

Designation/ **BÜFA Tec Delta3.3 RTM**



Art. No.:
028-4469

Operating Instructions and Spare Parts Sheets

Table of Contents

1. Technical Data	4
1.2 System	4
1.3 Accessories:	4
2. Commissioning	5
2.1 Getting Ready	5
2.2 Machine preparation	6
2.3 Venting the peroxide pump	7
2.4 Venting the resin pump	9
3. Operation	11
3.1 Circulation	11
3.2 Injection	12
3.3 End of work	13
4. Pump unit Delta3.3	14
4.1 Pump unit Delta3.3	16
4.2 Structural components of pump unit Delta3.3	17
4.3 Air motor unit 029-5339	19
4.4 Resin pump 029-8000	22
4.5 Peroxide pump 029-8045	25
5. Overflow valve 029-3449	28
6. Mixing head 028-1220	29
7. Hoses	31
8. Filter regulator 029-4057	32
9. Check valve VA	33
10. Flushing tank 10 l, VA / SS 028-0097	34
11. Resin drum suction unit 1" 028-0246	35
12. Remedy in case of a problem	36
12.1 Material härtet nicht aus / Material does not cure:	36
12.2 Material härtet zu langsam aus / Material cures too slowly:	

12.3	Material härtet unregelmäßig aus (Fleckenbildung) / Material cures irregularly (spotting): ..	38
12.4	Material härtet zu schnell aus / Material cures too quickly:	39
12.5	Harzpumpe läuft nicht / Resin pump does not work:	39
12.6	Harzpumpe bleibt stehen / Resin pump stops:	39
12.7	Peroxidpumpe nicht von der Harzpumpentransmission abziehbar / The peroxide pump cannot be disconnected from the resin pump:	40
13.	EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex II	41
14.	Safety and operating instructions for operating the Delta3.3 RTM	42
14.1	Before commissioning	42
14.2	During operation	42
14.3	Inspections	43
14.4	Maintenance and modifications	44
14.5	Intended Use	45
14.6	Modifications /Changes	45
14.7	Accessories and Spare Parts	45
14.8	Handling hazardous substances (leaks, storage, etc.)	46
15.	Test record for spraying units	47
16.	Test certificates	48
17.	Brief Instructions	49
18.	Notes	50

1. Technical Data

1.1 Use:

- For metering and mixing UP / VE resin systems used in injection processes

1.2 System

- Ratio of pressure transmission resin: 6.5:1
- Ratio of pressure transmission peroxide: -
- Volume throughput per double stroke: 127 ml
- Volume flushing tank: 10 l
- Length of hose: 7.5 m
- Output, water: max. 7.6 l/min (with 60 cycles/min)
- Air pressure max.: 7 bar
- Air consumption: 200-300 l/min

1.3 Accessories:

- 028-2600 flow heater set 3 kW, EEx de II B T3

2. Commissioning

2.1 Getting Ready

Compressed air:

- 7 bar max., filtered and dried
- Compressed air hose diameter at least = 13 mm

UP resin:

- Minimum temperature 18°C
- Pre-accelerated

Peroxide:

- User's choice, viscosity up to 30 mPas

2.2 Machine preparation

Connect the tong of the earth cable to a suitable place.

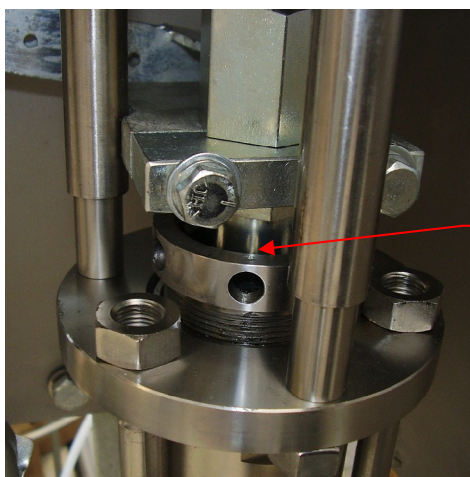
Fill the flushing tank with flushing agent.
Observe data sheet for the concerned hazardous substance!

Fill the lubricant cup for the resin pump with
lubricant, BÜFA No. 742-0002.

Connect the pump unit to the resin container / insert the suction
pipe into the container.

