



Operating Manual

Stationary Electrostatic Painting Installation Kontur V

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1.1 Introduction

This operating manual is intended to be read, understood and observed in all points by those responsible for the installation. The same is valid for any personnel working at the installation.

This operating manual is intended to ensure trouble-free operation of the installation.

Should there be any problems please contact our service department or your local dealer which will be pleased to assist you (see chapter 9 „Spare parts“).

The operator is responsible for the correct installation, operation and maintenance of the equipment.

Should you intend to use the equipment in a manner different to the intended one please apply for our approval.

The instruction manual must be completed with any local valid safety rules and environmental protection laws.

The operating manual on hand only refers to the „Stationary Electrostatic Painting Installation Kontur V“.

We reserve the right to alterations in drawings and specifications necessary for the technical improvement of the installation.

1.2 Operating Area

The stationary electrostatic spraying installation is exclusively to be used for the application of wet paints suitable for electrostatic application, with a flame point above 21° Celsius without additional heating. Not permissible are fluids which contain chlorid hydro carbonates (halogeated hydrocarbons) e.g. Trichloräthan or Methylenchlorid as well as zink or zink chromate paints .

The spraying installation is IP 54 classified.

The spraying installation may only be used together with the complete painting line. Valid rules and regulations must be adhered to (e.g fire protection, anti pollution laws).



The spray booths must be equipped with exhaust air ventilating system ensuring that the rate of emission is below the permissible rates depending on the fluids being sprayed. Air flow speed must be adjustable to at least 0,3 m/s.

Reciprocators with application equipment must only be operated within the enclosed spray booth.

Areas under high voltage (e.g. paint supply room, spray booth, etc.) must be protected with fences according to the valid regulations.

1.3 Guarantee

Therefore, it is recommended to read this operating manual carefully before start-up, as we cannot be held liable for damage or malfunctions resulting from the non-observance of this operating manual.

During the guarantee period repair work and changes only may be carried out by our assemblers or with our consent.

The system is designed only for the use according to the operating area described in chapter 1.2 „Operating Area“.

Any other use is considered improper and REITER can not be held liable for any possible damage.

1.4 Copyright

The copyright for this operating manual is retained by REITER GmbH + Co. KG Oberflächentechnik. This operating manual is intended for personnel involved in installation, operation and supervision. The operating manual include regulations and technical drawings which may not be copied, distributed, used for commercial purpose or given to others, either in full or in part.

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2.1 Explanation of symbols and special directions

2.1.1 Symbol of working safety



This symbol accompanies all special directions for working safety given in this operating manual, the non-observance of which may endanger life and limb. Observe these directions and take special care in these cases. Ensure all other operators are informed of these special directions. In addition to the special directions given in this operating manual, the generally valid regulations for safety and prevention of accidents are also to be observed.

2.1.2 Directions for „attention“



This warning is given in this operating manual at points which are to be given special attention in order that guidelines, regulations, special directions and proper work procedures are observed, and to prevent damage or destruction of the machine and/or other parts of the plant.



2.2 Direction for working safety

2.2.1 General

This machine can be hazardous if not used as described in the instruction manual.

We recommend to install a warning sign listing the important operating and safety rules. The sign should be in an understandable language for the operators and installed visible in the vicinity of the spray booth.

Additional safety regulations can be found in the operating instructions of used components provided in the annex of this manual. These instructions must be read and obeyed before starting to work with the installation.

2.2.2 Remarks specific for the installation

The machine is designed only for the application specified in Chapter 1.2 „Operation Area“. Any usage not covered in these specifications is considered contrary to regulations. Any other use is considered improper and REITER can not be held liable for any possible damage.

Proper use also includes the observance of prescribed conditions for installation, dismantling and re-installation, start-up procedures, operation and maintenance.

Unauthorized modifications or changes which impair the operating safety of the machine are not permitted.

2.2.3 Operating personnel

It is necessary that all persons assigned with the installation, dismantling and re-installation (inspection, maintenance, repairs) of the machine at the user's plant, read and understand the entire operating instructions, and the chapter 2 „Safety Regulations“ in particular. The user is recommended to have this confirmed in each case in writing.

The machine is to be serviced and repaired by authorised, trained and instructed personnel only. This personnel must have been specially instructed regarding occurring risks.

Responsibility for installation, dismantling and re-installation, start-up procedures, operation and maintenance must be clearly defined and observed in order to prevent responsibilities concerning safety aspects from becoming unclear.

Work being carried out on electrical appliances must only be done by trained personnel for this purpose.

On hydraulic systems (i.e paints and solvents) only personnel being trained and with experience is allowed to do work.

The operator is also to ensure that no unauthorized persons operate the machine.

Trained personnel and apprentices may only work under supervision of experienced operators.



2.3 Safety advise for different operating phases

2.3.1 Standard operation

All work jeopardizing the safety of the installation must be obeyed.

The system may only be used under troublefree and clean conditions according to the determined operation and as laid down in the operation manual.

ON and OFF switching must be done according the operation manual.

The selection switch must be on “standard operation” and the exhaust fan must operate.

The operator shall take appropriate action to ensure that the installation is kept in a safe and troublefree manner for operation. This includes on a regular basis (once every working shift) visual check for damages and proper function of safety devices, in particular:

- door locks and fences around areas under high voltage
- all loosable safety device are operational
- exhaust fan air works according to required level
- emergency Stop operational
- danger signs are in place and can be read
- noise level low
- fire fighting equipment or installation operational
- earthing bars properly connected

in addition all components of the sub assemblies such as

- visual check for leaks on joints, tubes and hoses
- contamination of system



In case of malfunction or dangerous function of the installation the system must be shut down, ensured and faults must be repaired.

The operator must advise his personnel that the spray booth must not be entered through the work piece in-out openings. It is possible to supervise this by means of doors or photo cell barriers.

2.3.2 Special work (Maintenance and repair work)

The dates, settings and regular maintenance work pointed out within the operating manual must be followed. Maintenance and repair work must only be carried out by trained personnel.



All special work at the installation must only be done when the power is switched off and all lines are depressurized the high voltage control must be switched off. Never dismantle parts which are under pressure

Operators must be informed about the start of maintenance and repair work.



- Release pressure of paint supply system
- Ensure that system can not switch on by others
- Switch off system at main control cabinet – main menu press F1
- Switch off main switch, lock and remove key



For work with hazardous materials wear appropriate protection clothes. (breathing mask, glasses, gloves, etc.)

To avoid eye damages caused by paint or solvent protection glasses must be worn at all times when working on paint supply systems.

During the work on the installation the fresh and exhaust air system must run. Also fire fighting equipment must be on duty. Should it be necessary to disable the fire fighting system permission of the fire fighting department and additional preventative measurements may be taken. After completion of the work the system must be prepared to be ready for start.

Dismantled safety barriers must be refixed immediately after finishing the work. Safety covers may only be removed when the system is shut down.

Before start up and after maintenance work the operator must ensure that no person is endangered and the spray booth is empty.

The operator must advise his personnel that the spray booth must not be entered through the work piece in- out openings. It is possible to supervise this by means of doors or photo cell barriers.

2.3.3 Entering of spray booth/areas under high voltage

Before entering the spray booth for cleaning operations the high voltage, reciprocators and paint supply system must be switched off and protected against restart.

During the work on the installation the fresh and exhaust air system must run.

- inform operators
- Switch off system at main control cabinet – press key “control off”
- turn lock switch to maintenance, lock and remove key
- prevent doors from closing unintentionally
- use earthing bars



Before start up and after maintenance work the operator must ensure that no person is endangered and the spray booth is empty.



2.3.4 Work on application system

Work on the application systems inside the spray booth can be defined into two areas which require different approaches.

