

OPERATING MANUAL

(Translation of the Original Operating Manual)



Schnorkle®

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Retain for future use!

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1 Introduction

This operating manual provides all information you need for the trouble-free operation of the Schnorkle[®] (referred to as the machine in the following).

The operating manual must be read, understood and followed by all personnel involved in the operation, maintenance, cleaning and troubleshooting of the machine. This applies in particular to the safety notices.

After studying the operating manual, you can

- operate the machine safely,
- maintain the machine as prescribed,
- clean the machine as prescribed, and
- take the corresponding steps in case of a machine fault.

In addition to the operating manual, generally applicable legal and other binding rules for accident prevention and environmental protection in the destination country must be observed.

The operating manual must be kept at the machine installation location at all times.

1.1 Forms of presentation

Notices and direct warnings of hazard in this operating manual that require special attention are identified as follows:



DANGER

This warning notice identifies a hazard with a high risk level that, if it is not avoided, leads to death or severe physical injury.



WARNING

This warning notice identifies a hazard with a moderate risk level that, if it is not avoided, can lead to death or severe physical injury.



CAUTION

This warning notice identifies a hazard with a low risk level that, if it is not avoided, can lead to minor or moderate physical injury.

NOTICE

This warning notice identifies a hazard with a low risk level that, if it is not avoided, can lead to damage to property.



This symbol identifies useful information.

The following forms of presentation are used as well:

- Texts following this symbol are itemisations.
- Texts following this symbol describe activities that have to be performed in the given sequence.
- „“ Texts in quotation marks are references to other sections or paragraphs.
- ON Text in small caps identifies a button/switch on a control element or a button/input field on the touch panel.

Symbols used in the manual

Specific hazards in warning notices are identified in addition as follows:



Danger to life due to electric current

This symbol warns against danger to life due to electric current. There is an immediate danger to life in case of contact with live components.



Hot surfaces

This symbol warns against the risk of burns on hot surfaces.



Warning of a risk of burns due to hot compressed air

This symbol warns against high heat when compressed air escapes.



Warning of crushing risks

This symbol warns against crushing hazards. Body parts may be crushed, drawn in or injured in other ways.



Warning of suspended loads

This symbol warns against hazards due to the presence of persons underneath suspended loads.



Warning of industrial trucks

This symbol warns against hazards when persons are present on traffic routes of industrial trucks.



Extinguishing with water prohibited

This symbol prohibits using water to extinguish a machine fire.



Unauthorised access prohibited

This symbol prohibits access to the danger area by unauthorised persons.

Hazards may not be recognised by unauthorised persons.

1.2 Warranty and liability

The obligations agreed upon in the supply contract, the general business terms and conditions, delivery conditions for the machine and the legal provisions applicable at the time the contract is concluded shall apply.

All specifications and instructions in this operating manual were compiled under consideration of the applicable standards and regulations, the state of the art and our long-term know-how and experience.

Warranty and liability claims in case of personal injury and damage to property are excluded when they are due to one or more of the following causes:

- Improper use or use of the machine for other than the intended purposes
- Improper setup, commissioning, operation, maintenance and cleaning of the machine
- Operating the machine with defective safety devices or improperly installed and/or non-functional safety and protective devices
- Failure to observe the operating manual and the notices in the operating manual regarding setup, commissioning, operation, maintenance and cleaning of the machine
- Use of personnel that is not qualified and/or not instructed
- Structural changes to the machine (conversions or other changes to the machine are not permitted without the prior written consent of StrikoWestofen GmbH. In case of violations, the machine loses its EC conformity.)
- Improperly completed repairs
- Use of unapproved replacement parts and/or use of replacement parts that do not meet the established technical requirements
- Catastrophes caused by foreign objects or force majeure

We reserve the right for technical modifications as part of the improvement of the usage features and further development.

1.3 Copyright

This operating manual is protected by copyright and intended for internal use only.

Making the operating manual available to third parties, duplication of any type and form – also in excerpts – and exploitation and/or disclosure of the content, except for internal use, are not permitted without the written consent of StrikoWestofen GmbH.

Damages are payable for violations. Further claims are reserved.

1.4 Warranty provisions

The warranty provisions are part of the general business terms and conditions of StrikoWestofen GmbH.

1.5 Customer service



Our Customer Service department is available for technical enquiries:

Telephone: +49 2261 7091 129

Furthermore, our employees are always interested in new information and experiences arising in practice that may be valuable for the improvement of our products.

2 Safety



WARNING

Failure to observe the following safety notices may have serious consequences:

- Danger to persons due to mechanical or thermal influences
- Failure of important machine functions

Read the safety and hazard notices in this section thoroughly before putting the machine into operation.

In addition to the notices in this operating manual, the generally applicable safety and accident prevention regulations also have to be observed.

Aside from the notices in this operating manual, the operating company/operator has to observe the existing national employment, operating and safety regulations. Compliance with existing internal factory specifications is required as well.

2.1 Intended use

The operating safety of the machine is only assured when it is used as intended.

The machine may **not** be used in potentially explosive atmospheres!

The machine is intended exclusively for the transportation of aluminium melt and filling a dosage furnace or holding furnace.

The machine is not intended for uses other than those listed here – that is considered inappropriate use. The following in particular are prohibited:

- Transporting persons with the machine
- Loading or transporting other materials or dangerous goods
- Loading or transporting weights other than the approved weight
- Loading or transporting higher than the approved volume

Intended use also includes:

- Observing all information in the operating manual
- Complying with the inspection and maintenance intervals
- Using auxiliary materials and supplies according to the applicable safety regulations
- Complying with the operating conditions

Compliance with the technical specifications provided in the technical data is mandatory with no exceptions.



The machine must only be used as intended, otherwise safe operation is not assured.

Not the manufacturer but the operator is responsible for all personal injuries and damage to property resulting from other than intended use!

2.1.1 Structural changes to the machine

The design and manufacturer acceptance are based on the Product Safety Act (ProdSG). Changes, additions or conversions to the machine are not permitted without the prior written consent of StrikoWestofen GmbH.

In case of violations, the machine loses its EC conformity. The machine manufacturer's warranty is void in this case. This also applies to welding work on load-bearing components.

Components that are not in flawless condition must be replaced immediately.

Only use original replacement parts/wear parts/accessories. These parts are designed especially for the machine. There is no guarantee that third-party parts are designed and manufactured to withstand the loads and meet the safety requirements.

Parts and special equipment not supplied by StrikoWestofen GmbH are not approved for use on the machine.

2.1.2 Foreseeable misuse

Any use of the machine going beyond the intended use and/or any other use may lead to severe injuries.

- Only use the machine as intended.

2.2 Requirements for personnel

The machine may only be operated, maintained and repaired by personnel with corresponding qualifications and/or instruction. These persons must know the operating manual and act accordingly. The respective authority of the personnel must be clearly established.

The operating manual specifies the following qualifications for various areas of activity:

Instructed personnel

Instructed personnel has been informed about the assigned tasks and possible hazards in case of improper behaviour in the course of instruction by the operating company or qualified personnel.

Qualified personnel

Based on technical training, knowledge and experience as well as knowledge of the applicable regulations, qualified personnel is able to perform the assigned tasks and to independently recognise and avoid possible hazards.

Pneumatics specialist

A pneumatics specialist is able to monitor and maintain pneumatics equipment and systems based on technical training, knowledge and experience. The pneumatics specialist is able to independently identify and avoid possible hazards.

The pneumatics specialist is trained for the specific deployment location in question and is familiar with the relevant standards and regulations.

2.2.1 Responsibilities

Improper use can lead to severe personal injury and damage to property.

Therefore, all activities must be carried out exclusively by qualified personnel.

- Only persons who can be expected to perform their tasks reliably are permitted as personnel. Persons whose ability to react is impaired by drugs, alcohol, medications or similar are not permitted to work on the machine.
- All persons who work on the machine must read the operating manual and by means of their signature confirm that they have understood it.
- Initially, personnel in training may only work on the machine under the supervision of qualified personnel. Completion and success of this instruction must be confirmed in writing.

Instructing the personnel is the responsibility of the operating company.

2.2.2 Obligations of the personnel

All persons assigned to work on the machine commit to the following, before commencing work:

- Observing the fundamental occupational safety and accident prevention regulations
- Reading the safety notices and warnings in this operating manual, and confirming their understanding of the same by their signature

2.2.3 Unauthorised persons

Unauthorised persons who do not meet the qualification requirements for personnel are not familiar with the hazards in the work area.

- Keep unauthorised persons away from the work area.
- In case of doubt, speak to persons and expel them from the work area.
- Stop the work as long as unauthorised persons are present in the work area.

2.2.4 Instruction

The personnel must be instructed regularly by the operating company. Instruction should be documented for improved traceability.

2.3 General safety instructions

- The machine may only be put into operation and maintained after reading this operating manual.
- Only use the machine as intended (see section “2.1 Intended use”).
- Do not fill or empty the machine while other persons are present in the danger area.
- While operating the machine, avoid all activities that endanger the safety of persons or the machine.
- Never operate the machine without the corresponding protective and safety devices. Never deactivate the installed safety devices.
- Keep the work area of the machine clean and tidy at all times to avoid hazards due to dirt or parts lying about.
- Do not exceed the limits of the technical performance data (see section “3.3 Technical data”).
- Keep all safety and hazard notices on the machine in legible condition and replace them as needed.
- Only qualified and instructed personnel is permitted to operate and work on the machine (see section “2.2 Requirements for personnel”).
- Shut down the machine immediately in case of malfunctions. Have faults eliminated by specialists with corresponding training or by StrikoWestofen GmbH.
- The operating manual must be kept at the machine installation location at all times. It must be ensured that all persons performing activities on the machine have access to the operating manual at all times.

2.4 Safety measures for environmental protection

Complying with the regulations for waste prevention and proper recycling/disposal is mandatory for all work.

During setup, maintenance and decommissioning in particular, ensure that substances hazardous to groundwater such as grease or similar cannot contaminate the soil or get into the sewer system. These substances must be collected, stored and transported in suitable containers and disposed of according to national regulations.

2.5 Specific hazards

2.5.1 Symbols used on the machine



Warning of hand injuries/risk of crushing

This symbol warns against the risk of hand injuries. The hands may be crushed, drawn in or injured in other ways.



Risk of burns due to hot surfaces

This symbol warns against the risk of burns on hot surfaces. Hot surfaces, such as hot machine components, containers or materials, but also hot fluids, are not always noticeable. Wear work clothing and protective gloves during all work to avoid burns due to hot surfaces.



Warning of a risk of burns due to hot compressed air

This symbol warns against high heat when compressed air escapes.



Keep all safety and hazard notices on the machine in legible condition and replace them as needed.

2.5.2 Hazards due to electrical energy



DANGER



Risk of electric shock when touching live components.

- Always keep electrical components enclosed.
- Work on the electrical system may only be carried out by an electrician with special training for work on electrical systems who is able to identify and avoid the applicable hazards.
- Five safety rules must be observed:
 1. Isolate
 2. Lock out the system so it cannot be powered up
 3. Establish voltage-free status
 4. Ground and short-circuit the system
 5. Cover or block off live components

- Before working on the electrical system, ensure the machine is voltage-free and lock it out so it cannot be powered up.
- Work on the electrical system may only be performed by an authorised electrician such as an industrial electrician.
- Regularly inspect the electrical system for defects such as loose connections or charred cables. Defects must be eliminated immediately.
- The electrical system and installed electrical equipment must be inspected by an electrician at least once every 4 years.

Installed electrical equipment includes fixed equipment or equipment without means of carrying and a mass that is too great to allow it to be moved easily. This also includes electrical equipment that is temporary fixed in place and operated via moveable connecting cables.

- Portable electrical equipment, connecting cables with plugs as well as extension cables and equipment connecting cables with their plugs/sockets, to the extent these are used, must be inspected by an electrician at least once every 6 months.

Equipment is portable if it can be moved while under voltage according to its type and common use. This includes for example electric floor cleaning machines.

- Changes made after the inspection must comply with DIN EN 60204-1.
- Regularly inspect all safety devices on the machine to verify their function.
- Only use original fuses.
- Keep the control cabinet doors closed at all times.

- Damaged housings and lines have to be repaired or replaced promptly before powering up the system.

2.5.3 Hazards due to pneumatic energy

Air discharged under pressure can cause injuries!

- Only qualified personnel with special pneumatics knowledge and experience is permitted to work on the pneumatics. Before working on the pneumatics, turn off the machine and lock it out so it cannot be powered up.
- Prior to commencing repair work, de-pressurise system components and pressure lines that need to be opened.
- Inspect all pneumatic lines, hoses and screw connections regularly for leaks and externally visible damage.
- Disconnect the hoses carefully. Escaping compressed air could disperse dust and chips.
- Always hold pneumatic hoses away from the body.
- Protect open air connections against dirt.
- Never mix up connections, plugs or switches. This invariably leads to malfunctions.

2.5.4 Hazards due to hot surfaces

Contact with hot components may cause burns.

- Always wear protective clothing and protective gloves for all work in the vicinity of hot components. Components that can get hot are identified by the graphic hot surface warning symbol (see section “2.5.1 Symbols used on the machine”).
- Allow the components to cool to the ambient temperature prior to maintenance or repair work.

2.5.5 Hazards due to using incorrect replacement parts

Incorrect or defective replacement parts may lead to damage, malfunctions or total failure, and can impair safety.

- Only use original replacement parts.
- Obtain replacement parts from StrikoWestofen GmbH. The required information about replacement parts is found in section “11 Appendix”.

2.6 Personal protective equipment

In order to minimise health risks, personal protective equipment must be worn while operating the machine.

- Always wear the protective equipment required for the respective tasks while working.
- Observe the notices regarding personal protective equipment posted in the work area.

The meaning of the symbols is as follows:



Safety clothing

Wear heat protection clothing to protect against burns.

The safety clothing consists of heat protection clothing, caster pants and gaiters made of flame-resistant fabric according to EN ISO 11612.

Do not wear rings, chains or other jewellery.



Safety footwear

To protect against burns, heavy falling objects or slipping on smooth surfaces, wear caster boots with a high leg that can be opened quickly.



Safety gloves

Wear category III heat protection gloves according to EN 407 to protect the hands against contact with hot surfaces.



Face protection

Wear face protection to protect against eye and or skin injuries due to spraying aluminium melt.



Hard hat

Wear a hard hat to protect against falling or ejected components.

The personal protective equipment must be provided by the operating company and has to meet the applicable requirements.

National regulations and, if applicable, internal instructions of the operating company also need to be observed.

2.7 Safety and protective devices

- Each time before powering up the machine, check that all safety and protective devices are properly installed and functional.
- In case of the delivery of subcomponents, the protective devices must be properly installed by the operating company.
- Safety and protective devices must not be bypassed, removed or otherwise deactivated during operation.
- Protective devices may only be removed after the machine is shut down and locked out so it cannot be started up again.
- Regularly inspect all safety devices on the machine to verify their function.

2.8 Information in case of emergency



WARNING



Risk of injury when extinguishing a fire with water!

Using water to extinguish a machine fire can cause severe injuries.

- Use suitable extinguishing agents for metal fires or dry covering salt to extinguish machine fires.

Preventive measures

- Always be prepared for accidents and keep first aid supplies (first aid kit, blankets and so on) within reach.
- Familiarise the personnel with accident notification, first aid and rescue equipment.
- Keep access routes for rescue vehicles clear.

Response to accidents

- Trigger an emergency stop.
- Rescue persons from the danger area and start first aid measures immediately in case of cardiac or breathing arrest.
- In case of personal injury, notify the first aid officer and an emergency physician and/or rescue service.
- Clear access routes for rescue vehicles. If necessary, assign a person to guide the rescue forces.

2.9 Obligations of the operating company

The machine is used in an industrial application. Thus, the operating company for the machine is subject to legal obligations for occupational safety.

In addition to the safety notices in this operating manual, the safety, accident prevention, and environmental protection regulations that are valid for the machine's range of use must be followed. The following especially applies:

- The operating company has to ensure that the machine is only used as intended (see section “2.1 Intended use”).
- The operating company must keep the operating manual in legible condition at all times and make it available at the machine installation location.
- The operating company must clearly specify the responsibilities for commissioning, operation, maintenance and cleaning.
- The operating company must only allow persons who have reached the legal minimum age to work on the machine.
- The operating company must only permit personnel with sufficient qualifications and training to work on the machine.
- The operating company must ensure that all employees working on the machine have read and understood the operating manual. Moreover, the personnel must be instructed at regular intervals and informed as to the possible hazards, with corresponding documentation.
- The operating company must provide the personnel with personal protective equipment and ensure that it is used.
- The operating company must ensure that persons whose ability to react is impaired by drugs, alcohol, medications or similar are not permitted to work on the machine.

Furthermore, the operating company is responsible for keeping the machine in flawless technical condition at all times. The following therefore applies:

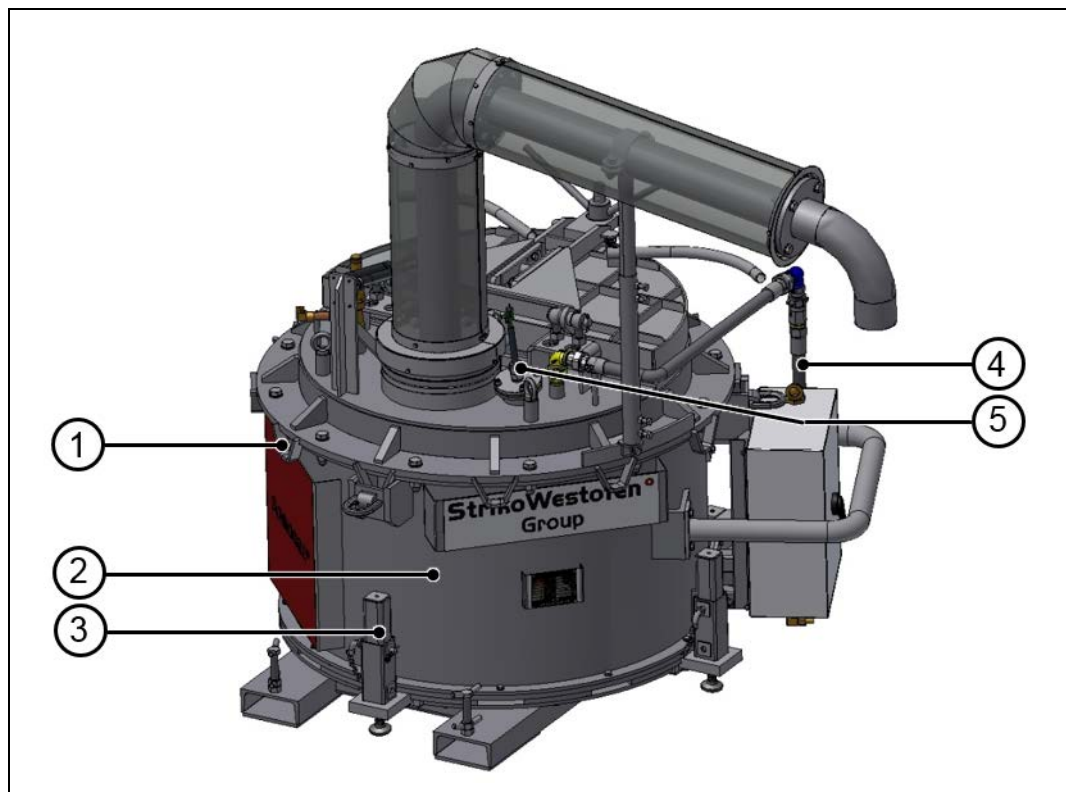
- The operating company must ensure that the maintenance intervals that are specified in this operating manual are followed.
- The operating company must ensure the regular testing of all safety devices for proper functioning and integrity.
- The operating company through regular inspections must ensure that all safety and warning notices posted on the machine are readily legible and remain permanently on the machine.