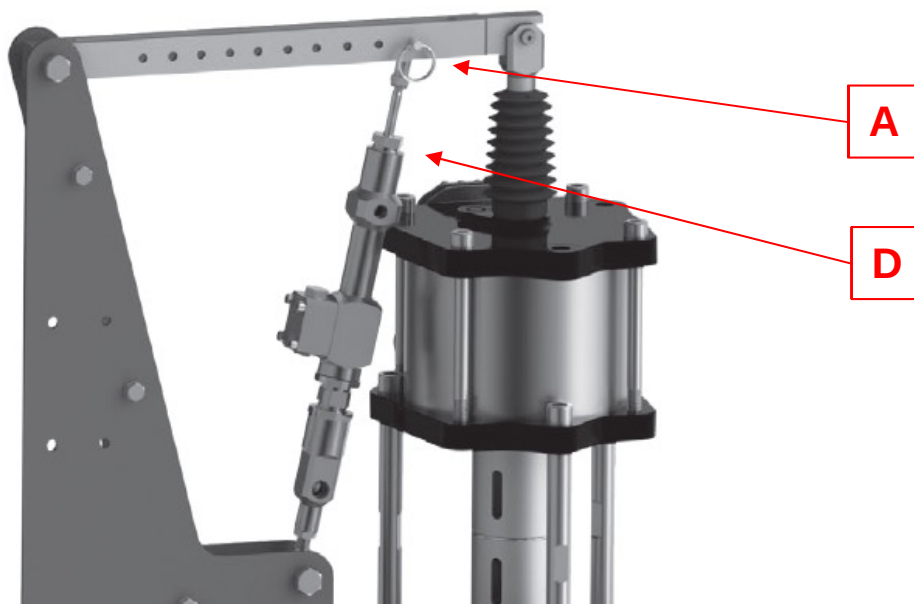


Earth cable with tong

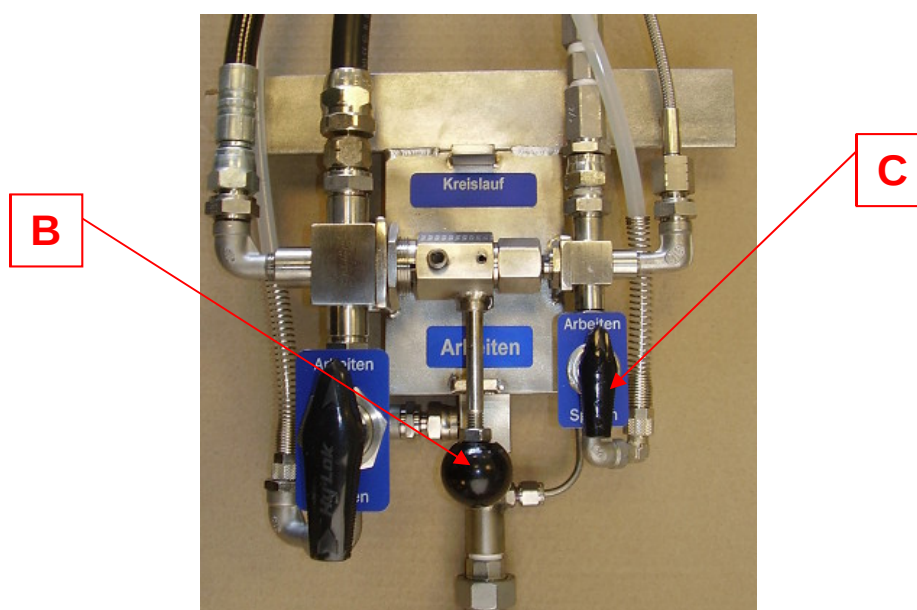


Lubricant cup

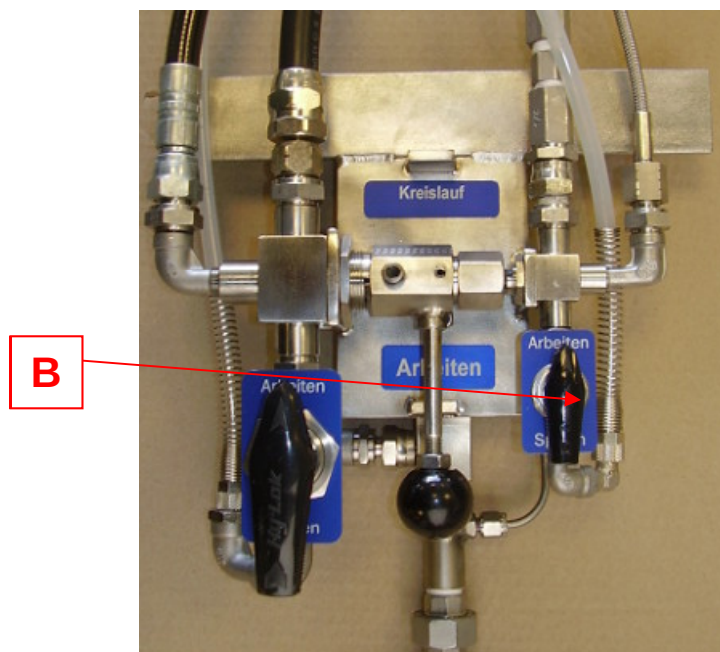
2.3 Venting the peroxide pump



- Disconnect the peroxide pump from the resin pump by removing the connection pin **A**. This pin connects the peroxide pump to the lever arm of the resin pump.
- Hold the mixing head over an empty and earthed container.
- Open the 3-way ball valve combination **B** on the mixing head in the direction “Operate” (as shown in the illustration) so that the peroxide can run out freely. The ball valve **C** for the peroxide must also be opened in the direction “Operate”.