- Repair work and cleaning operation where dismantling of pressurized lines and equipment is required.
- care taking work during production (i.e. nozzle cleaning)

For care taking:

For care taking the safety regulations described under “entering the spray booth” apply.

For repair work:

For repair work the safety regulations described under “special work” apply.

For both cases:



The paint jet leaving the spray gun without a nozzle is dangerous!

Never point on people or animals with the spraying equipment!
Do not rest the spray gun on naked skin (e.g. hand, thumb)!

Any repair work must only be carried out without material or air pressure.

Only tanks made of electrical conductive material must be used for cleaning material. Tanks must be grounded. For cleaning of the spray gun only solvents with a flame point at least 5K above ambient temperature must be used. In this instruction the use of flammable solvents is not intended.

Wear personal safety equipment during any work at the spraying system (e.g. protection glasses, gloves, breathing masks).

For cleaning of nozzles and atomizing bells carefully and exact adjustment is necessary. When cleaning with compressed air protection glasses must be worn according to working regulations.

Internal cleaning work combined with dismantling of the atomizer must only be carried out by trained personnel. The instruction manual for the spraying system must be adhered to.



2.3.5 Work on high pressure double filter unit



The filter housing is under pressure and must be depressurized before opening ! (see Maintenance for High Pressure double filter unit.)

Before work on the filter unit the high tension must be switched off. Permanent earthing must be achieved by means of the earthing bar.

2.4 Work with high voltage areas



Before entering into an area where HV can be found (e.g paint supply, spray booth, colour change unit) the HV must be switched off! The area must be earthed by means of the earthing bar. This is done by connecting it to conducting part (e.g metallic supply lines).

After installation or repair work the safety devices must be tested, in particular safety shut down mechanism (see chapter 8 daily procedures for more details). Ensure that all earthing cables are fixed correctly.

Entering a HV area is only permissible wearing appropriate footwear (i.e. resistance against earth less than 100 MegOhm).

When using gloves for work inside HV areas they must be made from electrostatically conductive material.

2.5 Work with paints; Solvents and cleaning agents



When working with solvents and cleaning agents toxic and explosive vapours can occur.

You must obey manufacturers handling sheets!

When disposing paints, solvents and cleaning agents you must follow the environmental laws at all times!

2.6 Avoiding threads

2.6.1 Organising action

Keep the operating manual always near to the installation. Add other relevant information and regulations regarding operating and safe working environment.

Assign a suitable person as responsible contact with appropriate training and competence.

All persons working with the installation should have read and understood the operating manual. This is in particular important for persons working only part time at the installation (maintenance work, cleaning work, etc.)

The operator must check on a regular basis that the rules and safety regulations are adhered too. Provide enough protective equipment, explain how to use and enforce the utilization of the same.

Advise on location and how to use next fire fighting equipment as well as procedures for fire detection and fighting.



Keep all safety regulations concerning the installation in good readable conditions.

Mandatory intervals for inspection and maintenance as described within the operating manual must be followed strictly.

Use only spare parts from original manufacturer.

Do not alter, modify or add any further equipment without written confirmation of supplier.

2.6.2 Special hazards

Gas, dust, fumes, smoke

Grinding, burning or welding work on the installation (in particular inside spray booths) is only with permission permitted. **Danger of fire and explosion!**

Before work especially grinding, burning or welding work remove all dust and flammable parts in the vicinity, ensure suitable fresh air supply. **Danger of fire and explosion!**

Work inside narrow areas follow national rules and regulations. **Danger of fire and explosion!**

Chemicals

When working with oil, fat, cleaning agents, solvents and paints or other chemicals the safety regulations for these products must strictly be followed.

Main issues:

- Danger of causing fires
- Danger of causing explosions
- When creating fumes:
 - response of breathing organs, eyes and skin?
 - Danger of choke in narrow rooms?
 - necessary action?
- Aggressiveness of agent
 - response of breathing organs, eyes and skin?
 - possible threats when reacting with other materials (e.g. metal, cleaning agents)
 - necessary action?

Electrical Energy

Switch off the installation immediately when problems with electrical power supply system occur.

Work is only permitted for trained personnel.
(see “Safety regulations – Operating personnel”)

The electrical installations must be checked on a regular basis for loose cables, burnt cables, open cables, immediately rectify potential dangers.



When working on HV assemblies earthing of the parts must be done by means of properly connected earthing bar.

2.7 List of safety rules

This list does only contain the rules and laws suitable for fixed electrostatic spraying installations and might be completed by other local rules.

1. EN 50176
2. EN 292-1
3. EN 292-2
4. EN 60204
5. prEN12621

Other standards related to the basic standards have been considered.



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3.1 Installation Data

Type:	Stationary electrostatic Airless painting installation	<input type="checkbox"/>
Number of colours:	X Colours + 1 solvent	<input type="checkbox"/>
	1 Colour + 1 solvent, special colour + solvent	<input type="checkbox"/>
Spraying system:	Airless model MAE 7-059	<input type="checkbox"/>
	Spray-Mix LP90 model 63201560	<input type="checkbox"/>
total number:	12 pcs.	
number reciprocator:	6 pcs.	
max. pressure:	MAE 7-059: 160 bar, adjustable pressure regulator	
	LP90: 250 bar, adjustable pressure regulator	
max. control air pressure:	MAE 7-059: 8 bar	
	LP90: min. 3 bar	
max. atomizer air pressure:	LP90: max. 10 bar	
Compressed air		
quality:	oil and condensate free	
compressed air temperature:	< 50° C	
max. piece quantity:	5 µm	
piece density:	5 mg/m ³	
dew point:	+ 3°C	
High tension supply:		
voltage:	100 kV	
current:	1 mA	



3.2 Control

Type:	Kontur V with central PLC and visualising system
max. spraying systems:	16 spraying systems
max. no off programs:	10 active programs in SPS, unlimited on fixed disk IPC
Identification:	Infrared scanning device
protection:	IP 54
grid:	10 mm
identification height:	max. 2635 mm
work piece size:	horizontal: min. 25 mm vertical: min. 25 mm

3.3 Paint Supply

Type:	piston pump 45.185
deliver volume:	max. 370 cm ³ / double stroke
pressure ratio:	45 : 1
max. material pressure:	315 bar
max. inlet air pressure:	7 bar
air consumption:	150 l/double stroke at 7 bar input pressure
operating temperature:	10°C - 90°C

Type:	piston pump 030.050
deliver volume:	max. 100 cm ³ / double stroke
pressure ratio:	30 : 1
max. material pressure:	240 bar
max. inlet air pressure:	8 bar
air consumption:	28,7 l/double stroke at 8 bar input pressure
operating temperature:	10°C - 90°C

3.4 Reciprocator

Type:	MH 2T with brake motor
protection:	IP 54
tracking speed:	direct adjustable max. 85 m/min
fixed stroke:	2900 mm
reversing point below:	750 mm

