Manual / Spare Parts

8/20/2026

RTM Sigma EVO Line

028-1991

1.0.0

Composites

Content

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1 Introduction

1.1 Forword

Thank you for choosing a BÜFA®-Tec product. Our products are manufactured to the highest quality standards and comply with current norms and testing guidelines.

Please read and follow the enclosed operating instructions and keep them near the device. Adhering to the safety instructions and requirements is essential for the safe, proper, environmentally friendly, and economical operation of the system and is the responsibility of the operator.

Due to the continuous development of our products, illustrations and content may vary slightly. If you notice any discrepancies, please send us an email at: Tec@buefa.de.

1.2 Manufacturer and Customer Service

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Please contact our customer service before sending repair devices or returns and fill out the return form included in the operating instructions.

1.3 System / Product Data

System designation:
Sigma RTM (Resin Transfer Moulding) EVO-Line

Model / Type:
RTM Sigma EVO-Line

Article number:
028-1991

Compressed air supply:
Use only dried, oil-free and dust-free compressed air (ISO 8573-1:2010 Class 4) at a pressure of 6 bar.

Compressed air hose:
Minimum inner diameter 13 mm and electrically conductive.

Pressure ratio resin:
23:1

Pressure ratio peroxide:
1:1

Maximum output capacity at 30 double strokes/min with water:
6.6 l/min

Displacement volume per double stroke:
220 ml

Air consumption:
Approx. 700 l/min

Dimensions (L × W × H):
1100 mm × 800 mm × 2600 mm

Weight:
Approx. 100 kg

Maximum noise level:
78 dB

Intended use:
The Sigma RTM system (Resin Transfer Moulding) is designed for the transfer, metering and injection of resin and curing agent systems for the production of fiber-reinforced plastic components in closed molds. The resin pump operates with a pressure ratio of 23:1 and achieves a maximum resin pressure of 138 bar. Peroxide transfer is performed by a separate pump with a pressure ratio of 1:1. The maximum flow rate is 6.6 l/min (based on water) at 30 double strokes per minute. The displacement volume is 220 ml per double stroke. The system is designed for use in industrial RTM processes for manufacturing components of various sizes and geometries.

Special features:
Specifically designed for RTM processes
Pressure monitoring (optional)
Peroxide monitoring (optional)

1.4 Version Status and Change History

This operating manual reflects the current state of the art and has been prepared based on the standards and regulations valid at the time of publication.

Version: V1.0 – August 2026

Change log

Version: V1.0 – August 2026

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1.5 Nameplate on the System

The nameplate is clearly visible on the outside of the system and contains all relevant information for identifying and technically classifying the equipment.
It includes the following details:

- System designation and model type
- Serial number
- Year of manufacture
- Article number
- Max. air pressure
- Delivery rate
- Pressure ratio resin
- Pressure ratio hardener
- CE marking and, if applicable, ATEX marking

The nameplate serves as the unique identification of the system and must be referenced in case of inquiries, spare part orders, or service requests.

1.6 Applicable Supplementary Documents

In addition to this operating manual, further documents are considered binding and must be observed during operation, maintenance, and servicing of the system. These include in particular:

- EC/EU Declaration of Conformity
- Safety data sheets of the materials used
- Operating manuals of supplier components (e.g. pumps, control units)

All supplementary documents are part of the technical documentation and must be made accessible to the operator and responsible personnel.

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2 Information on the Operating Manual

2.1 Purpose of the Operating Manual

The operating manual is intended to provide the user with all necessary information for the safe, proper, and efficient operation of the system. It includes instructions for commissioning, operation, maintenance, and troubleshooting, as well as safety-related information to protect people and property

2.2 Target Groups of the Operating Manual

The operating manual is intended for the following target groups who interact with the machine:

- Operating personnel
- Maintenance personnel
- Specialized personnel

2.3 Operators

Operators are individuals who control and monitor the system during daily operation. They must be familiar with the basic functions and have fully read and understood the safety and operating instructions in this manual. Appropriate training by qualified personnel is a prerequisite.

2.4 Maintenance and Service Personnel

Maintenance Personnel – Mechanics (M)

The mechanical maintenance personnel are employees appointed by the operator who are authorized to perform work on the mechanical components of the machine.

They are qualified through their training and experience to carry out mechanical tasks on the machine and to operate it.

Additionally, they possess advanced knowledge and experience in specialized systems such as pneumatics.

Maintenance Personnel – Electrical (E)

The electrical maintenance personnel are employees appointed by the operator who are authorized to perform work on the electrical components of the machine.

They are qualified through their training and experience to carry out electrical tasks on the machine and to operate it.

Additionally, they possess advanced knowledge and experience in specialized systems such as electrical engineering.

2.5 Specialized Personnel

Specialized personnel refers to the customer service or service technicians from the manufacturer of the respective machine component.

They are qualified through their training and extensive experience to perform all tasks on the machine and to operate it.

Additionally, they possess advanced knowledge and experience in specialized systems such as pneumatics and electrical engineering.

2.6 Presentation of Textual Content

Text content is clearly structured and presented in a logical sequence. Important terms and instructions are highlighted in bold or italics. Step-by-step instructions and tables help with orientation and implementation of the described actions.

Examples of formatting used:

1. Action sequences that must be performed in a specific order are numbered.

- Bullet points or action steps that do not require a specific order.

✅Reactions that result from an action step. (Not every action will trigger a reaction—only when it is relevant for operation.)

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2.7 Presentation of Safety and Instructional Notices

Important notices, such as safety-related instructions, are marked in the operating manual using appropriate pictograms and keywords.

The structure of these notices is as follows:

1. Type / Source of hazard
2. Possible consequences
3. Measures to prevent the hazard

This symbol identifies all safety instructions in this operating manual where non-compliance will result in death or serious injury.

This symbol identifies all safety instructions in this operating manual where non-compliance may result in death or serious injury.

This symbol identifies all safety instructions in this operating manual where non-compliance may result in moderate or minor injury.

This symbol identifies all safety instructions in this operating manual where non-compliance may result in damage to the product or surroundings and malfunctions.

Cross-reference to a specific document or source.

This symbol identifies helpful application notes and information that should be considered when using the product.

3 Safety

3.1 General Safety Instructions

The operating manual must be read by the operator before commissioning. The safety instructions, as well as the supplementary notes in the individual chapters, must be strictly observed during operation.

Installations, commissioning, repairs, and maintenance may only be carried out by persons who meet the following conditions:

- Qualification for the planned activity and handling of the system, as well as the auxiliary, operating, and processing materials
- Authorization and instruction by the system operator
- Knowledge of the regulations
- Ability to understand and follow operating instructions and conditions
- Compliance with legal requirements

The accident prevention regulations and any additional safety regulations of the respective country must be strictly observed.

3.2 Intended Use

The Sigma RTM system (Resin Transfer Moulding) is intended for the metering, transfer and injection of resin systems into closed RTM molds for the production of fiber-reinforced plastic components.

The system injects resin into a mold equipped with suitable fiber reinforcements under defined process conditions. Resin transfer is performed by a piston pump with a pressure ratio of 23:1. A separate pump with a pressure ratio of 1:1 is provided for the metering of organic peroxides.

The Sigma RTM system is designed for industrial use and is intended for the production of composite components of varying sizes and complexities. It enables the monitoring and control of relevant process parameters to ensure a reproducible manufacturing process.

The maximum operating pressure on the resin side is 138 bar. The maximum flow rate is 6.6 l/min (based on water) at 30 double strokes per minute. The displacement volume is 220 ml per double stroke.

The system may only be operated with resin systems, hardeners, initiators, fiber reinforcements, and suitable molds and system components approved by the manufacturer. Operation must be carried out in accordance with the technical specifications, operating parameters, and safety instructions contained in this operating manual.

Any use outside the described application or beyond the specified operating limits shall be considered improper use. The manufacturer accepts no liability for damage resulting from such use. The operator bears sole responsibility and risk.

3.3 Foreseeable misuse

All applications that do not comply with the specifications for intended use are to be considered misuse.

Additionally, the following applies:
- It is forbidden to work on parts that are under pressure.
- Safety devices must not be bypassed or disabled.

Especially in cases of damage caused by:
- Damage caused by incorrect transport, installation, or operation.
- Modifications to the function or structure of the system.
- Changes to the performance data of individual components or the entire system.
- Deviations from the specified connection values.
- Operating the system while it is not functioning properly.
- Repairs that were not carried out professionally.
- Operation by persons who have not been properly instructed.
- Operation without safety devices or with damaged or modified safety devices.
- Disregard of the instructions in the original operating manual.
- Use of aggressive substances that attack the materials used. In case of doubt, please consult the manufacturer.
- Use of certain solvents such as 1,1,1-trichloroethane or methyl chloride. These substances can cause dangerous chemical reactions with the materials used and may lead to an explosion.

3.4 Modifications / Additions

No modifications, additions, or alterations to the machine that could compromise safety may be made without the approval of the manufacturer/supplier. This applies particularly to the installation and adjustment of safety devices and valves.

Spare parts must meet the technical requirements specified by the manufacturer. This is always ensured with BÜFA®-Tec original spare parts.

3.5 Residual risks

Danger from Contact with Hot Surfaces

Due to operational conditions, components may become hot. Contact with hot surfaces can cause severe burns.

- Before working on the system or its components, allow them to cool down.
- Suitable protective gloves must be worn.

Danger from Contact with Hazardous Substances

Depending on the ingredients of the operating fluids used, contact may cause health damage and skin irritation.

- When working on or with the system, appropriate personal protective equipment must be worn.
- Safety data sheets from the manufacturers of the operating fluids must be observed.
- Work may only be carried out when the system is de-energized and depressurized, and only by qualified and authorized personnel.

Explosion Hazardous Substances

The use of 1,1,1-trichloroethane, methyl chloride, or other solvents and materials based on halogenated hydrocarbons may lead to severe chemical reactions with the materials used in the system components, potentially causing an explosion.

- The use of such materials is strictly prohibited!
- Safety data sheets from the manufacturers of the media must be observed.
- In case of doubt, consult the manufacturer of the material.

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3.6 Operator's responsibility

The operator is responsible for the safe provision, proper operation, and regular maintenance of the system. The operator must ensure that::

- The system is operated only by qualified and instructed personnel.
- All relevant safety regulations, standards, and legal requirements are complied with.
- The operating manual and all applicable documents are accessible at all times.
- Personal protective equipment is provided and its use is monitored.
- Regular instructions and training sessions are conducted.
- Safety-related changes or malfunctions are documented and resolved immediately.

3.7 Personnel's responsibility

Operating and maintenance personnel are required to operate the system in accordance with the specifications of this operating manual and the applicable safety regulations. This includes, in particular:

- Careful handling of the system and the materials used.
- Compliance with all safety and warning instructions.
- Use of the prescribed personal protective equipment.
- Immediate reporting of malfunctions, damage, or safety-related irregularities to the operator.
- No unauthorized modifications or interventions in the system.

3.8 Personnel qualification

The key to working safely is knowing the hazards specific to the workplace and strictly following all applicable regulations and rules. This includes safety instructions and regularly refreshing existing safety knowledge.

Activity	Operating Personnel	Maintenance Mechanics (M)	Maintenance Electricians (E)	Specialized Personnel
Transport	✗	✗	✗	✓
Mechanical Assembly	✗	✓	✗	✓
Electrical Assembly	✗	✗	✓	✓
Mechanical Installation	✗	✓	✗	✓
Electrical Installation	✗	✗	✓	✓
Commissioning	✗	✓	✓	✓
Operation	✓	✗	✗	✓
Service Operation	✗	✓	✓	✓
Troubleshooting	✗	✓	✓	✓
Maintenance and Servicing	✗	✓	✓	✓
Electrical Work	✗	✗	✓	✓
Temporary Decommissioning	✗	✓	✓	✓
Final Decommissioning	✗	✓	✓	✓
Dismantling	✗	✓	✓	✓

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3.9 Personal protective equipment

Wear protective clothing

Always wear the protective clothing required for your working environment (e.g., antistatic protective clothing in areas with explosion hazards) and also follow the recommendations in the material manufacturer's safety data sheet.

Wear safety goggles

Wear safety goggles to prevent eye injuries caused by material splashes, gases, vapors, or dust.

Use hearing protection

Suitable hearing protection must be provided to operating personnel. The machine operator is responsible for compliance with the accident prevention regulation "Noise". Pay special attention to the conditions at the installation site – for example, noise exposure may increase if the machine is placed in or on hollow bodies.

Use respiratory protection

Although material mist is minimized during the spraying process with correct pressure settings and proper working methods, we recommend using a respiratory protection mask.

Wear protective gloves

Wear antistatic protective gloves. When handling heated materials, the gloves must also include forearm protection to prevent burns.

Wear conductive safety shoes

Wear antistatic safety shoes to prevent foot injuries caused by falling, rolling, or tipping objects, slipping on slick surfaces, and static discharge.

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3.10 Safety labeling on the machine

The machine is equipped with various safety markings that indicate potential hazards and provide safety-relevant information. These markings are permanently affixed, clearly visible, and must not be removed, covered, or rendered illegible.

The following types of safety markings may be present on the system:

Warning signs
Indicate potential hazards (e.g. risk of hot surfaces, pinch points, electrical voltage).

Mandatory signs
Specify required protective measures (e.g. wearing safety goggles, gloves, or hearing protection).

Prohibition signs
Prohibit actions that could lead to danger (e.g. no open flames, no smoking).

