3:

 - Slowly open the ball valve, item 3, in order to lower the material pumps. The further the ball valve is opened, the faster the lifting movement.
10. In the case of versions without item 2+3:
 - Turn the compressed air supply down fully, as soon as the material pumps are in the lowest position.
 - Close the compressed air shut-off valve on the maintenance unit, item 1, again.

In the case of versions with item 2+3:

 - Close the ball valve, item 3, as soon as the pump is in the lowest position.
11. Release the coupling between the air motor and material pump.
12. Take off the material pump.

7.9.2 Fit material pump(s)



WARNING

During installation, the fingers, hands or other body parts may be crushed by moving parts.

- Do not reach between material pump and air motor.

**WARNING**

During installation, loose items of clothing may come between the material pump and air motor or be caught on other machine parts and pulled up.

- Wear tight-fitting clothing with low tear-resistance, tight sleeves and no projecting parts.

1. Set the material pump on the air motor and hang the coupling in place.
2. In the case of versions without item 2+3:
 - Open the compressed air shut-off valve at the maintenance unit, item 1.
 - Set a very low pressure at the compressed air regulator for the proportioning pump.In the case of versions with item 2+3:
 - Slowly open the ball valve, item 3, in order to raise the material pumps. The further the ball valve is opened, the faster the lifting movement.
3. In the case of versions without item 2+3:
 - Turn the compressed air supply down fully, as soon as the material pumps are in the highest position.
 - Close the compressed air shut-off valve on the maintenance unit, item 1, again.In the case of versions with item 2+3:
 - Close the ball valve, item 3, as soon as the pump is in the highest position.
4. Tightly screw the material pump with all screws onto the air motor.
5. Close the material hoses at the material intake and outlet for the material pump.
6. Fill the 3 release agent chambers of the **DUOMIX** with release agent, see Chap. 7.4.2 Check release agent for material residues and top up on page 76.
7. Open the shut-off valves (optional) on each feed pump.
8. Open the ball valve on the material intake (optional) for each material pump.
9. In the case of versions without item 2+3:
 - Open the compressed air shut-off valve at the maintenance unit, item 1.In the case of versions with item 2+3:
 - Open the safety ball valve on the maintenance unit, item 2.

7.10 Recommended operating fluids

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

Operating fluid	WIWA order number
Release agent (0.5l/0.13 gallons) ¹	0163333
Release agent for isocyanate (0.5l/0.13 gallons) ¹	0640651
Antifreeze (0.5l/0.13 gallons) ²	0631387
Pneumatic oil (0.5l/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 main pump and feed pumps

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.

7.11 Special tool

The machine is equipped with the following tools:

- Pin spanner for opening the high pressure filter (Fig. 77)
Attention: Only open the high pressure filter in a de-pressurised state!

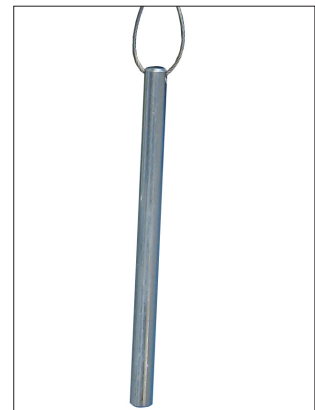


Fig. 77: Pin spanner

- Key for opening the control cabinet (Fig. 78)
Attention: Only qualified electricians are permitted to open the control cabinet!



Fig. 78: Control cabinet key

- ▶ Key for adjusting the operating limits at the contact manometers (Fig. 79)



Fig. 79: Key for setting the contact manometer

- ▶ Tool kit (see Fig. 80)

No.	Designation
1	Assembly aid for suspending the material pump
2	Jacket ring for needle change on automatic spray guns
3	Various Allen keys
4	Hook wrench for assembly/disassembly of the material pump
5	Ring spanner
6	Various open-ended wrenches



Fig. 80: Tool kit

8 Eliminating operational faults



When trouble-shooting, always also refer to the chapters "Fault detection and elimination" in the separate manuals for the optional auxiliary devices.