3.5 In/out positioning unit – Optional

Type:	MH 1 + MH 2
tracking speed:	manual
stroke:	600 mm



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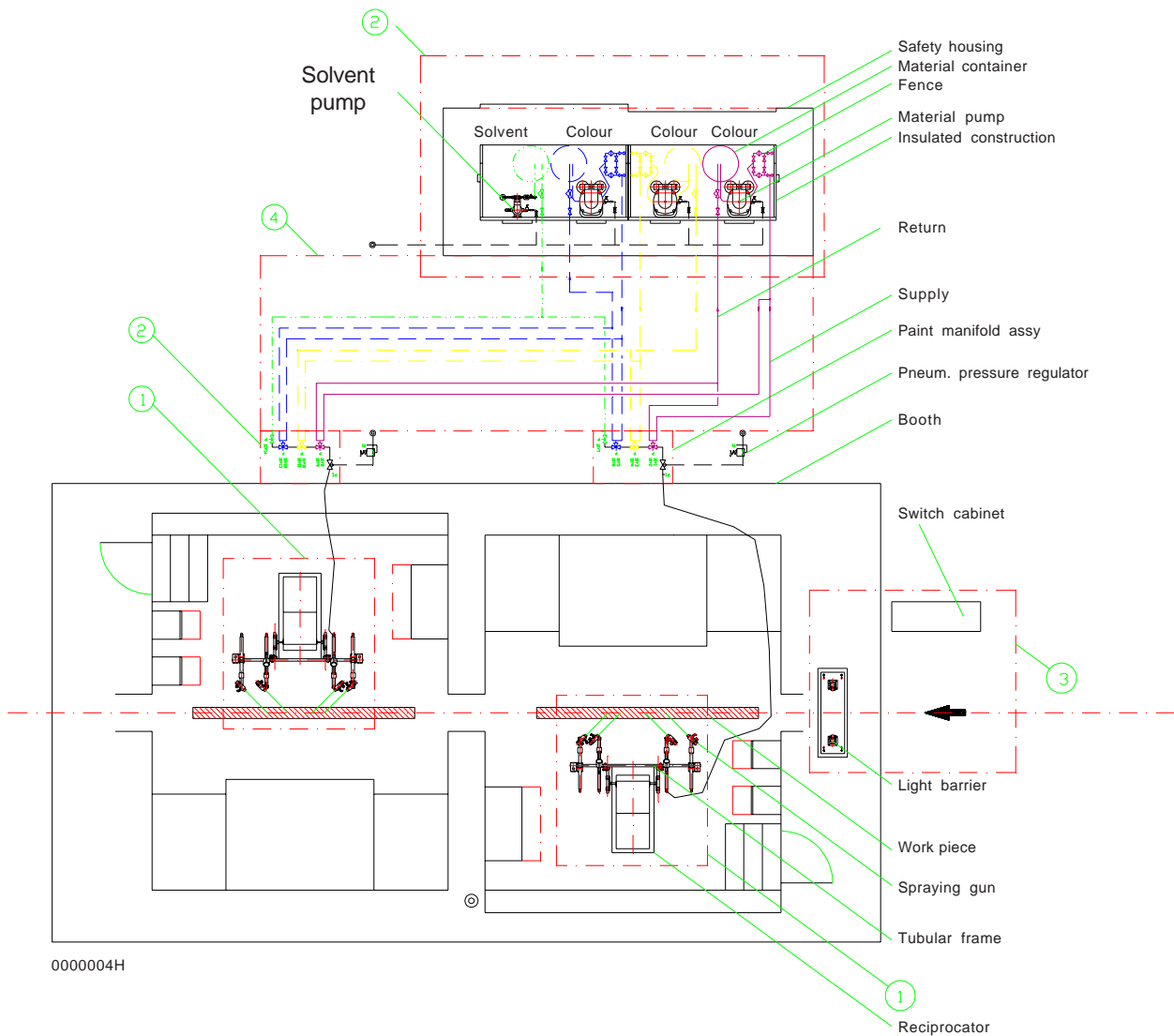
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5.1 Working principle of electrostatic spraying system

The installation consist in general of 4 main assemblies:
 (see also assembly structure diagram, register parts list and drawings)

1. Application equipment complete with spray guns and reciprocators
2. Material supply with pneumatic supply systems
3. Electrical control with sensors and HV generator unit
4. Installation material: supply lines, insulated paint lines etc.





5.2 Material Supply

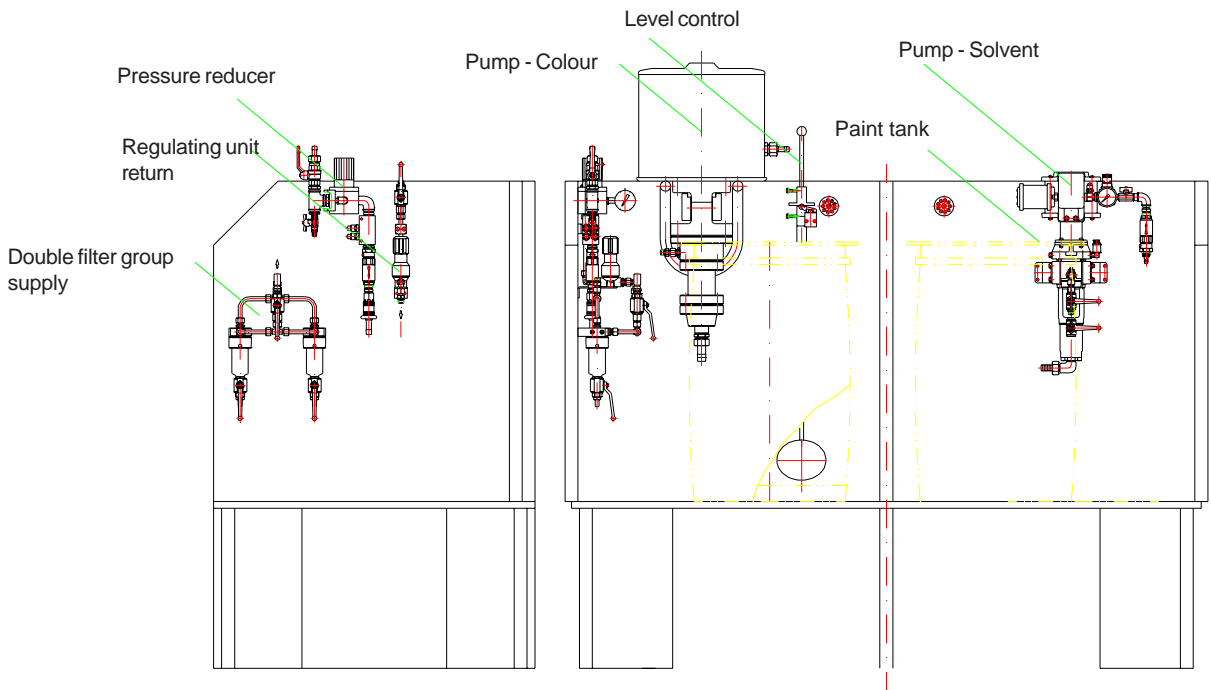
5.2.1 Central Paint Supply

The paint supply system consists in general of insulating desk, high pressure pumps for paint and solvent, main air control unit for pumps, double paint filter unit and back pressure regulator in the return line.

The paint supply system for conductive materials (e.g. water borne paints) must be placed within a closed room. Minimum safety distance must be followed. Any access during operation must be avoided.

The high voltage connected to the spray systems is transferred through the conductive material up to the paint supply unit. To avoid short circuit the paint supply is installed on a insulated desk.

When switching the system off the high voltage is discharged by means of an earthing switch. To ensure complete dischargement all parts must be properly connected with common earthing cable.



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5.2.2 Supply

The material to be transferred is feed from a tank via a pump and filter unit into the flow line to the take off points along the spray booth.

5.2.3 Return

After the last take off point the material circulated back into the feeding tank. By means of a regulator the required back pressure can be adjusted.

5.2.4 Paint Manifold Assy

The insulated paint manifold unit consists of several high pressure ball valves and one paint pressure regulator. The number of ball valves depends on the number of colours being used. By means of the paint regulator, which can be controlled by PLC system or remote manual pressure regulator the atomizing pressure can be adjusted. The dead leg supply line from the manifold unit to the spray guns must be flushed with solvent or cleaning agent before colour changing.

5.2.5 Air regulator unit for pumps

The air regulator unit consists of ball valve, air regulator with pressure gauge, pressure restricting valve and safety valve.

By means of the ball valve the pressure can be shut off.

Attention!