Information signs
Provide additional safety-related information or operating instructions (e.g. emergency stop, escape routes, first aid).

All markings must be regularly checked for legibility and completeness. Damaged or missing signs must be replaced immediately.

3.11 Signs used

3.11.1 Mandatory signs

List of mandatory signs used in the operating manual or on the machine

General mandatory sign

The general mandatory sign indicates that certain protective measures must be strictly observed during operation of the system.

Read the manual

The “Read the manual” mandatory sign instructs users to carefully read and follow the operating manual and all safety-related instructions before commissioning the system.

Ground before use

The “Ground before use” mandatory sign indicates that the system must be electrically grounded before operation to prevent electrostatic charges and ignition hazards.

Wear protective clothing

Always wear the protective clothing required for your working environment (e.g., antistatic protective clothing in areas with explosion hazards) and also follow the recommendations in the material manufacturer's safety data sheet.

Wear safety goggles

Wear safety goggles to prevent eye injuries caused by material splashes, gases, vapors, or dust.

Use hearing protection

Suitable hearing protection must be provided to operating personnel. The machine operator is responsible for compliance with the accident prevention regulation "Noise". Pay special attention to the conditions at the installation site – for example, noise exposure may increase if the machine is placed in or on hollow bodies.

Use respiratory protection

Although material mist is minimized during the spraying process with correct pressure settings and proper working methods, we recommend using a respiratory protection mask.

Wear protective gloves

Wear antistatic protective gloves. When handling heated materials, the gloves must also include forearm protection to prevent burns.

Wear conductive safety shoes

Wear antistatic safety shoes to prevent foot injuries caused by falling, rolling, or tipping objects, slipping on slick surfaces, and static discharge.

3.11.2 Prohibition signs

List of prohibition signs used in the operating manual or on the machine.

General prohibition sign

The general prohibition sign indicates that certain actions are forbidden in order to prevent hazards to people and the equipment.

No smoking

The “No smoking” prohibition sign indicates that smoking is strictly prohibited in the area of the equipment – especially due to the risk of fire and explosion.

No open flame, fire, ignition source, etc.

The “No open flame” prohibition sign warns against creating fire, open ignition sources, or sparks near the equipment, as this may lead to serious accidents.

3.11.3 Warning signs

List of warning signs used in the operating manual or on the machine

General warning sign

This symbol indicates potential hazards that, if ignored, may result in personal injury or property damage.

Warning: hot surfaces

Do not touch marked hot surfaces – risk of burns!

Warning: explosive atmosphere

An explosive atmosphere may occur in this area – strictly avoid ignition sources.

Warning: hand injuries

Be aware of moving parts – risk of crushing or cutting injuries to the hands.

Explosive substances

Handling explosive substances requires special caution – strictly follow all safety regulations.

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4 Technical Specifications

4.1 General Product Data

Description	BÜFA®-Tec RTM Sigma
Item Number	028-1991
Pressure Ratio (Peroxide)	23:1
Maximum Output at 30 Double Strokes/min (Water)	6,6 l/min
Delivery Volume per Double Stroke	220 ml
Maximum Resin Pressure	138 bar
Air Pressure, Inlet	6 bar
Air Consumption, approx.	700 l/min
Weight, approx.	100kg
Dimensions, approx. (L/W/H)	1100 mm × 800 mm × 2600 mm
Maximum sound level	78 dB

4.2 Operating Conditions

Application Area	Interior
Ambient Temperature	+10 °C to +40 °C
Air Humidity	max. 50% at +40 °C, Higher relative humidity levels are permissible at lower temperatures (e.g., 90% at +20°C)
Lighting	300 lux
Sound Pressure Level	<80 dB(A)
Maximum altitude	1000m

4.3 Storage Conditions

Storage Area	Interior
Ambient Temperature	From -24 °C to +55 °C, temporarily up to +70 °C (max. 24 h)
Air Humidity	max. 50% at +40 °C

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4.4 Equipment Technical Specifications

4.4.1 Air Motor Resin Pump

Article Number	029-9791
Weight approx.	9kg
Stroke Length	127 mm
Max. Inlet Pressure	8 bar
Max. Temperature	71 °C
Max. Noise Level	85 dB
Air Inlet	3/8"

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4.4.2 Resin Pump

Article Number	029-9812
Pressure Ratio	23:1
Max. Air Inlet Pressure	8 bar
Air Consumption approx.	700 l/min
Max. Temperature	70 °C
Delivery Volume per Double Stroke	220ml

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4.4.3 Peroxide Pump

Article number	029-5305
Inlet	1/4" NPT
Outlet	1/8" NPT
Max. stroke length	75 mm
Housing material	Stainless Steel
Max. working pressure	138 bar

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4.4.4 Flush Tank

Article Number	028-0076
Material	1.4301
max. Pressure	6 bar
Weight (empty)	approx. 4,2 kg
Volume content of pressure vessel	19,5 Liter
Permissible temperature	-20°C to 80°C

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5 Scope of Delivery & Accessories

1.	Fixed caster with steel rim	029-9521
2.	Swivel caster with brake	029-9520
3.	Handle bar	029-1120
4.	Resin pump holder	029-9761
5.	Outrigger (cantilever arm)	029-1378
6.	RMT mixing head	028-1220
7.	RTM flushing tank unit	028-0074 (not shown)
8.	Grounding cable with clamp	028-1325 (not shown)
9.	Compressed air hose assembly	028-0189 (not shown)
10.	Tool box	028-1327
11.	Resin pump (bare pump)	029-94702
12.	Sigma peroxide pump	028-1920
13.	Peroxide distribution unit	029-9991
14.	Pressure gauge 0-40 bar	029-4783
15.	Relief valve 1/4"	029-3449
16.	Drum suction assembly	028-0246 (not shown)

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6 Structure and Function

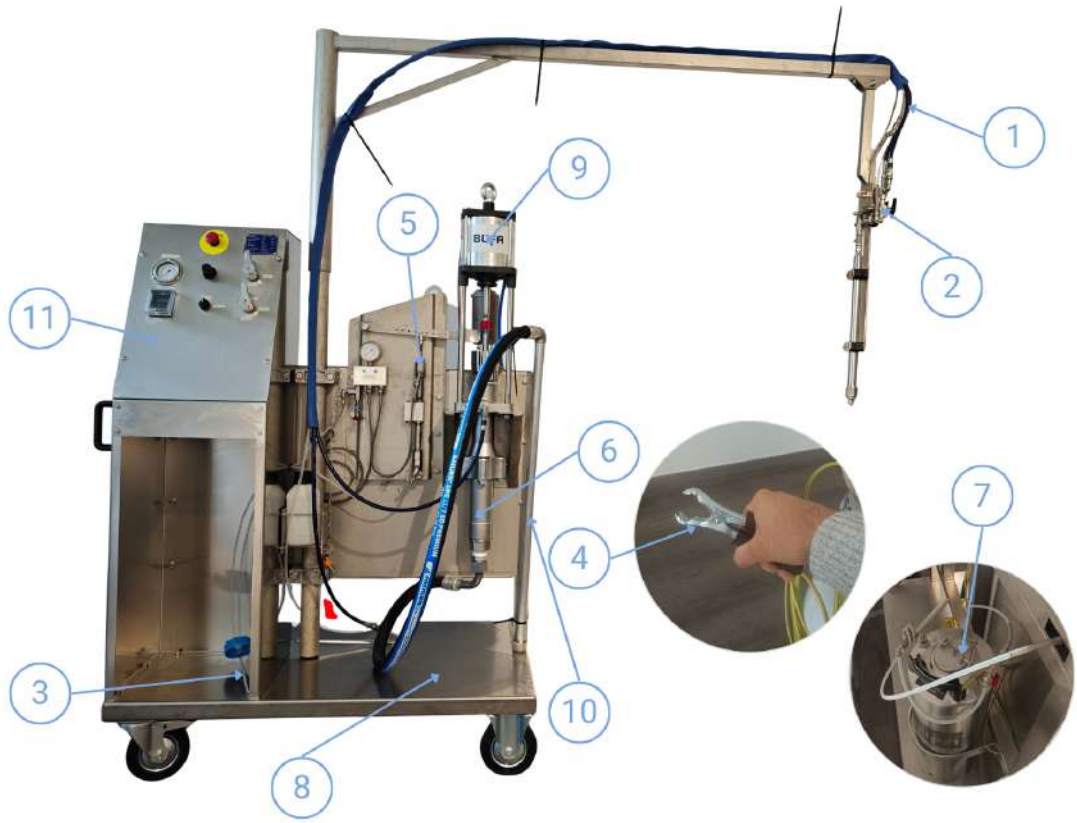
6.1 Functional Description

El sistema Sigma RTM (Resin Transfer Moulding) se utiliza para la fabricación de componentes de plástico reforzado con fibra mediante el proceso de inyección. En este proceso, la resina se introduce bajo condiciones de proceso definidas en un molde cerrado que contiene el refuerzo de fibra previamente colocado. La alimentación de la resina se realiza mediante una bomba de pistón con una relación de intensificación de presión de 23:1. Para la dosificación del peróxido orgánico se dispone de una bomba independiente con una relación de intensificación de presión de 1:1.

El sistema se utiliza para la dosificación, el transporte y la inyección de la resina, así como para la supervisión de los parámetros relevantes del proceso. La presión máxima de la resina es de 138 bar. El caudal máximo es de 6,6 l/min (referido al agua) a 30 dobles carreras por minuto. El volumen de suministro es de 220 ml por doble carrera.

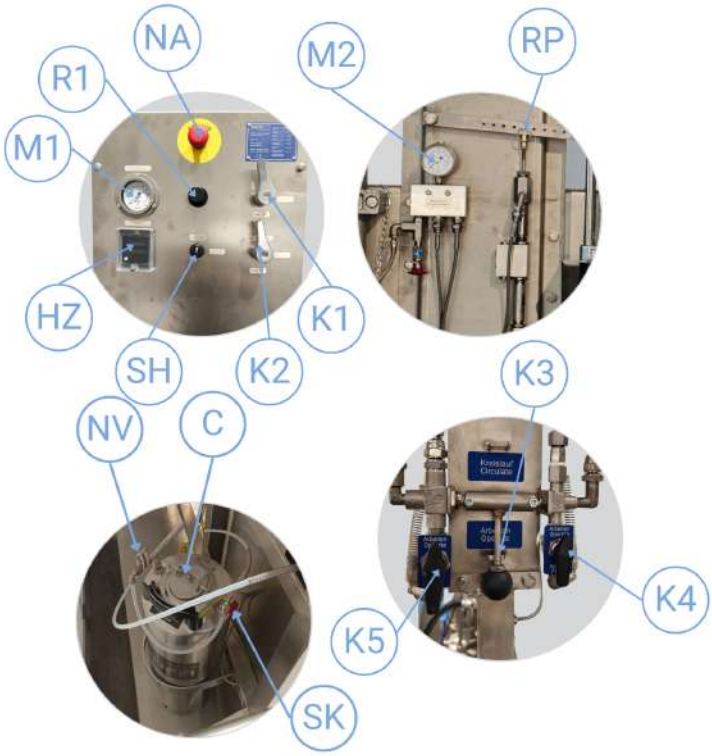
Gracias al diseño del sistema, pueden fabricarse tanto componentes de gran tamaño como piezas con geometrías complejas. Los parámetros del proceso pueden ajustarse a los requisitos específicos del material y del componente. El sistema puede funcionar con distintos sistemas de resina, refuerzos de fibra y conceptos de molde, y permite una fabricación reproducible de componentes compuestos reforzados con fibra en procesos de producción industrial.

6.2 Component Description



1. Material hoses to the RTM mixing head
2. RTM mixing head for mixing resin and peroxide.
3. Peroxide suction line for drawing peroxide from an unpressurized container.
4. Grounding clamp with cable for grounding the system.
5. Peroxide pump coupled to the resin pump via a slave arm.
6. Resin pump for conveying the reactive resin.
7. Flushing tank for flushing the system with acetone.
8. Chassis with rubber wheels and handle for moving the system.
9. Air motor for driving the resin pump.
10. Drum suction unit.
11. Control panel for operating the system.

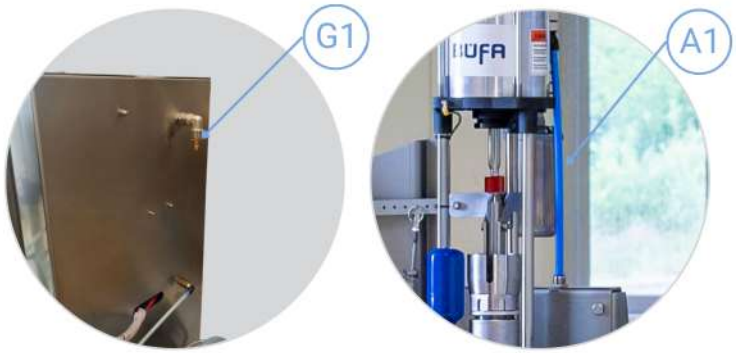
6.3 Display and Control Elements



NA = Emergency stop button. Press this button to shut down the system in an emergency.
M1 = Pressure gauge for measuring the compressed air supplied to the air motor of the resin pump.
M2 = Pressure gauge for measuring the peroxide pressure.
K1 = Ball valve for switching the compressed air supply to the air motor of the resin pump on/off within the system.
K2 = Ball valve for switching the compressed air supply to the flushing tank on/off.
K3 = Ball valve for switching the recirculation function for the reactive resin on/off.
K4 = Three-way ball valve for peroxide with operating mode selection: “Work”, “Flush”, or neutral position (during standstill or shutdown). In flushing mode, acetone with an air-pulse mixture is conveyed to the dispensing tool.
K5 = Three-way ball valve for resin with operating mode selection: “Work”, “Flush”, or neutral position (during standstill or shutdown). In flushing mode, acetone with an air-pulse mixture is conveyed to the dispensing tool.
R1 = Regulator for adjusting the compressed air supplied to the air motor of the resin pump.
C = Vent valve for the flushing tank (open the valve by turning it to vent the tank).
NV = Needle valve for adjusting the air-pulse mixture for acetone (close completely, then open two turns → optimum setting).
SK = Ball valve for emergency shut-off of the acetone supply at the flushing tank (open when the handle is parallel to the line).
RP = Adjustment of the peroxide ratio via the slave arm.
HZ = Stroke counter for counting the strokes of the resin pump.
SH = Switch for turning the stroke counter on/off.

