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## Operation Manual

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# Feed-Through Profile Edge Cleaner

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Customer	HGG Profiling Equipment B.V.
Order No.	B093777
Machine Serial No.	<b>MS 1091</b>
Main Pressure Vessel Serial No.:	49640
Commission No.	64159
Year of Construction	2009
Layout No.	201.0087

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### Service Hotlines

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### Important Note:

This machine must only be used for the purpose specified and for which it has been laid out and built. Use other than that shall be deemed misuse and is consequently dangerous.

The manufacturer shall not be held responsible for any damage caused by improper use.

The machine and associated equipment must not be modified without our prior written consent. Otherwise, we shall not assume any liability regarding performance and safety of the machine.

## Introduction

In the design of our blasting equipment we have made every effort to make operation as simple and safe as possible. To ensure a long and dependable operating life correct and regular maintenance is essential.

This manual has been prepared to assist the user in the care and maintenance of the machine. It is the responsibility of the owner to ensure that operators are provided with this manual and that they are suitably trained and instructed in the use of the manual, the equipment and safety procedures.

If the instructions are followed, we nevertheless cannot foresee circumstances in which this equipment may possibly present a health or safety hazard. It is expected that users will observe normal safe practices when operating or working on the equipment such as the safe handling of compressed air, lifting and moving the machine, working inside it, and general security of the machine if of a mobile nature.

*Take care of the machine, keep it clean and in good mechanical condition!*

Special attention must be given to the application of the blast process which, by its very nature may be hazardous if the operating instructions are not followed. In particular consideration should be given to the handling of the dust created by the process. While the abrasive media recommended for the use with the equipment are non-hazardous under normal conditions of usage, the material of the workpieces to be processed may produce a hazardous dust, either when inhaled or as a possible explosion risk, and all applicable requirements must be followed.

For operating, maintenance and servicing instructions in respect of the machine and associated equipment please see the corresponding chapters and the appendices.

The information contained in this Manual was correct at the date of publication. Munk + Schmitz reserves the right to modify specifications in accordance with new or improved designs. Whilst every effort is made to supply precise and correct data, all figures must be taken as typical and in no way binding.

Our machines are designed and built for a specific type of application. For safety reasons we request that you consult us before changing the type of abrasive or the material of the workpieces to be processed!



## Introduction

To obtain maximum efficiency and reliability from your machine read this Manual thoroughly before putting the machine into service.

- **Section 1 – Safety Precautions**

General advice to the operator to allow him to work with the machine in safety to himself and other personnel in the vicinity of the machine.

Moreover, it contains recommendations to the purchaser regarding installation of the machine and other safety requirements.

- **Section 2 – General Description and Function of the Machine**

General information about construction and layout of the machine with description of the function of the main assemblies as well as machine specification data.

- **Section 3 – Installation and Operation of the Machine**

Information on how to install and operate the machine

- **Section 4 – Maintenance and Inspection**

Information for the purchaser to keep the machine serviceable to ensure consistently good results and a long service life of the machine.

- **Section 5 – Trouble Shooting**

A trouble-shooting guide to assist in quick diagnosis of faults and to make repair

- **Section 6 – Bills of Material**

Complete lists of all replaceable parts including drawings

## Section 1 – Safety Measures

### Contents

- 1 Safety measures when using airblast machines
- 2 Safety measures when servicing airblast machines
- 3 Special safety measures
  - 3.1 Exposure safety
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    - 3.2.3 Safety recommendations for the maintenance
  - 3.3 Measures to be taken by the purchaser

## Section 1 – Safety Measures

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the machine. They should be brought to the attention of anyone who installs, operates or maintains this equipment.

### 1 General safety measures when using airblast machines

- Never operate the machine without ensuring that the daily/weekly/monthly maintenance and inspection has been completed in accordance with Section 4 of this Manual
- Do not smoke in the vicinity of the machine
- Never leave guards or inspection covers off the machine
- Never use abrasives other than those mentioned in the machine specification.
- Never look directly into a nozzle or point the nozzle at another person unless the air supply to the machine is turned off at the mains.
- Before clearing debris from the dump valve or screen always isolate the air supply at the mains and allow all pressurized air in the control system to exhaust.
- Always isolate the air supply whenever the machine is not in use. The blast valve cannot then be operated accidentally.
- Do not leave hoses in a position where they might be run over, trapped by equipment or cause people to trip over them. Apart from being damaged, a trapped hose may inadvertently operate the main air control valve.

#### Additional measures when operating a closed-circuit blast machine:

- Never lift the blast gun off the surface while blasting.  
After switching off the blast, allow time for the machine to depressurize (about 10 seconds) before removing the gun from the work surface.

## Section 1 – Safety Measures

### Additional measures when operating a cabinet type machine:

- Do not allow the blast stream to strike the viewing window or lighting covers. This can result in etching of the glass which could be a hazard due to poor visibility.
- Before opening the door always allow time for the machine to depressurize and any dust to clear.
- If the cabinet is equipped with a swing-in turntable always insert the lock pin, when positioning the turntable for operation.
- If the cabinet is equipped with a roll-in turntable secure turntable by means of locking bar once it has been correctly positioned.

### Additional measures when operating within a blast room:

- Operators must wear protective clothing of tightly woven material without pockets and cuffs to avoid accumulations of dust.
- Do not remove air helmet or open the door until all dust has cleared.
- Never enter a blast room until the operator opens the door – even if he is not blasting. Ensure that a clear view of the room interior is possible from the external viewing window.
- Operation by the open-blast method must not be done unless the operator wears the corrective protective clothing.
- Never open-blast in an area where the blast stream or ricocheting abrasive can come into contact with unprotected personnel..
- If working on a scaffolding do not blast unless the blast hose is securely tied to the scaffolding (about 4 m ahead of the nozzle).

### Additional measures when operating automated equipment:

- Before switching on the blasting system and/or the handling system it has to be ensured that there are no persons around in the blasting and/or handling areas.

## Section 1 – Safety Measures

### 2 Safety measures when maintaining the equipment

- Never attempt maintenance on a machine unless the air and electricity are isolated at the mains and a safeguard provided to prevent unintentional restarting and the pressure vessel is exhausted.
- Never carry out welding without removing any local dust, rubber lining and other inflammable material.
- If the machine is sited in such a way that failure of the air supply hose or blast hose may result in a hazard due to escaping air then install shielding around the hose.
- When making connections, always ensure that threaded components are clear of abrasive. Renew parts with damaged threads immediately.
- Regularly examine the inside of any blast enclosure for localized points of wear and provide suitable protection if necessary.
- Where mobile machines are used on outside applications, particularly in aggressive environments, examine the structure and component parts as well as the screws, bolts etc. required for assembly regularly for corrosion. Correct and protect where necessary.
- All machine weights given in documents are net weights (without abrasive). Machines should be drained of abrasive before lifting to avoid possible overload of the hoisting gear or crane.

**Use only genuine Munk + Schmitz spare parts in the interest of safety and correct functioning of the machine!**



## Section 1 – Safety Measures

### 3 Special safety measures

#### 3.1 Exposure

- Where equipment is of the pass-through type with flexible curtains, brushes etc. it may be impossible to avoid the escape of abrasive. This should be borne in mind when siting the equipment, and the persons working in these areas should wear suitable protective clothing.

- Where round abrasive is used there is the risk of slipping. Duckboards or gridding may be advisable to provide a non-slip footing

- Eye protection should be provided for operators and for personnel in nearby areas.



- Ear defenders should be provided for the operator and for personnel in nearby areas.



Noise levels depend on the type and the size of the nozzle and its application.

- In applications where possibly hazardous dusts are created, for instance when cleaning castings, asbestos, lead etc. it must be ensured that the dust is not exhausted into the workshop and that applicable regulations regarding the handling of hazardous material are observed. In particular, when cleaning castings regular inspection of the equipment and testing of the ventilation plant performance is necessary.

#### 3.2 Explosion

Certain materials when subjected to impact treatment can produce dust which is potentially explosive. Many materials fall into this category including some metals and organic matter from wood for instance. Dust from other material can also create a fire or explosion risk!



Although Munk + Schmitz recommends specific safety measures to be observed in this regard users must obtain the approval of the local Factories Inspector or other appropriate authority.



## Section 1 – Safety Measures

### 3.2.1 Explosive dusts

#### Hazardous metal dusts

Zirconium, titanium and magnesium are considered to be the most hazardous metals. Zirconium can ignite spontaneously, without an external heat source.



Aluminium dust presents a variable hazard depending on the process involved. The degree of risk can be categorized as follows:

- Iron or steel abrasives must not be used for cleaning aluminium. When mixed with iron dust a mixture is produced which can ignite.
- Shot peening aluminium under controlled conditions using good quality media should result in a negligible amount of dust and present no hazard.
- Excessive peening of aluminium, especially when using poor quality steel shot or insufficiently conditioned cut wire media, may remove metal and produce inflammable or explosive dust.
- When mixed with a large amount of inert friable material, such as aluminium oxide or glass beads, the effect is to reduce the risk of explosion, although not necessarily enough to make the procedure safe.