Ball valve must opened only with closed pressure regulator. By means of pressure regulator slowly adjust the air pressure on operating level. Pressure surge is not permissible for the pump and pressure gauge.

With the air pressure regulator the input pressure can be adjusted and therefore the required operating pressure for the paint material set.

The pressure restricting valves (3) (4 off) are not adjustable and restrict the maximum input pressure. This is necessary as the pump would create a material pressure exceeding the limits of the spray systems when operated at max. input pressure (MAE 7-059 max. 160 bar; AKP 95 max. 110 bar)

Pressure restricting valves for TAURUS pump	MAE 7-059: 3,5 bar
	AKP 95: 3,0 bar

Pressure restricting valves for MERKUR Pump	MAE 7-059: 5,0 bar
	AKP 95: 3,5 bar

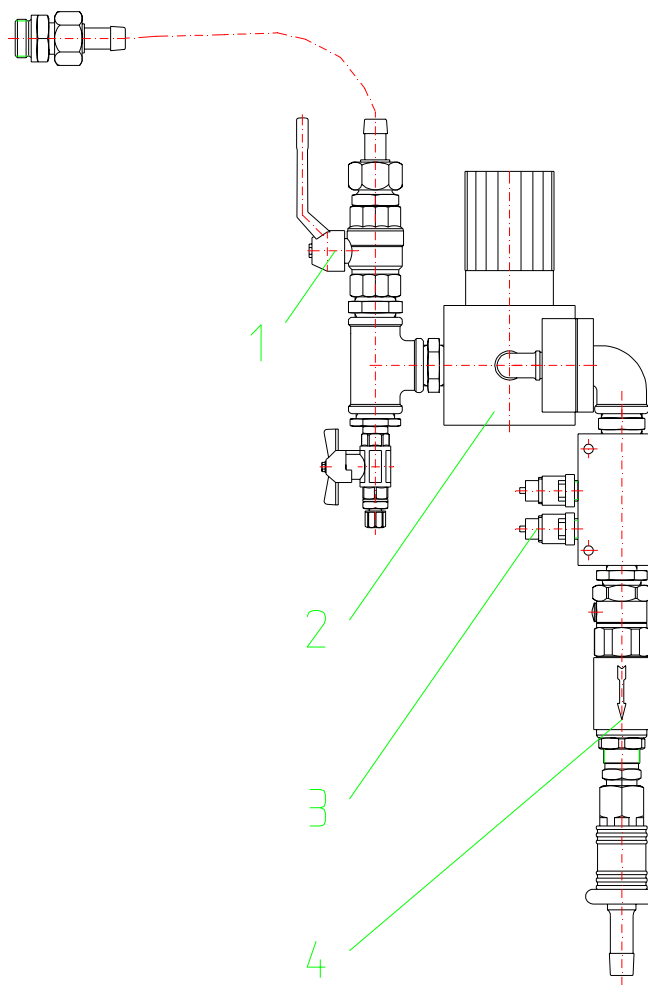
The safety valve ensures that under load the stroke frequency maintains low and a long troublefree operation is achieved. In case of bursting or disconnection of a material hose or when the material tank is empty the stroke frequency of the pump is rising and is stopped by the valve.

After safety stop

After operating conditions are restored press button on safety valve. The adjusted operating pressure is not changed by the valve.

Adjustment of valve

1. Switch off compressed air line by ball valve (1) loosen lock nut of valve (4) and turn valve nut anti clock wise to limit stop.
2. Switch on compressed air supply and adjust operating pressure with pressure regulator (2)
3. Press button on valve (4) and start pump
4. With working pump turn valve nut clockwise until pump comes to complete stand still. The turn valve nut on rev. anti clockwise direction lock nut.
5. By pressing button restart pump.



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5.2.6 Function of High Pressure double filter unit

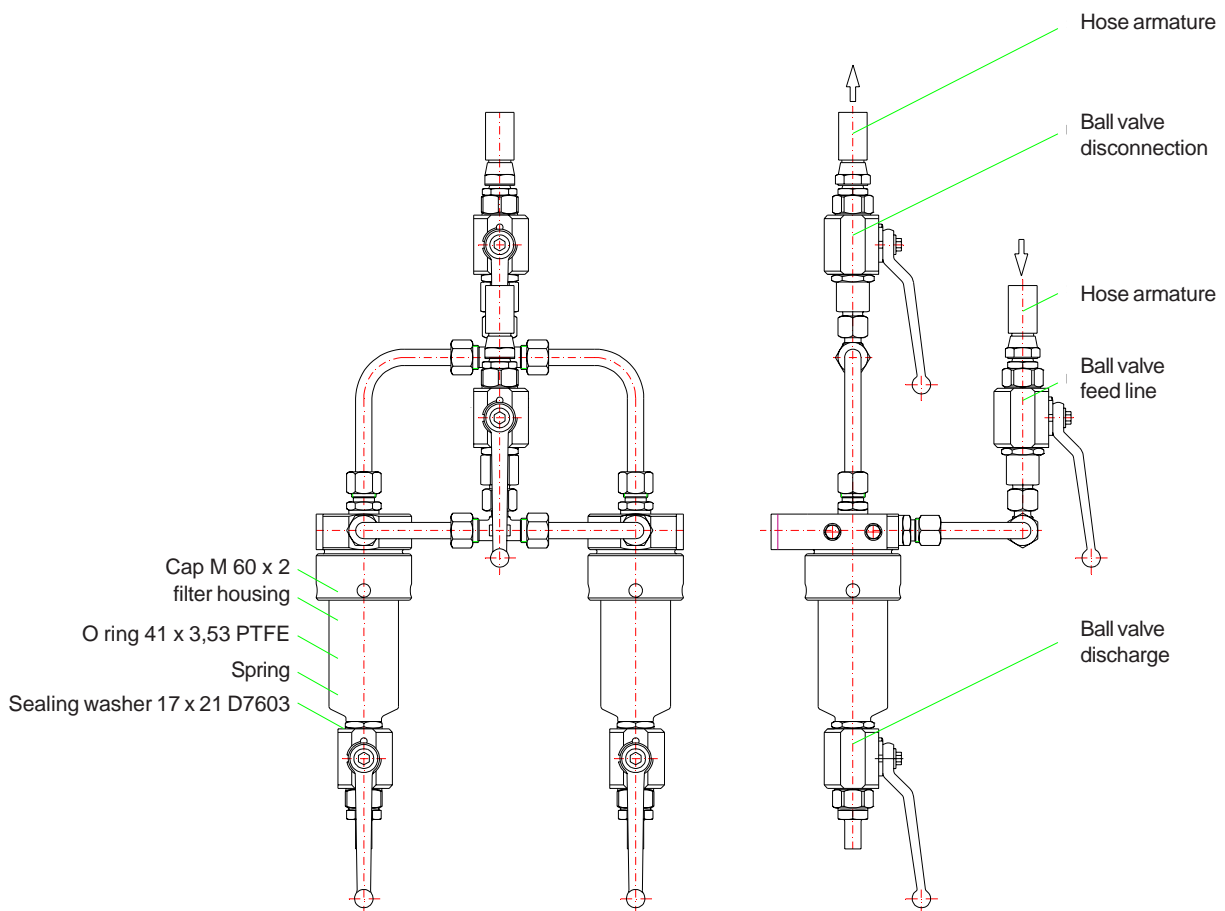
The double filter unit is designed to remove dirt particles from the liquid material and to prevent them being transferred to the spray gun nozzles.

We have chosen a double filter unit to accommodate the volume required for up to 12 guns of a spraying system. During operation both filters are used and thus the resistance is reduced and the service life increased.

The double filter unit consists of two HP-filter type H and two drain valves which are assembled on a support. By two tubes the filter are connected which each other. On each in and out lines ball valves to shut of the material flow are installed. This is for maintenance work to depressurize the filter housing.