Fault	Possible cause(s)	Elimination
The feed pumps operate continuously. No further material runs out of the outlet distributor with the relief valve open.	1. The material tank is empty.	⇒ Replace or top up material tank.
	2. The suction line is defective and the pump draws in air.	⇒ Replace suction line.
	3. The feed pump(s) is (are) defective.	⇒ Repair feed pump(s).
The feed pumps do not pump material into the 2K system. Material runs out of the outlet distributor with the relief valve open.	1. The ball valve at the material inlet is closed.	⇒ Open ball valve.
	2. The dirt trap upstream of the material inlet for the 2K system is contaminated.	⇒ Clean the dirt trap of the 2K system.
During the downward stroke of the proportioning pump, the hardening pump does not generate pressure. The base component pressure increases.	1. The hardening pump bottom valve is leaking.	⇒ Disassemble and clean the bottom valve.
		⇒ Replace defective ball or valve plate.
During the upward stroke of the proportioning pump, the hardening pump does not generate pressure. The base component pressure increases.	1. The hardening pump piston valve is leaking.	⇒ Disassemble and clean the piston valve.
		⇒ Replace defective ball or valve plate.
The hardening pump does not generate pressure during the upward and downward stroke.	1. The hardening pump does not receive material.	⇒ Check the material supply.
	2. The rupture disc on the high pressure filter is defective.	⇒ Check the rupture disc of the hardening component on the high pressure filter.
	3. The ventilation valve for the hardening component is leaking.	⇒ Check the ventilation valve for the hardening component for functionality and leak-tightness.
	4. The ball valve at the material inlet is closed.	⇒ Open ball valve.
During the upward stroke, the pressure of the hardener and base component is considerably higher than during the downward stroke, or the pressure of both components increases synchronously slowly.	1. A piston valve of the two A pumps is not operating.	⇒ Check and clean both piston valves.
		⇒ Replace defective balls or valve plates.
Both base component pumps generate no pressure during the upward stroke. The pressure on the hardener side is very high.	1. Neither piston valve is working.	⇒ Check and clean both piston valves.
		⇒ Renew defective balls or valve plates.

Fault	Possible cause(s)	Elimination
During the upward stroke, the pressure of the hardener and base components is considerably higher than with the downward stroke. The feed hose inflates or the overpressure valve at the outlet distributor opens and the material is fed back into the container via the return hose.	1. A bottom valve of the A component pump is not operating.	⇒ Check and clean both bottom valves. ⇒ Replace defective balls or valve plates.
No pressure is generated during the upward and downward stroke with the base component. The pressure of the hardening component is very high.	1. The base component pump receives no material.	⇒ Check material supply.
	2. Rupture discs on the high pressure filter defective.	⇒ Check rupture disc on the high pressure filter for the base component.
	3. Ventilation valve for the base component is leaking.	⇒ Check ventilation valve for the base component for leaks and function.
	4. Ball valve at the material inlet is closed.	⇒ Open ball valve.
With ventilation, the pressure of the base component remains stationary. The pressure of the hardening component drops.	1. Ventilation valve for the base component does not open.	⇒ Check ventilation valve.
	2. Return hoses are blocked.	⇒ Check return hoses for throughput.
	3. The high pressure filter insert is heavily soiled.	⇒ Clean high pressure filter.
With ventilation, the pressure of the hardening component remains stationary. The pressure of the base component drops.	1. Ventilation valve for the hardening component does not open.	⇒ Check ventilation valve.
	2. Return hoses are blocked.	⇒ Check return hoses for throughput.
	3. The high pressure filter insert is heavily soiled.	⇒ Clean high pressure filter.
During spraying, the pressure of the base component constantly increases in comparison to the hardening component.	1. The high pressure filter insert for the base component is becoming clogged.	⇒ Clean the filter insert for the high pressure filter or install a coarser one.
	2. The packing for the hardening component pump is leaking.	⇒ Repair the hardening component pumps (replace packing).
During spraying, the pressure of the hardening component constantly increases in comparison to the base component.	1. The high pressure filter insert for the hardening component is becoming clogged.	⇒ Clean the filter insert for the high pressure pump or install a coarser one.
	2. The packing for the base component is leaking.	⇒ Repair the base component pumps (replace packing).
During spraying, insufficient pressure or material arrives at the spray gun, although the pressure in the system is high.	1. The filter inserts are heavily soiled.	⇒ Clean the filter inserts for the high pressure filter or replace with coarser ones.
	2. The mixing block, static mixer, paint hose or spray gun are clogged.	⇒ Clean or replace the mixing block, static mixer, material hoses and spray gun.
	3. The nozzle of the spray gun is blocked.	⇒ Replace the spray nozzle in the spray gun.