6.4 System Connections

6.4.1 Air Connections



G1 = Air connection from the compressed air system to the unit.
A1 = Air connection for the resin pump.

6.4.2 Material Connections

RA = Drum suction connection for the reactive resin.
PT = Connection for the peroxide container.

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6.4.3 Flush Tank Connections

F1 = Air inlet connection for the flushing tank.
F2 = Outlet of the flushing tank for the acetone air-pulse mixture.
F3 = Air line used to add a controlled amount of air, creating an acetone air-pulse mixture.

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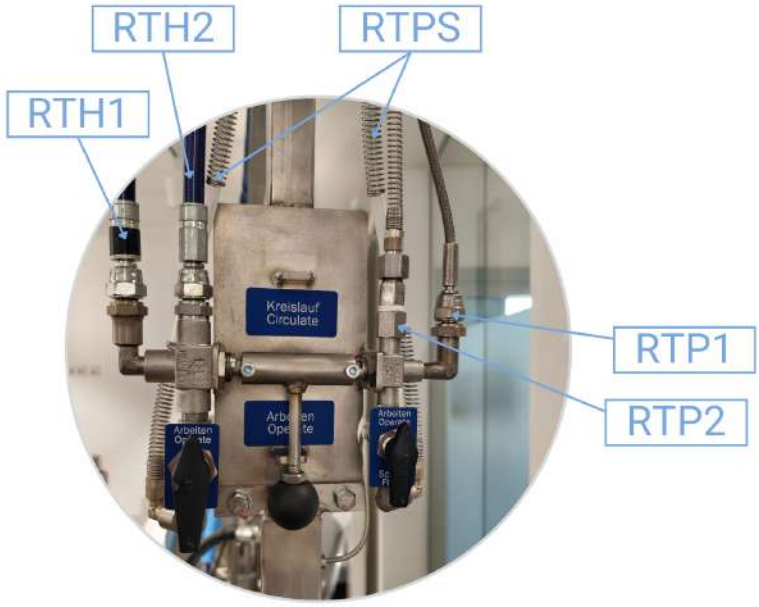
6.4.4 Connections RTM Mixing Head



RTH1 = Resin line connection on the mixing head.
RTH2 = Resin return line connection on the mixing head.
RTP1 = Peroxide line connection on the mixing head.
RTP2 = Peroxide return line connection on the mixing head.
RTPS= Flush line connection on the mixing head.

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7 Transport

Target group: Specialized personnel

7.1 Safety Instructions for the Transport

DANGER!

Danger from Suspended Loads
There is a risk of fatal injury from suspended loads in the loading area.
Never stand beneath suspended loads in the loading area.

WARNING!

Warning – Hazard from Tensioned Hoses
If hose connections are subjected to tensile stress, they may tear out.
Material escaping under high pressure can cause injuries and property damage.
Do not use hoses to lift or pull the device.

CAUTION!

Risk of Injury
Improper transport of the machine may result in crushing, cutting, or falling injuries.
Use only the designated handle to lift the machine.
Never place the machine on sloped surfaces to prevent unintentional rolling.

NOTE

Machine Inspection
You will receive the machine in a factory-tested condition. However, it is possible that screw connections may have loosened or transport damage may have occurred during shipping.
Immediately after unpacking the machine, check for any signs of transport damage.
Ensure that all screw connections are secure, especially those on hoses.

7.2 Transport of the System

The system is designed to be moved using standard commercial transport equipment. When loading the machine, ensure that the lifting devices and load-handling attachments have sufficient load-bearing capacity.

The unit may only be lifted using the designated handles. During transport, ensure a stable, tip-resistant position to avoid damage and accidents.

For lifting and loading, properly secure the machine (or additional accessories) on a pallet. Do not transport unsecured items (e.g., containers, tools) with the machine.

After transport, carefully check the system for any potential transport damage. Any defects must be properly repaired before the system is put back into operation.

If the machine has already been in operation, please note the following instructions:
- Disconnect the machine completely from the power supply – even for short transport distances.
- Empty the machine before transport – residual fluid may still leak during transportation.
- Remove all loose components (e.g., tools) from the machine.
- The pressure vessel must neither be filled nor under pressure during transport.

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8 Assembly and Installation

Target group: Mechanical maintenance (M)

8.1 Safety Instructions for Assembly and Installation

Warning – Hazard from Tensioned Hoses
If hose connections are subjected to tensile stress, they may tear out.
Material escaping under high pressure can cause injuries and property damage.
Do not use hoses to lift or pull the device.

Risk of Injury
If the system is not positioned correctly, there is a risk of crushing, cutting, or falling injuries.
The product must be aligned in such a way that lines and connections can be safely routed and secured, and an ergonomic body posture is ensured.

8.2 Positioning the System

Place the system on a level, stable, and low-vibration surface, ensuring sufficient clearance from walls and other equipment.

8.3 Suction Assembly

The suction assembly may not be fully connected upon delivery. In this case, screw the suction pipe with the coupling onto the suction hose and tighten the connection sufficiently using an appropriate wrench.

8.4 Connecting the Grounding Clamp

Connect the Grounding Clamp to a Suitable Grounding Point.

Connect the grounding clamp to a suitable grounding point before operating the system.
A suitable grounding point is a bare, electrically conductive metal surface that has a direct connection to the operational ground or the equipotential bonding system. Typical examples of suitable grounding points include:

- Bare metal parts on grounded machine frames
- Designated grounding rails or bolts
- Grounded metal piping (if electrically connected)

Important: Painted, coated, or contaminated surfaces are not suitable, as they may impair electrical contact. The contact area must be clean, dry, and free of insulating layers.
Ensure that the grounding clamp is securely and permanently attached to the grounding point and cannot become unintentionally detached during operation.

8.5 Connecting the Air Supply

For operation of the system, compressed air must meet the following quality standard: dry, oil-free, and dust-free air in accordance with ISO 8573-1:2010, Class 4.

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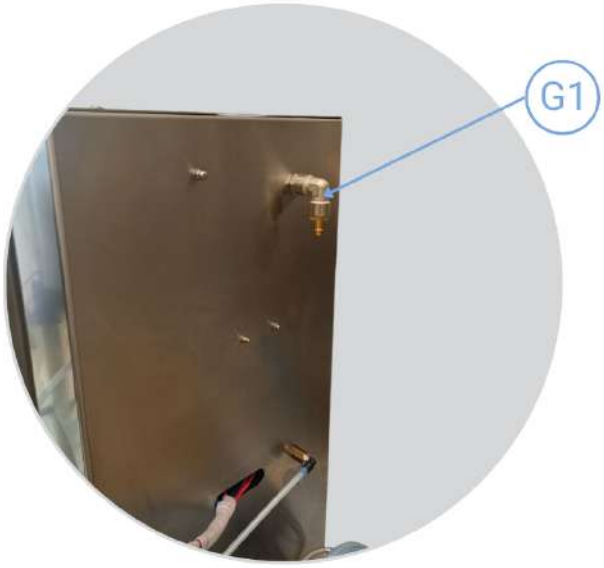

Connect the air supply to connection **G1** using a conductive compressed air hose with an inner diameter of at least 13 mm.

Ensure that all connections are leak-tight and mechanically secured before putting the system into operation.

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9 Commissioning

Target group: Mechanical maintenance (M), Electrical maintenance (E), Specialized personnel

9.1 Safety Instructions for Commissioning

DANGER!

Risk of injury due to explosion and inhalation

This machine uses flammable substances during operation, including peroxides that can build up pressure when heated and may explode. Always consult the operating instructions and the safety data sheet first. The prescribed safety measures must be strictly followed. Components of the substances evaporate very easily (e.g., styrene, acetone).

This leads to two main hazards:

1. **Health risk due** to accumulation of hazardous substances in the breathing air (see **hazardous substance operating instructions**)
2. **Fire and explosion risk** due to the formation of explosive mixtures

Therefore, the following points must be observed:

1. All containers must always be closed or covered (mixing containers, acetone cleaning containers, weighing containers, etc.)
2. Ensure proper ventilation at all times (extraction systems, fresh air supply, etc.)
3. During transfer operations, all containers and vessels must be grounded (grounding clamps)
4. Make sure that no contamination enters the peroxide, as this may cause uncontrolled reactions and lead to an explosion
5. In case of leakage in the system, it must be shut down immediately (switch off and interrupt compressed air supply) and repaired

WARNING!

Warning – Risk due to electrostatic discharge

Hazards such as electric shock and explosion may occur due to electrostatic discharge if the system is not properly grounded.

Therefore, check the grounding of the system.

WARNING!

Hazard due to contact with dangerous substances

The required chemicals may cause skin sensitization upon contact or absorption.

Inhalation of the substance may lead to respiratory problems and, in extreme cases, suffocation.

Repeated or prolonged contact may have carcinogenic effects.

- When working with or on the system, appropriate personal protective equipment must be worn.
- Observe the safety and hazardous substance data sheets provided by the manufacturers of the operating materials used.
- Avoid direct skin contact or inhalation of the substances.
- The product must only be used in combination with a functioning and active extraction system.
- The spray gun must not be aimed at people or animals and must be secured after use.
- Connections and hoses must be checked regularly.

First Aid Instructions for Contact with Peroxide
Eyes: Rinse immediately with plenty of water – every second counts! Keep rinsing for at least 15 minutes. Go to a doctor quickly.
Skin: Wash thoroughly with soap and water. Take off contaminated clothes and shoes. Then wash the skin again carefully with soap and water.
Swallowing: Drink plenty of milk or water. Call a doctor immediately so the stomach can be flushed.

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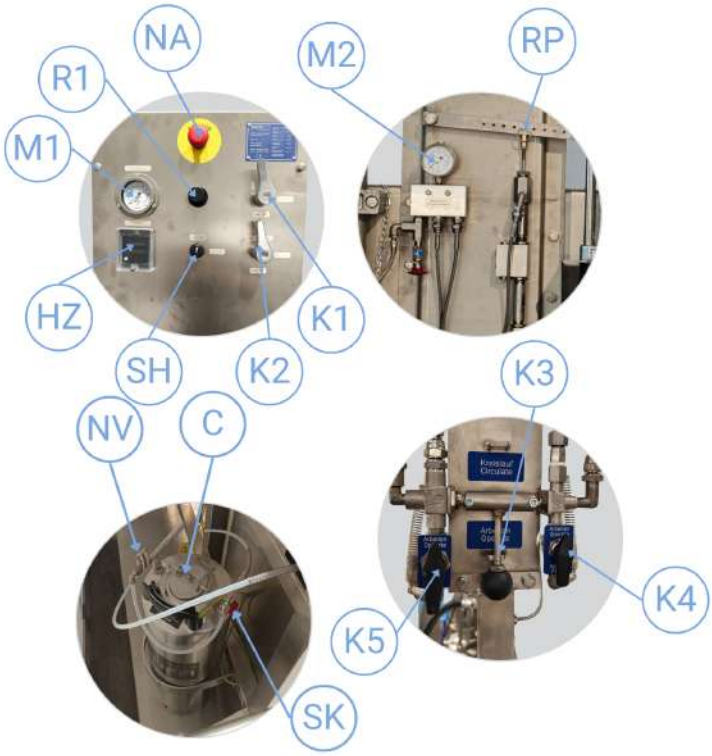
9.2 Provision

UP resin:
- Minimum temperature 18°C
- Ready for spraying

Peroxide:
- depending on the application

Acetone:
- As required

9.3 Preparation



1. Close valves **K1** (resin pump air motor) and **K2** (flush tank), and set **K3** to "circulation" then **K4**, and **K5** to the neutral position. Set regulator **R1** to its minimum setting.
2. Remove the black plastic cover from the resin pump to gain access to the lubricant cup. Fill the lubricant inlet **GT** of the resin pump with lubricant. Use the PE squeeze bottle supplied in the toolbox for filling the lubricant. Regularly inspect the lubricant for discoloration caused by resin contamination. If excessive material leakage is observed, please contact BÜFA Tec Support. After inspection, refill the filling opening with an appropriate amount of fresh lubricant. We recommend using the lubricant supplied by BÜFA (Article No. 7420002).

3. Immerse the suction assembly in the corresponding resin container(s).
4. Fill the flush tank with acetone (maximum 2/3 full).
5. Prepare a suitable peroxide container and insert both the suction hose and the return line into the container.