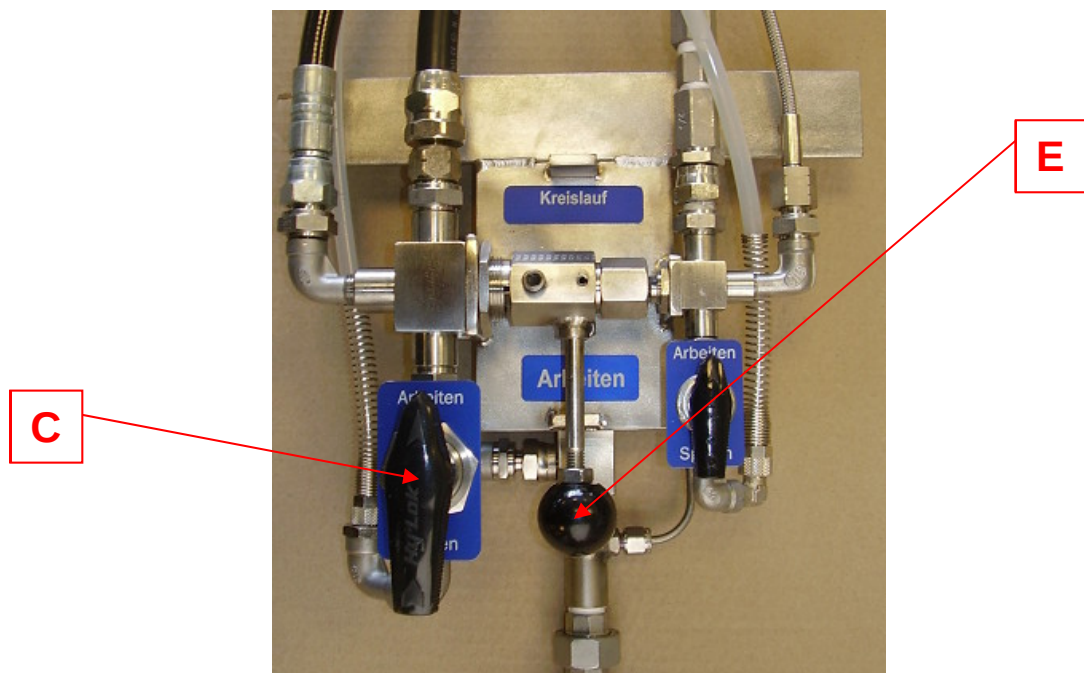
- d) Following this, begin by manually activating the peroxide pump by pulling out and pressing in the pump piston **D** to vent the peroxide pump and flush out enclosed air. It should be very easy to move the pump. If this is not the case, check whether all valves are open on the pressure side, the peroxide filter needs to be cleaned or there is any other blockage on the peroxide side.
Repeat the pump movements until the peroxide flows air-free from the mixing head.
- e) After venting, remove remaining peroxide in the mixing head through briefly cleaning with acetone by opening the 3-way ball valve **B** on the mixing head in the direction “Flush”.