3 Description of the machine

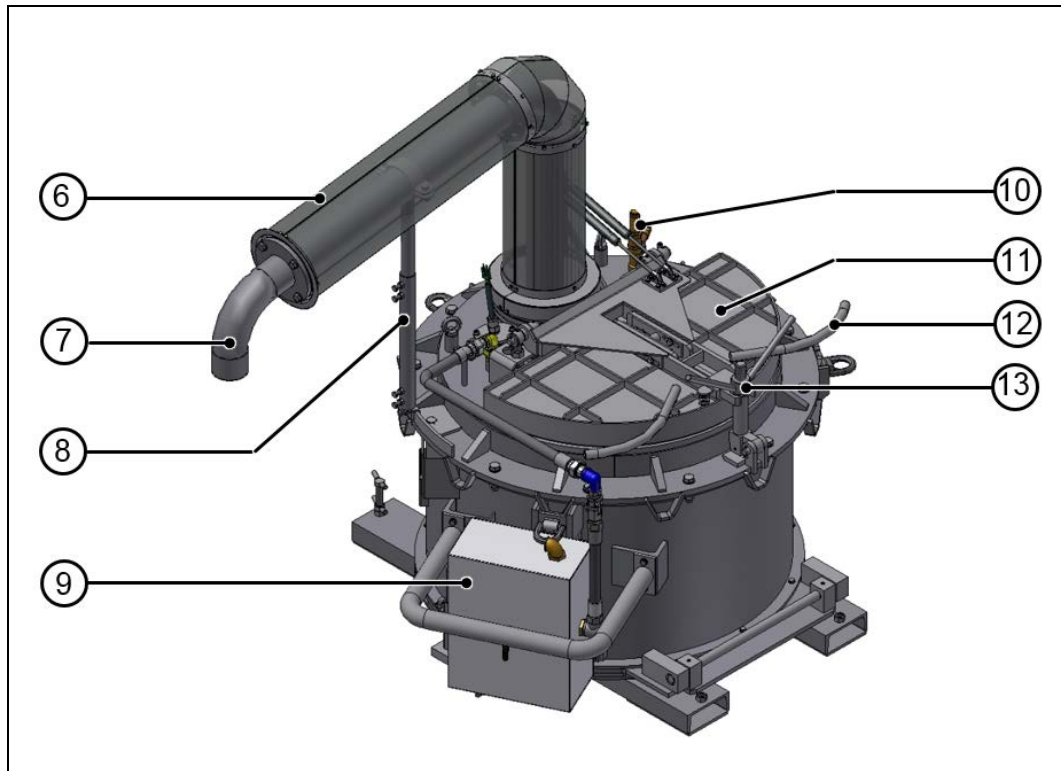
3.1 Overview

3.1.1 Functional elements

3.1.1.1 Transfer ladle



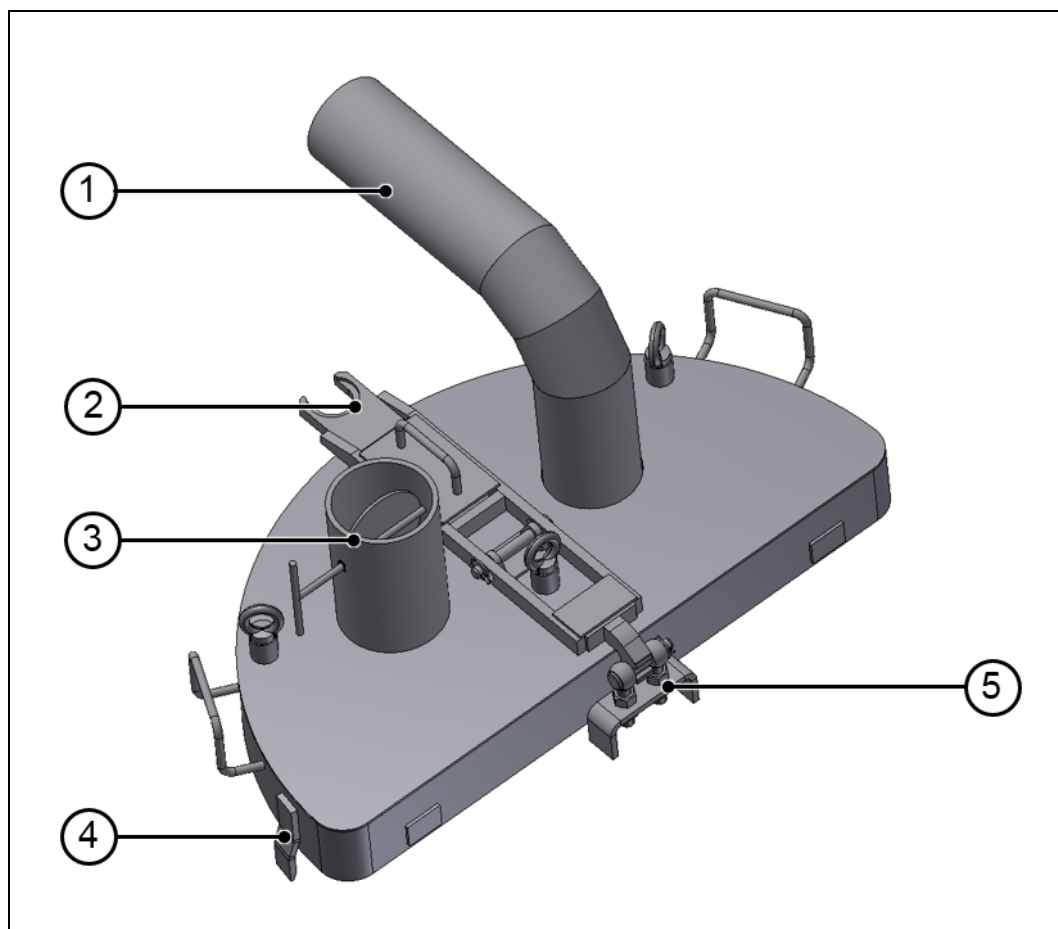
- | | | | |
|---|-------------------------------|---|---------------------|
| 1 | Cover alignment lug | 4 | Compressed air line |
| 2 | riser pipe (in the container) | 5 | Thermocouple |
| 3 | Adjustable support | | |



- 6 Perforated plate (contact protection)
- 7 Filling pipe
- 8 Pipe support
- 9 Pneumatics cabinet with fender

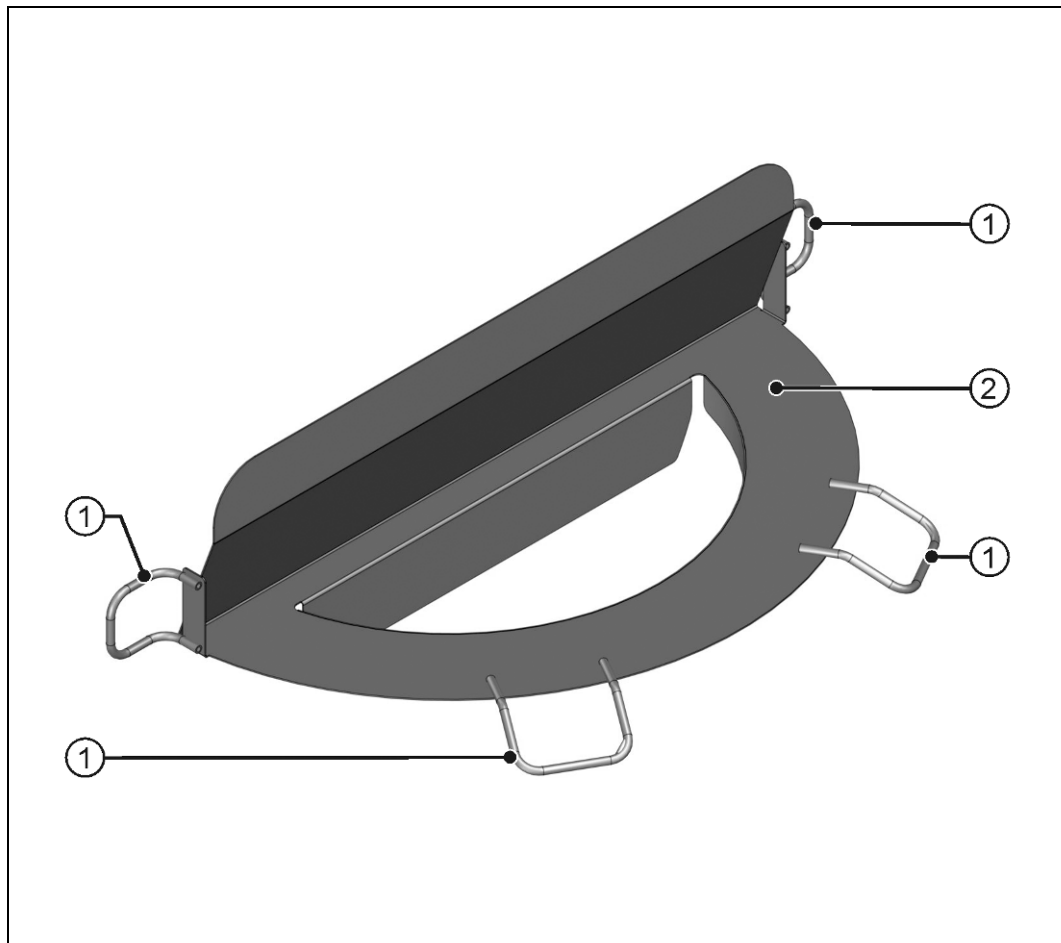
- 10 Safety valve
- 11 Filling hatch
- 12 Filling hatch handle
- 13 Quick-release screw closure

3.1.1.2 Heater cover



- | | | | |
|---|------------------------------|---|--------------------------------------------------------------|
| 1 | Muzzle pipe | 4 | Stopper plate |
| 2 | Pressing fixture | 5 | Catch for pressing fixture
(positioned on the main cover) |
| 3 | Vent stack with exhaust flap | | |

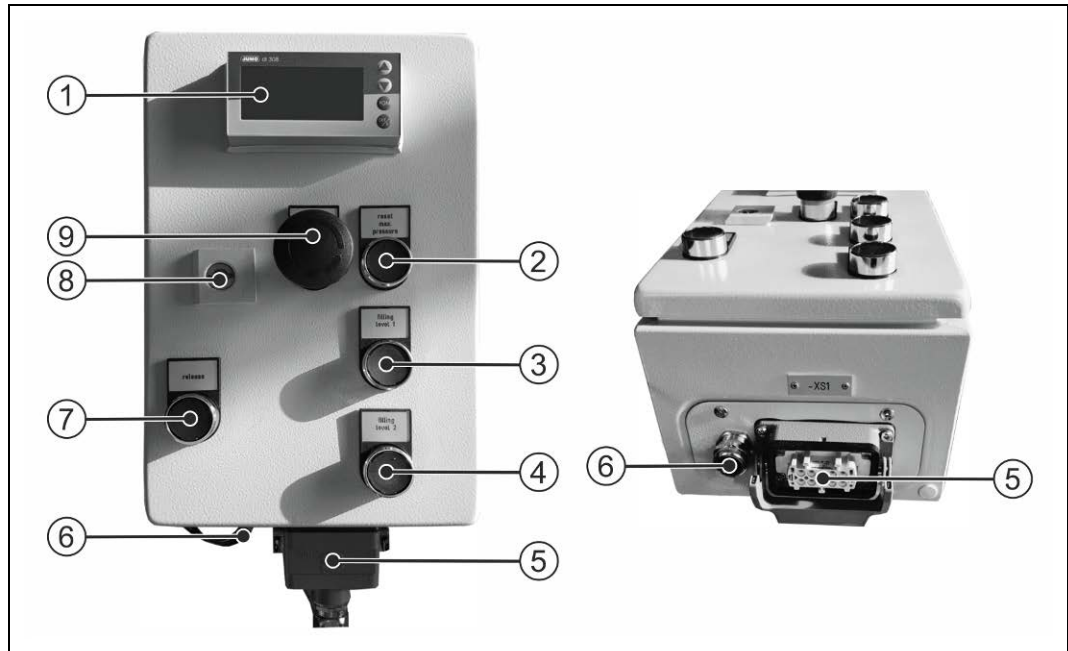
3.1.1.3 Splash guard assembly



1 Transport handle

2 Splash guard

3.1.1.4 Operator panel



- | | | | |
|---|----------------------------------------------------------------------|---|---------------------------|
| 1 | Display:
Pressure display [mbar]
Melt bath temperature (in °C) | 5 | Control cable connection |
| 2 | RESET MAX. PRESSURE button | 6 | Power supply connection |
| 3 | FILLING LEVEL 1 button | 7 | RELEASE button |
| 4 | FILLING LEVEL 2 button | 8 | Operator panel cover lock |
| | | 9 | EMERGENCY STOP button |

3.1.2 Type plate

The type plate is located on the transfer ladle.



3.2 Functional description

The machine is a self-contained transport system with a filling fixture for aluminium melt. Transportation and filling take place in the following phases:

Phase 1: sintering/pre-heating the transfer ladle

The transfer ladle on the machine has to be:

- Sintered when the machine is put into operation for the first time (see section “6.4 Initial operation”)
- Pre-heated when the machine is put back into operation after an extended shutdown (see section “6.5 Resuming operation”).

For sintering/pre-heating the transfer ladle, a ladle heater is set onto the filler hole of the transfer ladle. A mobile burner is set up in front of the transfer ladle and heats the transfer ladle through the muzzle pipe on the ladle heating fixture.

Phase 2: Filling the transfer ladle

After pre-heating the transfer ladle, the transfer ladle is filled with aluminium melt.

To fill the transfer ladle, a splash guard assembly is set onto the filler hole. A casting channel is installed on the outlet of the smelter.

The machine is moved in front of the smelter outlet with a lift truck and filled. After filling, the splash guard assembly is removed and the transfer ladle filler hole sealed, pressure tight, with the swinging filling hatch.

Phase 3: Filling the casting plant

After filling the transfer ladle, the machine is moved in front of the casting plant with a lift truck.

To fill the casting plant, compressed air is applied to the sealed, pressure tight transfer ladle. Compressed air is applied from the compressed air supply system. To fill the casting plant, the machine is operated from the operator station of the lift truck using the mobile operator panel.

One of 2 filling speed levels can be selected.

For initial operation, the pressure values for the filling speeds have to be configured (see section “6.4.2 Adjusting the pneumatics”).

The aluminium melt is transported through the riser pipe and filling pipe into the casting plant as pressure is applied.

Phase 4: Emptying the transfer ladle

After filling the casting plant and if there is no additional casting process, the transfer ladle is moved to the parking location and set onto the adjustable support.

Positioning at an angle allows the remaining aluminium melt to be removed.

The transfer ladle is raised on one side using the adjustable support and set onto the floor in a slightly tilted position. This tilted position of the transfer ladle ensures that the riser pipe is not cemented by the remaining, hardening aluminium melt if the transfer ladle was previously depleted or bailed out.

3.2.1 Safety devices

3.2.1.1 EMERGENCY STOP button

The EMERGENCY STOP button is located on the operator panel.

Pressing the EMERGENCY STOP button cuts off the supply of compressed air to the transfer ladle and bleeds the transfer ladle.

To power the machine back up again, the EMERGENCY STOP button has to be unlocked by turning it (also see section “7.8 Actions after triggering the safety devices”).

3.2.1.2 Safety valve



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.
– Personal protective equipment must be worn during all work in the vicinity of the machine.

The safety valve is installed in the cover plate. When the pressure applied to the transfer ladle exceeds 0.5 bar, the safety valve opens.

3.2.2 Control elements

3.2.2.1 Transfer ladle

The filling hatch on the half-round filler hole is equipped with 2 handles and a quick-release screw closure. After filling the transfer ladle, the filling hatch is closed and sealed, pressure tight, with the quick-release screw closure.

3.2.2.2 Operator panel

Filling the casting plant is controlled using the operator panel. The operator panel is located at the operator station of the lift truck and is operated by the lift truck driver. Control of the filling process is designed for two-hand operation. One of 2 filling speeds can be selected. To start the filling process, the corresponding push-button for the filling speed has to be pressed along with the release button.

The display on the operator panel informs the operator about the pressure in the transfer ladle and the melt bath temperature. The melt bath temperature is measured on the temperature sensor. The temperature sensor is installed in the cover plate.

After refilling the transfer ladle, the dosage lock has to be reset with the RESET DOSAGE LOCK button.

If there is no RESET DOSAGE LOCK button, the dosage lock is reset automatically when the RELEASE button is let go.

3.2.2.3 Mobile burner (optional)

The mobile burner is used to pre-heat the transfer ladle when the machine is put into operation for the first time or after an extended shutdown.

3.2.2.4 Heater cover

The ladle heater is equipped with a vent stack with exhaust flap. By adjusting the exhaust flap in the vent stack, the pre-heating output can be regulated according to the exhaust air volume.

3.3 Technical data

3.3.1 Dimensions and weight

Version 400

Length	1 590 mm
Width	2 016 mm
Height	1 891 mm
Weight (empty)	1 840 kg
Weight (filled)	2 240 kg
Capacity	400 kg

Version 700

Length	1 590 mm
Width	2 016 mm
Height	2 165 mm
Weight (empty)	2 110 kg
Weight (filled)	2 810 kg
Capacity	700 kg

Version 1300

Length	1 790 mm
Width	2 116 mm
Height	2 265 mm
Weight (empty)	2 720 kg
Weight (filled)	4 020 kg
Capacity	1 300 kg

3.3.2 Connection values/load

Operator panel power supply

Supply voltage	12 V DC
Max. power input	6 A
Control voltage	12 V DC

Compressed air supply

Pressure	5,0 bar
Safety valve opening pressure	0.5 bar

3.3.3 Airborne noise emitted



Factors that affect the actual sound pressure level at the workstation include the characteristics of the working space and other sources of noise, such as the number of machines and other neighbouring working processes.

Sound pressure level < 70 dB (may be briefly exceeded)

3.3.4 Ambient conditions



DANGER

Danger to life when using the machine in potentially explosive areas!

Do not use the machine in potentially explosive areas.

Allowable ambient temperature during operation	+10 °C up to +50 °C
Allowable ambient temperature for storage	+5 °C up to +50 °C
Allowable relative humidity	80 %

3.3.5 Equipment

Versions

The machine is carried out in the following versions:

- Schnorkle[®] 400 kg
- Schnorkle[®] 700 kg
- Schnorkle[®] 1300 kg

Standard equipment

The standard equipment consists of the following components:

- Transfer ladle
- Cover plate with pre-installed components (safety valve, thermocouple, pressure transmitter)
- Heater cover
- Splash guard assembly
- Operator panel
- riser pipe
- Filling pipe with encased with perforated plate
- Pneumatics cabinet with fender
- Mounting materials (bolts, nuts, lock washers)
- Seals
- Adjustable support

Optional equipment

The machine can be equipped with the following optional components:

- Mobile burner
- Cleaning tools
- Crane hanger
- Casting channel (for smelter STRIKOMELTER[®])



Casting channel:

Custom casting channels of different designs (fixed or tilting smelting furnaces) can be fabricated by StrikoWestofen GmbH on customer request.

4 Transportation and storage

The machine is delivered to the customer by StrikoWestofen GmbH or an authorised transport company.

4.1 Inspection upon transfer to the recipient

When the machine reaches the customer, it must be inspected for visual transport damage.

- Report transport damage to StrikoWestofen GmbH immediately.

4.2 Packaging

The means of transport is considered when choosing the packaging. Unless otherwise agreed by contract, the packaging meets the requirements of the packaging directive issued by the HPE (Bundesverband Holzmittel, Paletten, Exportverpackung e.V.) and the VDMA (Verein Deutscher Maschinenbuanstalten e.V.).

4.3 Notice of hazards during transportation



WARNING



The following specific hazards can be expected during transportation of the machine and components:

- Suspended loads may fall, posing a danger to life.
 - The machine's centre of gravity is outside the machine centre point. There is a risk of tipping during unsecured transportation.
 - Severe physical injury may result if load handling devices other than those specified here are used.
 - Severe physical injury may result if connection points other than those specified here are used.
 - Projecting edges can cause crushing or cutting injuries.
-
- Also read section "2 Safety".
 - Transporting the machine and/or components may only be carried out by correspondingly qualified and instructed personnel (lift truck driver with certificate of competence) and in compliance with all safety notices.
 - In selecting suitable hoisting equipment and load handling devices, always consider the weight of the heaviest component (for weights, see section "3.3 Technical data").
 - Wear protective clothing, safety footwear, protective gloves and a hard hat during work.
 - Always assign an additional person to keep the transportation route secure.
 - Make sure no persons are present on the route or underneath suspended loads.
 - Do not use pipes or add-on components as connection points. Eye-bolts on components (such as covers) are intended only for lifting the individual components, not for lifting the entire machine. Only lift the machine/component on the intended points (see section "3.1.1 Functional elements").
 - Always lift the machine slowly and carefully to ensure stability and safety.
 - Only remove the transport safety devices after final mounting or setup of the component at the installation location.