When changing or cleaning the filters the filter housing must always be depressurized.



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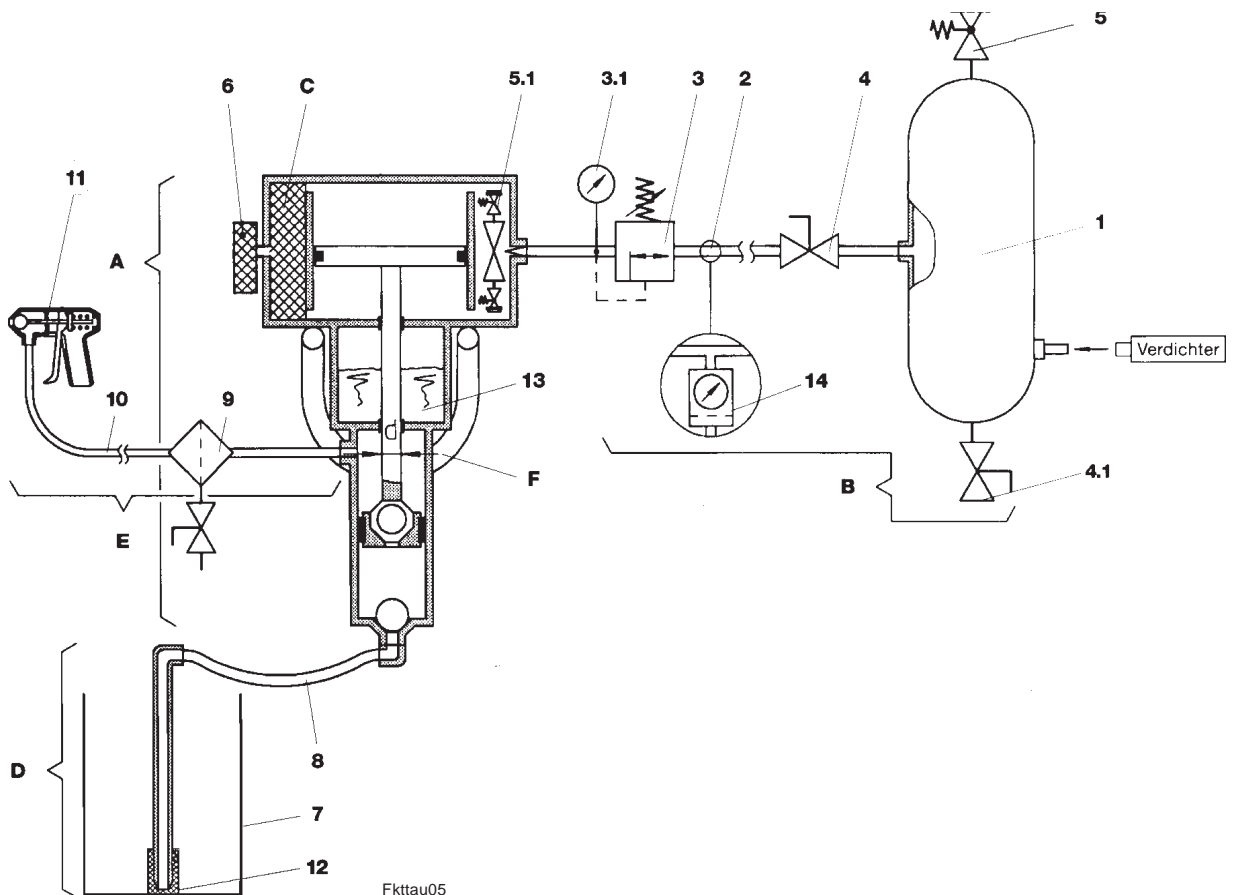
5.2.7 Functional principle piston pump

Compressed air is fed from an air receiver (1) to the piston pump (A) via a ring main or hose (2) and an air regulator (3). Air shut-off is by using a ball valve.

The safety valve (5) is for protection of the air receiver and prevents the safe working pressure from being exceeded. During operation, spent compressed air returns to the atmosphere via a silencer (C).

The coating material (or other liquids as pumped) is drawn from a reservoir (7) via the filtered suction tube (8) into the piston pump and feed to the spray gun (11) via a high pressure filter (9) and a suction hose (10).

- | | | | |
|-----|--------------------------|-----|----------------------------|
| A | Piston pump | 5 | Safety valve |
| B | Compressed air supply | 5.1 | Safety valve |
| C | Exhaust silencer | 6 | Additional silencer |
| D | Material suction device | 7 | Container unit (reservoir) |
| E | Material pressure system | 8 | Suction tube |
| F | Equipment holder | 9 | Double filter |
| 1 | Air receiver | 10 | Hose line |
| 2 | Pipe i.e. hose line | 11 | Spray gun |
| 3 | Air regulator | 12 | Filter |
| 3.1 | Gauge | 13 | Solvent chamber |
| 4 | Ball valve | | |
| 4.1 | Ball valve | | |





5.3 Safety equipment

5.3.1 Door safety device

All areas with high tension must be protected against unsecured access.

The door lock consists mainly out of limit switches with integrated access lock and signal columns with red and green lights.

If the signal column shows red light it is indicated that the area is with high tension. In this case access to this area is strictly prohibited. If the green light is on access to the area is allowed if the relevant safety regulations are obeyed.

The safety switch closes the door by its integrated solenoid lock against unintentionally opening. Further it releases the door only after a delay time ensuring the complete discharging of the components.

The safety switch provides feed back when the door is closed. Only after all supervised doors are closed the HV system, reciprocators and spray guns can be switched on.



We recommend to secure door against unintended locking. In this case you ensure an unintended start of the system by other persons.

In any case you have to use the grounding tube!