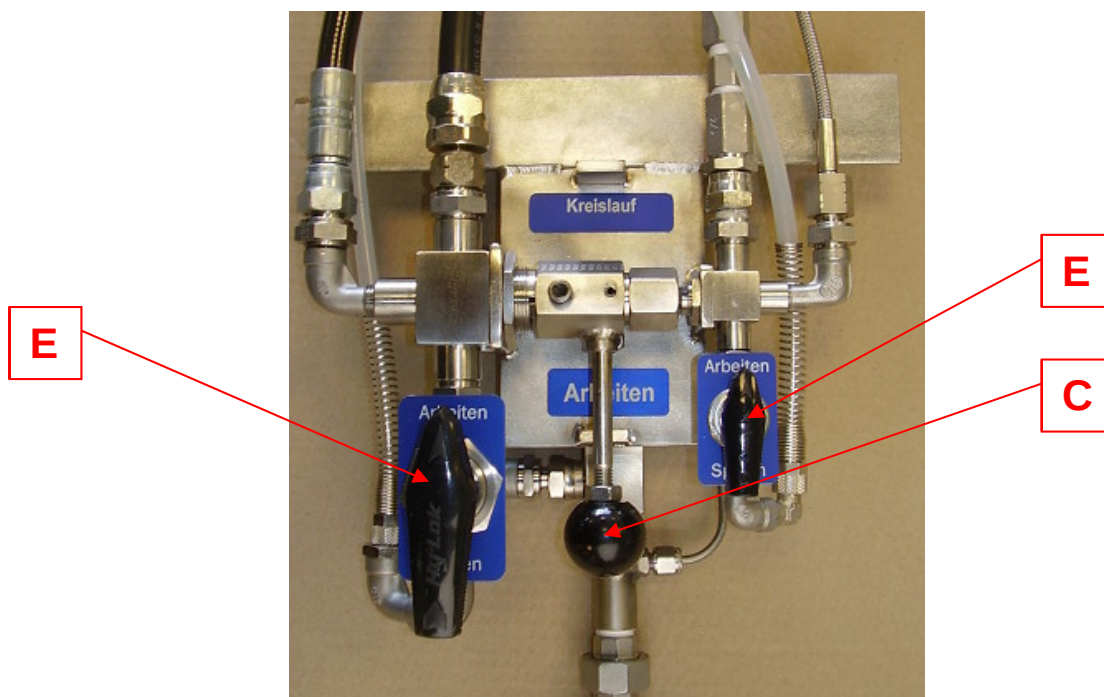
- f) Do **not** connect the peroxide pump to the lever arm yet!

2.4 Venting the resin pump

- The peroxide pump should still be disconnected from the resin pump.
- Place the resin suction device in the resin container or connect the container suction assembly to the container.
- Hold the mixing head over an empty and earthed container.
- Set the air pressure for the resin pump to approx. 1 bar and then **slowly** open the ball valve of the resin pump compressed air supply.
- The pump now begins to suck. Open the 3-way ball valve combination in the direction “Operate” **E** and ball valve **C** also in the direction “Operate” (as shown in the illustration) so that the resin can run out freely.



- f) After venting, remove remaining material in the mixing head through briefly cleaning with acetone by opening the 3-way ball valve **E** on the mixing head in the direction “Flush”. The ball valve **C** remains open in the direction “Operate”.



- g) Now connect the peroxide pump **A**.

3. Operation

Pressure adjustment

Air pressure at the air motor should not be less than 1.5 bar; otherwise the air motor will not run evenly.