4.4 Devices permitted for transportation

4.4.1 Delivery

The machine and components are delivered as transportation units.

These transportation units consist of pallets on which the machine and components are packaged.

Verify that the load capacity of the lift truck is suitable for the weight of the transportation units (see section “3.3.1 Dimensions and weight”).

- Unload the transportation units and move them to the installation location.

4.4.2 Internal transportation

The machine is moved to the smelter, casting plant and parking location during use.



WARNING



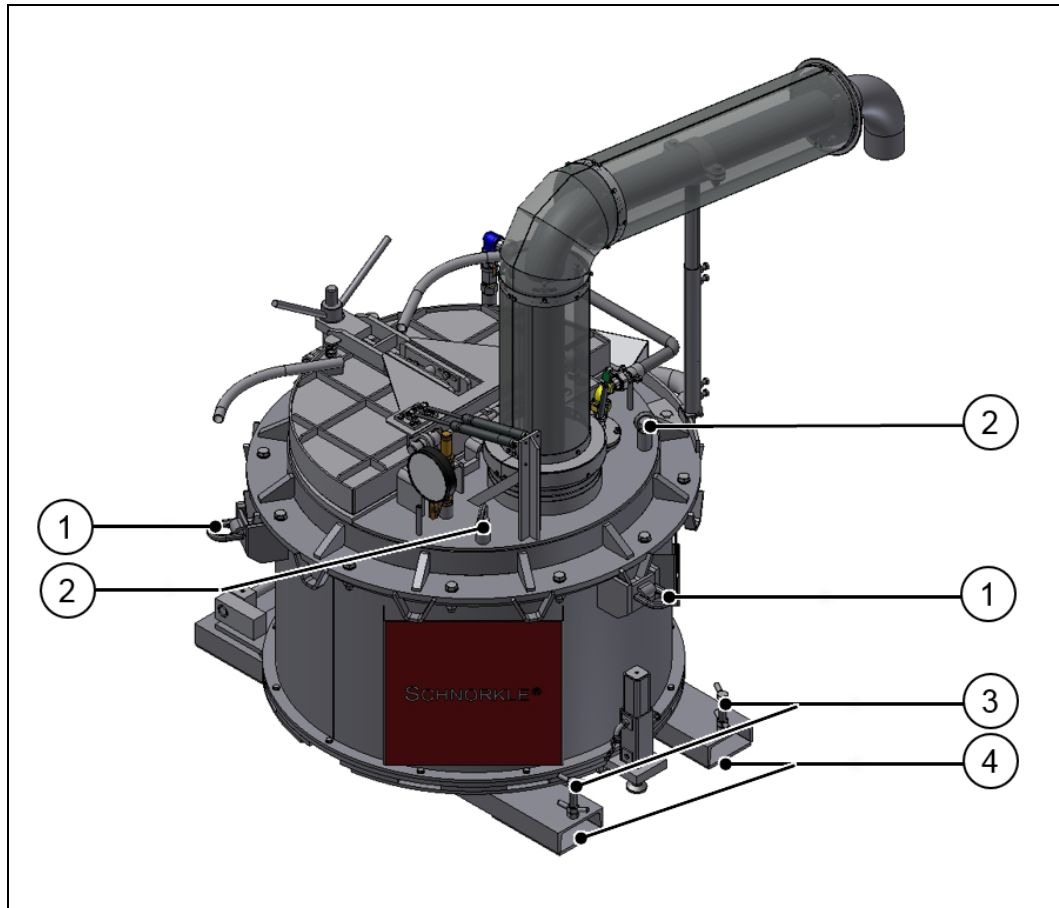
Risk of severe injuries if the transfer ladle falls!

The connection points on the cover plate are not designed for the load of the transfer ladle.

- Only lift the transfer ladle with a lift truck using the receivers for the lift truck forks.
- Ensure that:
 - The load capacity of the lift truck is suitable for the transport weight of the machine (see section “3.3.1 Dimensions and weight”)
 - The receiver for the lift truck fork is secured to the fork using the transport safety device (see section “4.5.1 Transfer ladle”)
 - Load chains or cables, shackles or hooks are designed for the transport weight of the ladle heater and cover plate, and connected only to the intended connection points
 - Avoid contact of the load chains/cables with components of the cover plate and ladle heater. If this is not possible, take corresponding precautions to exclude damage to the components.
 - Adjust the length of load carriers so the cover plate and ladle heater can be transported horizontally.

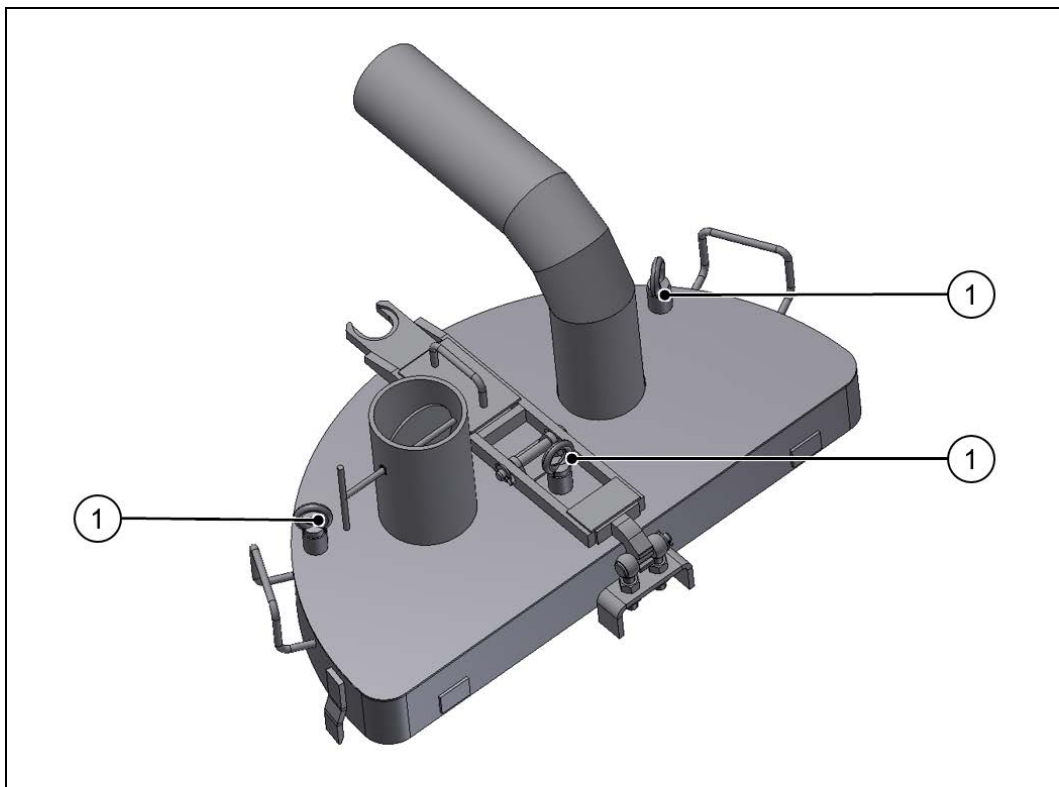
4.5 Suspension and connection points

4.5.1 Transfer ladle



- | | | | |
|---|-------------------------------------------------------------------------------------|---|--------------------------------------------|
| 1 | Transfer ladle connection points
(hanging transportation) | 3 | Lift truck fork transport safety
device |
| 2 | Cover plate connection points
(removable, not for lifting the
transfer ladle) | 4 | Lift truck fork receiver |

4.5.2 Heater cover



1 Connection points

4.6 Interim storage

If the machine is not set up immediately upon delivery, it has to be stored carefully in a protected location. For interim storage, the machine must be protected against cold, moisture, dirt and mechanical influences.

For the recommended machine storage conditions, please see section "3.3.4 Ambient conditions".

NOTICE

No liability is assumed for damage due to improper storage!

5 Assembly

Assembly of the machine is performed according to regulations and if applicable under the supervision of StrikoWestofen GmbH with the assistance of personnel provided by the operating company.

NOTICE

To ensure correct assembly and therefore the functional safety and precision of the machine, the personnel provided is required to follow the instructions of StrikoWestofen GmbH!

5.1 Notice of hazards during assembly



WARNING

The following specific hazards can be expected during assembly of the machine and components:

In general, the following applies:

- Personal protective equipment must be worn during all work.

Lifting the components except on the intended connection points may cause components to fall off the hoisting equipment and lead to injuries.

- Only lift the components on the intended connection points.

Prematurely releasing the transport safety devices on the lift truck fork receivers can cause the transfer ladle to slide off the lift truck forks.

- Only release the transport safety devices once the transfer ladle has been set onto the floor.

Defective pressure lines or connections may lead to injuries.

- All work on the pneumatics must be carried out exclusively by a pneumatics expert.

5.2 Requirements for assembly and operating areas



WARNING

Loss of stability

A loss of stability can lead to a significant risk of injuries. The load capacity of the assembly and operating areas must be adequate to withstand the loads.

- The assembly and operating areas must be level.
- The assembly and operating areas must have the required load capacity.

The operating company is responsible for the statics of the assembly and operating areas.

To calculate the load capacity, use the weights specified in section “3.3.1 Dimensions and weight” as a basis for calculations.

5.3 Preparations

Prior to assembly of the machine, ensure that:

- All electrical components are de-energised
- All pneumatic components are de-pressurised

Transport packaging



The packaging used for transportation and protection of the machine is made largely of recyclable materials.

- Dispose of the packaging material in an environmentally friendly manner and according to national provisions.

5.4 Assembling the machine

5.4.1 Aligning the pre-assembled cover plate

The alignment of the cover on the transfer ladle can be adjusted according to the arrangement of the smelter and casting plant. In order to do so, the cover plate can be aligned and screwed down on the flange of the transfer ladle in 12 positions (30° increments).

- Loosen the 12 nuts on the cover flange and remove the bolts.
- Attach the hooks or shackles of the load chains to the 3 connection points on the cover plate.
- Lift the cover plate with suitable hoisting equipment.
- Align the cover plate.

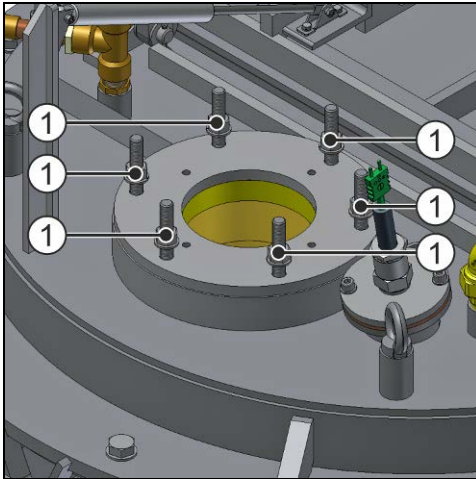


The cover plate and transfer ladle are equipped with alignment aids. These alignment aids ensure that the bolt holes in the flanges line up when the cover plate is lowered.

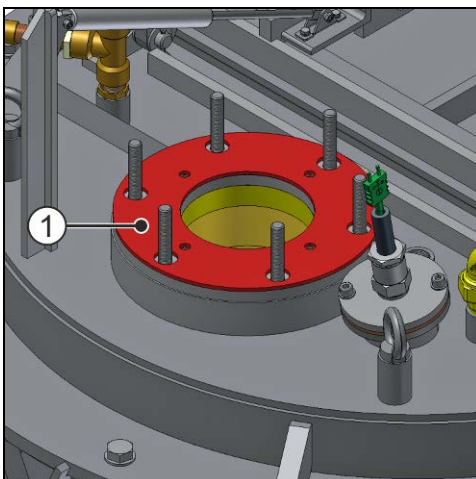
- Lower the cover plate.
- Ensure that the cover seal sits flat on the flange.
- Screw the cover plate to the transfer ladle (torque value max. 400 Nm).
- Release the load chain hooks or shackles from the connection points.
- Remove the 3 eye-bolts from the cover plate to prevent unauthorised lifting of the entire transfer ladle (see section “4.5 Suspension and connection points”).

5.4.2 Installing the riser pipe

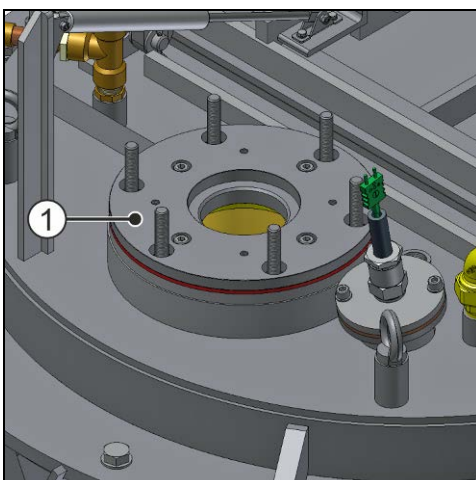
The riser pipe is installed in the opening in the cover plate.



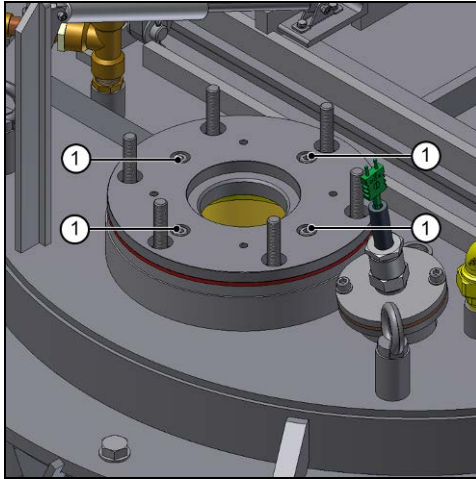
- Remove the nuts (1) from the stud bolts if applicable.



- Lay the mica seal (1) onto the flange connection.

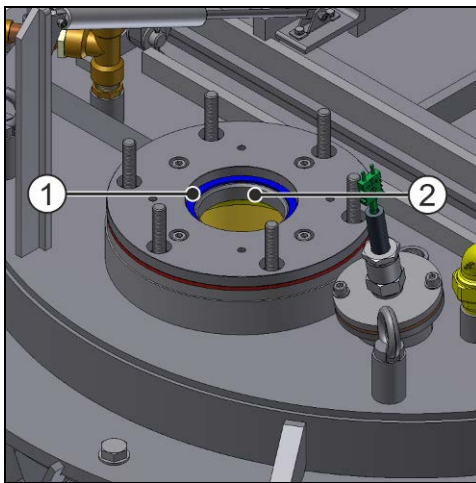


- Set the riser pipe flange (1) onto the seal.

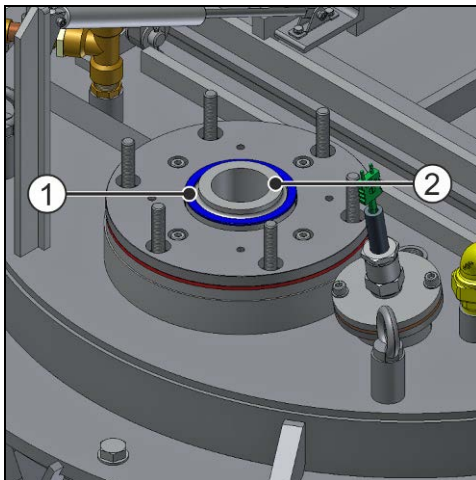


- At the positions (1), screw the riser pipe flange to the flange connection crosswise and step by step.

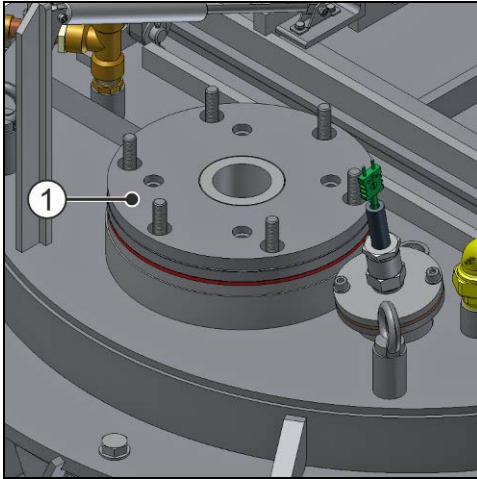
(Torque value max. 200 Nm)



- Lay the corrugated gasket (1) onto the lower flange connection (2).



- Set the riser pipe onto the flange connection through the opening in the cover plate.
- Lay the corrugated gasket (1) onto the riser pipe flange (2).



- Put on the flange ring (1).

5.4.3 Installing and aligning the filling pipe

NOTICE

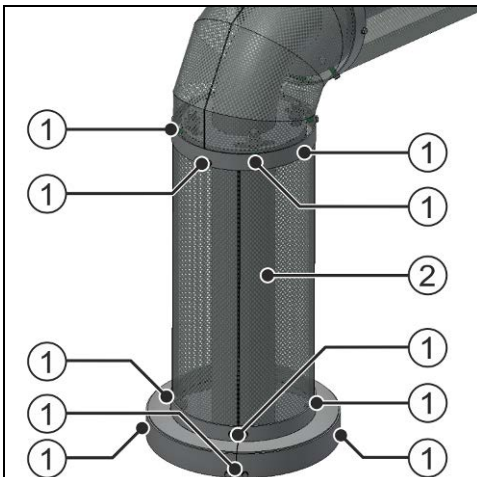
Risk of damage to the filling pipe and stud bolts!

During installation of the filling pipe, there is a risk of canting the connecting flange, thereby damaging the stud bolts.

- Two persons are required for installation.

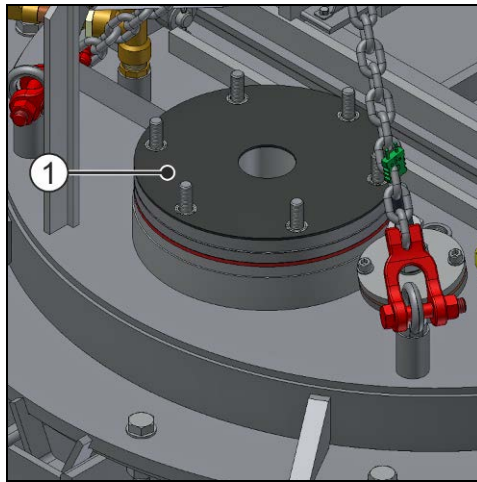
After the riser pipe is installed, the pre-assembled filling pipe is installed on the connecting flange of the riser pipe. The filling pipe can be aligned and screwed down on the flange in 8 positions (45° increments). In addition, the position of the filling pipe can be adjusted by 10° max. using slotted holes on the intermediate flange.

The perforated plate for contact protection in the area where the filling pipe connects may have to be removed prior to assembly.

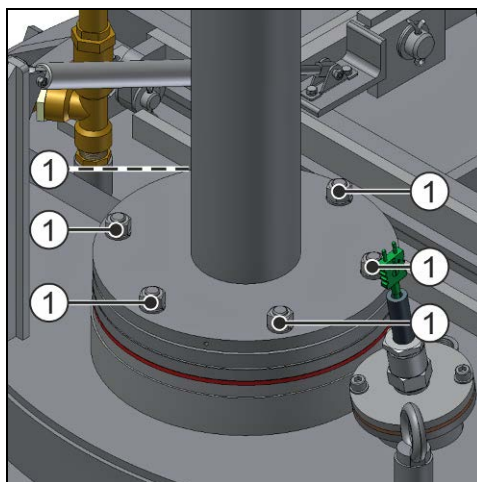


- Remove the screws (1) and the contact protection (2).

(Some of the screws are concealed)

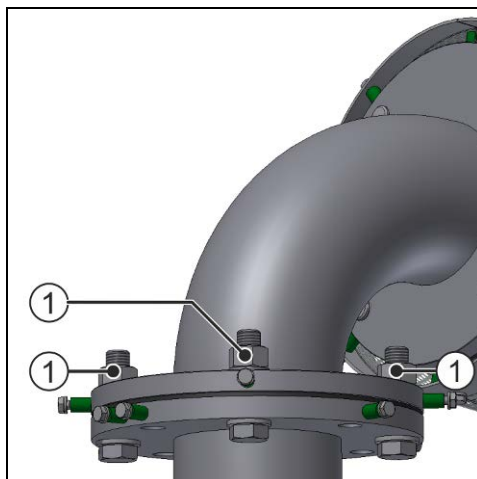


- Lay the seal (1) onto the flange ring.