#### Hazardous organic dusts

Organic dusts such as those resulting from the use of vegetable media, for example walnut shell, peach or apricot stone, or from processing wood, can represent a fire or explosion hazard. Safety recommendations are given on the following pages.

## Section 1 – Safety Measures

### 3.2.2 Safety recommendations for the installation

It is recommended that the measures described below are followed in order to reduce the risk or the consequences of fire and explosion. Basically, this applies to any installation producing larger quantities of dust which may ignite or explode.

- **Earthing**

The equipment must be sufficiently earthed to disperse any static electricity which may develop.

Connect a suitable copper earth strap from the body of the equipment to an earth connection. Where a turntable or other form of work rotation mechanism is used it should be earthed to the cabinet frame. When replacing/renewing parts ensure that the integrity of the electrical earthing is maintained.

- **Wet dust collectors**

For use on zirconium and magnesium wet dust collectors are required. These dust collectors incorporate all the safety features necessary for the dust being handled.

- **Dry dust collectors**

Dry dust collectors are normally used on materials other than zirconium and magnesium.

These dust collectors can be free standing or in the power unit assembly. They are anti-staticized and fitted with explosion-relief panels. Dust is to be discharged into a metal container which is held in position by quick-release clamps.

- The dust collector should be located outside the building with the explosion relief directed upwards. If this is not possible, location inside the building may be considered with the explosion relief ducted directly outside to atmosphere. Where small volume dust collectors are used with explosive dusts (other than metal dusts) the explosion relief must be directed clear of personnel or secondary dust accumulations.



The area of explosion relief should be 1 m<sup>2</sup> per 3 m<sup>3</sup> of the volume being vented for metal dusts.

For organic dusts the area can be reduced to 1 m<sup>2</sup> per 6 m<sup>3</sup>.

## Section 1 – Safety Measures

Metal ducting should be 2 mm steel with the minimum number of bends and flanged at all joints. Air stream velocity should not be less than 18 m/s to avoid settlement of dust.

**In any case: before installing a dry or wet dust collector consult Munk + Schmitz!**

### 3.2.3 Safety and Maintenance

- The main requirement for safety where potentially explosive dusts are produced is "cleanliness".
- Smoking and the use of naked flames are prohibited in the vicinity of the equipment.
- Remove all accumulated dust before performing any maintenance work, in particular before using welding equipment.



#### Safety and Maintenance when using blast rooms:

- The dust collecting system must be regularly examined and cleaned of all collected dust. In addition any accumulations of dust must be removed from within the equipment enclosure, concentrator etc. and surrounding area. It is essential that this be carried out at least once daily, since **without dust there is no risk.**
- The reclaim air wash must be regularly checked and adjusted to remove the maximum amount of dust and broken down media to the dust collector. (see 4.5)

### 3.3 Measures to be considered when modifications/supplementations to the machine are made by the customer:

The following requirements should be observed:

- Wherever possible all hoppers must be self draining of dust by the use of a satisfactory hopper angle, and ledges avoided where possible.
- Another precautionary measure is the use of steel gridding for cabinet work surfaces to give good drainage.

## Section 1 – Safety Measures

- Wall curtains should be eliminated wherever possible. Where essential they should be bonded to the wall or cut clear at the bottom to avoid dust retention.
- Anti-staticized rubber should be used for all loose curtains, elevator belting, rollers, etc.
- All hoses and equipment must be effectively earthed to prevent the formation of static charge.
- All electrical equipment and fittings must be isolated from within the blast enclosure or from areas where dusts may accumulate.

**Please consult Munk + Schmitz before taking any measures!**



## Section 2 –Description and Function

### Contents

1. Machine Data Sheet
2. General Description of the Edge Cleaner
3. Description of Assemblies
  - 3.1 Blast Cabinet
  - 3.2 Blast Generator
    - 3.2.1 Reclaimer – Adjustment of the airwash system
    - 3.2.2 Storage hopper
    - 3.2.3 Pressure vessel with level probe (see separate manual)
    - 3.2.5 Dump valve
  - 3.3 Abrasive Feed
    - 3.3.1 Abrasive metering unit  
- feed valve -
    - 3.3.2 Aeration stone
    - 3.3.3 Blast hose with blast gun
  - 3.4 Abrasive Recharging Hopper
  - 3.5 Dust Collector (see separate manual)
  - 3.6 Air Control System

## Section 2 –Description and Function

### 1. Data Sheet

#### Dimensions:

Blast cabinet:	Length:	2,890 mm
	Depth:	2,100 mm
	Height:	2,150 mm
	Weight approx.:	1,850 kg
Blast generator:	Type:	GRPB 120.045
	Length:	1,000 mm x 1,000 mm
	Height approx.	4,800 mm
	Pressure vessel:	120 litres; SN 49640
Recharging hopper:	Diameter:	540 mm
	Height approx.	1,150 mm
	Capacity:	95 litres
Dust collector:	Type:	FLC 2-4 HP
	SN:	01529-4696-09
	Total filtration area:	84 m <sup>2</sup>
	Filter medium:	Ultra-Web
	Dust emission:	≤ 1 mg/m <sup>3</sup>
	Number of cartridges:	4 ea.
Fan:	Type:	SVCM 562
	Connected load:	7.5 kW, 415 volts, 50 Hz
	Air volume:	max. 3,000 m <sup>3</sup> /h
	Pressure difference	approx. 4,650 Pa
Air requirement:	10 m <sup>3</sup> /min compressed to a nominal pressure of 7 bar (2 blast nozzles)	
Blast nozzle:	3 ea. dia. 8.0 mm boron carbide nozzle (MS 100/1) 1 ea. DURA BK 1/8 angled carbide nozzle	
Pressure vessel capacity:	120 litres corresponding to approx. 400 kg of ferrous abrasive	
Abrasive:	chilled cast iron grit	
Abrasive feed/metering system:	twin feed valve with pneumatic cut-off of abrasive supply	
Control system:	supply pressure (mains) 7 bar	
Compressed air supply hose:	1 ¼" inner bore (32 mm bore); ½" inner bore (12.5 mm bore)	
Controller:	only for shotblast unit	

## Section 2 –Description and Function

### 2. General Description

The shotblast unit comprises a pressure-fed cabinet of the feed-through type.

Inside the cabinet profiles are conveyed by means of rollers. The sections at the feed and discharge ends of the cabinet serve to minimise escape of abrasive. Air purging devices are fitted at the discharge end.

Purpose of the cleaner is to remove primer from the edges of profiles using chilled cast iron grit. Profiles to be blast cleaned are transferred through the cabinet on a roller conveyor. When the forward end of the profile is sensed the blasting/air purging operations start with a time delay. When the rear end of the profile is sensed the blasting operation is stopped, also with a time delay.

On principle profiles are cleaned as follows:

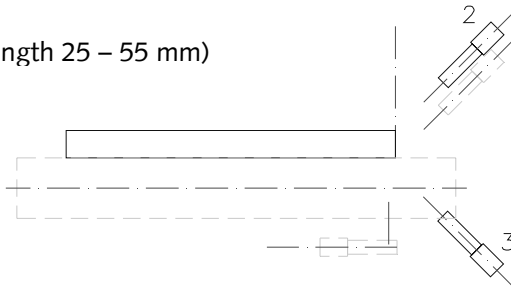
- flat bar:
  - a) material strength 20–55 mm    nozzles 3 and 2
  - b) material strength 4–25 mm    nozzles 4 and 3
- bulb (HP), unequal angle bar                    nozzles 4 and 3  
  equal T bar
- equal angle bar                                        nozzles 4 and 1

A more exact definition will only be possible after commissioning.

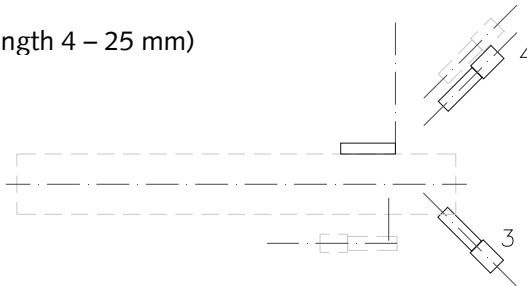
The optimum solution were if the master control had some sort of recipe management activating the nozzles (two at a maximum) according to type and size of the profiles.