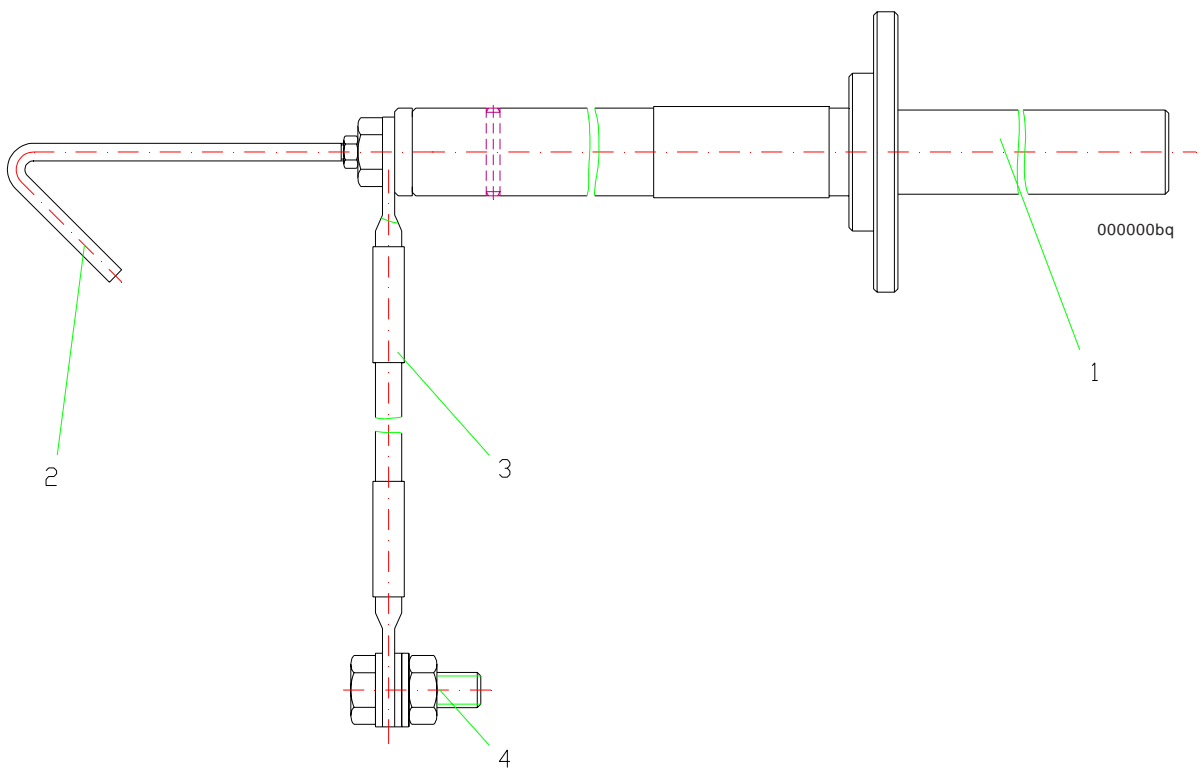
5.3.2 Grounding tube

The grounding tube is used as a short circuiting device for all installed equipment. Short circuiting is ensured through connecting the grounding tube with high tension conducted parts (example: metallic supply tubes).

While accessing the high tension area the grounding tube has to be hold on the isolated handhold (1) and the metallic hanger (2) has to be connected permanently with a high tension conducted part. Trough this procedure you ensure that possible existing final tension will be eliminated by the grounding cable. It is also ensured that unintended start of the high tension by third persons is prohibited.



We strongly recommend to check the grounding cable connection (3) and screw (4) at the grounding tube on a regular basis. The installation of grounding tubes at access doors to high tension areas is inevitable.





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7.1 General

Additional and more detailed operating instruction are given within the manuals of entities. They must be read and followed strictly.

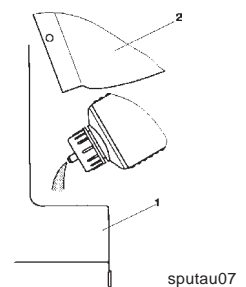
- Work on hydraulic systems (also paint and solvent) is only allowed for trained and experienced people.
- Before every start up all tube and hose joints must be checked for connection and tightness .See also manuals of piston pumps.
- The piston pump when empty may be briefly operated under supervision and only under low air inlet pressure.
- When starting the piston pump slowly increase the pressure from zero to operating pressure by means of compressed air regulator.

Rapid start up of the piston pump causes stalling of the piston and therefore higher wear.

- The coupling housing of the piston pump must be filled with sufficient material
 - Fill up coupling housing (1) with approx. 150 cm³ solvent.
For better access temporarily remove protection cover (2).

The piston pump may not be operated without protective cover (2).

 - The solvent used for this purpose should be compatible with the material pumped later, consultation with the material supplier is, therefore, recommended.





- Filter insert installed?
See Operating Manual „Piston Pump“.
- Before start up of the installation flush all paint lines thoroughly and clean from remains.
- During commissioning avoid pressure surges as pressure gauges are sensitive against pressure surges.



Before start of the system the operator must ensure that there is no person inside the spray booth and all safety measurements are functional and operational.

7.2 Operating Start

- **Fill up the solvent cup**
- **Installation of filter insert** (Double filter group; piston pump for solvent)
 - ball valves at double filter group closed?
- **Flushing the piston pump/system**
 - Following the flushing process, the solvent should be removed from the piston pump as thoroughly as possible (do not remove solvent from coupling housing). Air suction is used to accomplish this.
 - Set inlet air pressure (gauge to compressed air regulating unit) < 1 bar
- **Operating Piston Pump**
(s. picture chapter installation documentation compressed air regulating unit for pumps)
 - Close air regulator at regulating unit by turning the regulating cap counter clockwise to butt.
 - Open all locking devices in the material pressure system.
 - Open ball valve in pressure hose.
- **Air removal**
 - Ensure that material flow (material hose) is connected.
 - Slowly increase air pressure to start up piston pump (approx. 0,5 bar air pressure).
 - Operate piston pump at low frequency until all air is expelled.
- **Preparation for spraying**
 - Lock spraying device, install nozzle.
- **Adjust packing**
 - Increase material pressure slowly to the maximum level. Briefly operate piston pump at this level. Now set desired operating pressure level.

The flange nuts have to be adjusted according to prescribed tightening torque after the trial run.



7.3 Shutting off equipment



Depressurizing the air motor while the material pressure system is still pressurized could result in rising material pressure (depending on system used). Depressurize piston pump (both air and material system) by removing material only after compressed air supply has been shut off.

When shutting off the equipment piston should be located at lower reversal point (see Operating Manual Piston pump Taurus).

Attention!

When using quick hardening paint the whole system must be flushed thoroughly before switched off.

7.3.1 Shutting off equipment for short periods (End of shift)

- Shut off compressed air supply
- Depressurized piston pump by expelling material - do not empty

7.3.2 Shutting off equipment for longer periods (prior to vacation closing)

- Flushing piston pump/system thoroughly
- Leave solvent in the piston pump/system
 - Filling tube should be half filled with solvent
- Shut off compressed air supply
- Depressurize piston pump by releasing solvent



7.4 Problems and correction

7.4.1 Light Barrier

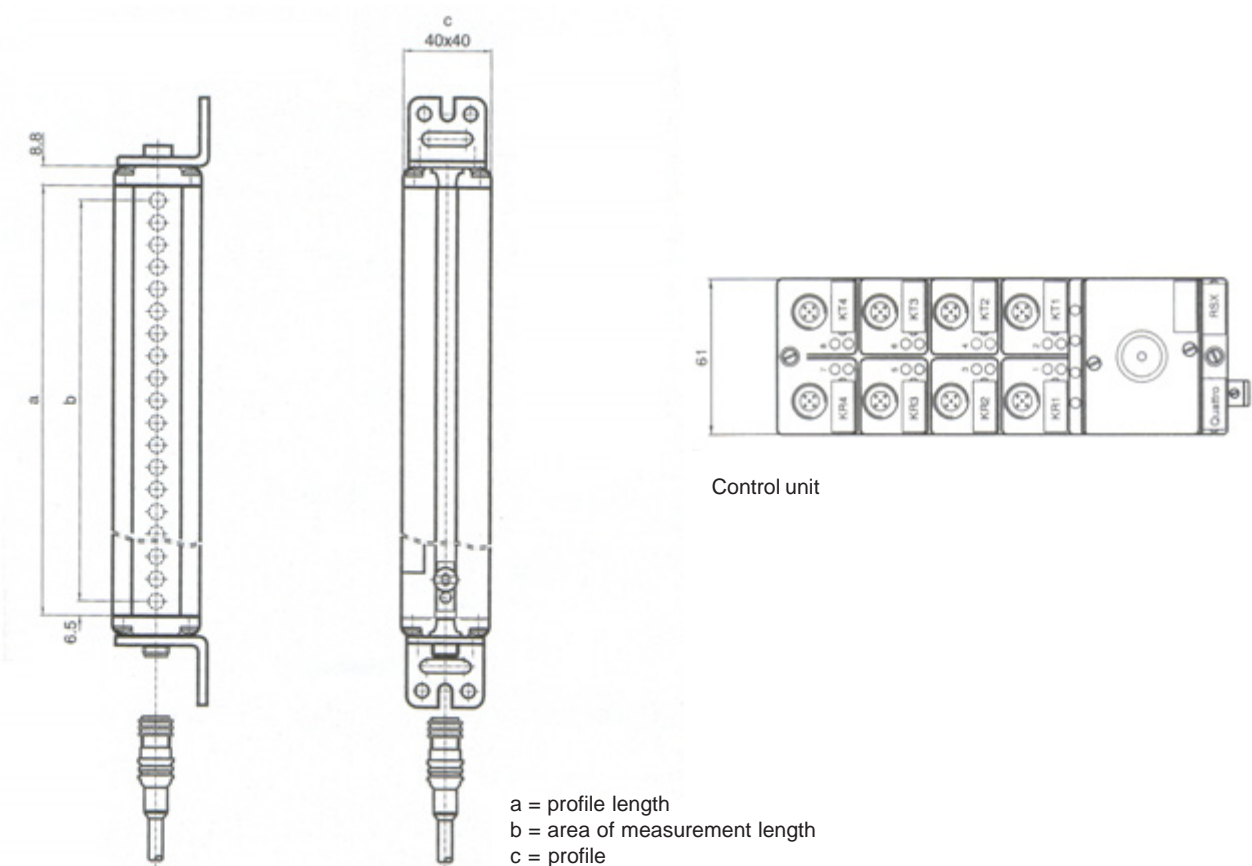
All display elements are attached behind the red coverplate.