- Set the filling pipe onto the flange ring in the chosen position.
- At the positions (1), screw the filling pipe to the flange ring crosswise and step by step.

(Torque value max. 200 Nm)



- If applicable, adjust the position of the filling pipe on the intermediate flange.
- In order to do so, loosen the nuts (1) and rotate the filling pipe.

(Some of the nuts are concealed)

- Tighten the nuts (torque value max. 200 Nm).
- Install the contact protection on the filling pipe.

5.4.4 Installing the pneumatic lines



CAUTION

Risk of injury due to improper assembly of the pneumatics!

Air discharged under pressure can cause injuries.

- Only qualified personnel with special pneumatics knowledge and experience is permitted to work on the pneumatics.

- Adapt the pneumatic lines to the connection fittings on the pneumatics cabinet and cover plate.
- Install the pneumatic lines.

5.4.5 Connecting the control cable

NOTICE

Risk of damage to the machine due to improper work on the electrical system!

If the electrical equipment is improperly connected, there is a risk of damaging the control unit.

- Work on the electrical system of the machine may only be performed by an authorised electrician.

- Connect the lines of the control cable to the connections in the pneumatics cabinet (circuit diagram: see section “11.2 Attached documents”).
- Install the operator panel at the operator station of the lift truck.



The operator panel must be installed so that the driver can see and reach all control and display elements.

6 Commissioning

Initial operation (see section “6.4 Initial operation”)

Resuming operation (see section “6.5 Resuming operation”)

6.1 Safety measures before commissioning

Adequately familiarise yourself with:

- The operating and control elements of the machine
- The machine equipment
- The machine’s mode of operation
- The immediate surroundings of the machine
- The machine’s safety devices
- Measures in case of emergency

Prior to initial operation/resuming operation, carry out the following activities:

- Check and ensure that all safety devices are installed and functioning.
- Inspect the machine for visible damage; defects that are noted must be rectified immediately or reported to supervisory staff. The machine may only be operated in flawless condition.
- Check and ensure that only authorised persons are present in the work area for the machine and that no other persons can be endangered when the machine is put into operation.
- Remove all items and other materials from the work area that are not needed for operation of the machine.

6.2 Connecting the operator panel

Energy for the control unit is supplied through the power supply connection on the lift truck.

- Connect the power supply cable to the operator panel and the connection on the lift truck.
- Connect the control cable to the operator panel.

6.3 Installing the heater cover



CAUTION

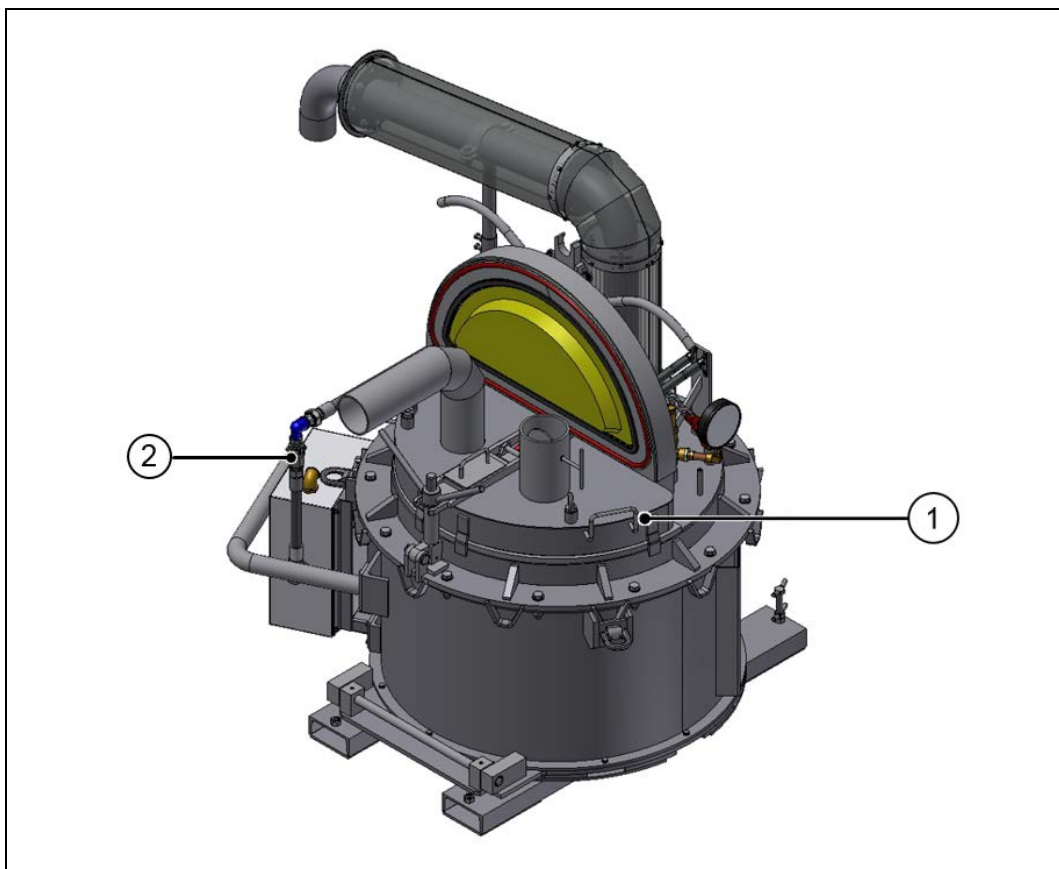


Risk of crushing while installing the heater cover!

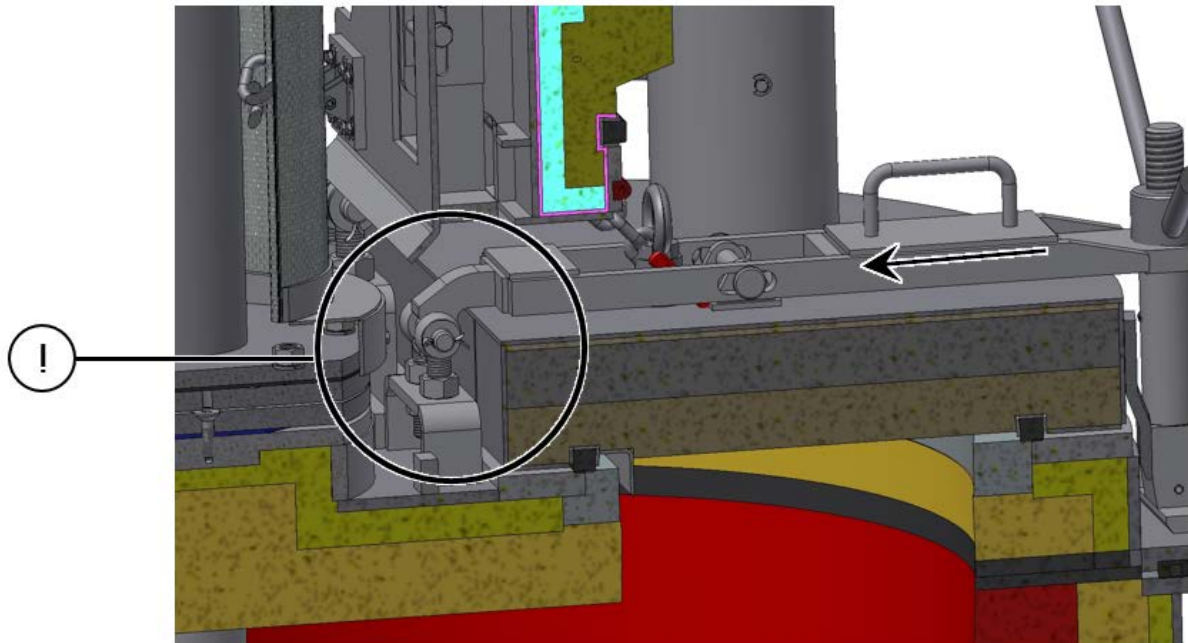
Body parts may be crushed when setting the heater cover onto the transfer ladle.

- Use suitable hoisting equipment to set the heater cover onto the transfer ladle.

- Open the filling hatch on the transfer ladle.
- Lift the heater cover by the intended connection points using suitable hoisting equipment.
- Set the heater cover (1) onto the filler hole of the transfer ladle (see following illustration).
 - In doing so, ensure that the fireproof material is not damaged!
- Disconnect the pneumatic line (2).



- Push the pressing fixture back and ensure that it is fully engaged with the latch on the main cover (see following illustration).
- Secure the pressing fixture with the quick-release screw closure.



6.4 Initial operation

6.4.1 Sintering the transfer ladle



WARNING



Risk of burns on the ladle heater and mobile burner!

Contact with hot components may cause severe burns.

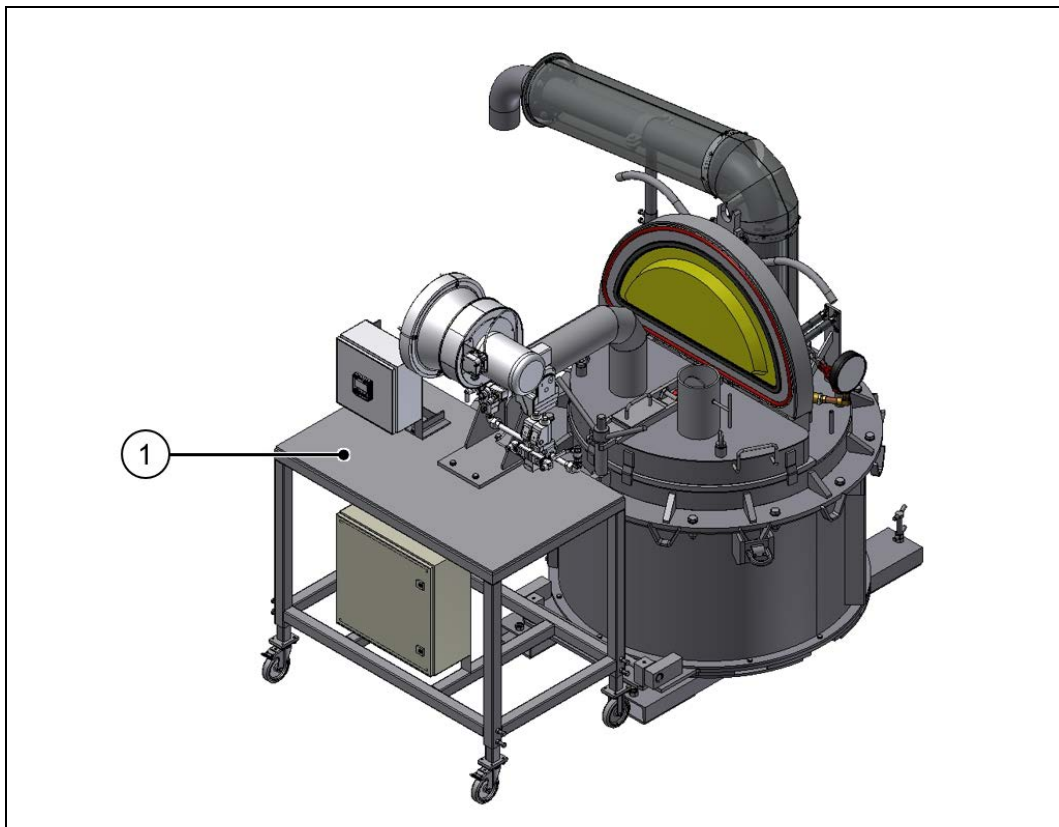
- Personal protective equipment must be worn during all work in the vicinity of hot components.

The transfer ladle and riser pipe must be sintered when the machine is first put into operation.



Before sintering the transfer ladle, the riser pipe and filling pipe must be installed (see section "5.4 Assembling the machine").

- Move the mobile burner (1) in front of the transfer ladle so that the burner pipe is positioned in the muzzle pipe of the ladle heater (see following illustration).



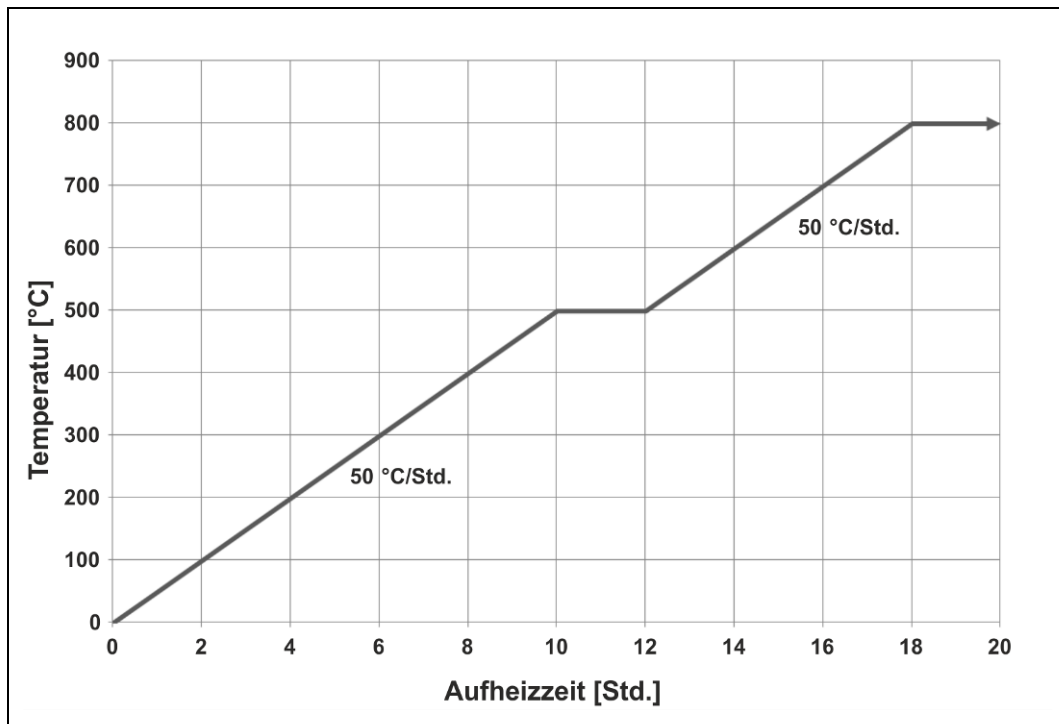
- Turn on the burner.



It takes 20 hours to sinter the transfer ladle to a temperature of 800 °C (see sintering process heating curve). The temperature can be checked with a display connected to the temperature sensor.

By adjusting the exhaust flap in the vent stack, the pre-heating output can be regulated according to the exhaust air volume.

Sintering process heating curve



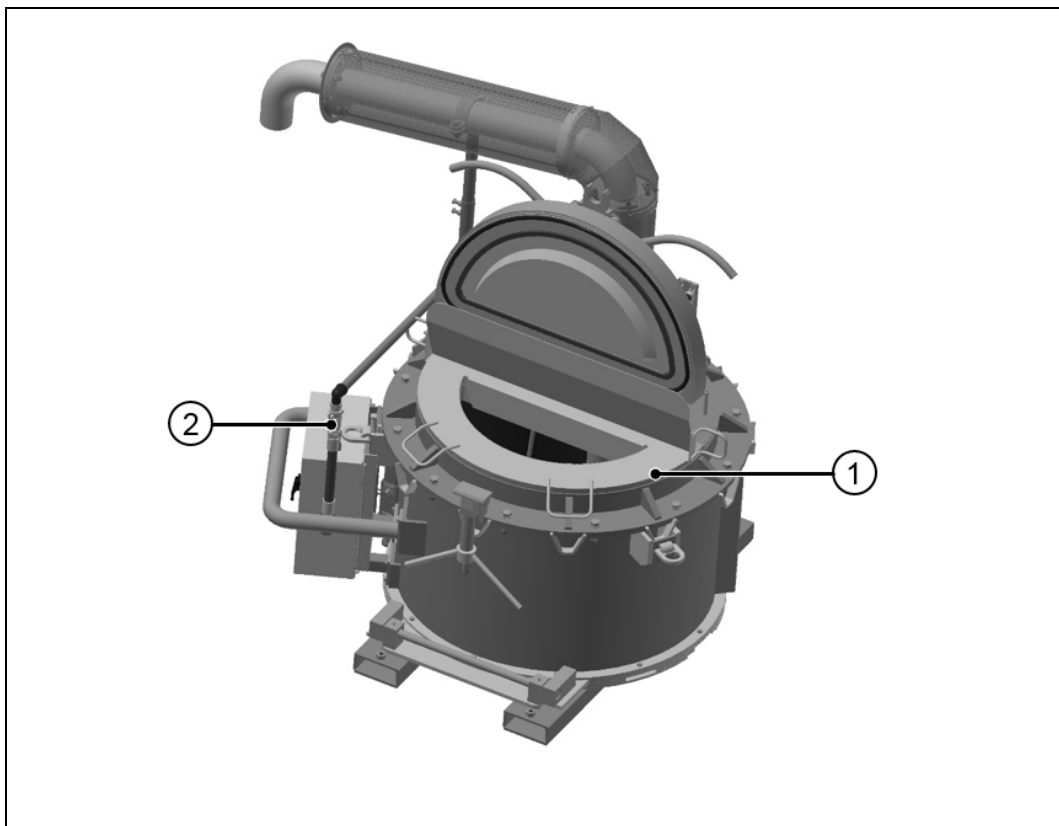
- Turn off the burner after the sintering process.
- Move the mobile burner out of the transfer ladle setup area.
- Release the ladle heater locking mechanism and lift it off using suitable hoisting equipment.
- Close the filling hatch on the transfer ladle.
- Allow the ladle heater to cool down in a safe place, blocking off the area during the cooling period.

6.4.2 Adjusting the pneumatics

To ensure that the filling process is carried out at the right flow rates, the pneumatics need to be adjusted the first time the machine is put into operation.

Step 1: Fill the transfer ladle

- Open the filling hatch on the transfer ladle.
- Set the splash guard assembly (1) onto the filler hole of the transfer ladle (see following illustration).
- Connect the pneumatic line (2).



- Where required, install the casting channel on the casting fixture of the smelter.
- Move the transfer ladle in front of the casting channel on the smelter.
- Do not overfill the transfer ladle!
- After filling, move the transfer ladle out of the smelter area.
- Remove the splash guard assembly.
- Close the filling hatch on the transfer ladle and lock it with the quick-release screw closure.

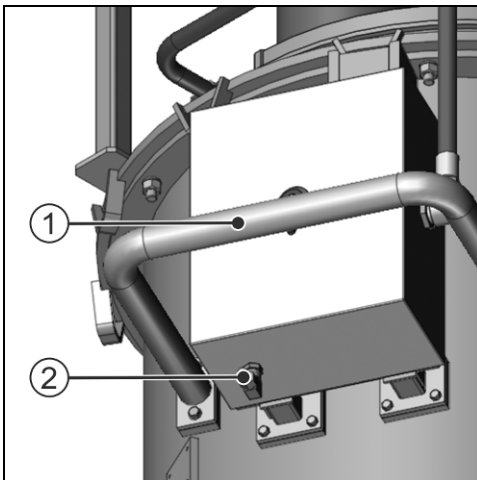
Step 2: Move the transfer ladle in front of the casting plant and connect it.

Filling the casting plant is controlled from the lift truck operator station using the operator panel.

- Verify that external power is supplied to the operator panel.
- Connect the control cable from the pneumatic cabinet to the operator panel (see section “5.4.5 Connecting the control cable”).
- Move the transfer ladle in front of the casting plant.



Ensure that the pneumatic unit in the pneumatics cabinet is supplied with air.



- Connect the quick-release coupling of the pneumatics hose to the quick-release plug (2) on the pneumatics cabinet.
- Remove the fender (1).

- Align the lift truck so that the filling pipe discharge is positioned close over the hopper on the casting plant.

Step 3: Adjusting the supply pressure

- Adjust the supply pressure to 2.5 bar on the adjustment wheel (1) of the pneumatics unit.