**Section 2 –Description and Function**

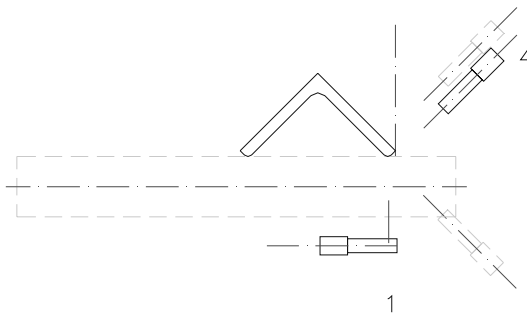
flat bar (material strength 25 – 55 mm)



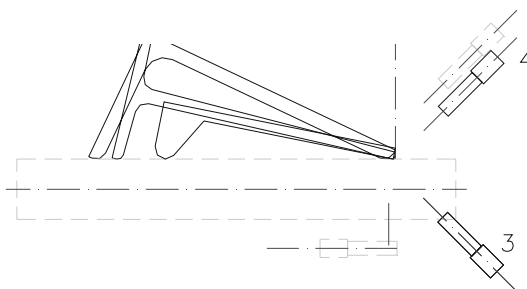
flat bar (material strength 4 – 25 mm)



equal angle bar



unequal angle bar  
equal T bar  
bulb (HP)





## Section 2 –Description and Function

When leaving the cabinet profiles are air purged from any remainders of abrasive, debris etc.

During blasting a vertical ventilating air flow, generated by the dust collector's fan, passes from the top to the bottom of the cabinet.

The cabinet floor is hopper shaped. Spent abrasive and dust remainders are conveyed via a flexible wire-reinforced vacuum hose to the generator/reclaimer. In the reclaimer the abrasive is separated from dust and debris. Fitted below the reclaimer is a storage hopper into which the cleaned abrasive is conveyed and stored, ready for re-use. Mounted below the storage hopper is a type tested pressure vessel with adjustable feed valve. This feed valve meters the abrasive into the air flow which carries it via the blast hose to the blast nozzle.

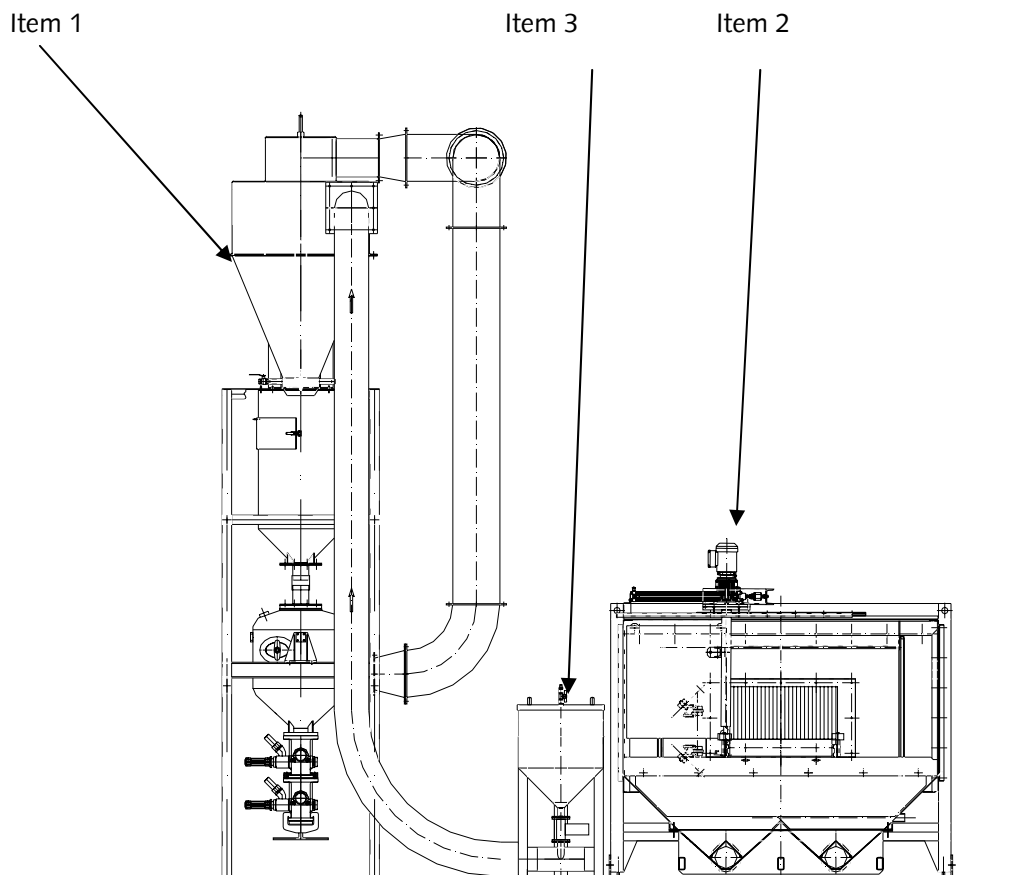
Upon start of the blasting operation which is initiated by a proximity switch, the pressure vessel is closed by a dump valve sealing against the storage hopper and pressurised. Each time the blasting operation is interrupted the pressure vessel is exhausted (depressurised) and the dump valve opens. Abrasive from the storage hopper is then transferred back to the pressure vessel.

Dust-laden air passes from the reclaimer to the dust collector where it is cleaned before it is exhausted to the atmosphere. The recovery air flow can be adjusted by a throttle valve fitted to the exhaust side of the fan.

## Section 2 –Description and Function

The edge cleaner comprises the following main assemblies:

- Blast cabinet (item 2)
- Blast generator (item 1)
  - reclaimer
  - storage hopper
  - pressure vessel
  - feed valve
  - level measuring probe
- Recharging hopper (item 3)
- Dust collector with fan



## Section 2 –Description and Function

### 3. Description of Assemblies

#### 3.1 Blast cabinet

The cabinet is a robust structure made from 3 mm welded steel plate. Access to the cabinet is via two inspection doors and two access plates.

The cabinet floor is hopped shaped (8). Spent abrasive and dust remainders are pneumatically conveyed through a flexible wire-reinforced vacuum hose to the reclaimer section of the generator.

The complete cabinet is lined with regenerated rubber. Additionally, the area of direct impact of abrasive is protected by wear resistant rubber curtains to minimise wear.

The cabinet is divided into three sections:

- feed section (1)
- blast enclosure (2)
- discharge section (3) with air purging device (4)

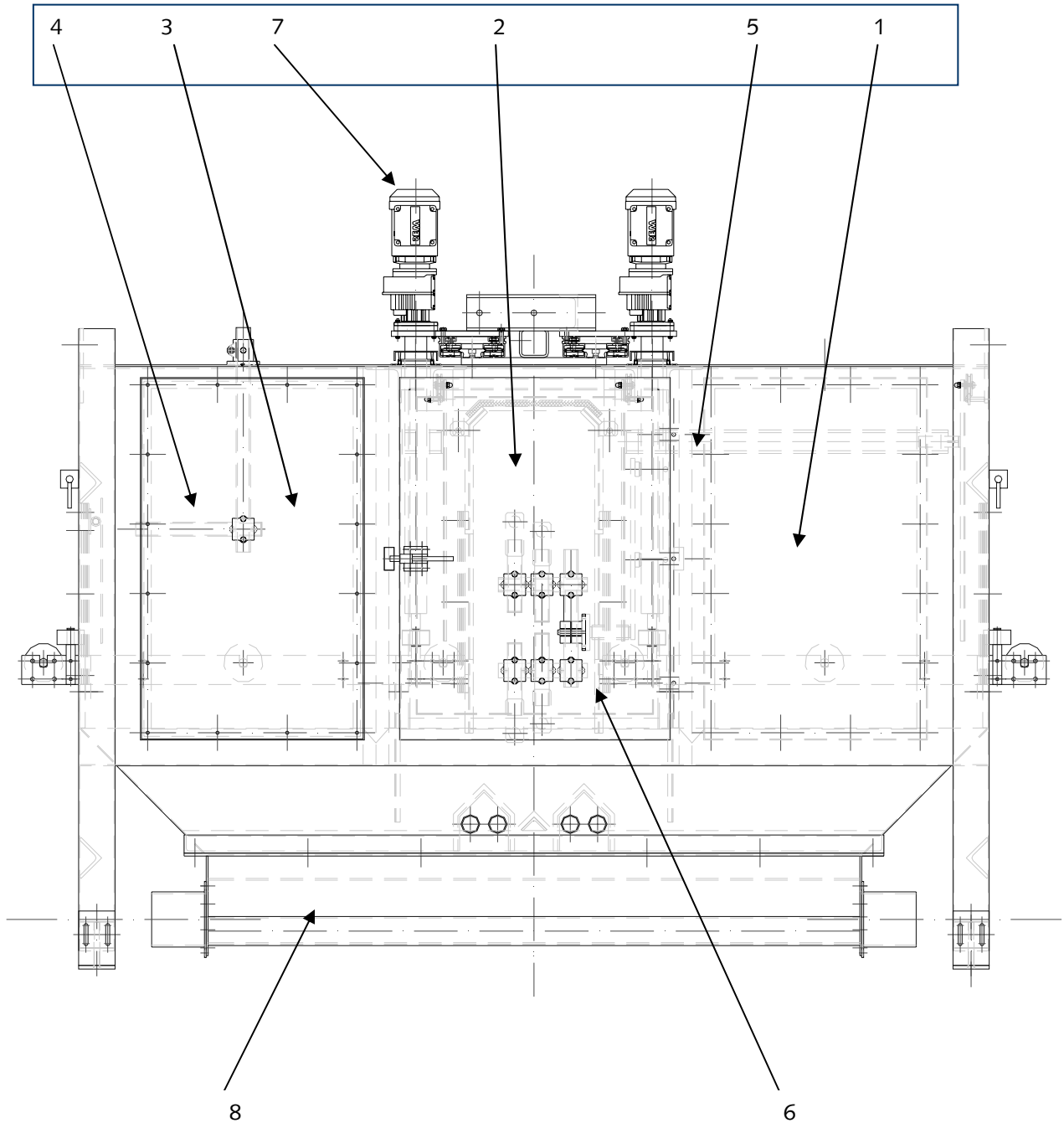
All sections are divided by means of sliding doors. The corresponding inside width depends on the width of the profile.