Fault	Possible cause(s)	Elimination
During spraying, the air motor of the 2K system runs jerkily. Synchronously fluctuating material pressure is present at the contact manometers.	1. The compressed air supply is insufficient.	⇒ Replace the compressor.
	2. The cross section of the compressed air supply line is too small.	⇒ Increase the cross section of the compressed air line.
	3. The air pressure in the supply network is too low.	⇒ Increase the air pressure in the network.
	4. The air pressure set at the maintenance unit is as high as the network pressure.	⇒ Turn down the maintenance unit somewhat.
When flushing the mixing block with a de-pressurised 2K system and closed ventilation, rising pressure is apparent at one or both contact manometers.	1. The check valves in the mixing block are not working.	⇒ Clean the mixing block.
		⇒ Renew defective balls, valve seats or pressure springs.
When switching from "FLUSH" to "SPRAY" on the system and simultaneously opening the spray guns, the pressure of one component rises dramatically, whilst the other drops.	1. An (automatic) valve does not open.	⇒ Check and repair valves.
When switching from "SPRAY" to "FLUSH", the flushing pump does not work.	1. The flushing pump is defective.	⇒ Check whether the flushing pump is in operation.
	2. The "FLUSH" valve on the mixing block does not open.	⇒ Check the valves.
		⇒ If necessary, remove the flushing hose on the mixing unit and replace with a spray gun.
		⇒ Perform flushing pump function test.
The air motor of the 2K system ices up very quickly and the system output reduces.	1. The de-icing system is not switched on.	⇒ Switch on the de-icing system and if necessary the Material fluid heater.
	2. The water separator is full.	⇒ Drain the water separator.
	3. The system is overloaded.	⇒ Make sure that system does not run too fast (guideline valve approx. 25 double strokes per minute).
At the air motor, compressed air escapes at the guide axes behind the protective grate and on the intermediate body.	1. The seals of the air motor are worn.	⇒ Re-seal the air motor.
The air motor no longer operates, although the compressed air supply is established. No material pressure is present in the system.	1. The air motor controller is defective.	⇒ Send the air motor to the WIWA service workshop for repair.

Fault	Possible cause(s)	Elimination
The system will not start up. However, pressure is displayed at the manometer on the maintenance unit.	1. The ball valve at the maintenance unit is closed.	⇒ Open the ball valve at the maintenance unit.
	2. The compressed air supply for the control cabinet is interrupted.	⇒ Establish the compressed air supply for the control cabinet.
	3. The filter pressure controller on the control cabinet is incorrectly set.	⇒ Set the pressure to 6 bar/87 psi.
	4. The stop/emergency stop button is pressed in and locked.	⇒ Disengage the stop/emergency stop button.
The system only starts up briefly (only whilst the start button is depressed).	1. The MANUAL/AUTOMATIC switch is set to "AUTOMATIC".	⇒ Set the MANUAL/AUTOMATIC switch to the "MANUAL" position.
	2. The material pressure of a component lies above the red contact pointer for the high pressure monitoring.	⇒ Relieve the material pressure.
	3. A contact manometer issues an incorrect signal.	⇒ Replace the defective contact manometer.
The contact manometer indicates pressure, although the system is depressurised.	1. The contact manometer is defective.	⇒ Replace the contact manometer.
The contact manometer does not indicate pressure, or only up to a certain pressure. The system is under full air intake. During spraying, the black needle points to a pressure and does not pulse.	1. The contact manometer is defective (oil has leaked out of the measuring mechanism of the manometer).	⇒ Replace the contact manometer.
After the stop/emergency stop button has been depressed the system does not come to a stop.	1. The compressed air inlet valve and compressed air outlet valve at the air intake for the air motor are not working correctly.	⇒ Check the control hoses for correct connection according to the wiring diagram.
	2. The stop/emergency stop button is defective.	⇒ Check the function of the valves (the membrane may have become swollen due to the use of incorrect pneumatic oil). ⇒ Replace defective parts.
The 2K system no longer works in the switch position "SPRAY" and "FLUSH".	1. The pot life has not been observed. The mixing unit, material hoses and spray guns have not been flushed, the material has hardened.	⇒ Attempt to clean or replace the parts hardened with the mixed material.
Hardener or paint leaks out of the intermediate piece beneath the air motor.	1. The packing for the material pumps is worn.	⇒ Replace the packing and seals of the material pumps.