Step 4: Adjusting the air intake flow

Discharging the aluminium melt is made possible by pressurising the transfer ladle. The melt is filled into the feed hopper of the Westomat® or another dosage system through the external pipe system. Here it is important that the discharged melt flow can be adapted to the various conditions for casting:

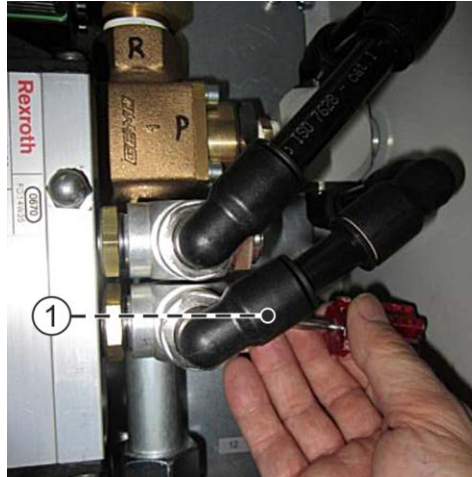
- The mass flow rate must not be too high so the feed hopper is not overfilled, but must not be too low so that a certain minimum level in the feed hopper can be maintained.
- It must be possible for the operator to easily control the mass flow rate.

Since the mass flow rate is determined by the airflow into the transfer ladle, this must be adjusted accordingly. Two different settings are provided for better control and the operator can switch between them.

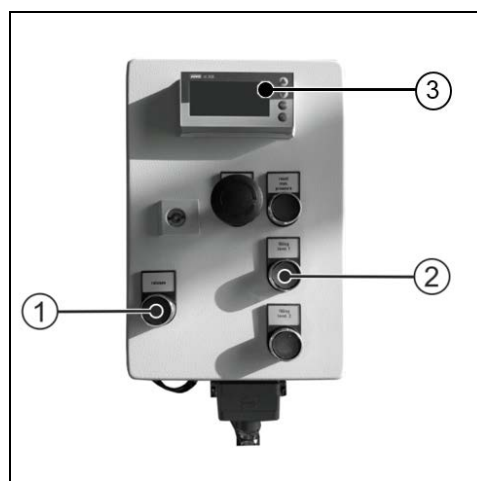
Attention: With the following settings, the ladle is pressurised but the discharge of metal is excluded provided the specified pressure level of 150 mbar is not exceeded and the Schnorkle system is in good condition. Nevertheless the possibility of endangering persons in case of metal discharge during the work must be excluded for safety reasons. At least two persons must be present during the adjustment work for safety reasons.

Step 4.1: Adjusting the air intake flow 1

- First use the supplied screwdriver to turn the lower flow rate restrictor (item 1) in the installed pneumatics cabinet clockwise to close it all the way.
- Then open it again counter-clockwise by one-sixth of a turn (corresponds to 10 minutes).



- Prepare a stopwatch
- Press the “release” button (item 1) and the “filling level 1” button (item 2) at the same time and start the stopwatch. This pressurises the transfer ladle so the pressure starts to rise.
- Keep the buttons pressed and monitor the pressure increase in the transfer ladle on the display (top row, item 3).
- When the value reaches 100 mbar, stop the stopwatch and release both buttons. The transfer ladle is de-pressurised.
- Read the time on the stopwatch.



If the time to reach an interior pressure of 100 mbar is between 9 and 11 seconds, the lower restrictor is adjusted correctly.

If the time is too long, the lower restrictor has to be opened farther counter-clockwise and vice versa. This can be done in small increments (rotation 5 to 10 minutes). The process described above has to be repeated after each adjustment.

Step 4.2: Adjusting the air intake flow 2

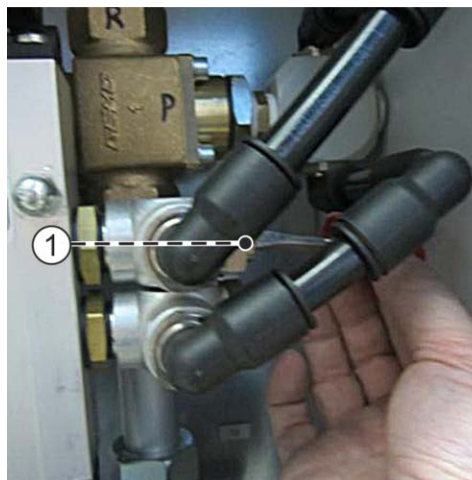
The process is similar to step 5.1, with the following differences:

Adjusting the upper flow rate restrictor

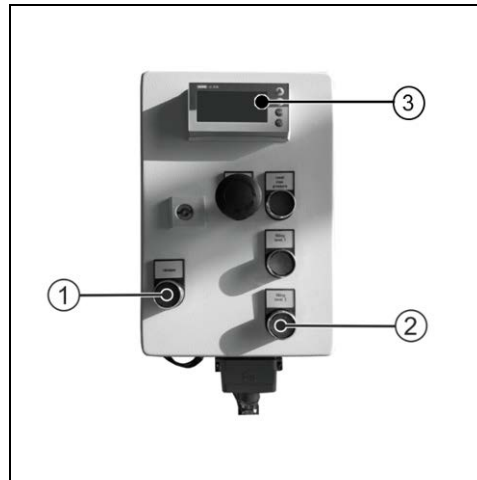
Instead of the “filling level 1” button, the “filling level 2” button has to be pressed

The pressure increase time to 100 mbar must be between 18 and 22 seconds

- First use the supplied screwdriver to turn the upper flow rate restrictor (item 1) in the installed pneumatics cabinet clockwise to close it all the way.
- Then open it again counter-clockwise by one-twelfth of a turn (corresponds to 5 minutes).



- Prepare a stopwatch
- Press the “release” button (item 1) and the “filling level 2” button (item 2) at the same time and start the stopwatch. This pressurises the transfer ladle so the pressure starts to rise.
- Keep the buttons pressed and monitor the pressure increase in the transfer ladle on the display (top row, item 3).
- When the value reaches 100 mbar, stop the stopwatch and release both buttons. The transfer ladle is de-pressurised.
- Read the time on the stopwatch.



If the time to reach an interior pressure of 100 mbar is between 18 and 22 seconds, the lower restrictor is adjusted correctly.

If the time is too long, the upper restrictor has to be opened farther counter-clockwise and vice versa. This can be done in small increments (rotation 3 to 5 minutes). The process described above has to be repeated after each adjustment.

Step 6: Adjusting the pressure switch



The pressure switch is set to a fixed value of 500 mbar. It has the same function as the mechanical safety valve and limits the interior pressure of the transfer ladle to 500 mbar.

Step 7: “Transfer ladle empty” setting

This setting is adjusted in the Jumo display unit and automatically shuts off the melt flow shortly before the transfer ladle is empty.

On delivery, the Jumo display unit is configured with standard parameters according to the size of the Schnorkle system. Only the automated shut-off that occurs shortly before the Schnorkle system is empty has to be checked and adjusted if applicable.

Attention: Wear safety clothing. Unauthorised persons are not permitted in the safety area around the Schnorkle!

Parametrisation is performed during the initial filling of the casting plant (also see section 7.3). When the machine can be emptied entirely during initial filling, carry out the filling process of the Westomat® until one of the following cases occurs:

- A) The filling process is stopped automatically.
 - Case 1: The filling process was stopped at the right time. → OK.
 - Case 2: The filling process was stopped too soon
 - To determine if case 1 or 2 applies, proceed as follows:
 - Set the machine down, tilted (also see section 10.1)
 - Open the cover
 - Visually check whether the ceramic riser pipe in the bottom is free of melt.

- If so, case 1 applies
 - If not, case 2 applies
- B) Slight spatter from the filling pipe, so the filling process must be stopped manually right away.
 - Case 3: The filling process was stopped too late

Procedure for case 1, 2 or 3:

Case 1: No parameter changes required

Case 2: The upper limit value for the maximum pressure has to be increased by a few millibar (also see the description for step 7). Then repeat the filling process for the Westomat[®] described above including the visual inspection one or more times until case 1 applies.

Case 3: Reverse procedure: Lower the maximum pressure (also see description 7) by a few millibar and check again.

Description for step 7: Parametrisation of the Jumo display

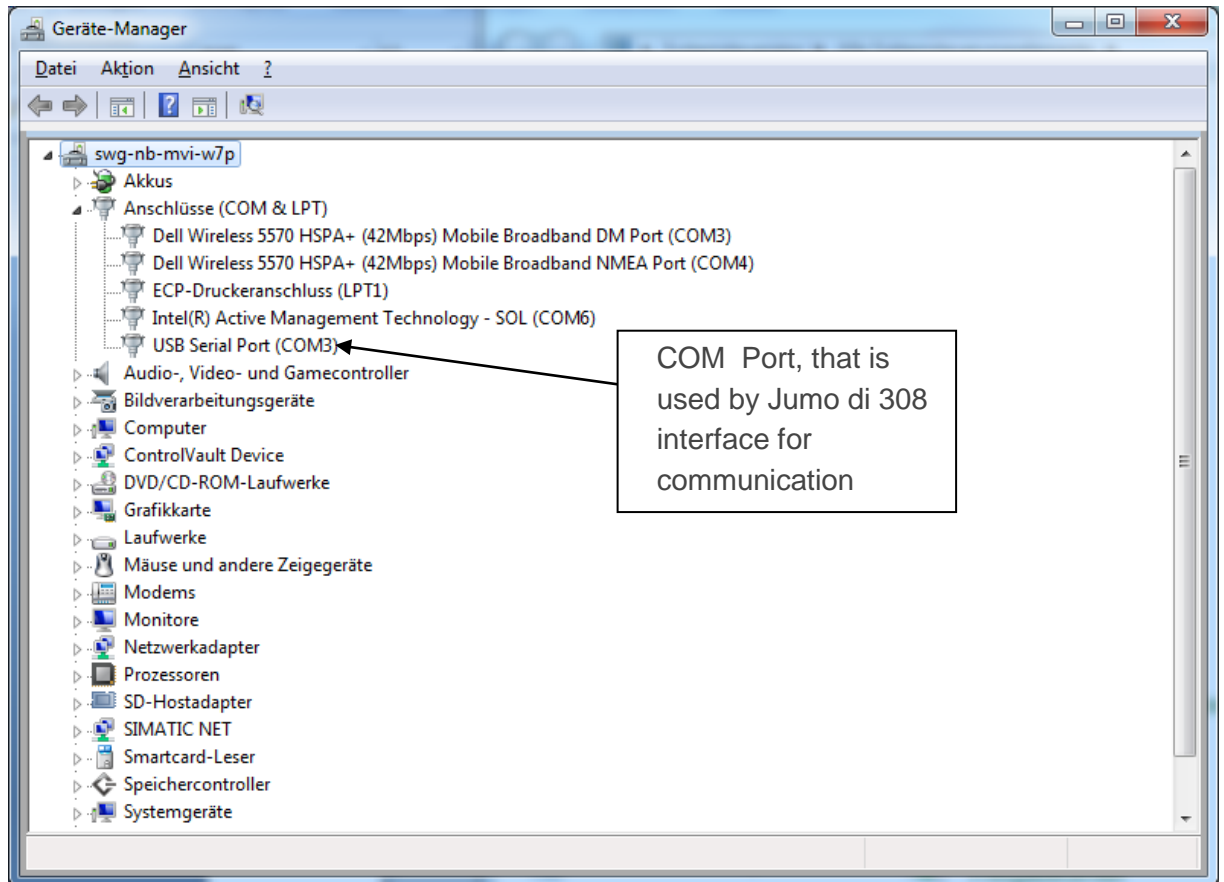
Parametrisation of the maximum pressure at which the dosage lock is activated and the bleeding process triggered is performed on the Jumo display unit, which also controls the valves required for the automatic bleeding process.

Prerequisites:

- Laptop with installed software:
 - Setup program Jumo di 308 including device description for the display unit and connecting cable
- Suitable parametrisation software
 - Schnorkle_DI_308_400kg.217 or
 - Schnorkle_DI_308_700kg.217 or
 - Schnorkle_DI_308_1300kg.217
- Special connecting cable:
 - Jumo PC interface with USB/TTL converter

First a connection between the laptop and di 308 needs to be established.

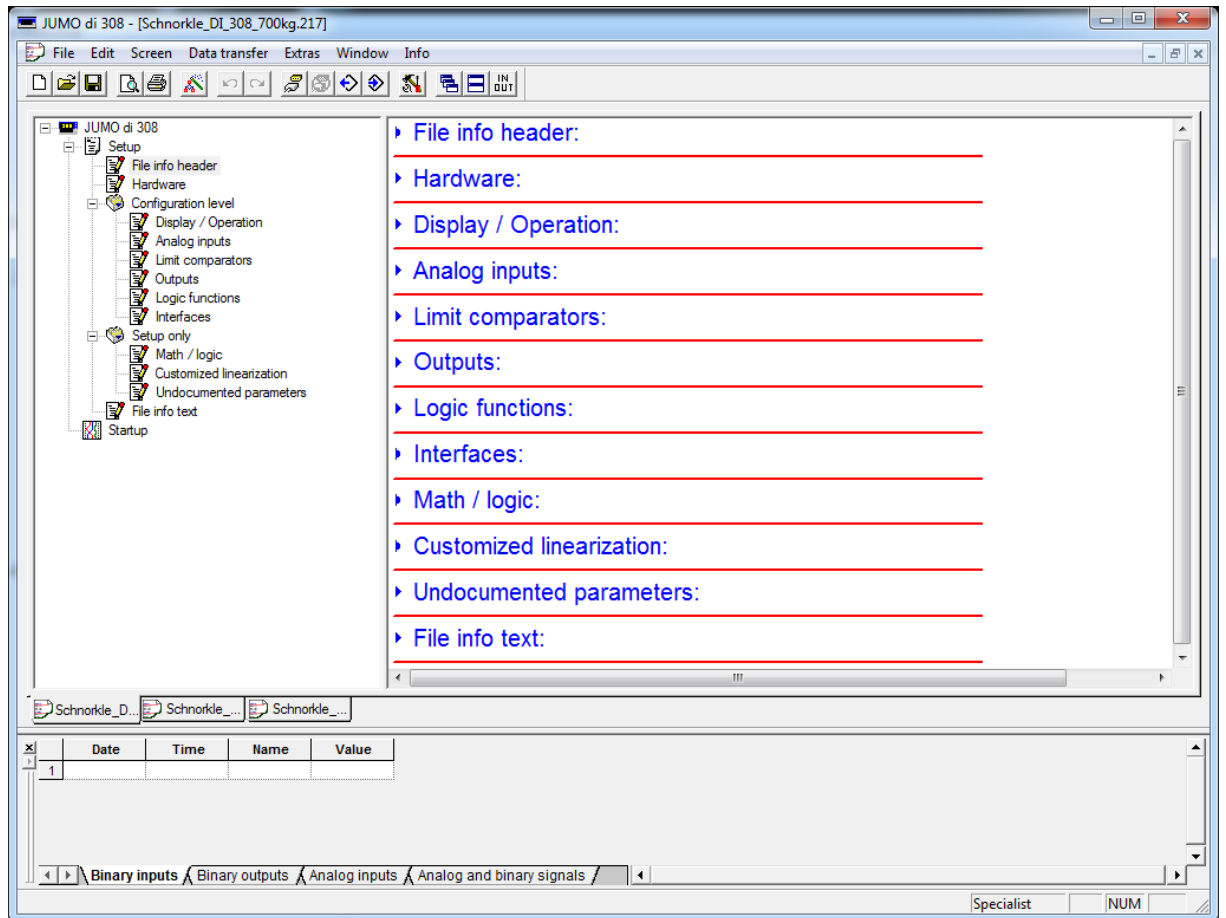
- Power up the laptop and connect the USB plug on the connecting cable to a USB port on the computer. The driver software is activated and selects a COM port. This port can vary and must be read in device manager.



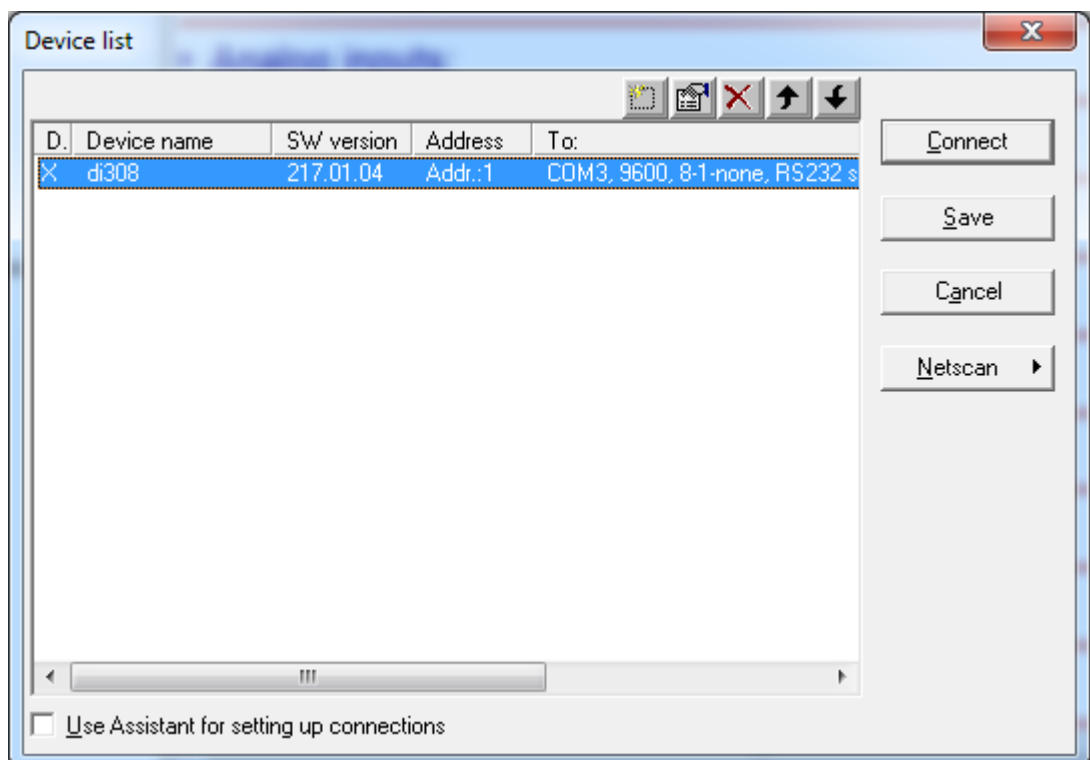
- Connect the other end of the connecting cable to the running Jumo di 308 display unit



- Start the setup program and open the corresponding parametrisation software



- Click the data transfer button; a device list is displayed if a device has already been parametrised



- Double-click the corresponding device and then select Settings in the pop-up that follows to access the settings. The device should be parametrised with the following settings. Note that the COM port may be different and has to be taken from the device manager.