Nozzles are mounted and fixed in a holder (6).

Nozzle holder and sliding doors are connected to drive rollers (7). As the drive rollers move towards the profile edge to be blast-cleaned blast nozzles and sliding doors move to their blasting position.

At the discharge end an air purging device is fitted comprising an air curtain blowing off remainders of abrasive from the profiles. Abrasive is conveyed back into the closed-circuit system.

**Section 2 –Description and Function**



## Section 2 –Description and Function

### 3.2 Blast generator (pressure vessel)

The blast generator comprises the assemblies

- reclaimer (1)
- storage hopper (2)
- vibrated screen
- dump valve (4)
- pressure vessel (3)
- level probe
- feed valve (5)
- blast nozzle

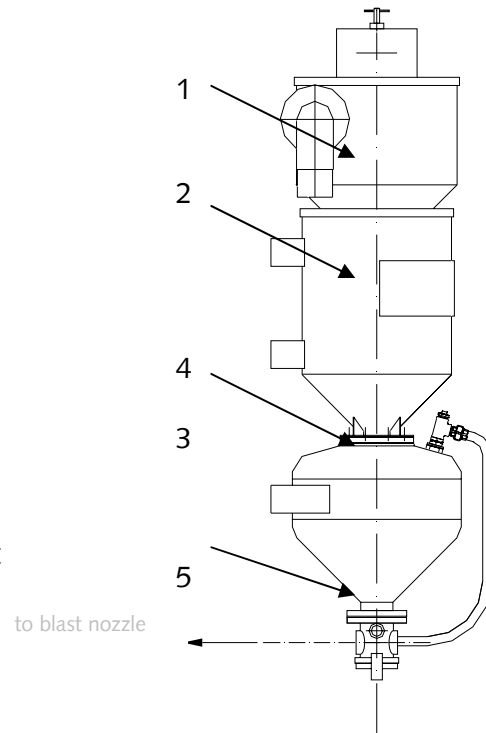
and is mounted as free-standing unit behind the dust collector.

Abrasive emitted from the nozzles is collected together with debris and dust in the hopper-shaped floor of the blast enclosure from where it is recovered and conveyed to the reclaimer comprising top and bottom sections. Here, the abrasive is separated from dust and debris by means of an adjustable airwash system.

Situated below the airwash is a pneumatically vibrated flat screen which removes oversize debris from the abrasive before it is deposited in the storage hopper ready for use. Dust-laden air is drawn from the reclaimer to the dust collector.

Fitted below the storage hopper is a type-tested and approved pressure vessel. Here the abrasive is stored under pressure and conveyed/ metered via the feed valve to the blast nozzle.

Upon start of blasting the vessel is automatically sealed against the storage hopper via a pneumatically operated dump valve. At the bottom of the pressure vessel a feed valve is fitted which adjusts and meters the flow of abrasive from the blast nozzle.

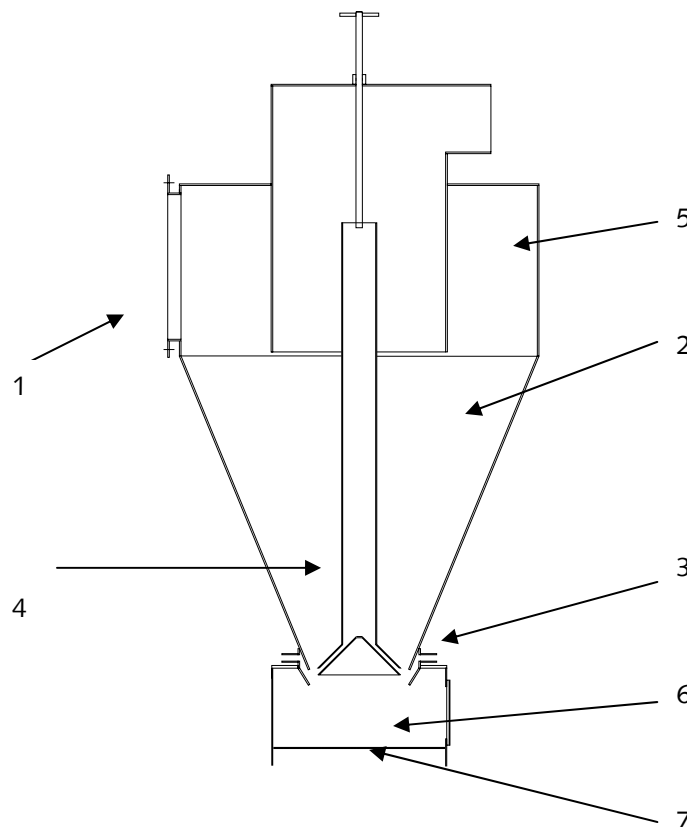


## Section 2 –Description and Function

### 3.2.1 Reclaimer

The reclaimer serves to separate dust and debris from the re-usable abrasive. The recovery air flow, which is generated by the dust collector's fan, conveys spent media, dust and debris to the reclaimer. They enter the reclaimer at the inlet (1) and pass via the cyclone (2) and an adjustable airwash system (4) to a vibrated screen (6).

Re-usable blast media is transferred to the storage hopper, dust is passed to the dust collector.



The separation process is as described on the following page.

## Section 2 –Description and Function

- **Cyclone - First Stage of Media Separation**

The recovery airflow comprising media, dust and debris produced during blasting enters the reclaimer through the inlet (1) which is offset tangentially near the top of the reclaimer body into the cyclone (2).

This positioning imparts a cyclonic influence on the air flow which spirals around the upper section of the cyclone in a descending movement. The lighter particles are drawn inwards and up to the top, whereas the heavier particles are drawn outwards and gravitate to the bottom via an adjustable airwash system (4).

- **Air Wash - Second Stage of Media Separation**

Continuing in a downward spiral the remaining abrasive and debris pass through an annular gap formed between cyclone hopper (3) and airwash system (4) to the vibrating screen (7).

Smaller particles are washed from the media by a flow of air passing through the airwash tube into the upper part of the cyclone. After emerging from the tube the airflow from the second stage mixes with the air from the first stage, exiting through the outlet (5) to the dust collector.

An additional air curtain controlled by four ball valves (6) fitted to the outlet of the cyclone hopper enhances the cleaning effect.

Reclaimer and airwash system are preset and need not be adjusted.

Only when changing the type of abrasive or in the case that a different surface effect is desired it needs adjustment.

## Section 2 –Description and Function

### 3.2.2 Storage hopper with vibrated screen

Any debris or oversize particles which may still be carried in the flow of abrasive are retained on a pneumatically vibrated flat screen. Reusable abrasive passes through the screen and deposits in the storage hopper fitted below. The size of the storage hopper is adapted to that of the pressure vessel.

### 3.2.3 Pressure vessel and level probe

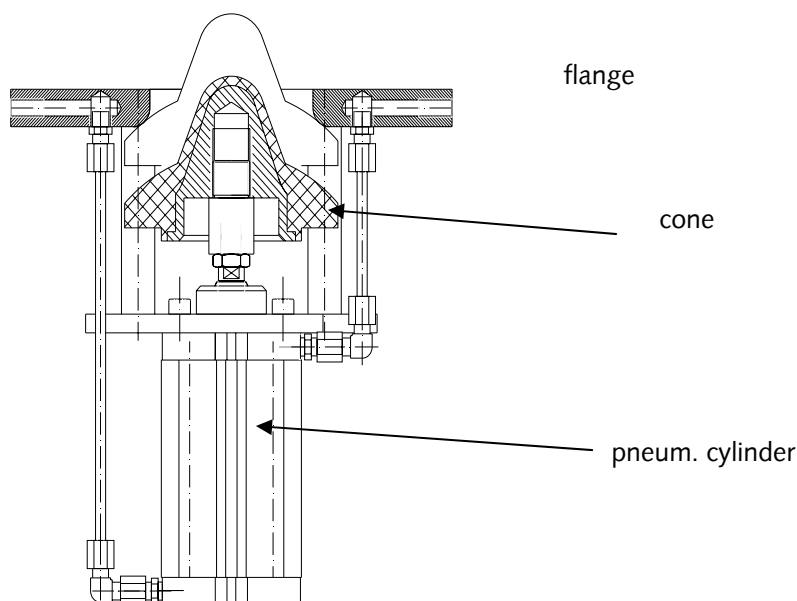
This a type-tested and type-approved pressure vessel with a maximum capacity of 120 litres. The useful capacity is 100 litres.