The light barriers are located in a light metal profil with a cross section of 40 mm x 40 mm. On both sides of the profil are T-channels for which special fastening elements have been designed.

The connection is located on the underside of the light barrier and is made with a M 12 plug. The numbering scheme of the light rays starts at the plug side with ray 1. A green LED display at the receiver barrier shows the state of all free rays.

A red LED display means **at least one interrupted ray**. This display is controlled by control unit QUATTRO and the blanking function was taken in consideration.

At the configuration of the light barrier the distance between the sender and receiver light barrier must be adjusted. The distance can be adjusted in 6 steps between 30 cm and 400 cm. To avoid that the rays are going around the objects to be measured by too much light output, the distance should be adjusted exactly.



The total length A pertains to the area of measurement of the light barrier and differs. The total length can be taken from the model identification.



Displays	Causes	Mode of Acting
<p>No lights are displayed at the receiver and sender</p> <p>The green LED light of the QUATTRO unit functions as error and position display</p> <ul style="list-style-type: none"> - a short blinking when turned on, then no light: - slow blinking (~1 Hz) - blinking (~1 Hz) - long blinking/short time off (~1 Hz) - short time blinking/ long time off (~1 Hz) - permanent steady light 	<p>no distribution voltage</p> <p>everything is functioning</p> <p>no light barrier connected or connected wrong</p> <p>amount or length of light barrier has changed since last turned on</p> <p>profibus status is waiting for input of parameters</p> <p>profibus status is waiting for configuration</p> <p>unit defect</p>	<p>turn on main switch at control unit</p>



7.4.3 Painting Process

Problem	Causes	Correction
System is spraying without object in front of it	emitter or receiver bar dirty	clean emitter and receiver bars
	there is an object permanently between the scanning bars	remove object
	photo cell on emitter or receiver is defect	deactivate photo cell by means of Kontur control
Paint pressure drops with constant pump pressure	filters of double filter unit are blocked	clean filters
Often nozzle blocking	filters of double filter unit are broken	clean and replace filter sieves

7.4.4 Paint Pressure regulator P200-VP

Problem	Causes	Correction
Outgoing pressure is equal to incoming pressure	particle inside the regulator	clean regulator and replace damaged parts
Material is leaking from holes of packing housing	packing is defect	replace packing



7.4.5 Piston Pump

Problem	Causes	Correction
Material pressure drops	large amount of leakage diameter shrinkage	check fittings replace defective parts visual inspection for hose connections, replace when damaged; clean fittings
Air motor irregulating running; lifting frequency drops, pump stops	freezing; compressed air too humid, lifting frequency too high	remove ice change operating conditions
Continuous air release from exhaust fan	flat slide defective	debris entered
Pressure fluctuations on hydraulic component; does not suction properly, operates irregularly	not properly ventilated O ring at suction connection damaged	ventilate pump replace O ring
Pump does not stop during downward lift	ball or valve seat defective	visual inspection, replace worn parts
Pump does not stop during upward lift	ball or valve seat defective on refilling valve; packing below defective	visual inspection, replace worn parts
Material releasing at piston rod	packing above defective	visual inspection, replace worn parts
Scratches on the surface of the piston	wear	visual inspection, replace worn parts
Pump operating irregularly	material soiled, suction filter clogged	visual inspection, clean suction filter



7.4.6 Spraying System

Problem	Causes	Correction
Film build uneven change of fan pattern	tip or nozzle blocked, sieve blocked	clean tip, nozzle and sieve
Uneven film build, stripping rough atomization	throttles are closed or not opened enough	readjust throttles
Paint or air leakage at gun body	seals worn out	replace seals
Spray system is not working, no air tip and no ON-OFF action	air supply is broken	check air supply hoses and connections



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8.1 Operation and maintenance

Additional and more detailed operating instruction are given within the manuals of entities. They must be read and followed strictly.

- During work on the installation the fresh air supply and fire fighting system if available must be activated.
- After the work the system must be returned to operational status.
- During operation do not remove suction lance form material container. The system could be filled with air and cause unsatisfactory results.

8.1.1 Cleaning



Insufficient cleaning can lead to accumulation of coating materials. These accumulations bear (especially on the floor) high risk of explosion and fire.

The operator must take care off:

- cleaning of installation on a regular appropriate basis
- the cleaning instructions for single entities are followed strictly
- electrical devices are cleaned carefully



- no excessive use of cleaning agent occurs – this may result in malfunctioning
- removed parts and used cleaning rags are stored outside the fire – explosion hazardous areas

8.1.2 Recycled paints from reclaim system

Attention!

Recycled paint being reclaimed must be prepared before being used again!

1. Sieve paint – sieve size not smaller than installed in paint filter unit
2. Prepare paint ready for spraying – for requirements contact paint supplier

8.1.3 Suction lance

Attention!

The suction lance with sieve should be placed inside a bucket with cleaning agent during longer production stops!

Hereby a blocking of the sieve or the tube with dried paint can be avoided. The time from when this should be done depends on the paint being used. After end of production the filter at the end of the suction lance must be cleaned and rested inside a bucket with cleaning agent at all times.



8.2 Maintenance Work

The intervals recommended are directly related with production conditions (paint material, no. off shifts, spray booth, etc.) Therefore the intervals should be verified by the operators after start up and commissioning of the systems. The intervals recommended should however no be exceeded.

8.2.1 Daily Maintenance Work

Component	Activity	Error/Remedy/Note
Light barrier	visual inspection - pollution	clean sensors with soft rag and cleaning solvent
High tension	note readings kV/mA	if values differ much from basic setup => look for fault system to dirty short circuit
	safety disconnection	make contact with earthing bar => start at 10 kV and increase in 2 kV steps tension => note switch at current
Reciprocator	pollution - visual inspection	cleaning, see manual reciprocator
Moving device	pollution - visual inspection	cleaning
Pumps	solvent level control	too low => refill rising level
		slow => more frequent check fast => change packing see operating manual piston pump
		solvent changes colour => replace see operating manual piston pump
	note pump pressure	check with basic set up
Suction lance	visual inspection - filter	cleaning
Minimum level control	visual inspection	Shaft moving freely ?! no => cleaning
Nozzle	cleaning	use only cleaning agent with flame point above 21° C see operating manual spraying system
Double filter	cleaning filter	Release pressure from filter! If paint pressure drops at constant air pressure => filter blocked => change filter



8.2.2 Weekly Maintenance Work

Component	Activity	Error/Remedy/Note
Reciprocator	check chain tension	slack of loos port exceeding 2% at total => refrighten chain see operating manual reciprocator
	chain check	lubrication; if worm out see operating manual reciprocator
Paint pressure regulator	visual inspection	material releasing => change packing
	compare in- and outlet pressure	foreign substance; defective parts see operating manual air regulator
Paint hose	visual inspection - leakproofing	
Solenoid valve	function	operate spray guns individually with test programs

8.2.3 Monthly Maintenance Work

Component	Activity	Error/Remedy/Note
High tension	HT cable - Check pins	
Earthing rod	visual inspection earthing cable check for good contact	
Pumps	solvent	replace solvent see operating manual piston pump



8.2.4 Other Regular Maintenance Work

Checking of HV-Safety devices

- during commissioning, then every 40 operating hours

8.3 Maintenance for sub assemblies

8.3.1 Maintenance for High Pressure double filter unit



Before removing the filter housing the filter assembly must be depressurised. When working at the unit with cleaning agents or solvents personnel protection equipment must be worn (i.e eye protection and gloves).