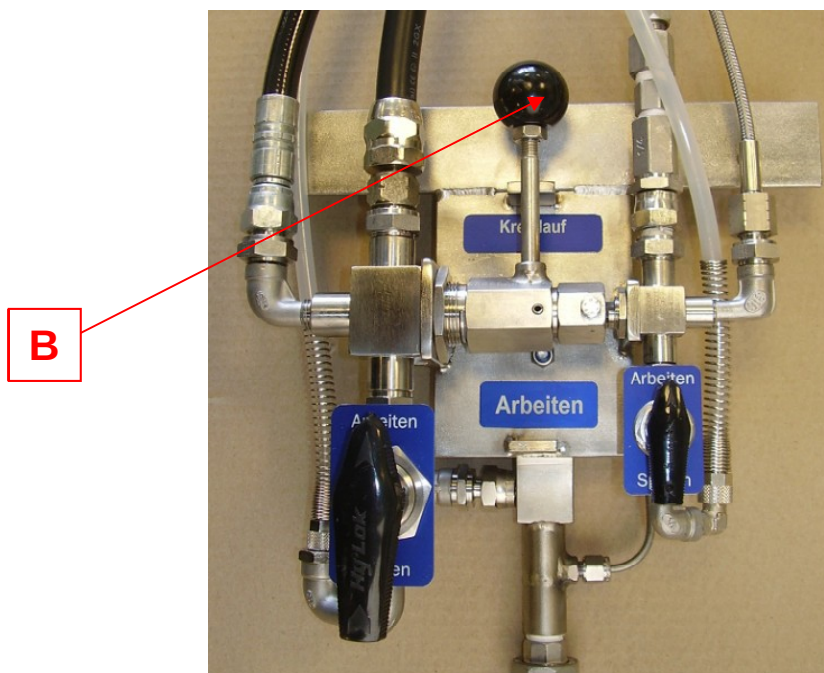
Pay attention to peroxide pressure; it should circulate between 8-9 bar in the unopened gun.

Fluctuations in pressure should not be more than 2 bar. If fluctuations are greater, the peroxide system should be vented again.

3.1 Circulation

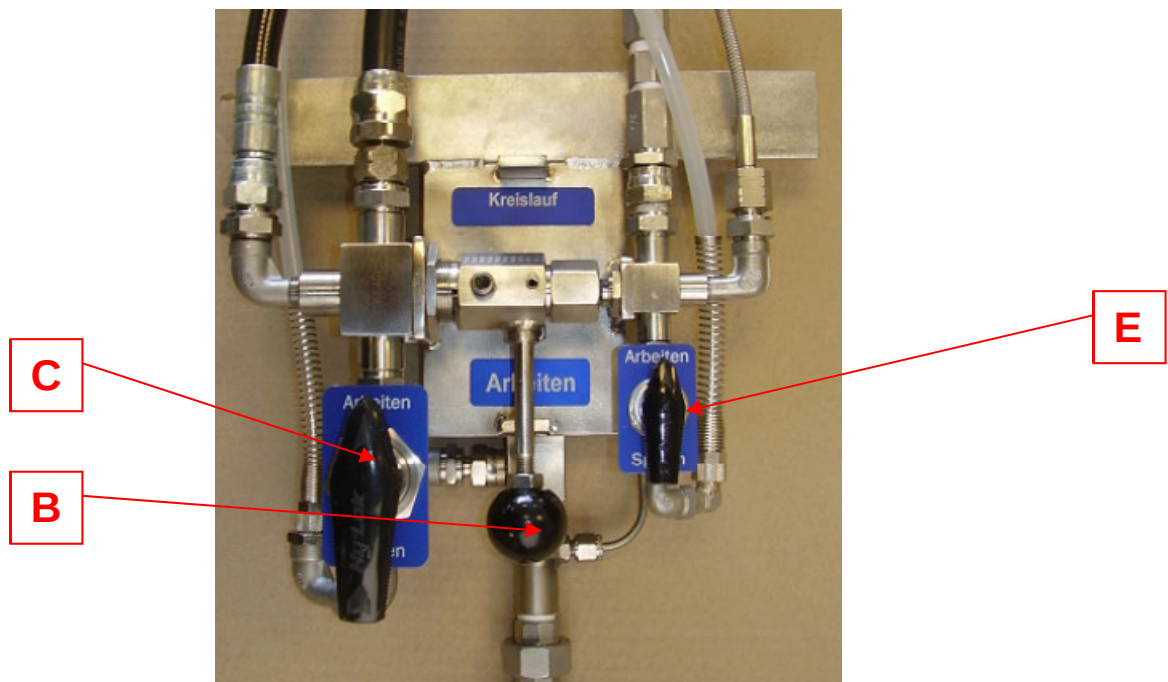
Before each injection process it is recommended to vent the resin and peroxide through the circulation process and to transport fresh material to the mixing head.