In this vessel the abrasive is stored under pressure and metered via a feed valve and blast hose to the blast nozzle. The pressure is indicated by a manometer fitted to the upper bottom.

A level probe (*see separate manual*) monitors the abrasive level.

### 3.2.4 Dump valve

The dump valve (2) is positioned inside the top of the generator pressure vessel, forming a seal when under pressure and opening when pressure in the vessel decreases.





## Section 2 –Description and Function

### 3.3 Abrasive feed

#### 3.3.1 Abrasive metering unit (feed valve)

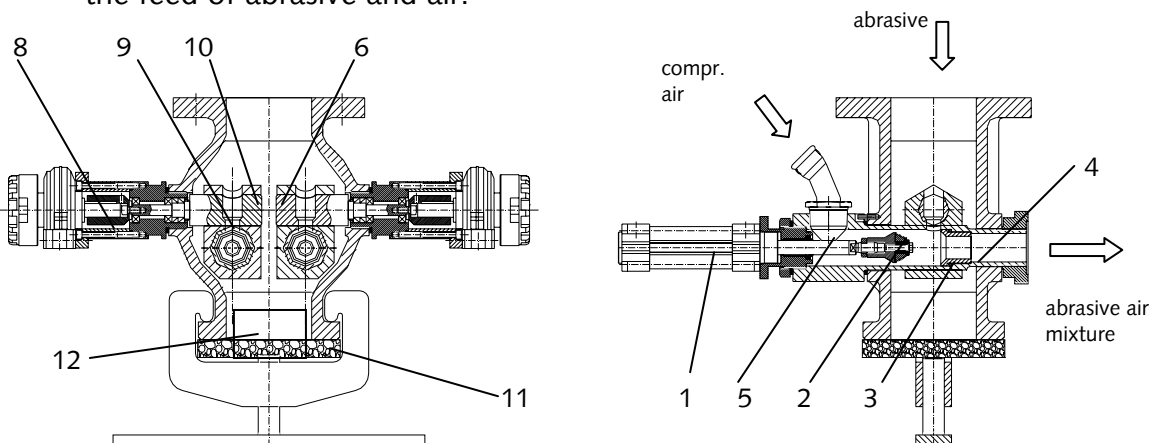
This type of feed valve is used where changes in abrasive size necessitate quick alteration of the abrasive feed orifice, and for easy removal of debris blocking the feed orifice.

In operation, the feed valve body is always full of abrasive when the machine is charged. Air from the pressure feed hopper enters the feed nozzle at (5). Abrasive drops through the orifice (6) and the resultant air/abrasive mix leaves the nozzle directly into the blast hose.

By the pneumatic operation of the rotary actuator (8) the feed shaft (9) is rotated so blocking the orifice and no feed will result. The abrasive is metered by limiting the rotating angle.

To adjust the valve for correct feed the head of the rotary actuator is moved slowly from the closed position until a regular flow of abrasive emits from the blast nozzle. In this position the end stop (max.) is to be fixed. If the blast hose jumps and kicks there is too much abrasive emitting and the angle of the orifice must be reduced.

The pneumatic air cut-off system comprises a cylinder on the plunger rod of which a valve plug is located. Upon actuation of the cylinder (1) this plug (2) is moved towards the insert (3) of the feed nozzle (4) thus closing the orifice and cutting off the feed of abrasive and air.

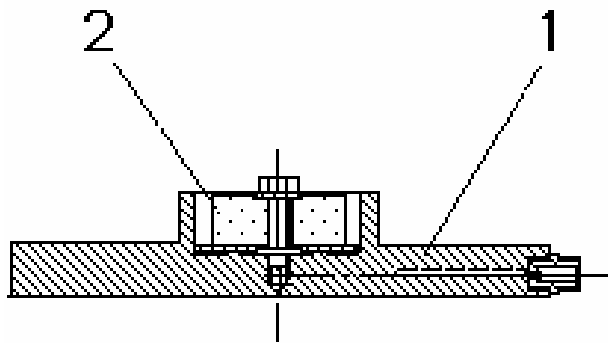


To ensure a continuous flow of the fine abrasive through the feed orifice (6) an aeration block (12) is fitted to the plate flanged to the bottom.

## Section 2 –Description and Function

### 3.3.2 Aeration block

A porous aeration block (2) is fitted to the feed valve's cover plate (1). During blasting the metered and filtered compressed air passes upwards through this aeration block into the abrasive. When using angular abrasive cavities may form in the abrasive accumulations preventing the abrasive from sinking. The compressed air flowing upwards "breaks" these cavities. The fluidised abrasive has then the same flowing characteristics as a liquid, i.e. any impurities which might still be in the abrasive sink onto the aeration block.



### 3.3.3 Blast hose with blast nozzle

One end of the blast hose is connected to the feed valve. It is provided with an antistatic conductor inside. Ends are to be connected using metal couplings to ensure safe earthing. The other end of the blast hose is connected to the supersonic blast nozzle which is passed manually over the workpiece.

## 3.4 Recharging hopper

The recharging hopper is connected to the take-off tube via a metering valve. The abrasive level in the pressure vessel is monitored by a level probe. As from a certain level abrasive from the recharging vessel is metered automatically into the recovery air flow and thus the volume of abrasive within the closed-circuit system raised.

## Section 2 –Description and Function

### 3.5 Dust collector

*(See separate manual)*

### 3.6 Air control system

From the isolator valve incoming air passes through a filter/moisture extractor which removes impurities, including moisture in droplet form but not in vapour form, from the air. Each time this valve is activated, the vibrator is switched on.

Having passed the extractor the air flow is routed as follows:

- One line is routed via a reducer to the storage hopper where it connects with the vibrator.
- One line supplies the air reservoir for cleaning the dust collector filter
- The main line is routed via a pressure regulator/manometer to the main air valve and from there to the pressure vessel
- Downstream the main air valve the air required for the aeration block of the feed valve is branched off.

Please see also the attached pneumatics diagram.

## Section 3 – Installation and Operation

### Contents

1. Necessary Connections
2. Siting and Preparing the Machine for Operation
  - 2.1 Compressed Air
  - 2.2 Electrical connections
  - 2.3 Connecting the blast hoses
3. Checks and Measures before Starting the Machine
4. Starting the Machine
  - 4.1 Installing the controller (*by customer*)
  - 4.2 Turning on the edge cleaner
    - 4.2.1 Setting-up the machine
      - loading the machine with abrasive
5. Stopping the Machine
6. Checking Supply of Abrasive
7. Checking Refilling of Abrasive
8. Storage or Temporary Non-Use

## Section 3 – Installation and Operation

### 1. Necessary connections

- Compressed air supply: 1", 7 m<sup>3</sup>/min of free air compressed to a nominal pressure of 7 bar
- Compressed air supply: ½", 3 m<sup>3</sup>/min of free air compressed to a nominal pressure of 7 bar  
Air to be dry and free from oil and grease
- Electrical connections: 8kW, 415 volts, 50 Hz

### 2. Siting and Preparing the Machine for Operation

The proposed site for the various component parts of the machine must be of sufficient area to facilitate both operating and maintenance activities. The area designated for clean air discharge must be clear and unobstructed.

- Mount machine on a level floor in accordance with layout 201.0087.
- Align blast cabinet and secure with anchors.
- Mount blast generator together with dust collector on floor, align and secure with anchors.
- Mount air control system to dust collector
- Install recharging hopper
- Fasten 6" vacuum hose between blast cabinet and recharging hopper
- Fasten 6" vacuum hose between recharging hopper and reclaiming

Important:

Earth hoses to disperse any static electricity which may develop – see separate manual

- Cut blast hoses to required length



#### 2.1 Compressed air

- See chapter 1 – Compressed air requirements
- Before connecting the mains air supply, check for water in the air mains by briefly discharging air from the mains to atmosphere.

## Section 3 – Installation and Operation

- k) Make sure that air relief valve has been closed
- l) Close air isolating valve on filter/moisture extractor and connect mains air supply to the machine.
- m) The air supply line to the filter/moisture extractor must not be of smaller bore than 5/4"

Setting and checking compressed air:

R1 – blast pressure	according to type of machine
R2 – control pressure	6 bar
R3 – pressure -air curtain	3 bar
R4 – pressure - air purging	2 bar
R5 – reduced feed pressure (drive roller)	2 bar
R6 – feed pressure	5 bar

**Important:**

**Difference between R6 (feed pressure) and R5 (reduced feed pressure) must be 2 bar at a minimum!**

### 2.2 Electrical connections

*By customer*

**Important:**

Check electric motors for correct direction of rotation!