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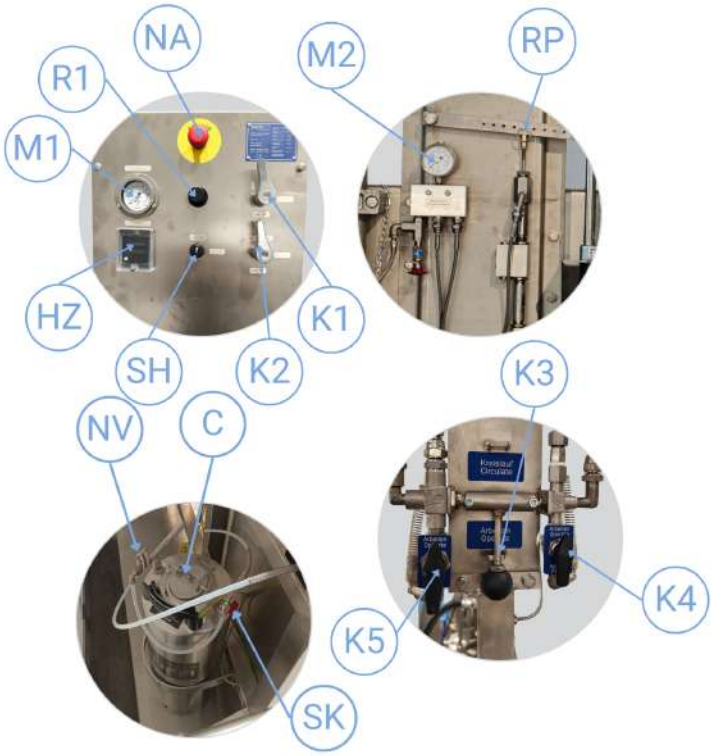
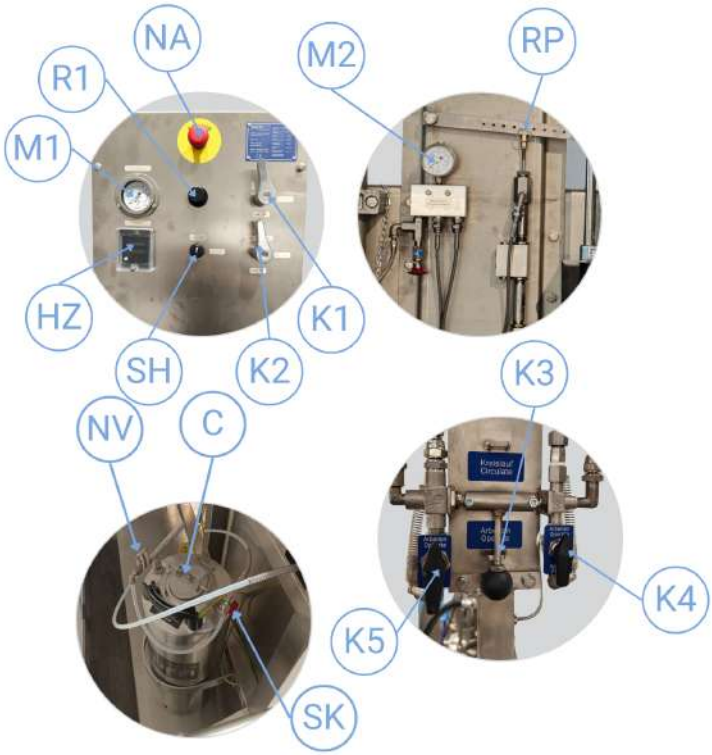
9.4 Venting the Peroxide Pump



To vent the peroxide side, proceed as follows:

1. Disconnect the peroxide pump from the lever arm by removing the **RP** cotter pin used for ratio adjustment. The cotter pin connects the rod and the lever to the resin pump.
2. Hold the mixing head over an empty and properly grounded container.
3. Set the three-way ball valves **K3** and **K4** to the "Work" position. This allows the peroxide to flow out of the mixing head.
4. Then begin manually actuating the peroxide pump by pulling out and pushing in the pump piston to vent the peroxide pump and flush out any trapped air. The pump movement should be very easy. If this is not the case, check whether all valves on the pressure side are open, whether the peroxide filter has been cleaned, and whether there are any other blockages in the peroxide pump. Repeat the pumping motion until a continuous, air-free peroxide flow emerges from the mixing head.
5. After venting, remove any peroxide residues from the mixing head using a suitable cleaning agent through the opening of the three-way ball valve **K4** on the mixing head in the "Flush" direction.

9.5 Venting the Resin Pump



To vent the resin pump, follow these steps:

1. The peroxide pump should still be disconnected from the resin pump.
2. Hold the mixing head over an empty and properly grounded container.
3. Set the air pressure supplied to the resin pump to approximately 1 bar using regulator **R1** and slowly open the ball valve **K1** for the resin pump compressed air supply.
4. Set the three-way ball valve combination **K5** to the "Work" position and the three-way ball valve **K3** also to the "Work" position (as shown), so that the resin can flow out freely. The pump will now begin to draw in material. Allow the pump to run until the resin exits free of air bubbles.
5. After venting, remove any material residues from the mixing head by performing a short acetone flush through the openings of the three-way ball valves **K4** and **K5** on the mixing head in the "Flush" position. Ball valve **K3** remains in the "Work" position.

10 Operation and Handling

Target group: Operating personnel

10.1 Safety Instructions for Operation and Handling

DANGER!

Risk of injury due to explosion and inhalation

This machine uses flammable substances during operation, including peroxides that can build up pressure when heated and may explode. Always consult the operating instructions and the safety data sheet first. The prescribed safety measures must be strictly followed. Components of the substances evaporate very easily (e.g., styrene, acetone).

This leads to two main hazards:

1. **Health risk due** to accumulation of hazardous substances in the breathing air (see **hazardous substance operating instructions**)
2. **Fire and explosion risk** due to the formation of explosive mixtures

Therefore, the following points must be observed:

1. All containers must always be closed or covered (mixing containers, acetone cleaning containers, weighing containers, etc.)
2. Ensure proper ventilation at all times (extraction systems, fresh air supply, etc.)
3. During transfer operations, all containers and vessels must be grounded (grounding clamps)
4. Make sure that no contamination enters the peroxide, as this may cause uncontrolled reactions and lead to an explosion
5. In case of leakage in the system, it must be shut down immediately (switch off and interrupt compressed air supply) and repaired

WARNING!

Warning – Risk due to electrostatic discharge

Hazards such as electric shock and explosion may occur due to electrostatic discharge if the system is not properly grounded.

Therefore, check the grounding of the system.

WARNING!

Hazard due to contact with dangerous substances

The required chemicals may cause skin sensitization upon contact or absorption.

Inhalation of the substance may lead to respiratory problems and, in extreme cases, suffocation.

Repeated or prolonged contact may have carcinogenic effects.

- When working with or on the system, appropriate personal protective equipment must be worn.
- Observe the safety and hazardous substance data sheets provided by the manufacturers of the operating materials used.
- Avoid direct skin contact or inhalation of the substances.
- The product must only be used in combination with a functioning and active extraction system.
- The spray gun must not be aimed at people or animals and must be secured after use.
- Connections and hoses must be checked regularly.

First Aid Instructions for Contact with Peroxide
Eyes: Rinse immediately with plenty of water – every second counts! Keep rinsing for at least 15 minutes. Go to a doctor quickly.
Skin: Wash thoroughly with soap and water. Take off contaminated clothes and shoes. Then wash the skin again carefully with soap and water.
Swallowing: Drink plenty of milk or water. Call a doctor immediately so the stomach can be flushed.

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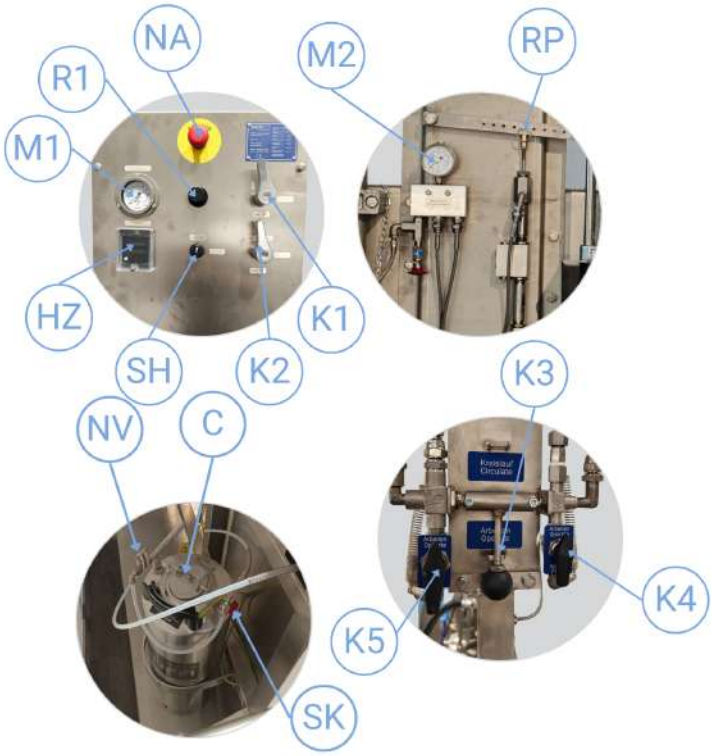
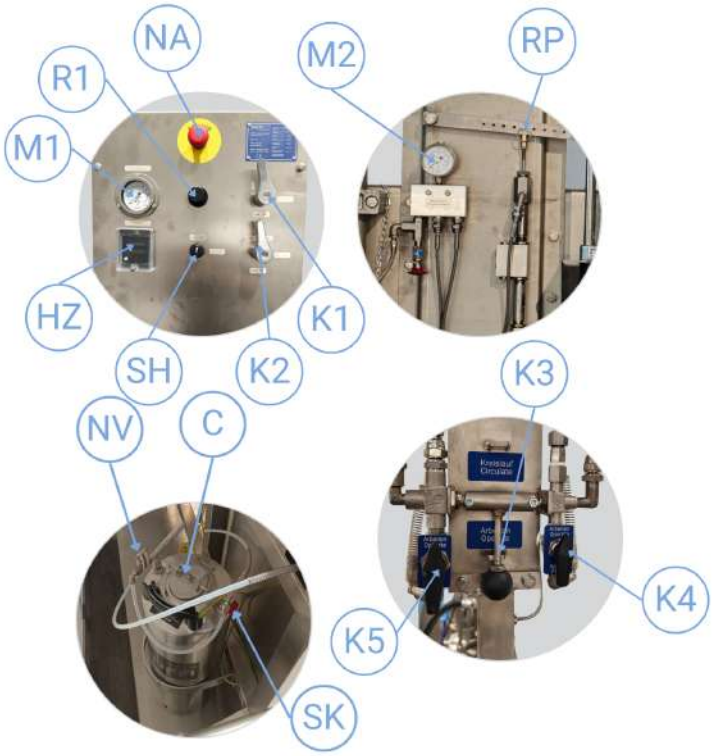
10.2 Start the System



1. Set **K3** to "Circulation" and set **K4** and **K5** to the neutral position.
2. Slowly open ball valve **K1** (air motor resin pump).

✅ The system is now switched on.

10.3 Set the Pressure Values



Set the resin pressure for your application using regulator **R1**. The pressure must be high enough; otherwise, the air motor may not operate smoothly. Monitor the peroxide pressure. With the mixing head closed and the system in circulation mode, a certain pressure should be present (approx. 5 bar). Pressure fluctuations should not exceed 2 bar. If the fluctuations are greater, the peroxide system must be vented again.

The exact settings depend on the specific application.

10.4 Peroxidbedarf ermitteln und einstellen

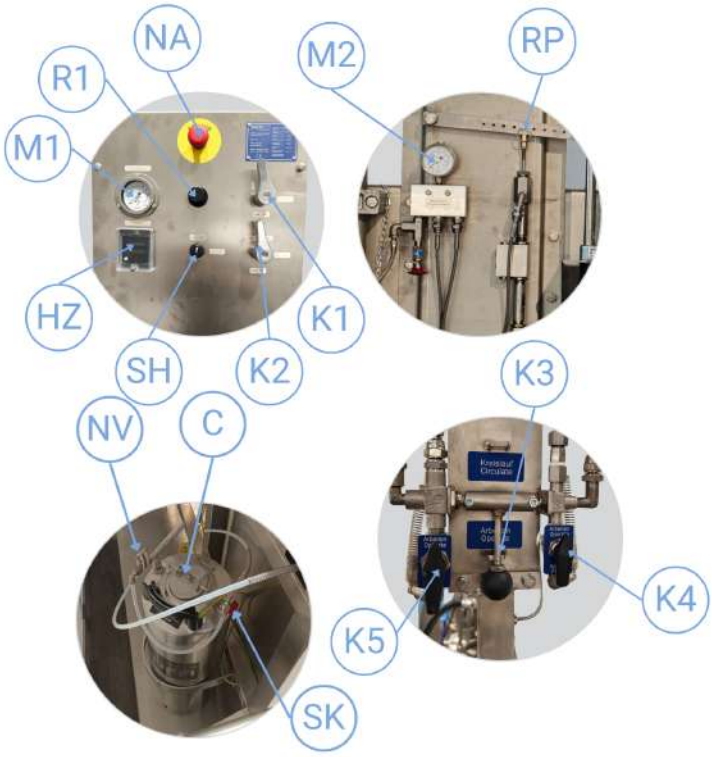
1. Determine the desired peroxide percentage.
2. Calculate the required peroxide quantity.