This is achieved by activating the air motor (ball valve on the compressed air input of the machine) and by switching the 3-way ball valve combination **B** in the direction "Circulate". The duration of the circulation process depends on the material and machine still stand.



3.2 Injection

- a) To inject or fill, open the 3-way ball valve combination **B** in the direction “Operate” as well as both ball valves **E** and **C** on the mixing head in the direction “Operate” (as shown in the illustration).



- b) After injection has been concluded, close the ball valve of the air supply to the air motor. All of the ball valves remain open to relieve the pressure lines.
- c) Flush the head by turning both 3-way ball valves **C** and **E** in the direction “Flush”. The ball valve **B** should remain open in the direction “Operate”.
- d) After sufficient flushing with acetone, close ball valves **C** and **E**.

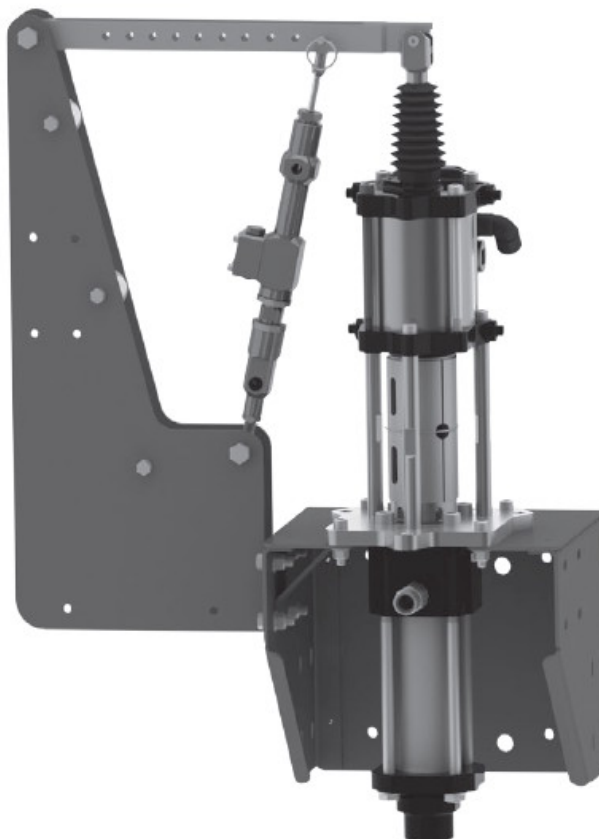
3.3 End of work

- a) Close the ball valve on the compressed air input of the machine.
- b) Clean the mixing head, also from the outside.
- c) Relieve the flushing agent tank ("let off pressure") by pulling out the venting valve in the tank lid.