### 2.3 Connecting the blast hoses

The edge cleaner is equipped with two twin feed valves supplying all blast nozzles.

One end of each of the 3/4" blast hoses is, together with a cap nut, connected to the hardened adapter of the feed valve. Connect the other end to the blast nozzle.

### 3.0 Checks and Measures Before Starting the Machine

- a) Ensure that all workpieces to be processed are free from oil, grease and other substances likely to contaminate or coagulate the media and cause stoppages.
- b) Check that all inspection doors/access plates, e.g. dust collector, generator/reclaimer, blast cabinet etc. are closed and secured. Check the dust collector's waste container for correct position and secure it.

## Section 3 – Installation and Operation

- c) Check that the blast hoses are connected to the feed valves.  
Check the condition of all air and vacuum hoses.
- d) Check motor of dust collector fan for direction of rotation (see separate manual)
- e) Check that inspection door on cabinet is locked.

### 4.0 Starting the Machine

#### 4.1 Controller Layout

*By customer*

#### 4.2 Turning on the Machine

*By customer*

##### 4.2.1 Setting up the Machine

*By customer*

#### ATTENTION:

In the setting-up mode only two functions are possible:

- fan ON/OFF
- drive rollers forward / backward

Blasting in the manual mode is not possible!



#### – Loading the Machine with Abrasive

- a) Turn on vacuum
- b) Open inspection door
- c) Pour specified quantity of blast media slowly into cabinet

#### ATTENTION:

Do not exceed the recommended quantity of abrasive.  
Overfilling will cause malfunction of the reclaimer and thus malfunction of the complete machine system. The exact level is shown on the display of the operator panel!



## Section 3 – Installation and Operation

### 5. Stopping the Machine

- a) Press button "Controller OFF"
- b) Master switch OFF
- c) Close air isolation valve on filter/moisture extractor

### 6. Checking Supply of Abrasive

The optimum amount of abrasive to be fed into the airflow must be set separately for each nozzle.

Upon start-up of the actual blasting open the head of the rotary actuator from the closed position „O“ until a uniform flow of abrasive emits from the corresponding blast nozzle. If the blast hose starts to jump and kick there is too much abrasive emitting from the nozzle.. Turn head somewhat back. If a "spitting" effect is observed this means that the feed of abrasive is insufficient.

Once the optimum setting has been found the stop of the rotary head (maximum) is to be locked in this position.

### 7. Storage or Temporary Non-Use

If the machine is not to be used for a period of more than 3 days or if it is to be put in storage, carry out the following steps:

- a) Disconnect compressed air supply
- b) Empty dust container
- c) Drain abrasive from the blast generator ( main pressure vessel).  
To do this dismount end plate with aeration block on the feed valve.  
Use a clean container of adequate size to collect the media as it drains.  
Store media in a clean and dry place.
- d) Using the blow gun, blow out the blast generator (main pressure vessel), feed valves, blast hoses etc.  
**Wear eye protection!**
- e) Open drain plug on filter/moisture extractor, allow to drain completely.
- f) If the unit is to be put in storage, cover and store in a clean, dry place!



## Section 4 – Maintenance and Inspection

### Contents

1. Preventive Maintenance Safety Precautions
2. Maintenance of the Blasting Area
3. Daily Maintenance
  - 3.1 Filter/Moisture Extractor
4. Weekly Maintenance
  - 4.1 Blast Nozzle
  - 4.2 Y-strainer
5. Monthly Maintenance and Inspection
  - 5.1 Main Pressure Vessel and Recharging Vessel
  - 5.2 Dump Valve
  - 5.3 Feed Valve
  - 5.4 Dust Collector
6. Quarterly Maintenance and Inspection

**When worn or defective parts have to be replaced during maintenance use only genuine spare parts from Munk + Schmitz!**



## Section 4 – Maintenance and Inspection

### 1. Preventive Maintenance Safety Precautions

Before attempting any form of maintenance or inspection, personnel must be fully conversant with, and comply with, the general safety precautions applicable to impact treatment equipment as detailed in the introductory pages of this manual. Additionally, the following paragraphs apply specifically to those engaged in maintenance and inspection duties.

#### 1.1 Isolation from supply

Always isolate the machine electrically and pneumatically before commencing maintenance or inspection work on it and provide safeguard to prevent unintentional "restarting".

#### 1.2 Dust Explosion Risk

The dust collector and system must be examined and cleaned daily. All dust accumulations must be removed from the machine and surrounding area at least once daily and also before maintenance is carried out.

The use of naked flames, e.g. welding or any tool from which sparks are produced is strictly prohibited in the vicinity of the equipment.

**Smoking in the vicinity of the equipment is strictly prohibited!**

To reduce collective dust, operators must wear tight-weave protective clothing, preferable a one-piece garment without pockets or cuff turnbacks etc.



### Welding

In conducting any maintenance work involving welding, the component being welded must be removed from the machine assembly.

Welding must be done at a suitable place.

Do not under any circumstances weld directly onto any part of the machine which may be rubber-lined or containing material which may be flammable, e.g. ducting, reclaimers, dust collector, hopper, doors etc. to avoid damage and possible fire.

## Section 4 – Maintenance and Inspection

### Maintenance and Inspection

The frequency of maintenance will vary according to work load and work processed. The schedule list below is intended for general guidance purposes to give efficient operation and refers to one-shift operation. Where necessary, the operator may need to adjust the maintenance frequency.

#### Warning:

Except for test purposes, at all times before carrying out Inspection and Maintenance, the machines must be pneumatically isolated at the mains supply and a safeguard provided to prevent unintentional restarting.



### 2. Maintenance of the Blasting Area

Due to their very nature blasting machines are prone to wear. This aspect was duly considered in the design and testing.

To obtain an optimum service life regular maintenance and inspection as well as replacement of wear plates, rubber linings etc. are of great importance. A daily inspection is recommended during the first weeks of operation so that areas showing signs of wear can be protected by providing additional measures, such as wear plates or rubber curtains etc.

### 3. Daily Maintenance

**Before starting maintenance and inspection always isolate the compressed air supply on the air isolating valve of the filter/moisture extractor, provide safeguard to prevent unintentional restarting and allow all pressurized air to exhaust.**

- Empty the dust container at the base of the dust collector. Do not under any circumstances attempt to reuse the material emptied from the dust collecting container.
- Open the air isolating valve on the filter/moisture extractor, check the vibrator for correct function. The vibrator should emit a distinct and continuous buzzing note. Close air isolating valve. Open inspection cover and remove debris from vibrated screen, close inspection cover.
- Clean cabinet, dust collector and surrounding area, avoid accumulations of dust to minimise risk of dust and fire explosions.

## Section 4 – Maintenance and Inspection

- Clean inside of cabinet and remove any debris which might cause blockages in the recovery system.
- Check cabinet doors for free movement.
- At the end of each working day remove the blast media from the machine by removing the quick release drain plate from the feed valve flange. Drain the media into a clean container and store in a dry place.
- Check the abrasive supply hose and nozzle for wear and replace as necessary. Instead of a visual inspection it is best for hoses to feel along the length of the hose (when not pressurized!) for any soft spots. Replace as necessary.
- Check that all covers and seals are fitted and in place.
- Check rubber curtains and rubber lining in cabinet for wear.
- Inspect vacuum hose between reclaimer and dust collector for wear.

### 3.1 Filter/moisture extractor

Press button to completely drain filter/moisture extractor.

If extractor does not work properly check direction of flow. Replace filter element if there is a reduced flow rate or an excessive pressure loss.

## Section 4 – Maintenance and Inspection

### 4. Weekly Maintenance

**Before starting maintenance and inspection always isolate the compressed air supply on the air isolating valve of the filter/moisture extractor, provide safeguard to prevent unintentional restarting and allow all pressurised air to exhaust.**

- Remove the storage hopper access plate. Release the vibrated screen by unscrewing the hand nuts. Withdraw the screen, check it for wear and clean it. Ensure that all perforations are clean and free from coagulation.
- Check the blast hose for wear. This may be accomplished by feeling along the length of the hose for any soft spots. A hose will wear more rapidly at sharp bends, it should therefore be arranged so that bends are as gradual as possible.  
Hose life may be prolonged by periodically loosening the fittings and rotating the hose through 90° to re-distribute the inner wearing surface.
- Check vacuum hose for wear.
- Check that filter/moisture extractors of air control system have been completely drained.

#### 4.1 Blast nozzle

Check blast nozzle for wear. If wear at the bore exceeds 25 % of the original size, replace nozzle.

The nozzle size used is 8.0 mm. Therefore, when wear increases the bore to 10 mm the nozzle should be replaced. A quick way of checking this size is to try the shank of a 10 mm drill in the orifice. If the drill passes through the nozzle it must be replaced.