Example:

Resin quantity per minute:	960ml
Peroxide requirement at 2%:	2ml/100ml
Peroxide quantity:	2x 9,6ml = 19,2ml/min

Setting the peroxide ratio:

1. Disconnect the peroxide pump from the lever arm by removing cotter pin **RP** for percentage adjustment. The cotter pin connects the rod and the lever to the resin pump.
2. Select the desired peroxide ratio setting on the lever arm.
3. Reconnect the lever arm to the peroxide pump at the selected setting.



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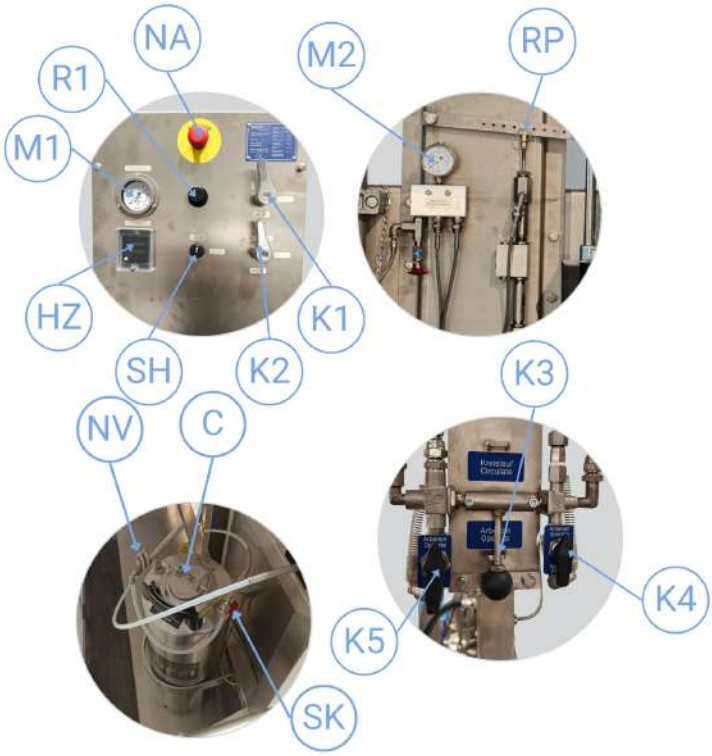
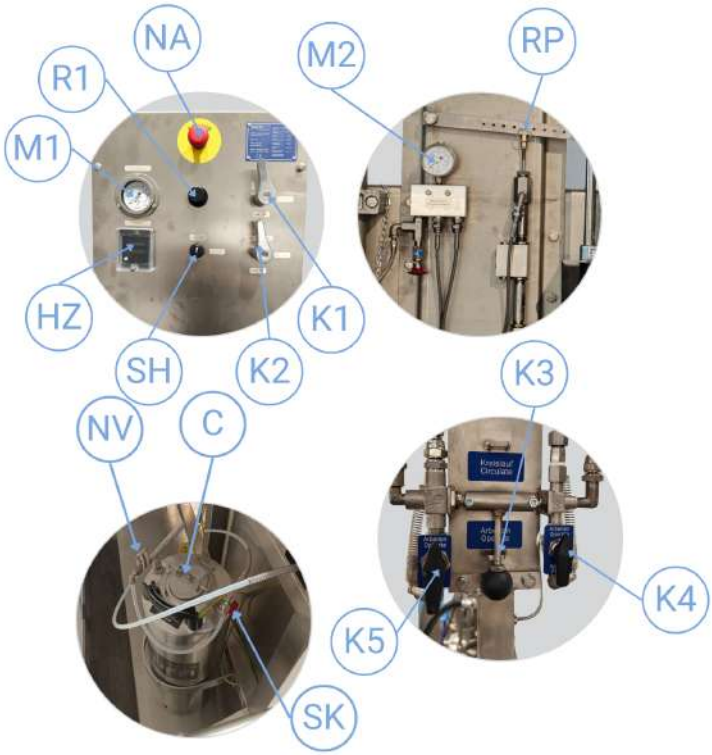
10.5 Operation



1. For injection or filling, set both ball valves **K4** and **K5** on the mixing head to the "Operating" position.
2. Then set the 3-way ball valve combination **K3** to "Operating".
3. After injection or filling, close ball valve **K1**. All other ball valves remain open to relieve pressure from the pressurized lines.
4. Flush the mixing head by opening ball valve **K2** for the flushing tank and turning both 3-way ball valves **K4** and **K5** to the "Flush" position (use a suitable collection container). Ball valve **K3** remains open in the "Operating" position.
5. After sufficient flushing with cleaning agent, return the 3-way ball valves **K4** and **K5** to the closed "Neutral" position.

10.6 End of Work



1. Close ball valves **K1** and **K2**.
2. Set ball valve **K3** to the "Circulation" position.
3. Set ball valves **K4** and **K5** to the "Neutral" position.
4. Open the vent valve **C** on the flushing tank.
5. Clean the outside of the mixing head with a suitable cleaning agent.

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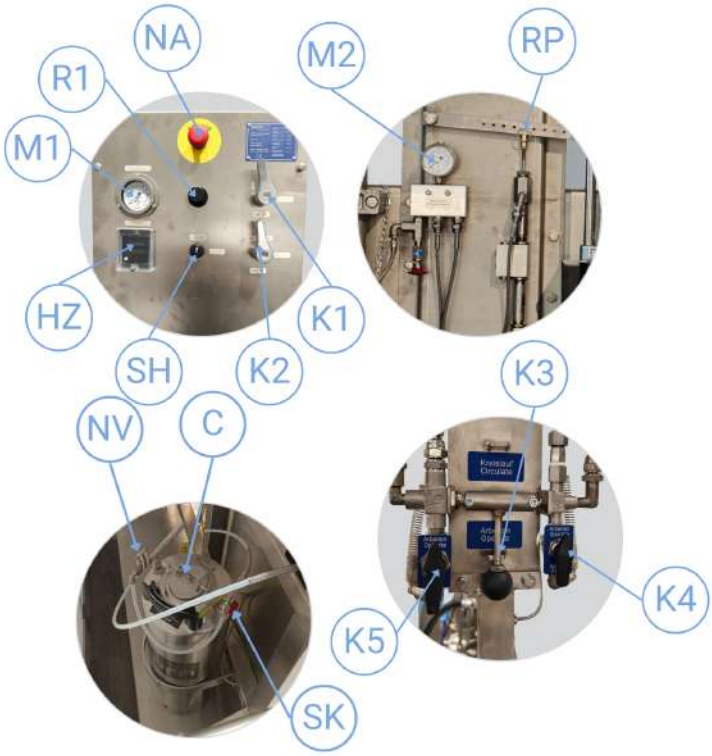
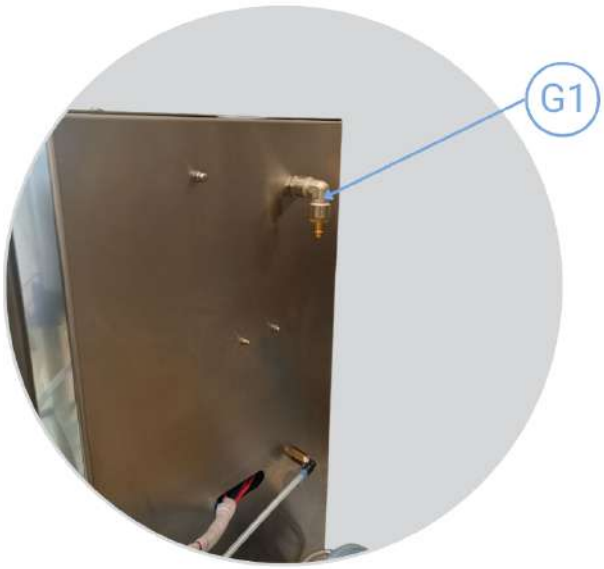
11 Action in Case of Emergency

11.1 Safe Shutdown in Case of Emergency



In the event of an emergency, the system must be shut down quickly and safely to prevent injuries and damage. Proceed as follows:

1. Immediately interrupt the main air supply using the emergency stop **NA**.
2. Close ball valves **K1** and **K2**.
3. Disconnect the main air hose from connection **G1** to prevent accidental restart.
4. Set ball valve **K3** to the "Circulation" position.



5. Warn nearby personnel and secure the area if necessary.

6. Inspect the system for visible damage or blocked components.
7. Inform the responsible specialist or safety officer before taking any further action.

11.2 Restarting After an Emergency

Before restarting the system after an emergency, the following steps must be carried out:

1. Ensure that the cause of the emergency has been completely resolved.
2. Check the system for visible damage or foreign objects.
3. Restart the system according to the chapter “Commissioning”.
4. Perform a functional test to confirm correct operation of the system.

12 Maintenance and Upkeep

Target group: Mechanical maintenance (M), Electrical maintenance (E), Specialized personnel

12.1 Safety instructions for maintenance and repair

Risk of injury due to explosion and inhalation

This machine uses flammable substances during operation, including peroxides that can build up pressure when heated and may explode. Always consult the operating instructions and the safety data sheet first. The prescribed safety measures must be strictly followed. Components of the substances evaporate very easily (e.g., styrene, acetone).

This leads to two main hazards:

1. **Health risk due** to accumulation of hazardous substances in the breathing air (see **hazardous substance operating instructions**)
2. **Fire and explosion risk** due to the formation of explosive mixtures

Therefore, the following points must be observed:

1. All containers must always be closed or covered (mixing containers, acetone cleaning containers, weighing containers, etc.)
2. Ensure proper ventilation at all times (extraction systems, fresh air supply, etc.)
3. During transfer operations, all containers and vessels must be grounded (grounding clamps)
4. Make sure that no contamination enters the peroxide, as this may cause uncontrolled reactions and lead to an explosion
5. In case of leakage in the system, it must be shut down immediately (switch off and interrupt compressed air supply) and repaired

Warning – Risk due to electrostatic discharge

Hazards such as electric shock and explosion may occur due to electrostatic discharge if the system is not properly grounded.

Therefore, check the grounding of the system.

Hazard due to contact with dangerous substances

The required chemicals may cause skin sensitization upon contact or absorption.

Inhalation of the substance may lead to respiratory problems and, in extreme cases, suffocation.

Repeated or prolonged contact may have carcinogenic effects.

- When working with or on the system, appropriate personal protective equipment must be worn.
- Observe the safety and hazardous substance data sheets provided by the manufacturers of the operating materials used.
- Avoid direct skin contact or inhalation of the substances.
- The product must only be used in combination with a functioning and active extraction system.
- The spray gun must not be aimed at people or animals and must be secured after use.
- Connections and hoses must be checked regularly.

First Aid Instructions for Contact with Peroxide
Eyes: Rinse immediately with plenty of water – every second counts! Keep rinsing for at least 15 minutes. Go to a doctor quickly.
Skin: Wash thoroughly with soap and water. Take off contaminated clothes and shoes. Then wash the skin again carefully with soap and water.
Swallowing: Drink plenty of milk or water. Call a doctor immediately so the stomach can be flushed.

NOTE

- The operating personnel must be informed before starting any special or maintenance work! A supervisor must be appointed.
- All system sections and pressure lines must be depressurized and the system relieved before starting repair work.
- The machine – especially the connections and fittings – must be cleaned or flushed at the beginning of maintenance or repair using operating and care products; lint-free cleaning cloths are suitable for this purpose.
- Only use silicone-free lubricants! Silicone components can cause surface defects and must therefore be kept away from production areas.
- Any screw connections loosened during maintenance and repair work must always be tightened before each new commissioning.
- If it is necessary to dismantle safety devices during setup, maintenance, or repair, they must be reassembled and immediately checked after completion of the maintenance and repair work.
- In the event of safety-relevant changes to the machine or its operating behavior, the machine must be shut down immediately and the malfunction reported to the responsible person. In this case, the machine must not be put back into operation.
- Safe and environmentally friendly disposal of operating and auxiliary materials as well as replacement parts must be ensured! Please also refer to the chapter on disposal.

12.2 Maintenance Overview

Components to be inspected		Mainten. Interval				
		DAY	WEEK	MONTH	½ YEAR	YEAR
Pumps (Resin and Peroxide)						
Check seals for leakage		X				
Check lines and hoses for functionality		X				
Inspect pumps for running noises and vibrations		X				
Check the pressure relief valve on the peroxide pump				X		
Check pump delivery pressure		X				
Resin	Target: max. 6 bar	X				
Peroxide	Target: max. 6 bar	X				
Check and clean filters if necessary				X		
Inspect grounding cable and connection		x				
Storage Container						
Check containers for contamination		X				
Check the pressure of the cleaning agent			X			
Check lines and hoses for functionality		X				
Inspect the safety valve on the cleaning tank (vent lever)				X		
Compressed Air Supply						
Drain condensate from the maintenance unit			X			
Check the operating pressure of the maintenance unit	Target: 6 bar			X		
Peroxide Overflow Container						
Check the fill level		X				
Thermometers & Manometers						
Check temperatures and pressures		X				
Manually Operated Ball Valves						
Check valve positions		X				
Operate ball valves and check for functionality			X			
Agitator (if present)						
Check for running noises	Every 1000 operating hours or ½ yearly					
Inspect gearbox for leakage	Every 1000 operating hours or ½ yearly					
Check stuffing box for leakage	Every 1000 operating hours or ½ yearly					
Change gearbox oil	1st change after 400 operating hours, then every 1500 operating hours					
Check shaft for imbalance	Every 1000 operating hours or ½ yearly					

If your system includes pressure vessels, these are considered safety-relevant components. According to the German Ordinance on Industrial Safety and Health (BetrSichV), they must be inspected every three years by a qualified or competent person. Any deformation immediately voids the operating permit.