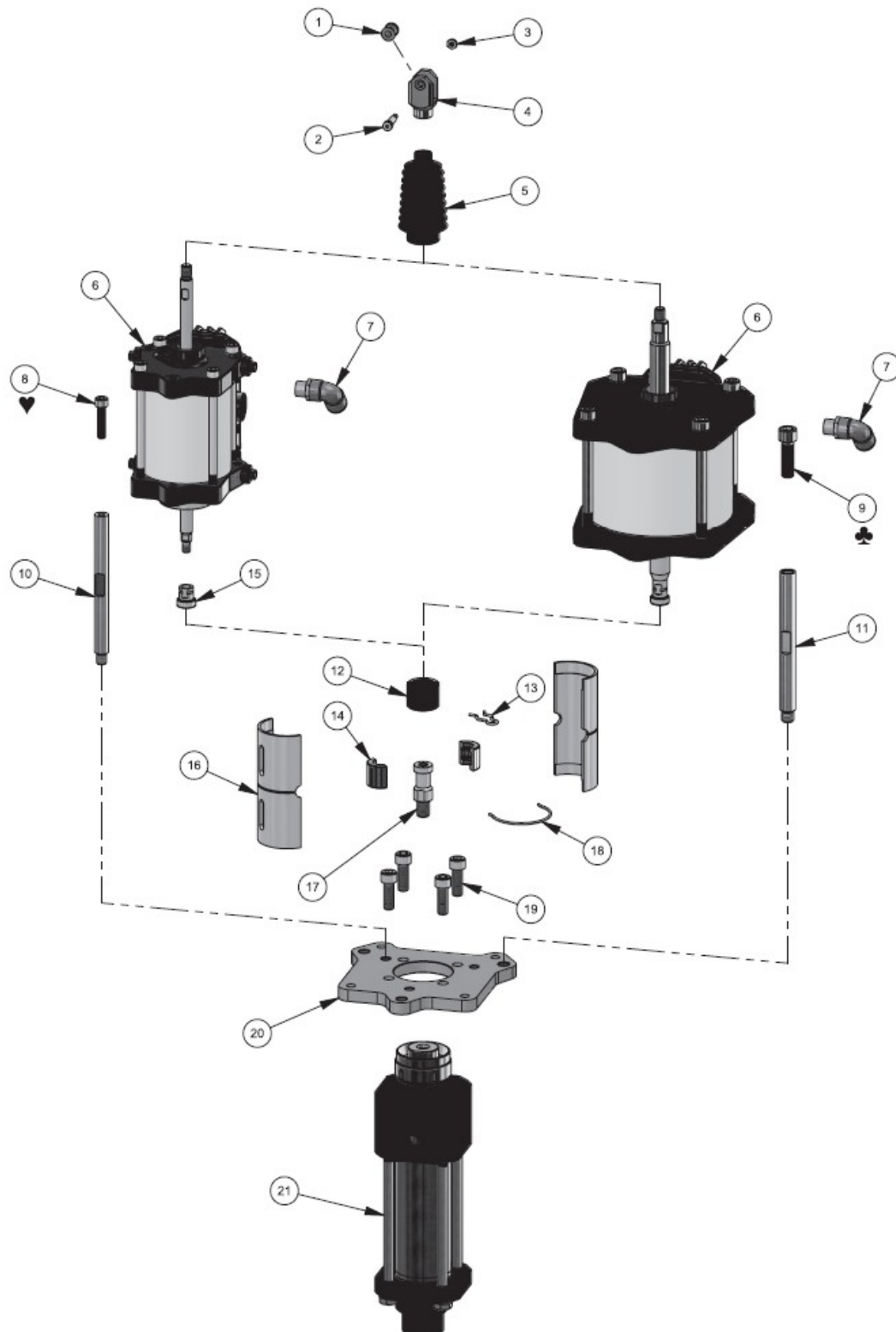
These instructions should be strictly observed during operation and when carrying out maintenance work on the machine. Failure to follow these instructions may result in personal injury and/or damage to the machine.

Operating instructions must be given to the user of the machine!

4. Pump unit Delta3.3



Ratio:	6.5:1
Maximum air inlet pressure:	116 psi (8 bar)
Maximum recommended continuous cycle rate:	20 cycles/min
Air consumption @ 20 cycles/min and 116 psi (8 bar) air inlet pressure:	5.2 SCFM (147 LPM)
Maximum fluid pressure:	750 psi (52 bar)
Displacement per cycle:	4.3 oz (127 cc)
Output @ 60 cycles/min:	2.0 gal/m (7.6 l/m)
Maximum operating temperature:	160°F (71°C)
Air inlet connection:	3/8" BSP (F)
Piston diameter:	3.3 in (85 mm)
Stroke length:	3 in (75 mm)
Sound level:	96.2 dB
Fluid inlet connection:	1 1/4" NPT (M) & 1" NPT (F)
Fluid outlet connection:	1/2" NPT/NPS (M)