#### 4.2 Y strainer

The Y-strainer is positioned in the air feed line to the main pressure vessel. Its function is to arrest any airborne grit and so prevent its entering the control system. This is particularly important when the pressure is exhausting, and air from the vessel flows to the three-way valve and then exhausts to atmosphere. It is recommended to carry out maintenance of the Y-strainer once a week (or every 40 hours).

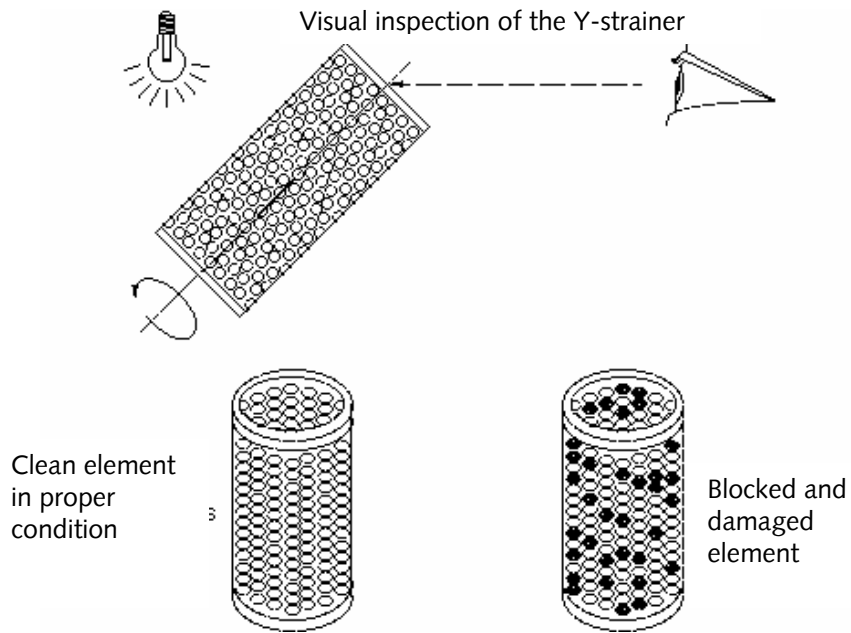
**Neglecting the following cleaning procedure may cause serious damage and expensive repairs.**



## Section 4 – Maintenance and Inspection

1. Removal of the Y-strainer elements is carried out by unscrewing the union nut at the end of the strainer housing, after which, the strainer element, together with two washers may then be withdrawn.
2. The element comprises a 200 mesh fine wire gauze sandwiched between two perforated cylindrical sections, soldered together to form a single unit. To reveal any blockages to the inner gauze hold it up to the light source and look through the perforations. Blockages will not allow passage of light.
3. To clean the element, use a suitable detergent (until any surface coagulation is softened, then carefully remove the deposits from both sides with a clean brush. Finally, use an air jet nozzle to blow clean and dry the inner gauze.
4. Inspect the element by holding it towards a light source as illustrated. Simultaneously, rotate the element through its longitudinal axis whilst checking the consistency of the inner gauze for passing light. Dark areas will indicate coagulation and light areas will show a blown or broken mesh. Where one or both defects are evident, the element must be discarded and replaced by a new item.
5. In instances where the mesh of the "Y" strainer is broken, or it is found to have been assembled with one or both washers missing, it will be necessary to remove and dismantle the 2-way valve and check for abrasive contamination. Minor scouring or rough edges may be smoothed by using a fine abrasive cloth. Damaged "O" rings or parts sustaining advanced damage must be replaced by new parts. Also ensure that the associated high-pressure air lines are clean and free from abrasive.
6. To assist in the refitment of the "Y" strainer into the housing, lightly spot-stick each end of the strainer periphery. Position the element exactly upright onto a new washer located in the recess of the base nut. Position the upper washer concentrically relative to the strainer periphery. Carefully insert the element into the housing and tighten the base nut in position.

**Section 4 – Maintenance and Inspection**



## Section 4 – Maintenance and Inspection

### 5. Monthly Maintenance and Inspection

**Before starting maintenance and inspection always isolate the compressed air supply on the air isolating valve of the filter/moisture extractor, provide safeguard to prevent unintentional restarting and allow all pressurised air to exhaust.**

- Check vacuum hose between cabinet and generator reclaimer for wear.
- Check blast hoses for wear. This may be accomplished by feeling along the length of the hose for any soft spots. A hose will wear more rapidly at sharp bends, it should therefore be arranged so that bends are as gradual as possible. Hose life may be prolonged by periodically loosening the fittings and rotating the hose through 90° to re-distribute the inner wearing surface.
- Remove the storage hopper access plate. Release the vibrated screen by unscrewing the hand nuts. Withdraw the screen, check it for wear and clean it. Ensure that all perforations are clean and free from coagulation.
- Inspect reclaimer inlet for wear. In particular check rubber lining for wear.
- Check reverse jet pulsing device of dust collector for proper operation
- Check filter element of filter/moisture extractors and clean by means of compressed air.
- Check dust bin seal for tightness
- Check filter elements for dampness, tears or holes
- Check seal on feed valve
- Check air hoses for damage. Hoses must not show any kinks, cuts or other damage
- Check hose connections for tightness.



**Section 4 – Maintenance and Inspection**

**5.1 Main Pressure Vessel**

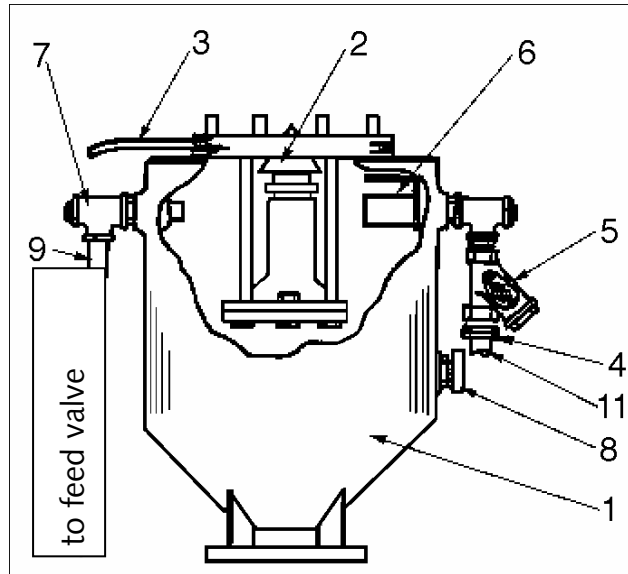
Remove dump valve (2)

Check the diffuser block (6) for coagulated media in the bore. When necessary, remove and clean. Ensure the diffuser block is correctly re-assembled within the pressure feed vessel as illustrated.

Remove "Y" Strainer (5). Inspect in accordance with Weekly Inspection Schedule.

With "Y" Strainer removed and also hose disconnected from item 4, clean bores of items 4, 5 and 11.

With hose disconnected from item (7) clean bores of items 7, and 9.



**ATTENTION:**

In instances where an electronic measuring probe (8) is used, clean and remove any coagulated abrasive from the probe.

Inspect the pressure feed vessel internally. Where evident, remove coagulated media.



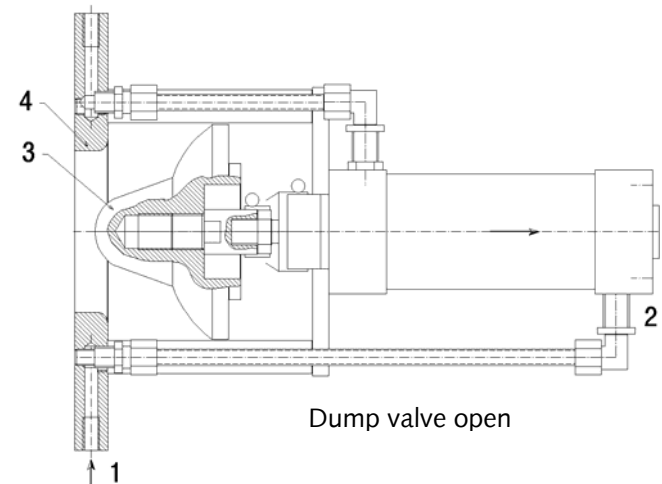
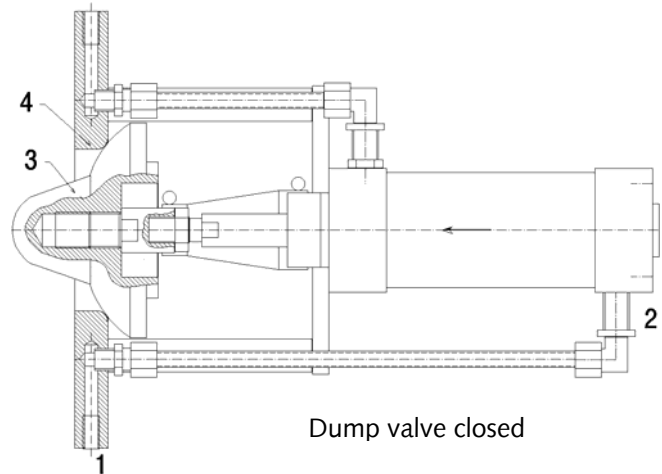
## Section 4 – Maintenance and Inspection

### 5.2 Dump Valve

Quarterly inspection is based on an 8-hour shift operation.