If your system includes a fiber cutter, the motor must be lubricated and the blades replaced as needed.

Any changes (including those in operating behavior) must be reported immediately to the responsible authority. The machine should be shut down and secured immediately, even if there are minor concerns. It is recommended to record not only inspections but also setup work, malfunctions, and repairs in an operation logbook.

12.3 Fill Lubricant

Regularly check the lubricant level. Refill lubricant if necessary. The lubricant cup (**GT**) should contain at least 1 cm of lubricant.

Remove the black plastic cover on the resin pump to access the lubricant cup. Fill the lubricant inlet (**GT**) of the resin pump with lubricant. Use the PE squeeze bottle included in the toolbox for filling. Regularly check the lubricant for discoloration caused by sprayed material. If there is excessive material leakage, please contact BÜFA Tec Support. After inspection, add an appropriate amount of fresh lubricant to the filling opening. We recommend using BÜFA lubricant (article number 7420002).

12.4 Packing Nut Resin Pump

The resin pump must be regularly checked for leaks. This resin pump does not have a self-adjusting packing. If the packing becomes leaky (when material escapes from the lubricant cup), the packing nut **PM** must be readjusted. Remove the black plastic cover on the resin pump to access the packing nut.

Important: The resin pump must not be under pressure when tightening. Adjust the packing nut **PM** only slightly and carefully, otherwise the packing can be easily damaged.

13 Troubleshooting

Target group: Mechanical maintenance (M), Electrical maintenance (E), Specialized personnel

13.1 Safety Instructions for Troubleshooting

DANGER!

Risk of injury due to explosion and inhalation

This machine uses flammable substances during operation, including peroxides that can build up pressure when heated and may explode. Always consult the operating instructions and the safety data sheet first. The prescribed safety measures must be strictly followed. Components of the substances evaporate very easily (e.g., styrene, acetone).

This leads to two main hazards:

1. **Health risk due** to accumulation of hazardous substances in the breathing air (see **hazardous substance operating instructions**)
2. **Fire and explosion risk** due to the formation of explosive mixtures

Therefore, the following points must be observed:

1. All containers must always be closed or covered (mixing containers, acetone cleaning containers, weighing containers, etc.)
2. Ensure proper ventilation at all times (extraction systems, fresh air supply, etc.)
3. During transfer operations, all containers and vessels must be grounded (grounding clamps)
4. Make sure that no contamination enters the peroxide, as this may cause uncontrolled reactions and lead to an explosion
5. In case of leakage in the system, it must be shut down immediately (switch off and interrupt compressed air supply) and repaired

WARNING!

Warning – Risk due to electrostatic discharge

Hazards such as electric shock and explosion may occur due to electrostatic discharge if the system is not properly grounded.

Therefore, check the grounding of the system.

WARNING!

Hazard due to contact with dangerous substances

The required chemicals may cause skin sensitization upon contact or absorption.

Inhalation of the substance may lead to respiratory problems and, in extreme cases, suffocation.

Repeated or prolonged contact may have carcinogenic effects.

- When working with or on the system, appropriate personal protective equipment must be worn.
- Observe the safety and hazardous substance data sheets provided by the manufacturers of the

operating materials used.
- Avoid direct skin contact or inhalation of the substances.
- The product must only be used in combination with a functioning and active extraction system.
- The spray gun must not be aimed at people or animals and must be secured after use.
- Connections and hoses must be checked regularly.

First Aid Instructions for Contact with Peroxide
Eyes: Rinse immediately with plenty of water – every second counts! Keep rinsing for at least 15 minutes. Go to a doctor quickly.
Skin: Wash thoroughly with soap and water. Take off contaminated clothes and shoes. Then wash the skin again carefully with soap and water.
Swallowing: Drink plenty of milk or water. Call a doctor immediately so the stomach can be flushed.

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13.2 Troubleshooting

Fault	Possible cause	Remedy
Pressure relief not possible (compressed-air shut-off valve closed).	Relief hose or relief ball valve clogged.	Open the relief ball valve.
		Carefully open the unit; cover screw connections with a cloth.
	High-pressure filter clogged.	Remove cured material with solvent, if possible; soak parts in solvent if necessary. Otherwise, remove mechanically or replace.
		Contact BÜFA Service if necessary.
Pump does not start despite the spray gun being actuated or the relief valve being open.	Compressed-air shut-off valve closed.	Open the compressed-air shut-off valve.
	High-pressure filter clogged.	Clean or replace the filter element.
	Relief hose or relief ball valve clogged.	Clean the relief hose or relief ball valve; replace if necessary.
	Air motor defective.	Repair the air motor; contact BÜFA Service if necessary.
Pump is running, but no material is being conveyed to the mixing head.	Suction strainer clogged	Clean the strainer; replace if necessary.
	Suction hose clogged.	Replace the hose.
	Ball in the lower ball seat is stuck / blocked.	Tap the foot valve lightly from the side (using a hammer). Unscrew the suction system and push the ball in the foot valve free from below using a pin or screwdriver.
	Foot valve does not close.	Unscrew the foot valve and thoroughly clean the ball and seat.
Pump conveys material but does not stop when the dispensing tool is closed.	Packing or valve worn.	Replace the parts.

Pump runs evenly, but the required spray pressure is not reached.	Air pressure is too low or air supply is insufficient.	Increase the air pressure at the compressed-air regulator or check the air line for the correct cross-section.
	Air motor iced up (runs too slowly).	Check compressed-air quality.
Pump runs unevenly (indicated by different stroke speeds during the upstroke and downstroke) and does not reach the required pressure.	Material viscosity is too high (suction losses)	Thin the material. Heat the material. Use a larger pump.
	Suction system leaking	Check seals at all screw connections of the suction pipe or suction hose; replace if necessary (see spare parts list for suction assembly).
	Foot valve leaking (with the spray gun closed, the pump stops only on the upstroke).	Foot valve: unscrew and thoroughly clean the ball and seat; replace the ball or valve seat if necessary.
	Lower or upper packing leaking (wear)	Replace the packing.
No material or too little material is discharged although the rest of the system is running steadily.	Mixing head clogged	Flush with acetone
		Contact BÜFA Service

13.3 Material does not cure

Possible cause	Indicated by	Remedy
Hardener suction hose is kinked	Hose routing	Open the relief ball valve.
No hardener or insufficient hardener filled	Suction hose not filled	Fill hardener to at least above the filter on the suction assembly.
Hardener pump not vented	Air bubbles in the suction hose	See chapter "Venting the peroxide pump"
Hardener proportion set too low	% scale on the hardener pump	See chapter Setting the peroxide quantity
Hardener pump defective		Replace the pump
Peroxide injector stuck or defective		Clean or replace the injector
Hardener pump not connected	Hardener pump does not run	Depressurize the hardener circuit, then connect the hardener pump to the lever arm at the desired % setting
Hardener suction hose draws in air	Air bubbles in the suction hose	Seal / replace the hose

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13.4 Material cures too slowly

Possible cause	Indicated by	Remedy
Hardener proportion too low 0%	Hose routing % - scale on hardener pump	See chapter Setting the peroxide quantity
Hardener suction hose is kinked	Hose routing	Route the hose without kinks
Hardener suction hose draws in air	Air bubbles in the suction hose	Seal/replace the hose
Peroxide injector stuck or defective		Clean or replace the injector
Hardener pump defective		Replace the pump
Peroxide needle in the spray gun defective		Replace the needle
Overflow valve defective/contaminated		Clean/replace the valve
Hardener pump not vented	Air bubbles in the suction hose	See section "Venting the peroxide pump"
Material too cold		Increase the temperature (drum heater / flow heater).

13.5 Material cures unevenly

Possible cause	Indicated by	Remedy
Hardener suction hose is kinked	Hose routing	Route the hose without kinks
Hardener suction hose draws in air	Air bubbles in the suction hose	Seal / replace the hose
Hardener pump not vented	Air bubbles in the suction hose	See section "Venting the peroxide pump"
Peroxide needle in the spray gun defective		Replace the needle
Overflow valve defective / contaminated		Clean/replace the valve
Hardener proportion set too high	% scale on the hardener pump	See chapter "Setting the peroxide quantity"

13.6 Material cures too quickly

Possible cause	Indicated by	Remedy
Hardener proportion set too high	% scale on the hardener pump	See chapter "Setting the peroxide quantity"
Hardener suction hose draws in air	Air bubbles in the suction hose	Seal / replace the hose
Resin pump draws a vacuum		Clean the suction strainer. Check suction side for restrictions/blockages .

14 Shutdown

To decommission the system, please follow these steps:

1. Remove the resin pump from the container and let it run until no more material comes out of the lines.
2. Flush the resin pump with acetone by running it in a container filled with acetone.
3. Thoroughly clean the resin filter on the pump and the peroxide filter on the gun.
4. Place the night cap on the gun head.
5. Flush the resin pump again with acetone.
6. Empty the resin pump completely.
7. If necessary, fill the resin pump with Mesamoll.
8. Completely empty the peroxide container and lines. Remove all contamination from the peroxide system.

15 Storage

Target group: Mechanical maintenance (M), Electrical maintenance (E), Specialized personnel

15.1 Safety Instructions for Storage

CAUTION!

Risk of Injury
If the system is not positioned correctly, there is a risk of crushing, cutting, or falling injuries.
Ensure that the system is set up in a stable position. Use the designated transport handle when lifting the unit.

15.2 Storage

To ensure the functionality and safety of the system, the following storage instructions must be observed:

Decommissioning
Follow the steps described in the "Decommissioning" chapter of this operating manual.

Storage Location
Store the system and all associated components in a dry, well-ventilated, and frost-protected room. Avoid direct sunlight, high humidity, and extreme temperatures.

Protection from Chemicals
Always store the required chemicals in their original, tightly sealed containers. Keep them away from sources of ignition, food, and beverages.

Safety
Ensure that the storage area is inaccessible to unauthorized persons. Observe the applicable regulations for the storage of hazardous substances.

Maintenance During Storage
Thoroughly clean the system before extended storage and remove all residues of reaction resins. Regularly check the condition of hoses, seals, and filters.

Labeling
All containers and components should be clearly and permanently labeled to avoid confusion.

Important Note
Always observe the safety data sheets of the substances used as well as the legal and company-specific storage requirements.

16 Disposal

Environmentally Responsible Disposal of the System and Its Components
The system, as well as all associated components and consumables (e.g., hoses, filters, containers with residues of reaction resins), must not be disposed of with household waste at the end of their service life. Reaction resins and their residues can be hazardous to the environment and human health.

System: Dispose of the system in accordance with applicable legal regulations. Take the equipment to an authorized collection point or a specialized disposal company.
Residual materials and consumables: Residues of reaction resins, cleaning agents, and contaminated consumables (e.g., filters, hoses) must be treated as hazardous waste. Hand these over exclusively to approved disposal facilities.

Packaging: Packaging materials, provided they are clean and free from hazardous substances, can be recycled.

Important Note:
Observe local and national regulations regarding the disposal of chemicals and electrical equipment. Improper disposal can cause significant environmental and health hazards.

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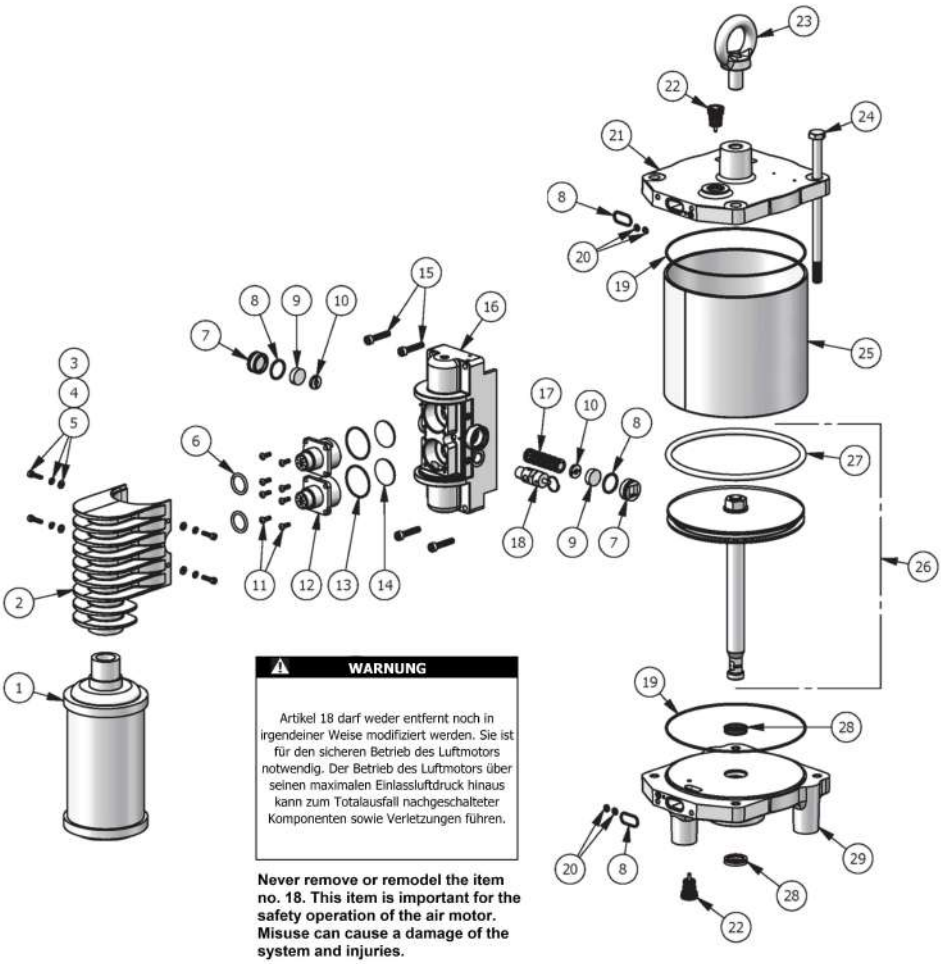
17 Component Details