Fault	Possible cause(s)	Elimination
If a Material fluid heater is installed, this does not heat up.		⇒ Observe and adhere to the separate user manual for the Material fluid heater.
	1. The power supply has been interrupted.	⇒ Check power supply.
	2. The ambient temperature is below 5-8 °C.	⇒ Depress the button for the overload protection, until the glow lamp stays on.
	3. Technical defect in the Material fluid heater.	⇒ Have specialist personnel with an electrical qualification check the Material fluid heater.
In the case of versions with automatic valves:		
Valves of the mixing unit are not working correctly (e.g. if the B-component automatic valve opens with the automatic operation of the flushing pump, the A-component closes).	1. The control hoses have not been correctly connected, e.g. after a repair.	⇒ Connect the control hoses according to the wiring diagram.
The (automatic) valves leak at the packing, material escapes.	1. The packing is insufficiently tight or worn.	⇒ Tighten the packing and sealing screw whilst the system is de-pressurised, or replace the seals.
In the case of versions with metering and filling control:		
With a deviation from the mixing ratio check the material feed => poss. one component pressure too weak or feed blocked	1. poss. pressure too weak with one component or feed blocked	⇒ Check material feed

9 Technical data

You can find the technical data for your machine on the machine card enclosed, on the type plate or in the documentation for the individual components.

9.1 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.

9.2 Type plates

The **DUOMIX 300/333** type plate is located on the frame. It contains a note of the device type and the serial number, as well as the machine's year of manufacture.

The technical data for the proportioning pump may change with a replacement of the material pumps. A separate type plate therefore exists for the proportioning pump, which is rail-mounted and easily replaced. This contains the following data:

- the output per double stroke of the material pumps for the base component (comp. A and the hardener (comp. B),
- the pressure ratio,
- the mixing ratio,
- the total output of the proportioning pump per double stroke,
- the maximum permissible air intake pressure and operating pressure, and
- the year of manufacture.

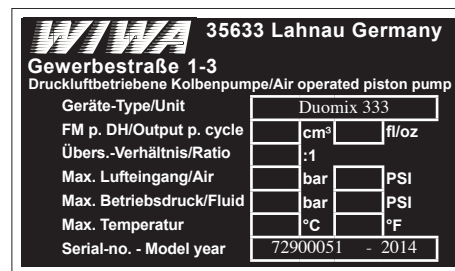


Fig. 81: Type plate for the **DUOMIX 333** (example)

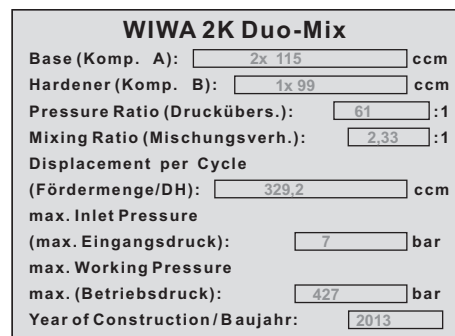


Fig. 82: Type plate for the proportioning pump (example)



Please ensure that the data on these two type plates 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 for the proportioning pump
- the material pumps for the A and B component
- the flushing pump
- the control cabinet, etc.

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



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