The maintenance interval is to be determined according to the type of application.

- Check dump valve cone for wear.  
**Note:** Wear is attributable to overfilling of the pressure vessel. Valve cannot close so that there an excessive pressure build-up causing leakage of abrasive.
- Check cone (3) for cuts or abrasive wear. Check recess as well.
- Check canvas protection for splits or tears. A defective protection will allow abrasive to enter and collect between the center shaft and the seal causing seizure.



## Section 4 – Maintenance and Inspection

### 5.3 Feed valve

1. Drain abrasive:

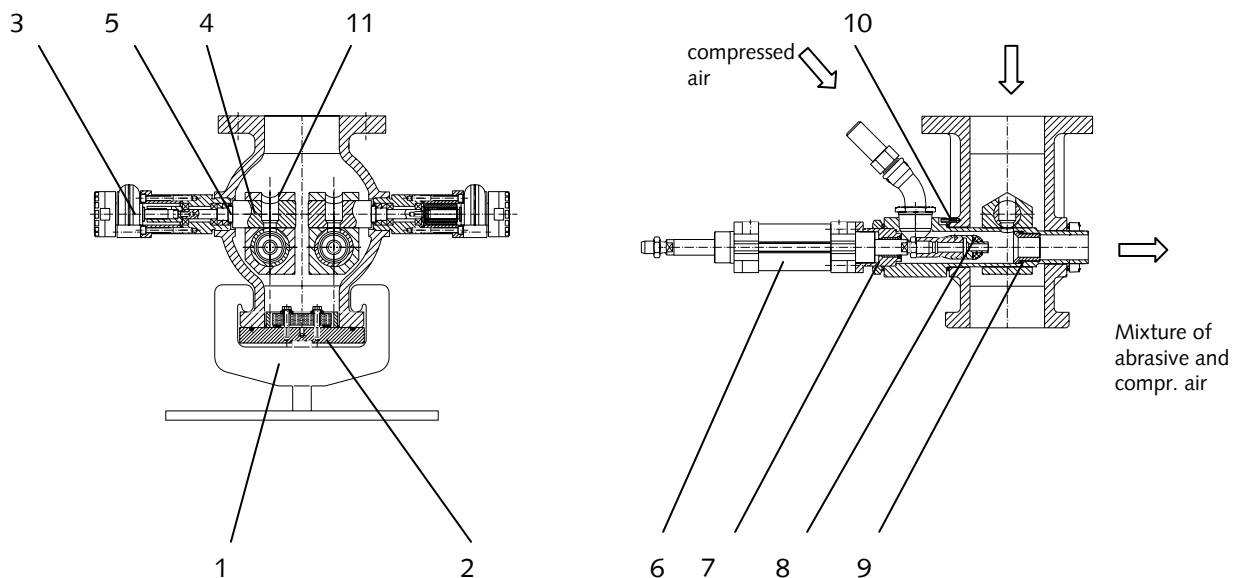
- Place clean container of adequate size to collect the quantity of abrasive in the machine.
- Loosen toggle, remove clamp (1) and end plate (2) from flange.  
Drain abrasive. The air hose (if fitted) to the end plate may be removed, but must not necessarily be removed. Store the drained media in a clean dry place until required for re-use

2. Disconnect air hose and blast hose

3. Dismount feed valve body and drain remainders of abrasive

4. Dismount feed control shaft assembly comprising rotary actuator (3), feed control shaft (4) and bearing case (5). Check for wear.

5. Dismount cylinder (6) with adapter (7) and check (8) for wear.



6. Check insert (9) and feed nozzle (10) for wear. To dismount nozzle first loosen nut, then withdraw nozzle carefully from the seal (11) and the valve body. Then push out the insert.

## Section 4 – Maintenance and Inspection

7. Check bore in seal (11) for wear.
8. Reassemble all parts in reverse order.

**It is essential that worn items are replaced by new items  
Otherwise the serviceability of the feed valve will be impaired.  
Use only genuine spare parts from Munk + Schmitz.**



### 5.5 Dust collector

The frequency of the maintenance depends on the usage and the type of work to which the dust collector is subjected. For more details please refer to the separate Manual.

## Section 4 – Maintenance and Inspection

### 6.. Quarterly Maintenance and Inspection (or every 600 hours)

**Before starting maintenance and inspection always isolate the compressed air supply on the air isolating valve of the filter/moisture extractor, provide safeguard to prevent unintentional restarting and allow all pressurized air to exhaust.**

- Clean interior of reclaimers and check condition of rubber lining
- Check and clean adjustable airwash tube. It must not exhibit any signs of wear or defects impairing its function
- Clean inside and outside of storage hopper
- Check and service main pressure vessel
- Check and service dump valve
- Check and service feed valves

## Section 5 – Fault Finding and Correction

### Contents:

1. General information on faults
2. Little or no vacuum recovery air flow
3. Only air emitting from nozzle
4. Neither air nor abrasive emitting from nozzle
5. Abrasive is carried over to dust collector
6. Machine will not reach mains pressure

## Section 5 – Fault Finding and Correction

### 1. General

If this Munk + Schmitz machine is used and maintained as detailed in this Manual there will be no operating problems. However, in the widely varied service conditions existing it is possible that some minor difficulties may arise.

The following pages shall help identify faults and their cause as quickly as possible.

**Before commencing maintenance or inspection work always isolate the compressed air supply and allow all pressurized air to exhaust.**



**Use only genuine spare parts from Munk + Schmitz**

## Section 5 – Fault Finding and Correction

### 2. Little or no vacuum recovery air flow

- a) Dust collector fan not on or defective (see separate manual)
- b) Butterfly throttle valve on fan outlet closed
- c) Filter/moisture extractor element blocked
  - a) Automatic cartridge cleaning of dust collector defective
  - b) Compressed air line for cartridge cleaning of dust collector leaky
- d) Vacuum hose between cabinet and reclaimer blocked or leaking
- e) Dust container not fitted or fitted incorrectly
- f) Dust container seal leaking
- g) Reclaimer inlet socket worn or rubber lining loose
- h) Dump valve not closing correctly and allowing pressure to nullify suction
- i) Sealing on filter housing or reclaimer defective

### 3. Only air emitting from nozzle

- a) Feed valve orifice blocked
- b) Media metering shaft seized in closed position
- c) No media in pressure vessel; abrasive level probe defective
- d) Vibrated screen blocked so that there is no abrasive in pressure vessel
- e) Vibrator unit not working
- f) Dump valve seized in closed position preventing transfer of media
- g) Abrasive damp or wet causing coagulation in main pressure vessel and/or feed valve



## Section 5 – Fault Finding and Correction

### 4. Neither air nor abrasive emitting from nozzle

- a) Coupling of blast hose over-tightened causing restriction or blockage of bore
- b) Kink in blast hose
- c) Blast nozzle blocked
- d) Air isolating cylinders on feed valve blocked in closed position
- e) Y strainer elements blocked
- f) Air isolating valve on filter/moisture extractor not turned on or blocked
- g) Air relief valve on filter / moisture extractor not closed
- h) Filter / moisture extractor element blocked
- i) 3/2way valve to pressurize main vessel blocked in closed position
- j) Pilot valve to 3/2 way valve defective
- k) Blast gun nozzle blocked

### 5. Media carry over to dust collector

- a. Vibrated screen blocked
- b. Vibrator unit not working
- c. Dump valve not closing allowing compressed air from pressure vessel to lift media towards airwash cones
- d. Pressure vessel overfilled
- e. Storage hopper access plate not fitted or incorrectly sealed, thus causing secondary airflow to deflect reusable media into fixed airwash tube and cones
- f. Separation shaft of airwash incorrectly set

#### Note:

Overfilling of the pressure vessel will prevent the dump valve from sealing correctly. This will result in media and compressed air leaking between feed orifice and dump valve causing rapid wear of the dump valve head and thus a permanent leak.

If replenishment of the machine with abrasive appears unusually frequent, check for media carry-over in dust container.



## Section 5 – Fault Finding and Correction

### 6. Machine will not reach mains air pressure

There will always be a minimal pressure drop between the mains pressure and that shown on the machine's pressure gauge.

- a) Mains air supply hose too small in bore
- b) Isolation valve not fully open or restriction in valve
- c) Filter/moisture extractor elements blocked
- d) Three-way main valve only partially opening
- e) Y strainer element blocked
- f) Dump valve not sealing correctly
- g) Excessive wear in blast nozzle
- h) Air leak at end plate of feed valve flange
- i) Pressure regulator not operating or incorrectly set
- j) Leaks in pneumatic system