17.1 Resin Pump

17.1.1 Air Motor 0299791 Exploded View Drawing

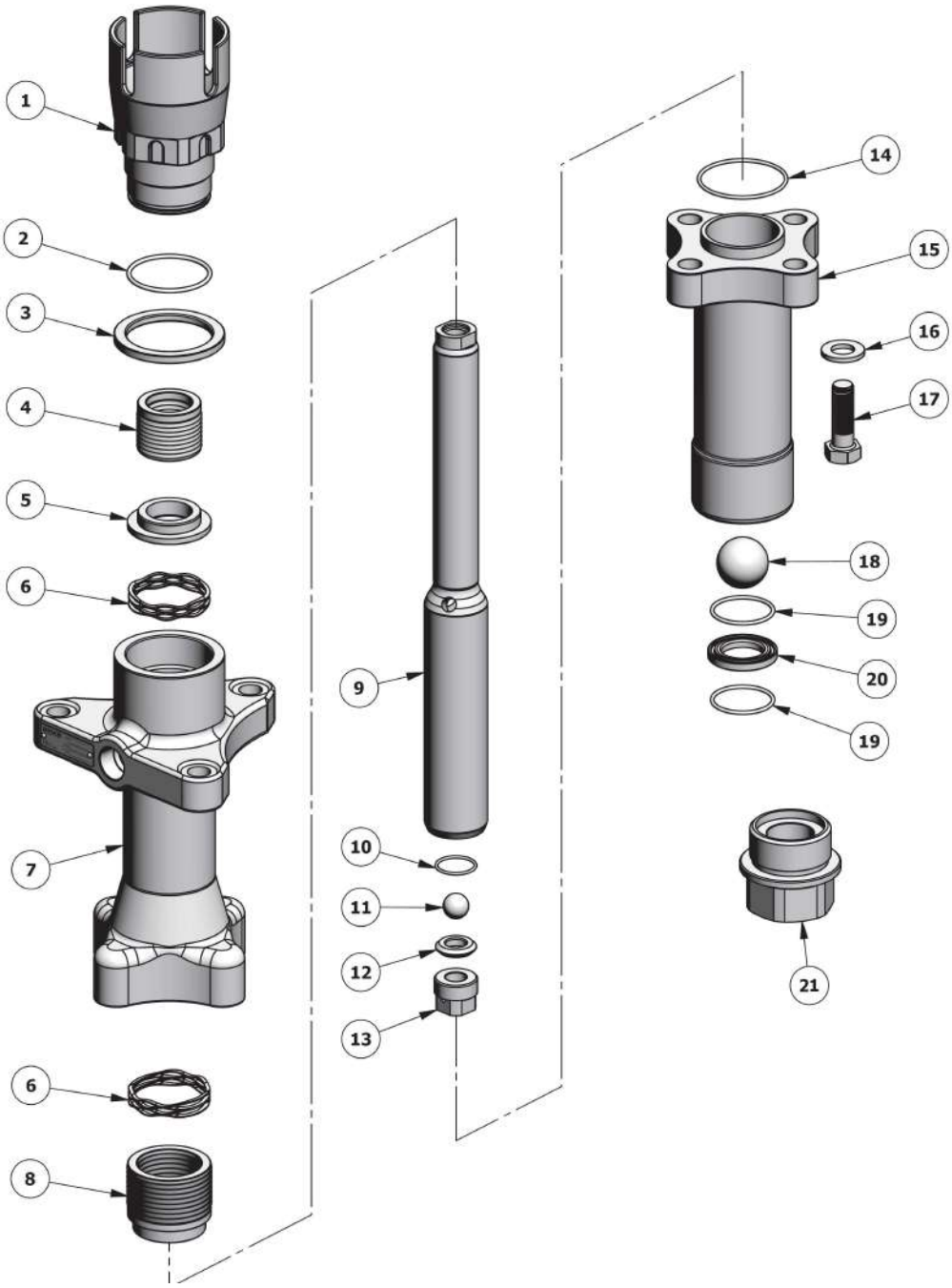


17.1.2 Air Motor 0299791 Parts List

no.	item no.	description	pcs	servicing sets
1	029-9791	silencer	1	
2	029-9792	exhaust adapter	1	
3	029-9793	hexagon screw	4	
4	029-9794	spring washer	4	
5	029-9795	washer	4	
6	029-9796	o-ring	2	1
7	029-7960	valve block end cap	2	3
8	029-7961	o-ring	4	1,2,3
9	029-7962	magnet	2	3
10	029-7963	damper	2	1,3
11	029-7953	screw	8	
12	029-9797	fast exhaust valve housing	2	
13	029-7955	o-ring	2	1,2,3
14	029-7956	membrane	2	1,3
15	029-9798	hexagon screw	4	
16	029-9799	valve block	1	
17	029-7964	piston and socket	1	3
18	029-7965	safety valve	1	
19	029-9800	piston sealing	2	1,2
20	029-7966	o-ring	4	1,2,3
21	029-9801	upper end cap	1	
22	029-7969	poppet valve	2	1
23	auf Anfrage	lifting screw	1	
24	029-9802	hexagon screw	4	
25	029-9803	cylinder	1	
26	029-9804	piston	1	
27	029-9805	piston sealing	1	1,2
28	029-9806	U-cup sealing	2	1,2
29	029-9807	lower end cap	1	

servicing sets			
no.	**item no.**	**description**	**parts included with**
1	029-9808	repair set	1
2	029-9809	sealing set	2
3	029-7983	valve repair set	3

17.1.3 Resin Pump 0299812 Exploded View Drawing



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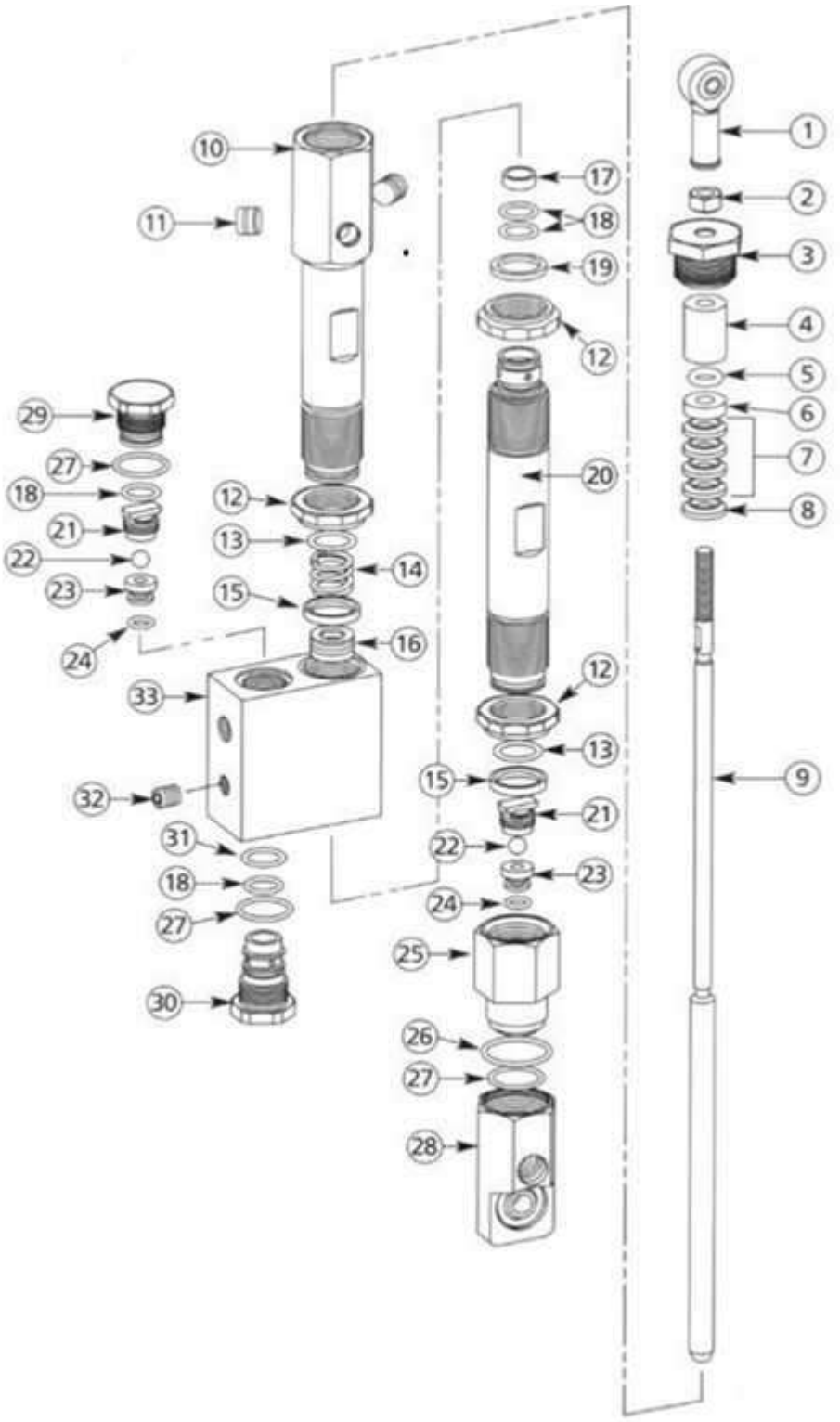
17.1.4 Resin Pump 0299812 Parts List

no.	item no.	description	pcs.	servicing sets
1	0299812	pump 220ml	1	
2	0299813	packing nut	1	
3	0299814	o-ring 52mm	1	3,4
5	0299815	packing spacer	2	
6	0299816	upper packing assembly PTFE/UHMW	2	3,4
8	0299817	packing loader	1	
9	0299818	packing spring	1	
10	0299819	upper housing	1	
11	0299820	lower packing assembly PTFE/UHMW	1	3,4
12	0299821	pump rod	1	
12a	0299822	o-ring 27 mm	1	3,4
13	0299823	ball 3/4"	1	1,3
13a	0299824	ball seat 3/4"	1	1,3
14	0299825	seat retainer	1	
15	0299826	o-ring 62 mm	1	3,4
16	0299827	lower housing	1	
17	0299828	washer	1	
18	0299829	hex head cap screw	1	
19	0299830	ball 1-1/2"	1	2,3
20	0299831	o-ring 45 mm	1	3,4
21	0299832	ball seat assembly 1-1/2"	1	2,3
22	0299833	fluid inlet	1	

servicing sets			
no.	**item no.**	**description**	**parts included with**
1	0299835	upper ball and seat	1
2	0299836	lower ball and seat	2
3	0299837	Reparatursatz	3
4	0299838	seal kit PTFE / UHMW	4

17.2 Peroxide Pump

17.2.1 Exploded View Drawing



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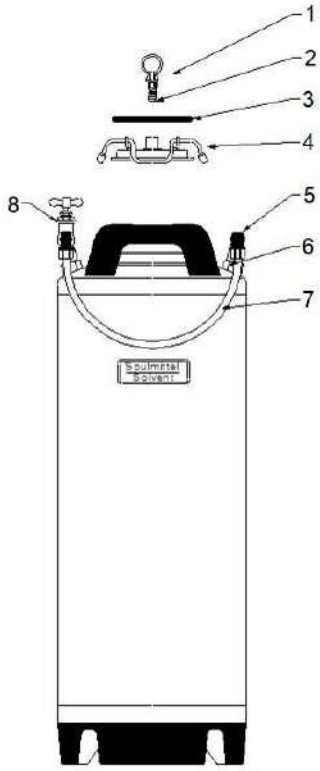
17.2.2 Parts List

No.	Article Number	Description	Quantity	Maintenance Kits
1	029-5310	Rod end	1	
2	029-5311	Nut	1	
3	029-5312	Packing nut	1	
4	029-5313	Bearing	1	
5	029-5314	O-ring	1	1
6	029-5315	Adapter	1	1
7	029-5316	Packing	4	1
8	029-5317	Adapter	1	1
9	029-5318	Piston rod	1	
10	029-5319	Pump tube (upper)	1	
11	029-2047	Plug 1/8" NPT	2	
12	029-5321	Nut	3	
13	029-5322	O-ring	2	1
14	029-5323	Spring	1	
15	029-5324	Seal	2	
16	029-5325	Packing set	1	
17	029-5326	Guide	1	
18	029-5327	O-ring	4	
19	029-5328	Seal	1	
20	029-5329	Pump tube (lower)	1	
21	029-5330	Cage	2	
22	029-5331	Ball	2	
23	029-8022	Seat	2	
24	029-5333	O-ring	2	
25	029-5334	Valve housing (lower)	1	
26	029-5335	O-ring	1	
27	029-5336	O-ring	3	
28	029-5337	Joint housing	1	
29	029-5338	Plug	1	
30	029-5339	Valve housing (upper)	1	
31	029-3824	O-ring	1	
32	029-5340	Plug 1/16" NPT	1	
33	029-5341	Bypass	1	
34	029-5342	Pin	1	
35	029-5343	Wrench	1	