Cleaning of High Pressure double filter unit

(see also picture chapter “function of High Pressure double filter unit”)

- Close high pressure ball valves at inlet and outlet connections
- Release pressure by opening the both drain ball valves
- Opening of filter housing
 - Release nut with bolt provided
 - Move filter housing downwards
- Pull out the filter sieve with the spring
- Clean all parts with suitable tools and cleaning agents (ask paint supplier for advise)
- Check seal of the housing for fit and function if damaged or in doubt replace by new seal
- Make sure that the filter is reinstalled together with the spring only inside the filter housing
- When tightening the filter housing ensure that the seal is not damaged.



8.3.2 Maintenance Instruction – Piston Pump

Repair work must be carried out by trained personnel only.

Top up sealing liquid

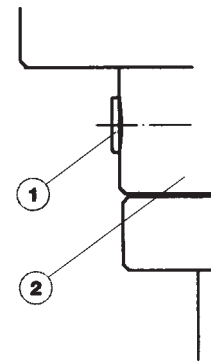
(see chapter Commissioning)

Refill sealing liquid

Consult with material supplier regarding solvent compatibility. NITRO-thinner, i.e. cleaner must not be used as flushing liquid.

Change solvent at signs of discoloration or once a month.

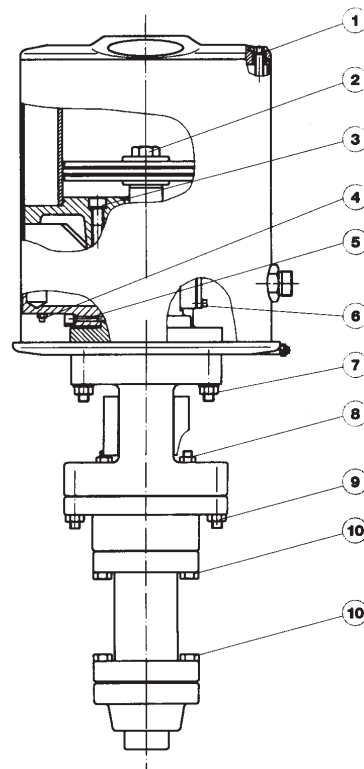
- Drain by removing cap screw (1).
- Flush housing (2) with solvent.
- Refill with approx.: 150 cm³ of solvent.
- When using anti-freeze liquid (operation in approx. 10°C) replenish after consumption.



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Tightening torques

Piston Pump						
	012.185-DP	020.185-DP	025.185-DP	030.185-DP	045.185-DP	060.135-DP
1	M10 8,8 25 Nm		M10 8,8 45 Nm			
2	M16 8,8 140 Nm	M20 8,8 180 Nm				
3	M10 8,8 40 Nm	M12 8,8 70 Nm		M12 8,8 80 Nm		
4	-	-	-	M 6 10,9 3 Nm		
5	-	-	-	M 6 8,8 5 Nm		
6	-	-	-	M 6 8,8 7 Nm		
7	M12 8 50 Nm					
8	M 10 10,9 8 Nm					
9	M 12 8,8 86 Nm					
10	M 12 — Thread 8,8 — Material 60 Nm — Tightening torque					



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9.1 General Instructions

A stock of the most important spare and wearing parts to wear at the place of installation is an important prerequisite for the constant proper function and availability.

We provide a guarantee only for original spare parts delivered by us.

In case of damage resulting from the use of non-original spare parts and accessories, any liability or guarantee provided by REITER GmbH + Co. Oberflächentechnik is excluded.

9.2 Spare Parts Order

To the order make use of the spare parts list in the part documentation and parts lists.

For the spare parts order the following data shall indicate:

- Order number (see acknowledgement)
- Part number (see parts list)
- Designation (see parts list)
- Parts lists designation
- Quantity

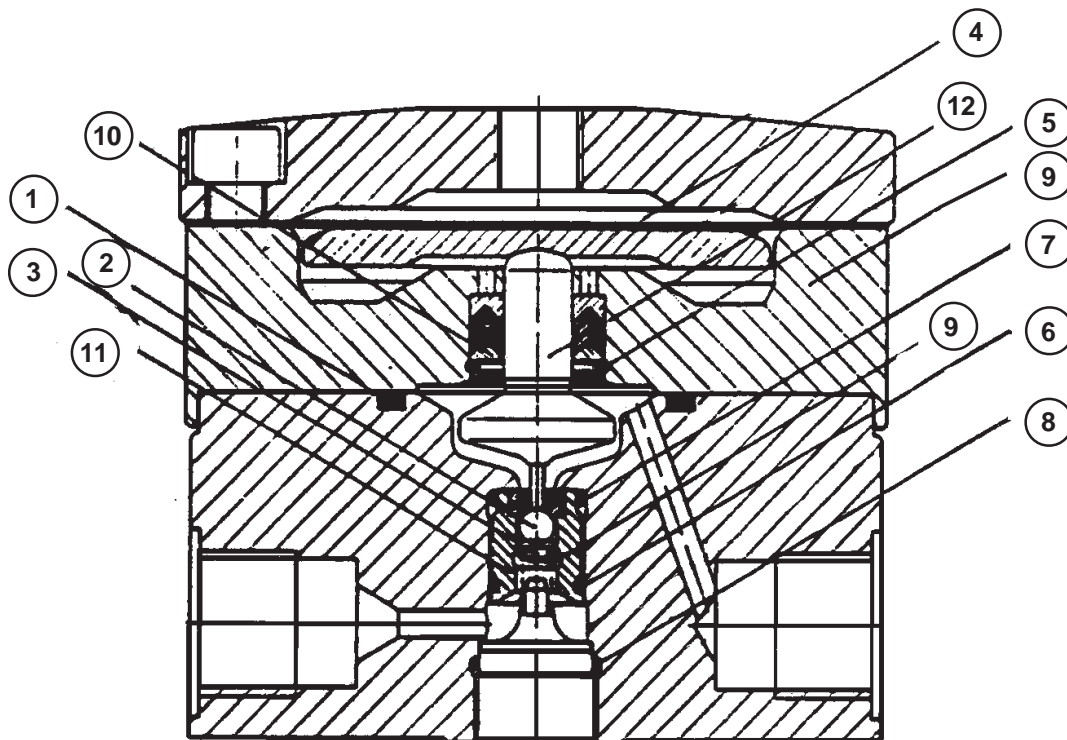


9.3 Spare Part Storage

9.3.1 Kit for high-pressure paint pressure regulator P 200-VP

Repair kit 63300260 consists of:

1.	O ring	40 x 3	FPM
2.	Ball	5 mm	hard metal
3.	Ball support		1.4571
4.	Diaphragm	105,5 x 0,65	
5.	Circlip	20 x 1	
6.	O ring	10 x 2	FPM
7.	O ring	11 x 2	FPM
8.	O ring	16 x 2	FPM
9.	Pressure spring	4,3 x 0,7 x 14	1.4571
10.	Packing	10 x 209,4	PTFE
11.	Valve seat		
12.	Valve stud		



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