Settings for establishing communication

Communication protocol: Modbus protocol

Communication interface: Serial interface

Device address (1 - 255): 1

Connected to: COM3

Stop bit: 1

Transfer rate: 9600

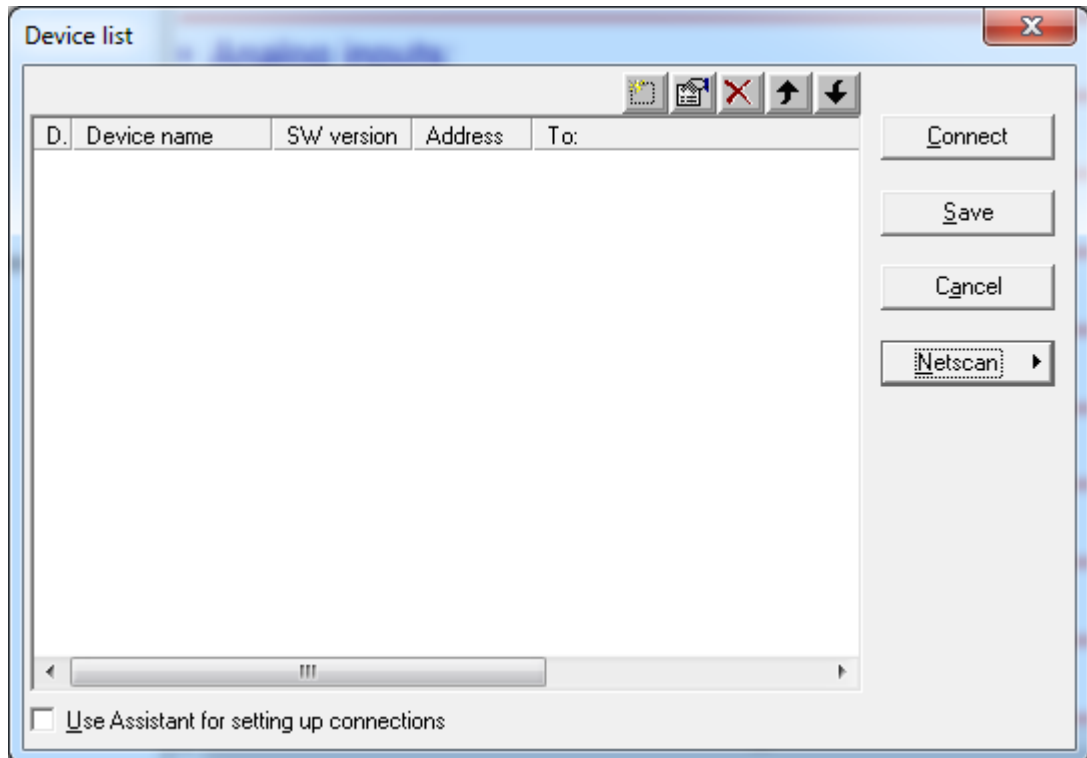
Parity: none

Control signal: RS232 setup interface(TTL)

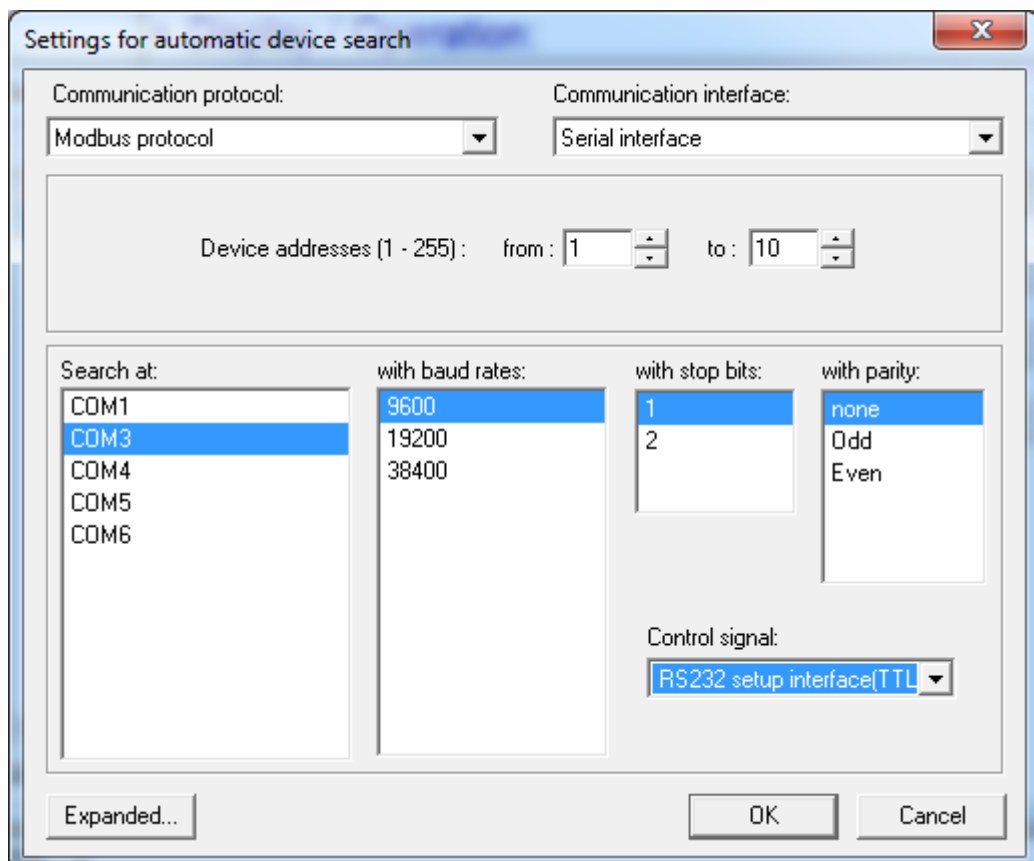
Expanded... Default Factory setting OK Cancel

- Confirm with OK, return to the device list and then click the “Connect” button. A connection is established.

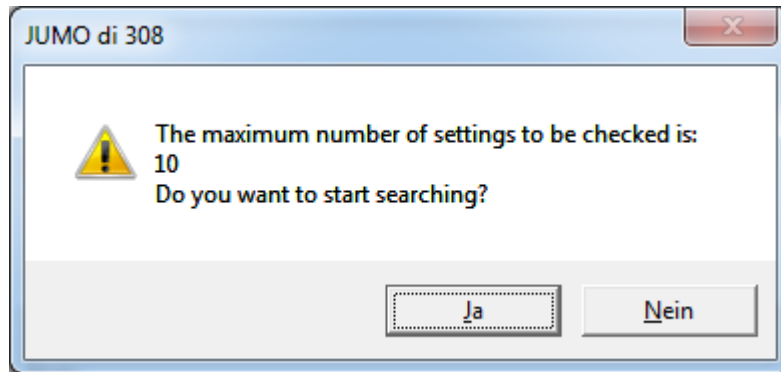
- If there is no device in the device list or the connection attempt ends with an error, search for the connected device:



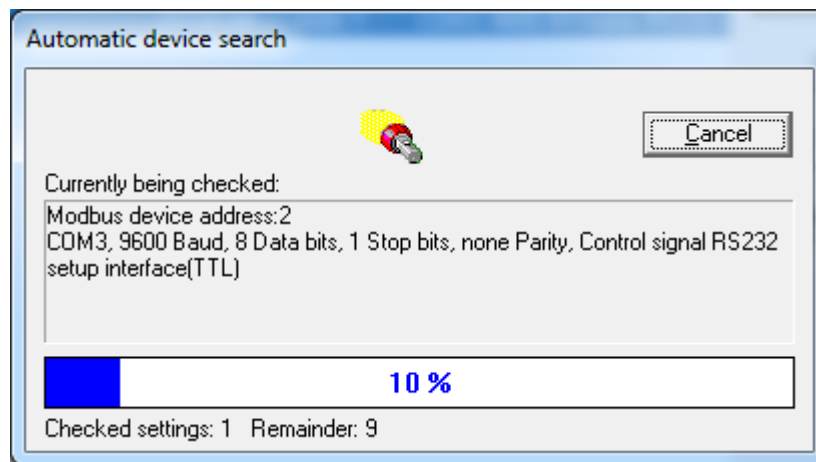
- Click the network scan button and use the following settings to search for the device, selecting the COM port according to the device manager.



- Click OK to display the following pop-up

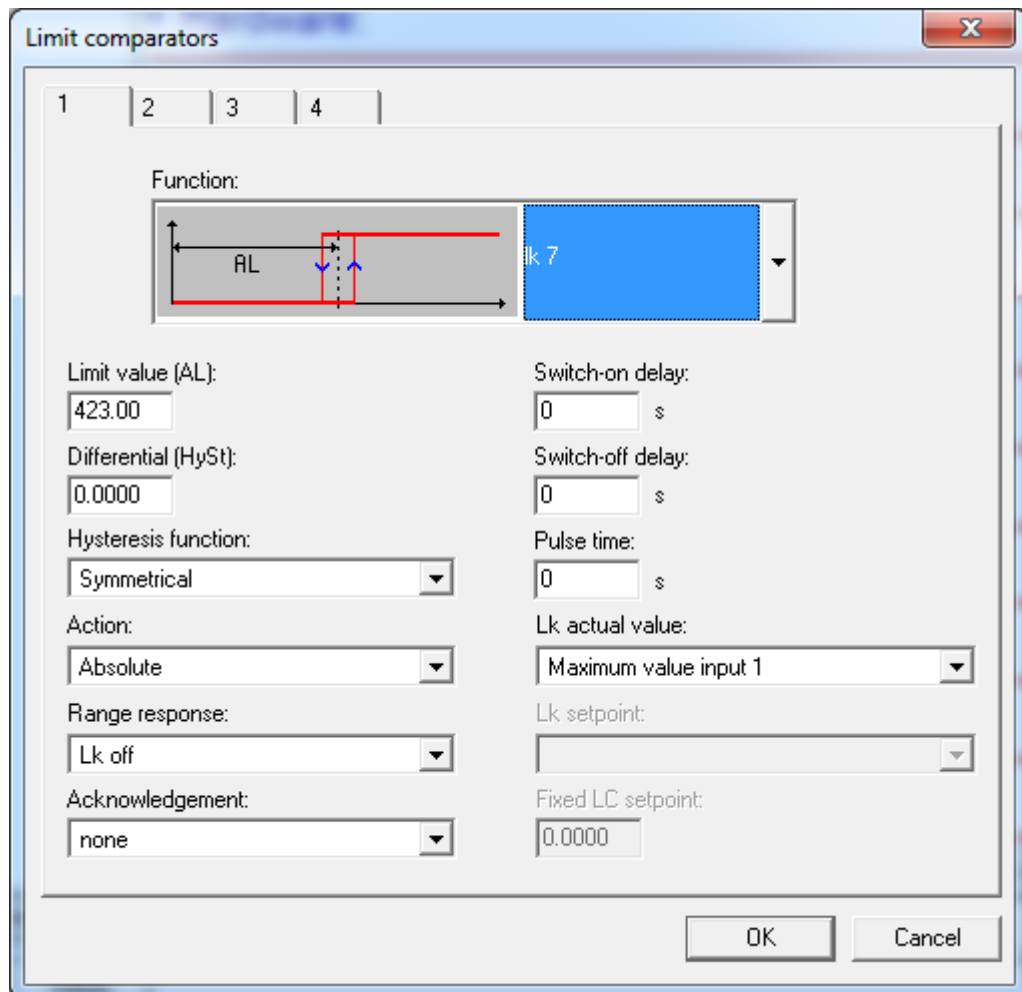


- Click "Yes" to search for the connected device



Finally, the Jumo display unit is found in the device list and the "Connect" button can be clicked. If there are still problems, further information is found in the description of the interface cable.

After the connection is established, the upper pressure limit value to automatically stop metal dosage can be changed according to the following description. In order to do so, click “Limit comparators:” in the main menu of the setup program; the following screen appears:



The editable upper limit value for the maximum pressure in mbar is found at the top left under “Limit value (AL)”. Confirm with OK.

Finally save the changed setup under a new name, for example:

- Schnorkle_DI_308_700kg_F12345.217

Then click “Data transfer” in the main menu to transfer the changed parametrisation to the device, where it takes effect immediately.

6.5 Resuming operation

6.5.1 Pre-heating the transfer ladle



WARNING

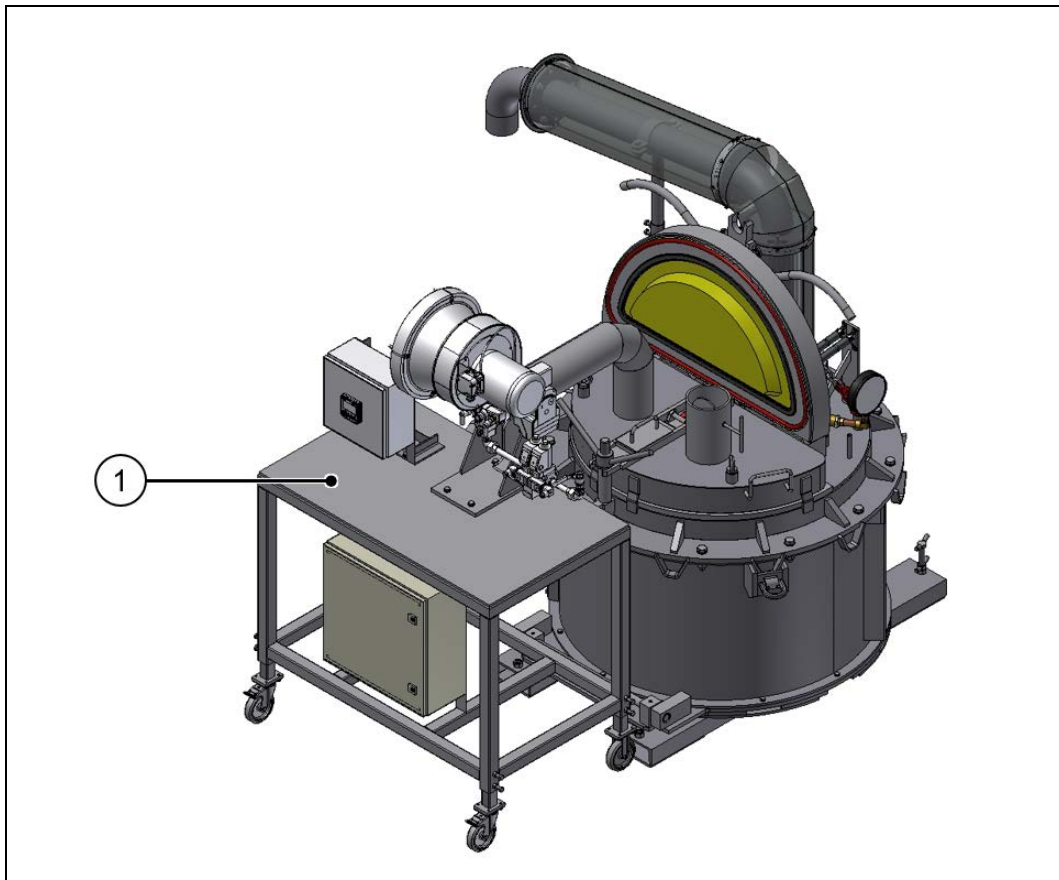


Risk of burns on the ladle heater and mobile burner!

Contact with hot components may cause severe burns.

– Personal protective equipment must be worn during all work in the vicinity of hot components.

- Ensure that the transfer ladle is set down in the tilted position using the adjustable support. This ensures that the riser pipe and filling pipe are heated as well and not sealed by liquefied residual aluminium.
- Move the mobile burner (1) in front of the transfer ladle so that the burner pipe is positioned in the muzzle pipe of the ladle heater (see following illustration).



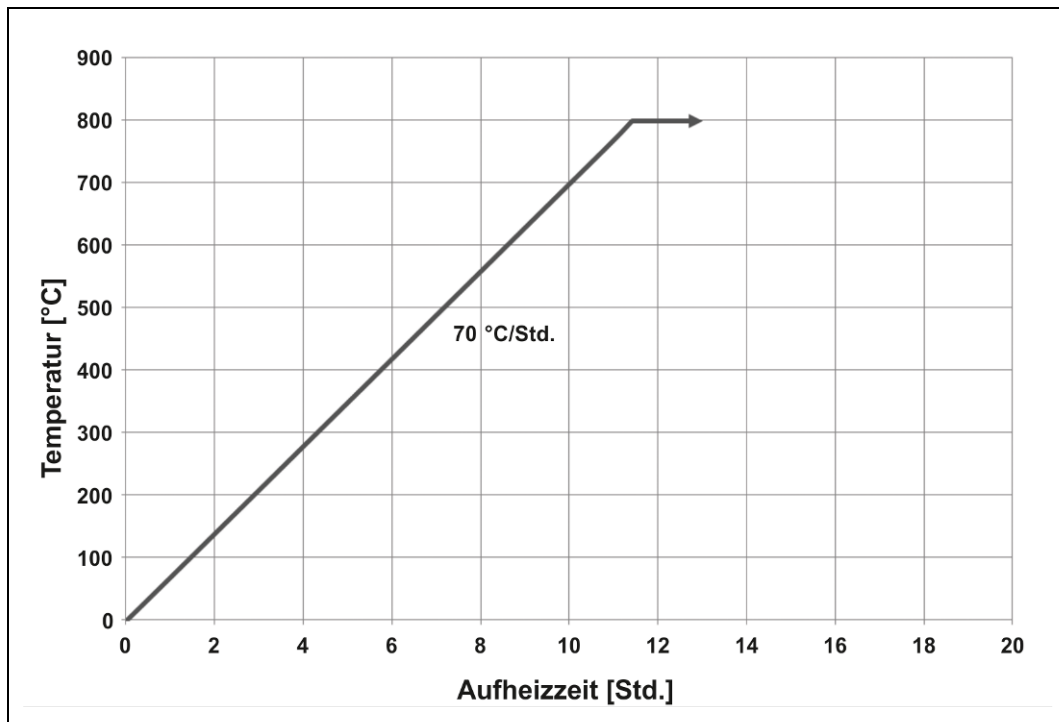
- Turn on the burner.



The time to pre-heat the transfer ladle to 800 °C is 11.5 hours (see transfer ladle heating curve). The temperature can be checked with a display connected to the temperature sensor.

By adjusting the exhaust flap in the vent stack, the pre-heating output can be regulated according to the exhaust air volume.

Transfer ladle heating curve



- Turn off the burner after the pre-heating process.
- Move the mobile burner out of the transfer ladle setup area.
- Lift off the ladle heater using suitable hoisting equipment.
- Close the filling hatch on the transfer ladle.
- Allow the ladle heater to cool down in a safe place, blocking off the area during the cooling period.

7 Operation

7.1 Safety measures in normal operation

- The filling process may only be started from the operator station of the lift truck.
- Safety devices may not be removed or deactivated during operation of the machine.
- The operating personnel has to ensure that there are no unauthorised persons in the work area of the machine.

Perform the following inspections once a day:

- Inspect the machine for externally visible damage.
- Verify the functionality of all safety devices.
- Check all pneumatic lines for leak tightness and correct connection.



WARNING



Risk of burns on the machine!

Contact with the aluminium melt causes severe burns.

- Personal protective equipment must be worn during all work on the smelter.



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.

- Personal protective equipment must be worn during all work in the vicinity of the machine.



WARNING



Risk of severe injuries while moving the transfer ladle!

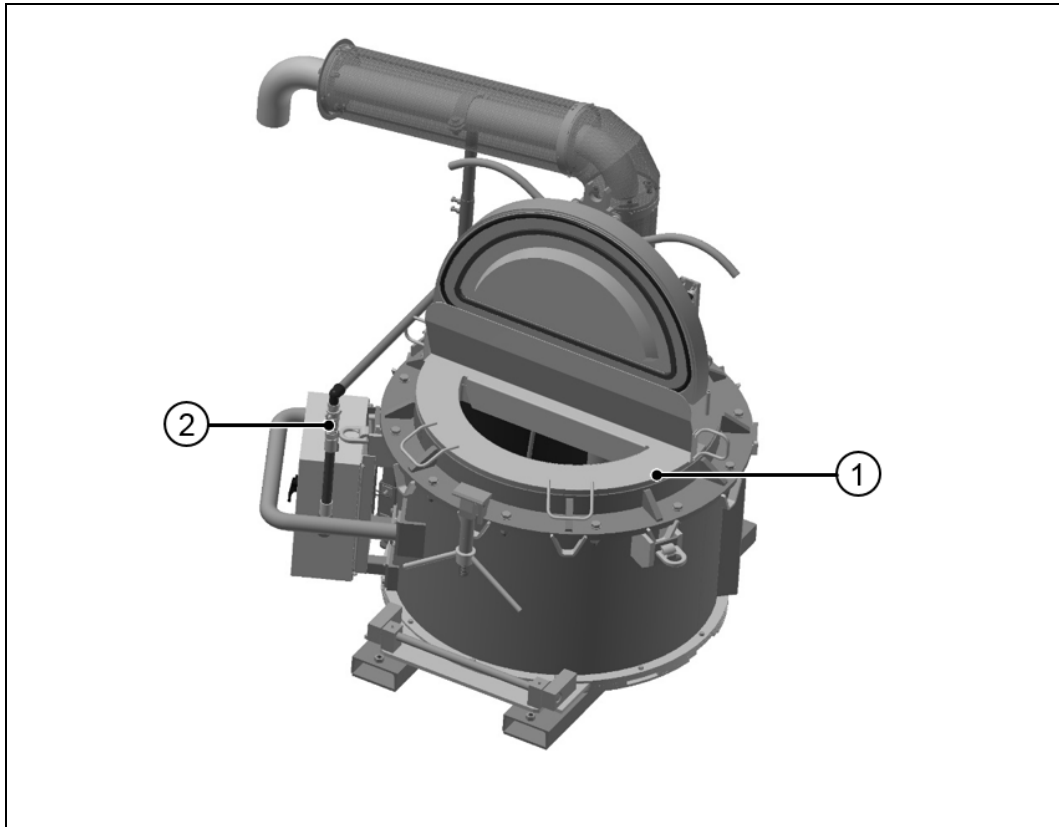
Persons along the route can be hit and may fall and be seriously injured.

- Watch for persons that may be present along the route.
- Post a second person as a guide to secure the route.