Maintenance Kits			
No.	**Article Number**	**Description**	**contains all articles with**
1	029-3597	Seal kit	1

17.3 Flush Tank Unit 0280076

17.3.1 Exploded View Drawing



17.3.2 Parts List

No.	Article number	Description	Quantity	Remarks
1	029-0820	Tank lid valve	1	
2	029-1204	Tank lid valve seal	1	
3	029-0003	Stainless steel tank seal	1	
4	029-0822	Tank lid	1	
5	029-1118	Screw-in elbow	1	
6	029-1153	Tank connection	1	
7	029-0802	PA tube	1	0,4
8	029-1095	Needle valve 1/4"	1	

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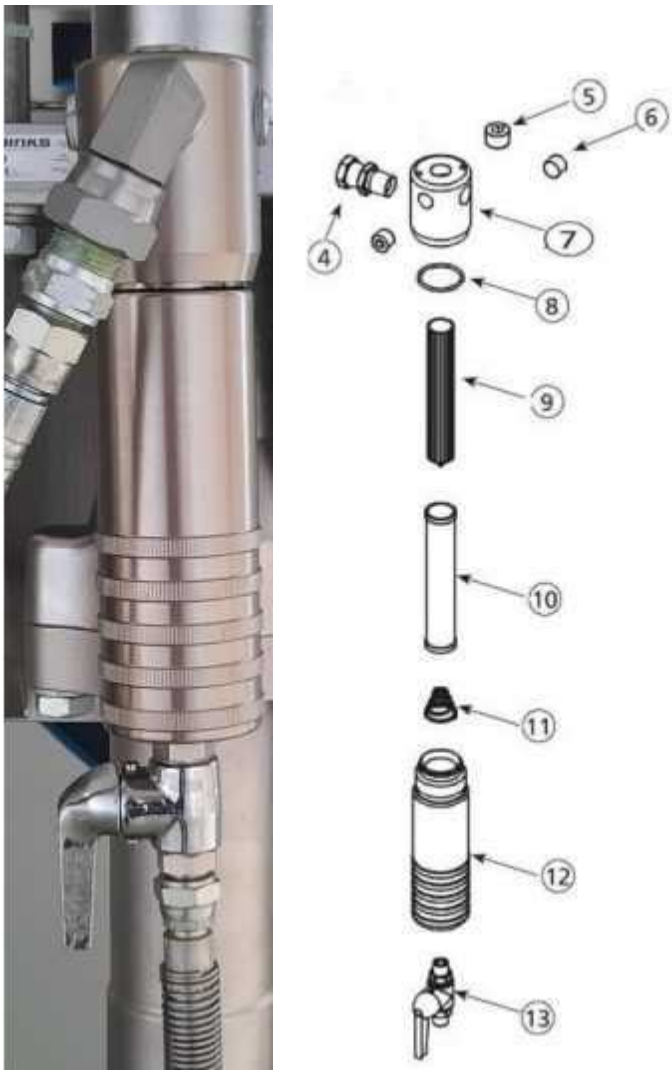
17.4 Filter Unit 0293961

17.4.1 Exploded View Drawing



17.4.2 Parts List

No.	Article Number	Description	Quantity	Remarks
1	0293040	Pulsation damper	1	
2	0239455	Adapter with O-ring	1	
2a	0294389	O-ring	1	
3	0299423	Double nipple	1	
4	on request	Union fitting	1	
5	on request	Threaded plug	1	
6	on request	Threaded plug	2	
7	on request	Filter head	1	
8	0294791	O-ring	1	
9	0295478	Filter body	1	
10	0293937	Filter element 60 mesh		optional
10a	0293938	Filter element 100 mesh	1	default
11	0295595	Spring	1	

12	0299456	Filter housing	1	
13	0290579	High pressure ball valve	1	
14	0290080	Return hose	1	

17.5 Check Valve 0299476

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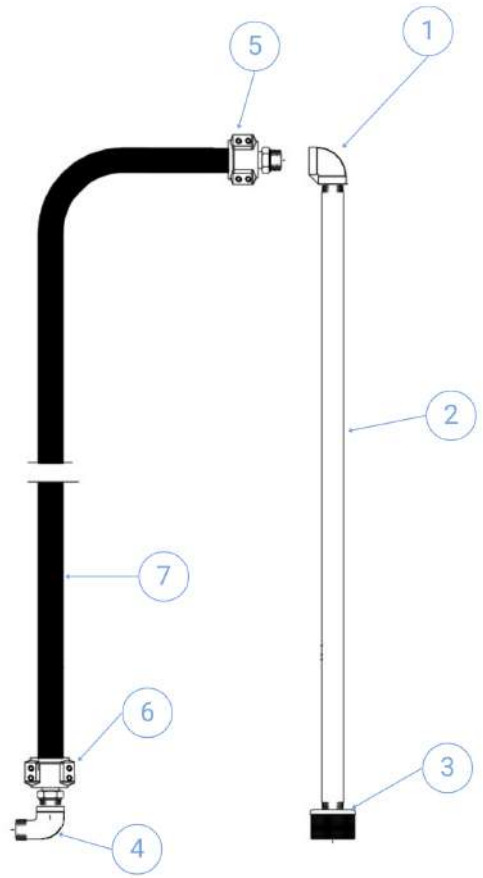
17.6 Suction Hose Kit 1" 028-0248

Possible versions:
- Drum Suction Hose Kit 0280246
- Hobbock Suction Hose Kit 0280245



No.	Article Number	Description	Quantity	Remarks
1	029-1740	Elbow 1"	1	
2	029-3031	Suction pipe 1"	0,52m	for Keg
2a	029-1749	Suction pipe 1"	1m	for Drum
3	029-0724	Strainer 1", stainless steel	1	
4	029-3790	Elbow 1 1/4" incl. hose nozzle	1	
5	029-2144	Hose nozzle 1", stainless steel	1	
6	029-2145	Hose clamps	1	
7	029-1017	Chemical hose	1,2m	for Keg
7a	029-1017	Chemical hose	1,8m	for Drum

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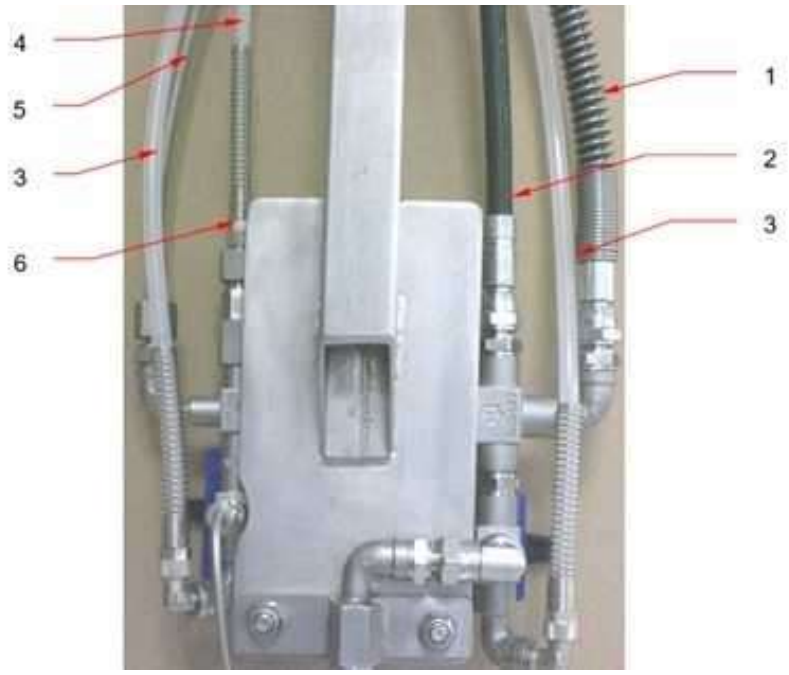
17.7 Hoses RTM

No	Article number	Description	Quantity	Remarks
1	029-5380	HD hose 1/4"–1/4", 5 m	1	
2	029-5360	Return hose 1/4", 2.5 m	2	
3	029-0804	PE hose 8x6, 6 m	2	
4	029-3448	PE hose 6x4, 6 m	1	
5	029-5486	Peroxide hose PTFE-HD, 5 m, ID 3.0	1	
6	029-4786	Anti-kink compression fitting	1	



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18 EC Declaration of Conformity

EC Declaration of Conformity, according to Directive 2006/42/EC Machinery, Annex II 1A
We hereby declare that the machine described below, in its design and construction as delivered, complies with the essential health and safety requirements of the EC Machinery Directive.

Designation of the machine: _____

Year of manufacture: _____

Item number: _____

Serial number: _____

Machine type: _____

Intended use : _____

The following health and safety standards were applied to the above-mentioned machine:
According to EC Machinery Directive 2006/42/EC
According to ATEX Directive 2014/34/EU

EN ISO 12100:2010	Safety of machinery — Basic concepts, general principles for design. Part 1: Basic terminology, methodology
EN ISO 14123-1:2015	Safety of machinery - Reduction of health risks from hazardous substances
DIN EN ISO 13854:2019	Safety of machinery - Minimum gaps to avoid crushing of body parts
EN ISO 13850:2015	Safety of machinery - Emergency stop function
EN ISO 14118:2018	Safety of machinery - Prevention of unexpected start-up
EN 1127-1:2019	Explosive atmospheres - Explosion prevention and protection Part 1: Basic concepts and methodology
EN ISO 80079-36:2016	Explosive atmospheres - Part 36: Non-electrical equipment for use in explosive atmospheres - Basic method and requirements
EN ISO 80079-37:2016	Explosive atmospheres - Part 37: Non-electrical equipment for use in explosive atmospheres - Protection by constructional safety "c", control of ignition sources "b", liquid immersion "k"

Manufacturer's address / Authorized person:
BÜFA Composites Systems GmbH & Co. KG
Department BÜFA Tec
Hohe Looge 2-8
DE-26180 RASTEDE

Rastede, the

Signature: .....

i.V. Sören Auen, Head of BÜFA Tec

19 Return Form

Checklist for Shipping Preparation (Please decommission according to the operating instructions):

1. Resin Side (Resin Type):
_____ ☐
Resin Container Removed: ☐
Resin Container Removed:

2. Hardener Side (Hardener Type):
_____ ☐ or
Hardener Container Removed: ☐
Hardener Tank Emptied:

3. Additional Pumps: ☐
All Containers Removed: ☐
All Additional Pumps Flushed: ☐
All Additional Pumps and Hoses Emptied: ☐

4. Flushing Container (Cleaning Agent):
_____ ☐ or
All Containers Removed: ☐
Tank Emptied: ☐
Pumps and Hoses Emptied:

Important Note:

Acceptance of goods for repair of systems and their parts by BÜFA Composite Systems GmbH & Co. KG can only take place if this form is completely filled out and visibly enclosed with the shipment. The sender agrees to bear the full costs if the complete emptying and cleaning of the system has not been carried out before shipping. Liquid contaminants must be removed before shipping.

Delivery Address::

BÜFA Composite Systems GmbH & Co. KG
Hohe Looge 2-8, 26180 Rastede
goods receiving 4 / BÜFA Tec

Delivery Times: Mon-Thu: 07:00 - 14:00

We hereby declare:

Company: _____

Adress: _____ Postal Code, City:_____

Responsible Contact Person _____

Phone Number: _____

The system/component sent for repair:

☐ Repair without cost estimate

Type: _____ Serial Number:_____

Defect: _____

_____

_____

is to be sent in an emptied and cleaned condition, free of resin, hardener, or other hazardous substances, depressurized and de-energized.

_____

Date, legally binding signature, company stamp

20 Safety Card

Attention: Safety Information!

Wear protective clothing

Wear safety goggles

Wear hearing protection

Wear protective gloves

Wear respiratory protection

Wear conductive safety shoes

The use of the machine is only permitted by trained and instructed personnel. Follow the instructions in the operating manual, especially the safety regulations! The operating manual is located in the toolbox upon delivery!

Always observe the following before any work on the system and during any work breaks:

- Turn off the spray device at the compressed air shut-off valve!
- Relieve the spray gun and spray hose of pressure!
- Secure the spray gun!
- Never point the spray gun at yourself, other people, or any living beings!
- Never place your fingers or hand in front of the spray gun and never reach into the spray jet!
- Observe the maximum permissible operating pressure of all system components! The lowest value applies to the entire machine.
- The material hoses must correspond to the maximum working pressure!
- Check the grounding on the spray device, the material container, and the mold!
- For any decommissioning, malfunction, repair, or other work, the entire machine must be depressurized! Pay attention to residual pressure in the machine and relieve it according to the operating manual.
- In case of malfunctions or leaks, replace the defective parts immediately after depressurizing the entire maschine.
- When cleaning the machine, ensure an adequate amount of cleaning agent. Observe the safety data sheet of the cleaning agent. To avoid heating the cleaning agent, reduce the cleaning duration to 5 minutes.
- Observe the safety data sheets of the materials and cleaning agents to be processed! Have the device checked by a qualified person at least every 12 months.