7.2 Filling the transfer ladle

Install the splash guard assembly and casting channel

- Open the filling hatch on the transfer ladle.
- Set the splash guard assembly (1) onto the filler hole of the transfer ladle (see following illustration).
- Connect the pneumatic line (2).



- Where required, install the casting channel on the casting fixture of the smelter.

Fill the transfer ladle

- Move the transfer ladle in front of the casting channel on the smelter.
- Do not overfill the transfer ladle!
- After filling, move the transfer ladle out of the smelter area.
- Remove the splash guard assembly.
- Close the filling hatch on the transfer ladle and lock it with the quick-release screw closure.
- Press the RESET PRESSURE DISPLAY button to set the fill level to 100%.

7.3 Filling the casting plant

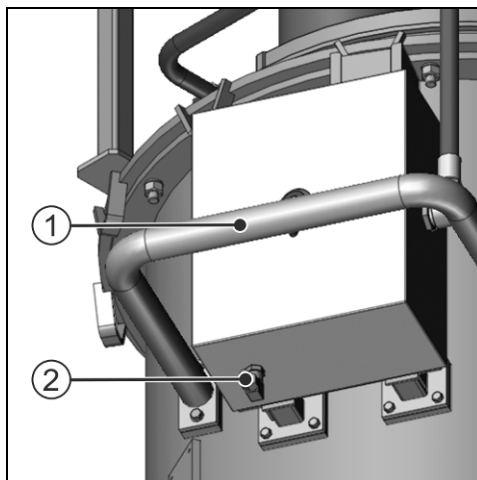


Filling speed and pressurisation

One of 2 filling speed levels can be selected and it is possible to switch between them during filling. The pressurisation value according to the filling speed can be read on the display of the pressure gauge on the cover plate.

Filling the casting plant is controlled from the lift truck operator station using the operator panel.

- Verify that external power is supplied to the operator panel.
- Connect the control cable from the pneumatic cabinet to the operator panel (see section “5.4.5 Connecting the control cable”).
- Move the transfer ladle in front of the casting plant.



- Connect the quick-release coupling of the pneumatics hose to the quick-release plug (2) on the pneumatics cabinet.
- Align the lift truck so that the filling pipe discharge is positioned close over the hopper on the casting plant.

Filling with speed level 1

- On the operator panel, press the RELEASE and FILING LEVEL 1 buttons at the same time.

Filling with speed level 2

- On the operator panel, press the RELEASE and FILING LEVEL 2 buttons at the same time.

The transfer ladle is gradually pressurised with compressed air.

The aluminium melt rises up the riser pipe and filling pipe, and flows out of the filling pipe into the filler hole of the casting plant.

7.4 Stopping casting plant filling

- Release the FILLING LEVEL 1 or FILLING LEVEL 2 button.
 - Pressurisation stops.
 - The transfer ladle is not de-pressurised.
 - Filling the casting plant slows down.
 - The filling process is not stopped immediately.

7.5 De-pressurising the transfer ladle



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.

- Personal protective equipment must be worn during all work in the vicinity of the machine.

- Let go of the RELEASE button.

Pressurisation with compressed air stops and the transfer ladle is de-pressurised.

7.6 Emptying the transfer ladle



WARNING



Risk of burns on the machine!

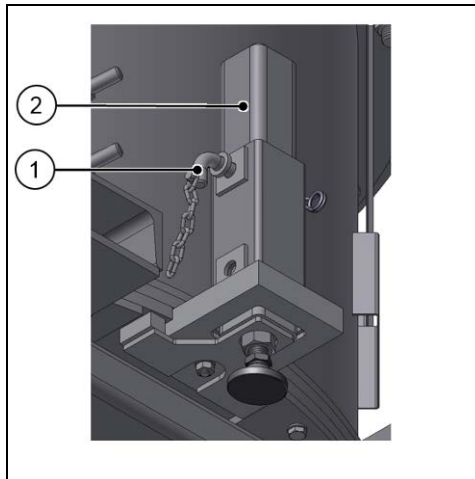
Contact with the machine may cause severe burns.

- Block off the storage area against unauthorised access during the cooling phase.



If there is no further filling of the casting plant within 1 hour or the machine is taken out of operation for an extended period of time (> 1 hour), the transfer ladle has to be emptied. The machine is set down in the tilted position using the adjustable support and the remaining melt is bailed out.

- Disconnecting the compressed air supply:
Pull the quick-release coupling of the pneumatic hose out of the quick-release plug on the pneumatics cabinet.
- Move the machine to the storage location in the raised position.

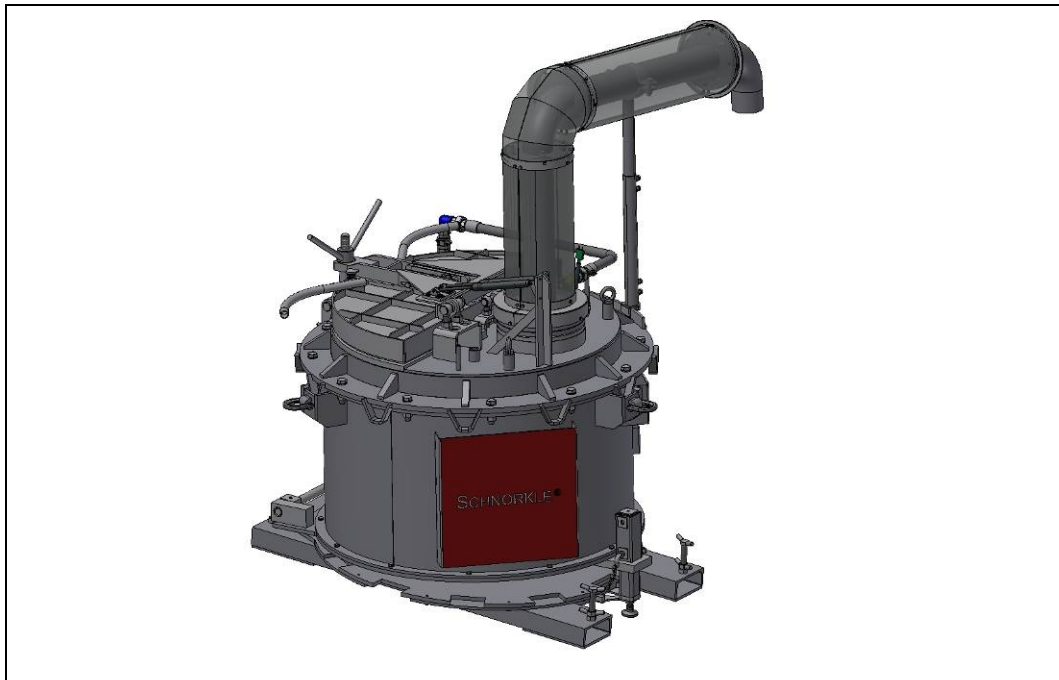


- Take the bolt (1) out of the upper bore of the adjustable support (2).
- Slide the adjustable support (2) down and lock it with the bolt (1) in the lower bore.
- Set the machine onto the floor.



This tilted position of the transfer ladle ensures that the riser pipe is not cemented by the remaining, hardening aluminium melt.

The following illustration shows the transfer ladle in the tilted position.



- Open the filling hatch on the transfer ladle.
- If applicable, empty the transfer ladle with a suitable bailing system until the riser pipe is free of aluminium melt.

7.7 Cleaning the transfer ladle



WARNING



Risk of burns on the machine!

Contact with the machine or liquid aluminium may cause severe burns.

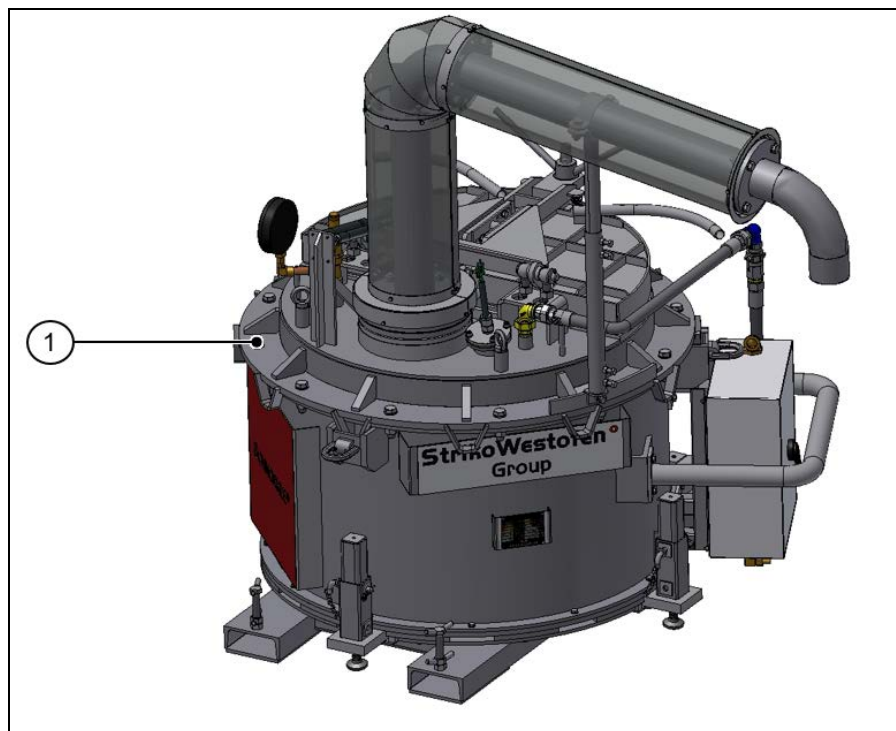
- Personal protective equipment must be worn during all work on the machine.

- To maintain the metal quality and proper operation, and to extend the service life of the machine, contaminants such as slag and dross in the liquid aluminium have to be skimmed and removed regularly.
 - Fill the transfer ladle with liquid aluminium (see section “7.2 Filling the transfer ladle”).
 - Scrape off aluminium slag with suitable cleaning tools and transfer it to an appropriate container.
 - Ensure that the riser pipe, protective tube and fireproof material are not damaged.
 - Once all contaminants have been removed from the surface of the aluminium bath, operation of the machine can continue (see section “7.3 Filling the casting plant”).

- To extend the service life of the fireproof material and the entire machine, accumulated aluminium residue must be removed regularly.

Removing the main cover from the machine is recommended in order to reach all corners.

- Remove the screws (1) and lift the main cover on the specified eye-bolts using suitable hoisting equipment.
- Remove the contaminants with suitable cleaning tools.
- Put the main cover back on and install it as described in section "5 Assembly".



7.8 Actions after triggering the safety devices

7.8.1 EMERGENCY STOP button



WARNING

Danger to life due to uncontrolled powering up of the machine!

Uncontrolled powering up may lead to serious personal injury or death!

- Before powering up the machine, ensure that the cause of the emergency stop has been eliminated and that all safety devices are installed and functional.
- Only unlock the EMERGENCY STOP button when all hazards have been eliminated.



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.

- Personal protective equipment must be worn during all work in the vicinity of the machine.

After pressing the EMERGENCY STOP button on the operator panel, pressurising the transfer ladle stops and the transfer ladle is bled via the air valve. After bleeding the transfer ladle is de-pressurised.

After pressing the EMERGENCY STOP button, follow these steps to put the machine back into operation:

- Eliminate the cause of the emergency stop.
- UNLOCK THE EMERGENCY STOP button.

7.8.2 Safety valve



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.

- Personal protective equipment must be worn during all work in the vicinity of the machine.

The safety valve on the cover plate trips when pressurisation exceeds a value of 0.5 bar.

Bleed the system manually and eliminate the cause of tripping the safety valve (see section "8 Faults").

8 Faults

8.1 Safety instructions



WARNING

Risk of severe injuries due to improper troubleshooting!

- This work may only be carried out by qualified personnel or skilled workers.
- Contact StrikoWestofen GmbH in case of doubt.



WARNING



Risk of burns on the machine!

Contact with the machine may cause severe burns.

- Personal protective equipment must be worn during all work on the machine.



WARNING



Risk of burns when the safety valve is opened!

Contact with escaping hot compressed air can cause severe burns.

- Personal protective equipment must be worn during all work in the vicinity of the machine.

8.2 Faults and corrective actions

Fault	Cause	Corrective actions
The aluminium melt is not transported	The power supply from the lift truck to the operator panel is disrupted	Have the power supply on the lift truck and the cabling to the operator panel inspected by an electrician and correct any errors
	The control signal from the operator panel to the pneumatics cabinet is disrupted	Have the control line from the operator panel to the pneumatics cabinet inspected by an electrician and correct any errors
	The compressed air supply is disrupted	Check the compressed air connection and verify that system pressure is adequate
The aluminium melt is not transported and the safety valve opens	Blocked riser pipe	Replace the riser pipe
	Blocked filling pipe	Replace the filling pipe
The aluminium melt is not transported and compressed air is escaping.	Damaged or incorrectly installed seal	Check the correct fit of the seal, replace if needed
	Leaking pneumatic line/connections	Check the pneumatic line connections, replace if needed
	Leaking pneumatic hose/connection	Replace the pneumatic hose
No temperature on operator panel	Interrupted power supply	Check the power supply and inspected by an electrician if necessary
	The connection cable thermo couple is unaligned	Close the connection to the pneumatics cabinet

8.3 Customer service



We are happy to help you if you need assistance with troubleshooting.
Please contact our head office in Gummersbach by telephone.

StrikoWestofen GmbH

Hohe Straße 14

D-51643 Gummersbach, Germany

Telephone +49 2261 7091 129

Fax +49 2261 7091 107

E-mail sales@strikowestofen.com

Internet www.strikowestofen.com

9 Maintenance

9.1 Safety measures for maintenance

Perform the prescribed maintenance tasks such as cleaning, lubrication, servicing and inspections in a timely manner.

Before doing maintenance work, note the following points:

- Lock out all de-pressurised machine components so they cannot be activated again unintentionally.
- Block off access to the work area for the machine. Ensure that no unauthorised persons are present in the machine work area.
- Ensure that all machine components have cooled to the ambient temperature.
- Ensure that suitable hoisting equipment and load handling equipment is available for the replacement of larger machine components.
- Squat down instead of bending over when working on components lower down. Stand straight and upright when working on components higher up.
- Replace all machine components that are not in sound condition immediately.
- Only use original replacement parts.

After the completion of maintenance work, perform the following tasks:

- Once again check the tightness of all screw connections that were loosened.
- Verify that all previously removed safety devices and covers have been properly reinstalled.
- Ensure that all tools, materials and other equipment that were used have been removed from the work area.
- Clean the work area. Clean up any spilled liquids or similar substances.
- Ensure that all safety devices on the machine function properly again.

9.2 Inspection and maintenance tasks

9.2.1 Maintenance intervals

Maintenance location	Maintenance task	See section
Daily		
Overall machine	Visual inspection	9.2.3
Filling hatch seals	Inspect seals on the filling hatch for damage and replace if needed.	9.2.4
Pneumatic components	Check pneumatic hoses for leaks and replace if needed.	9.2.5
	Check screw connections on the pneumatic lines and tighten if needed.	9.2.5
Every 6 months		
riser pipe seals	Replace seals	9.2.6
Filling pipe seals	Replace seals	9.2.8
Overall machine	Check screw connections	9.2.7
Annually		
Cover seals	Replace seals	9.2.9
Quick-release closure spindle	Lubricate	9.2.10
Special maintenance intervals		
Pneumatic hoses (no later than every 10 years)	Replace	9.2.11

9.2.2 Preparations



WARNING



Risk of burns on the machine!

Contact with the machine components may cause severe burns.

- Personal protective equipment must be worn during all work on the machine.
- Allow the machine to cool to the ambient temperature.



WARNING

Risk of injury due to escaping compressed air!

In case of leaks or removal of pneumatic components under pressure, there is a risk of injuries due to the ejection of aluminium melt.

- De-pressurise the pneumatics prior to the work.

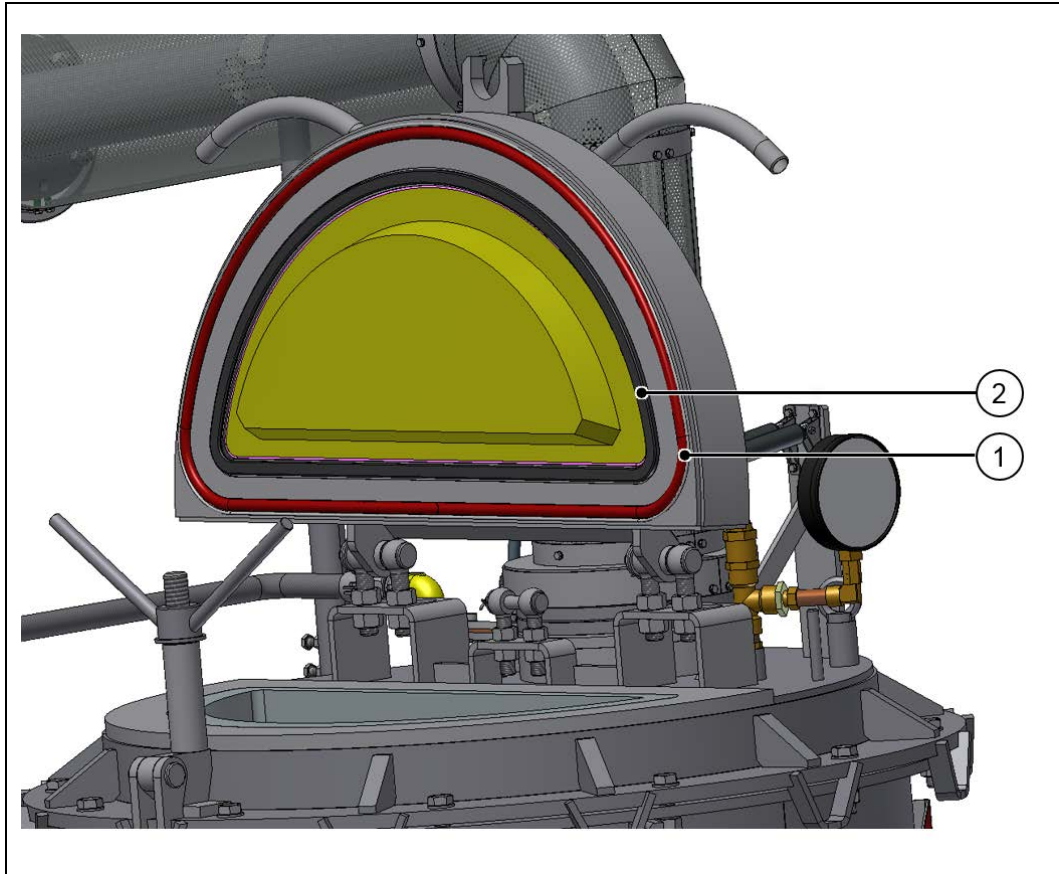
- Disconnect the control cable from the operator panel.
- Move the transfer ladle to the storage location and empty it.
- Disconnect the compressed air connection

9.2.3 Visual inspection

- Inspect the machine for mechanical damage.
- Report damage to a superior immediately.

9.2.4 Checking the filling hatch seals

The illustration that follows shows the filling hatch seals.



- 1 Sealing profile
- 2 Sealing strip

Inspecting/replacing seals



Only install seals included in the list of replacement parts (see appendix "Replacement part sheet").

- Inspect the seals for damage.
- Remove contaminants from the seal groove and clean it.
- Evenly press the new seal into the groove.
- After replacing the seals, conduct a pressure tightness test (see section "9.3 Conducting a pressure tightness test").

9.2.5 Inspecting the pneumatic components

- Inspect the pneumatic line and its connections for leaks and damage.
- Replace damaged pneumatic components.
- Check screw connections on the pneumatic line and tighten if needed.

9.2.6 Replacing the riser pipe seals

The seals on the riser pipe have to be replaced every 6 months.

- Remove the filling pipe.

NOTICE

Risk of damage to the filling pipe and stud bolts!

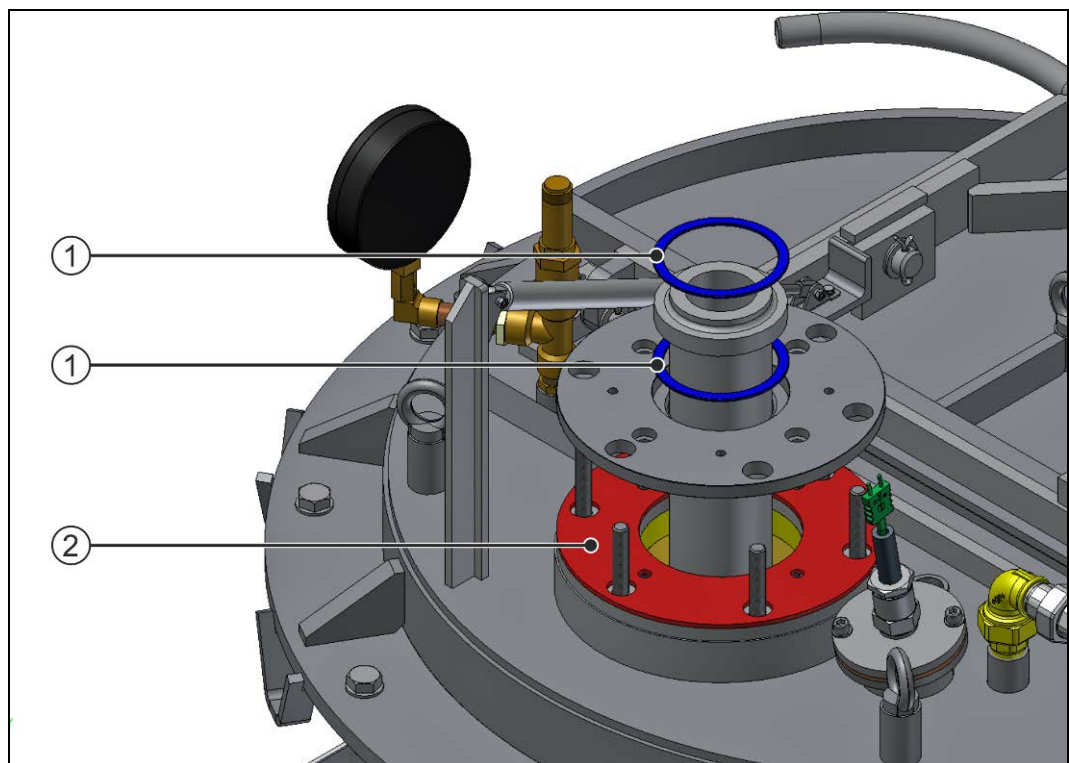
During removal and installation of the filling pipe, there is a risk of canting the connecting flange, thereby damaging the stud bolts.

- Two people are required for removal and installation.



To remove the filling pipe, proceed in the reverse sequence described for installation (see section “5.4.3 Installing and aligning the filling pipe”).

The illustration that follows shows the riser pipe seals.



- 1 Corrugated gaskets
- 2 Mica seal

- Remove the riser pipe.



To remove the riser pipe proceed in the reverse sequence described for installation (see section “5.4.2 Installing the riser pipe”).

- Install the riser pipe with the new seals.



Only install seals included in the list of replacement parts (see appendix “Replacement part sheet”).

- After replacing the seals, conduct a pressure tightness test (see section “9.3 Conducting a pressure tightness test”).
- Install the filling pipe (see section “5.4.3 Installing and aligning the filling pipe”).

9.2.7 Checking screw connections

- Check the following screw connections on the machine for firm fit:
 - Cover plate with transfer ladle
 - Pneumatics cabinet and fender with transfer ladle
 - Components of the supporting and tilting mechanism with the floor
- Tighten loose screw connections (torque values according to screw size and strength class).

9.2.8 Replacing the filling pipe seals

The seals on the filling pipe have to be replaced annually.

Removing the filling pipe

NOTICE

Risk of damage to the filling pipe and stud bolts!

During removal and installation of the filling pipe, there is a risk of canting the connecting flange, thereby damaging the stud bolts.

- Two people are required for removal and installation.

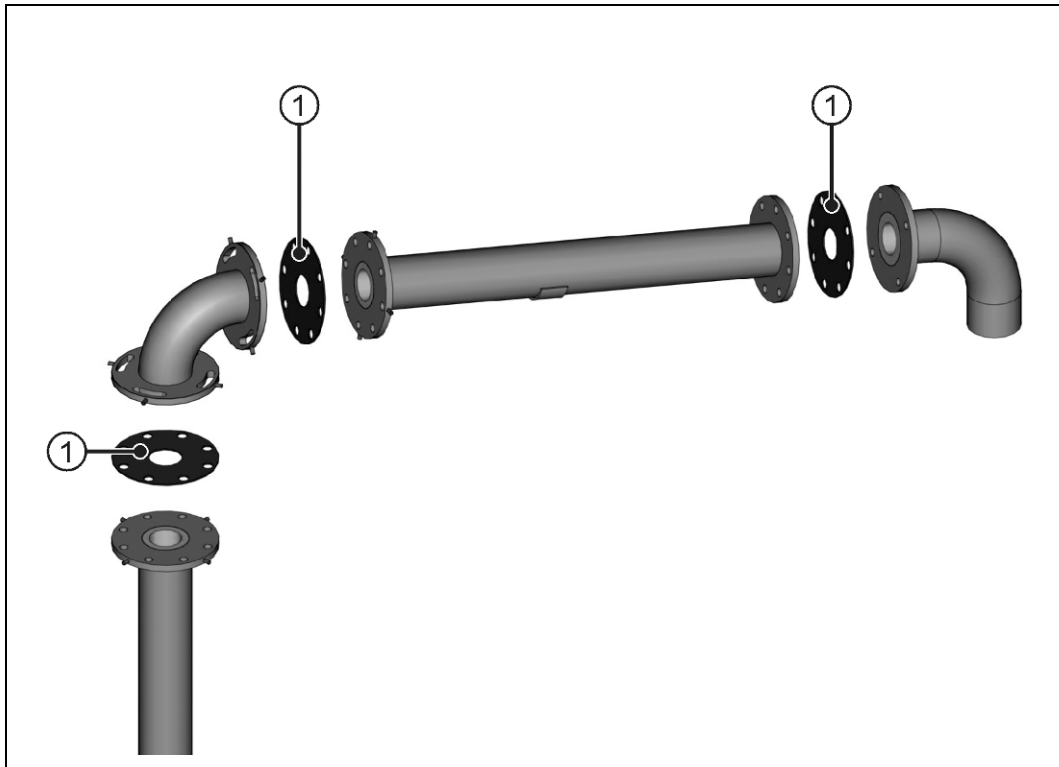
- Remove the contact protection elements from the filling pipe.
- Remove the filling pipe.



To remove the filling pipe, proceed in the reverse sequence described for installation (see section “5.4.3 Installing and aligning the filling pipe”).

- Loosen the filling pipe flange connections.

The illustration that follows shows the filling pipe seals.

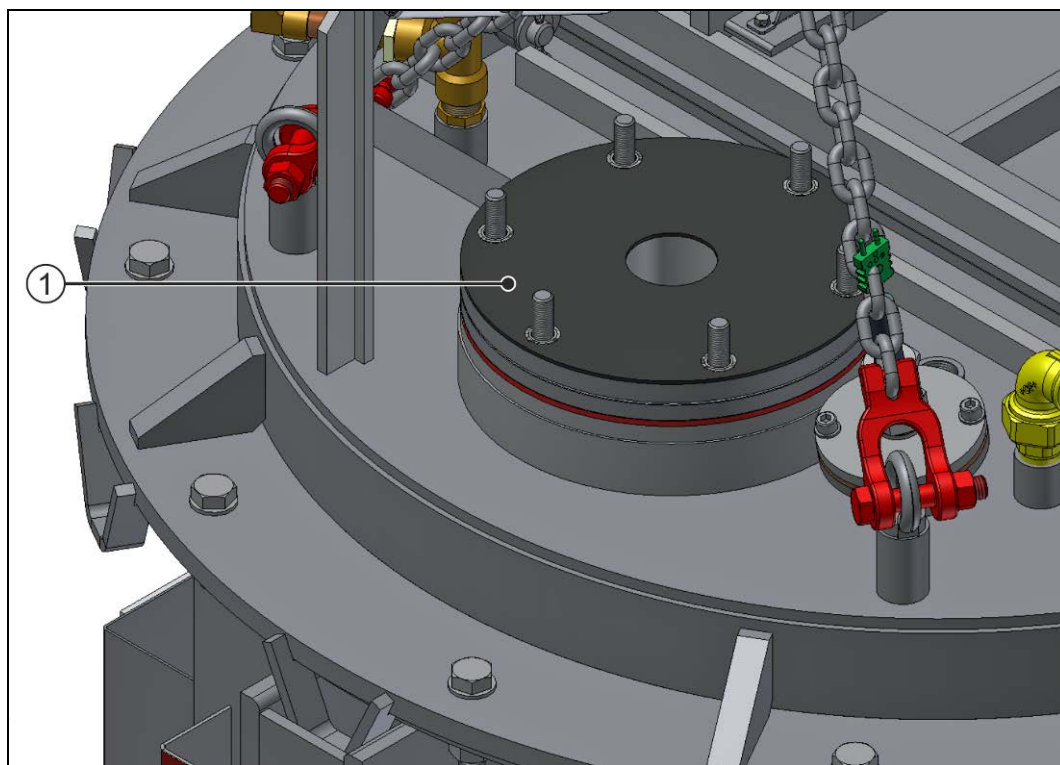


-

1 Seal

- Replace the seals in the flange connections and screw the flanges together.

The illustration that follows shows the seal of the filling pipe to the riser pipe flange.



1 Seal

- Replace the seal and screw the filling pipe to the riser pipe flange.
- Install the contact protection elements on the filling pipe.

9.2.9 Replacing the cover seals



WARNING

There is a risk of crushing during disassembly and assembly of the cover plate!

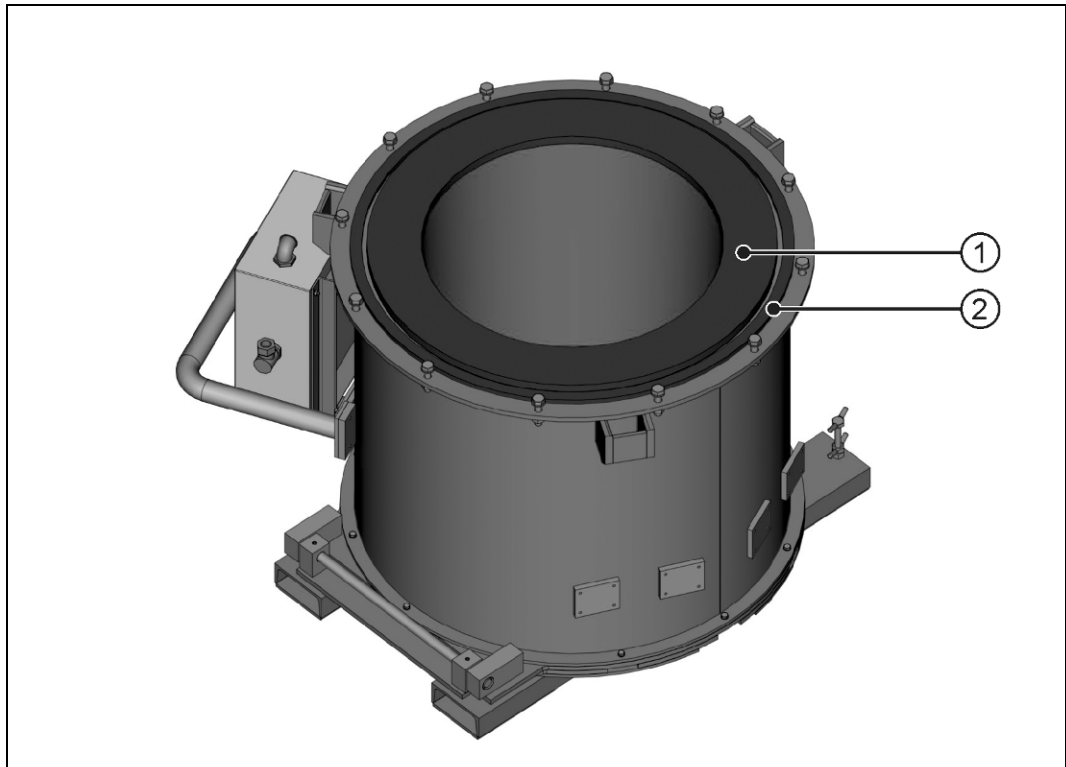
If the cover plate is raised and lowered with unsuitable hoisting equipment on other than the intended connection points, there is a risk that the cover plate may fall and cause crushing.

- Personal protective equipment must be worn during all work.
- Only lift the components by the intended connection points using suitable hoisting equipment.

The seals between the cover and transfer ladle must be replaced annually.

- Remove the pneumatic line between the pneumatics cabinet and cover plate.
- Pull the thermocouple out of the protective tube.
- Loosen the 12 nuts on the cover flange and remove the bolts.
- Attach the hooks or shackles of the load chains to the 3 connection points on the cover plate.
- Lift the cover plate with suitable hoisting equipment.

The illustration that follows shows the seals on the cover plate.



- 1 Superwool seal
- 2 Sealing profile

- Replace the cover seals.

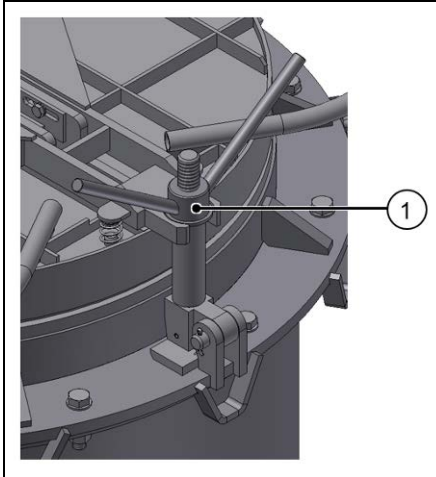


Only install seals included in the list of replacement parts (see appendix “Replacement part sheet”).

- Lower the cover plate.
- Ensure that the cover seal sits flat on the flange.
- Screw the cover plate to the transfer ladle (torque value max. 400 Nm).
- Release the load chain hooks or shackles from the connection points.
- Remove the 3 eye-bolts from the cover plate to prevent unauthorised lifting of the entire transfer ladle (see section “4.5 Suspension and connection points”).
- Install the pneumatic line between the pneumatics cabinet and cover plate.
- After replacing the seals, conduct a pressure tightness test (see section “9.3 Conducting a pressure tightness test”).

9.2.10 Lubricating the spindle

The spindle of the quick-release closure has to be lubricated annually.



- Lubricate the spindle (1) of the quick-release closure with a suitable lubricant.

9.2.11 Special maintenance intervals

Replacing pneumatic hoses (no later than every 10 years)



WARNING

Risk of injury due to escaping compressed air and dispersion!

When replacing pneumatic components with unforeseeable residual pressure in the system, there is a risk of eye and skin injuries due to escaping compressed air and the dispersion of, for example, dust or chips.

- Disconnect pneumatic hoses carefully.
- Never aim pneumatic hoses at persons.



Replace the pneumatic hoses no later than after 10 years. Here the manufacturing date of the hoses (printed on the hose) is relevant.

9.3 Performing a pressure tightness test

The pressure tightness test must be performed after seals were replaced on the following components:

- Filling hatch
- riser pipe
- Cover plate



Make sure that the filling hatch is closed and locked with the quick-release closure.

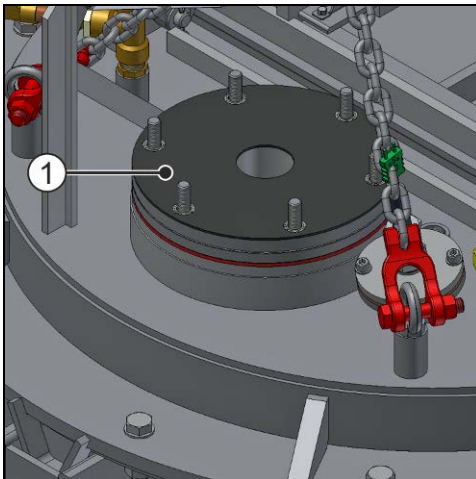
Verify that the cover plate has been screwed to the transfer ladle with the correct torque value.

To perform the pressure tightness test, a blind flange has to be screwed onto the riser pipe opening. The filling pipe has to be removed for this purpose.

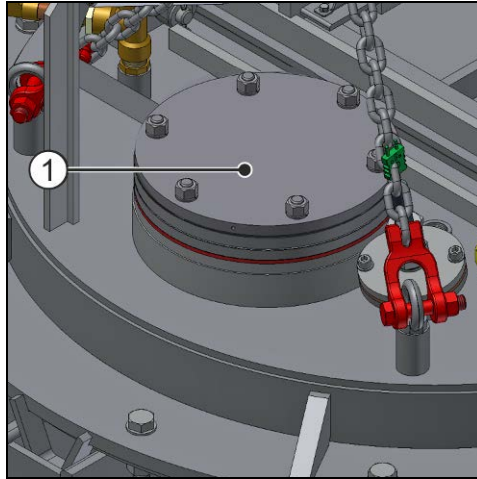
- Remove the filling pipe if applicable.



To remove the filling pipe, proceed in the reverse sequence described for installation (see section “5.4.3 Installing and aligning the filling pipe”).

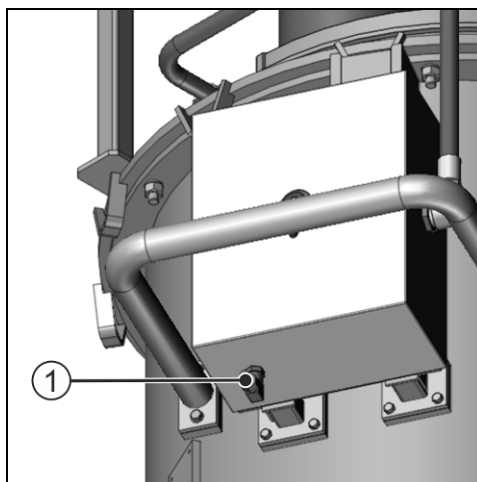


- Lay the seal (1) onto the flange ring.



- Set the blind flange (1) onto the flange ring.
- Screw the blind flange to the flange ring crosswise and step by step.

Torque value max. 200 Nm)



- Connect the quick-release coupling of the pneumatics hose to the quick-release plug (1) on the pneumatics cabinet.

- Pressurise the transfer ladle with compressed air.

Hissing or whistling noises or falling pressure on the pressure gauge indicate leaks on the transfer ladle.

- Bleed the transfer ladle if applicable.
- Ensure that the filling hatch is fully closed and locked, pressure tight, with the quick-release closure.
- Check the seals on the filling hatch, riser pipe and cover plate for proper fit and correct as needed.
- Perform the pressure tightness test again.



If the transfer ladle is still leaking, contact StrikoWestofen GmbH.

9.4 Maintenance of third-party components

For further information about maintenance tasks on third-party components, please see the documentation from the respective suppliers.

10 Decommissioning and disassembly



WARNING

Risk of severe injuries due to improper decommissioning and disassembly!

- This work may only be carried out by qualified personnel.
- Personal protective equipment must be worn during all work.
- Contact StrikoWestofen GmbH in case of doubt.

10.1 Taking the machine out of operation



WARNING



Risk of burns on the machine!

Contact with the machine may cause severe burns.

- Block off the area around the supporting and tilting mechanism against unauthorised access during the cooling phase.

- Have energy supply lines (electricity, compressed air) disconnected by corresponding qualified personnel.
- Set the machine so it is tilted.
- Empty the transfer ladle.
- Allow the machine to cool down.

10.2 Disassembling the machine

- Remove the filling pipe.
- Remove the fender and pneumatics cabinet from the transfer ladle.

Please contact Customer Service if you want to disassemble the machine into smaller components (see section “8.3 Customer service”).

10.3 Disposing of the machine

NOTICE

Environmental damage due to improper disposal!

- Do not allow lubricants to enter the groundwater, bodies of water or sewer system.
- Cleaning agents used to clean the machine and resulting cleaning residues must be disposed of according to local regulations and the information in the safety datasheets of the manufacturers.



The main components of the machine are made of steel and steel composite materials (steel/ceramics).

The machine and its components must be disposed of by a suitable specialist firm.

National regulations in effect at the time of disposal at the location of the machine and its components must be observed in any case.

- Dispose of the machine in an environmentally friendly manner, separated by materials.

11 Appendix

11.1 Attached documents

The following documents are attached to this operating manual:

- EC declaration of conformity
- Replacement part sheets
- Schnorkle system circuit diagram
- Pneumatics plan no. KP2-15F0070
- Supplier operating manuals/datasheets