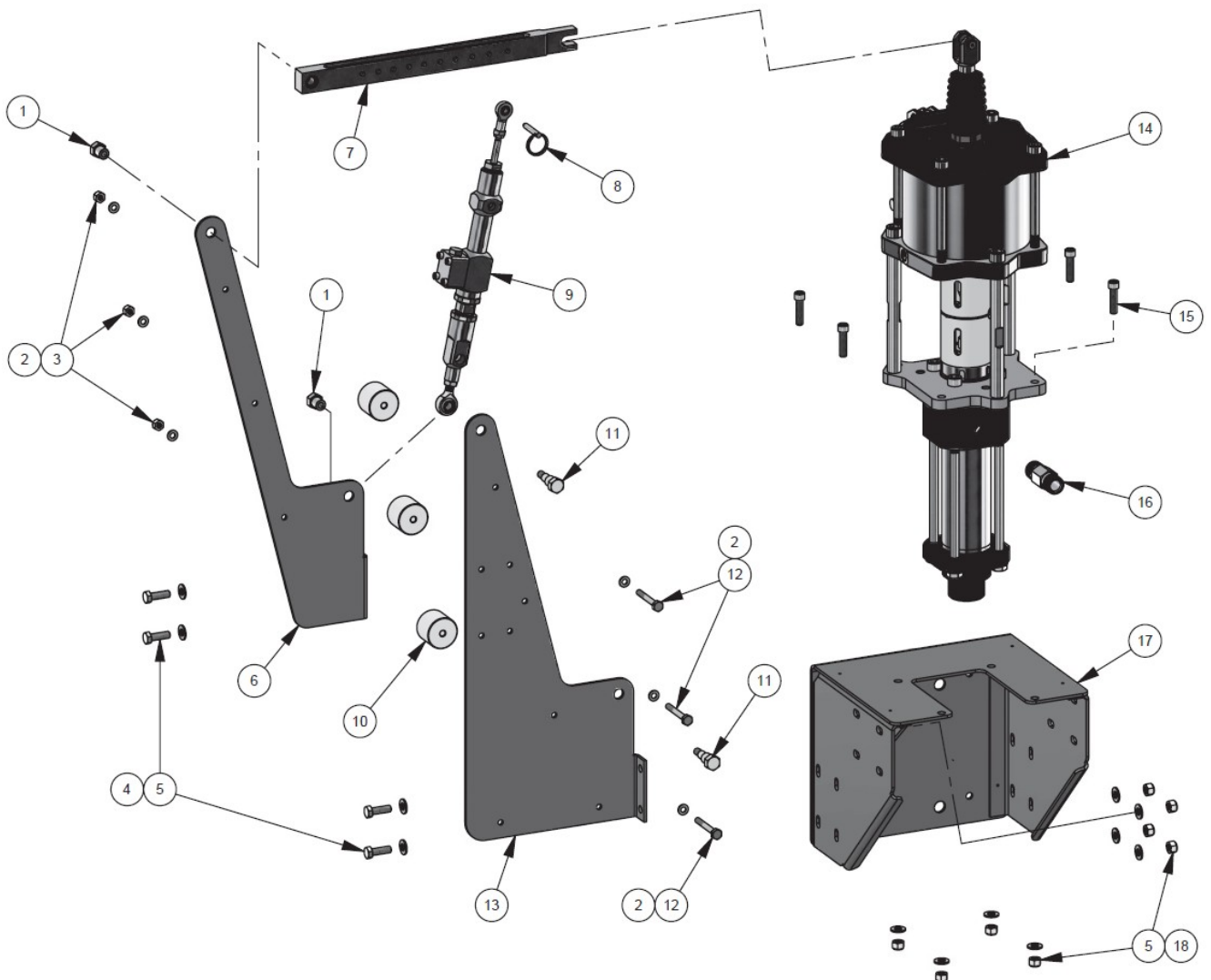


4.1 Pump unit Delta3.3

No.	Art. No.	Part description		Qty.	Comments
1	029-7900	Lager	Bearing	1	-
2	029-7901	Schraube	Screw	1	-
3	029-7902	Hutmutter	Acorn Nut	1	-
4	029-7903	Gabelkopf	Clevis	1	-
5	029-7904	Faltenbalg	Bellows	1	-
6	029-5359	Luftmotoreinheit 85	Air Motor Assembly 85	1	-
7	029-7906	Bogen	Elbow	1	-
9	029-7917	Schraube	Screw	3	♠
11	029-7918	Stehbolzen 85	Stay bolt 85	3	-
12	029-7909	Hülse	Sleeve	1	-
13	029-7910	Halteklammer	Retaining clip	1	-
14	029-7911	Motorstangenhülse, getrennt	Motor rod split collar	1	-
15	029-7919	Adapter für AX85	Adapter for AX85	1	-
16	029-7912	Abdeckung	Hood	1	-
17	029-7913	Pumpenkolbenadapter	Pump piston adapter	1	-
18	029-7914	Abdeckungsklammer	Hood clip	1	-
19	029-7915	Schraube	Screw	4	-
20	029-7916	Adapterplatte	Adapter plate	1	-
21	029-8000	Materialpumpeneinheit	Material pump unit	1	-

♠	029-7984	Teile in Reparatursatz enthalten	Parts included in Repair Kit
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4.2 Structural components of pump unit Delta3.3

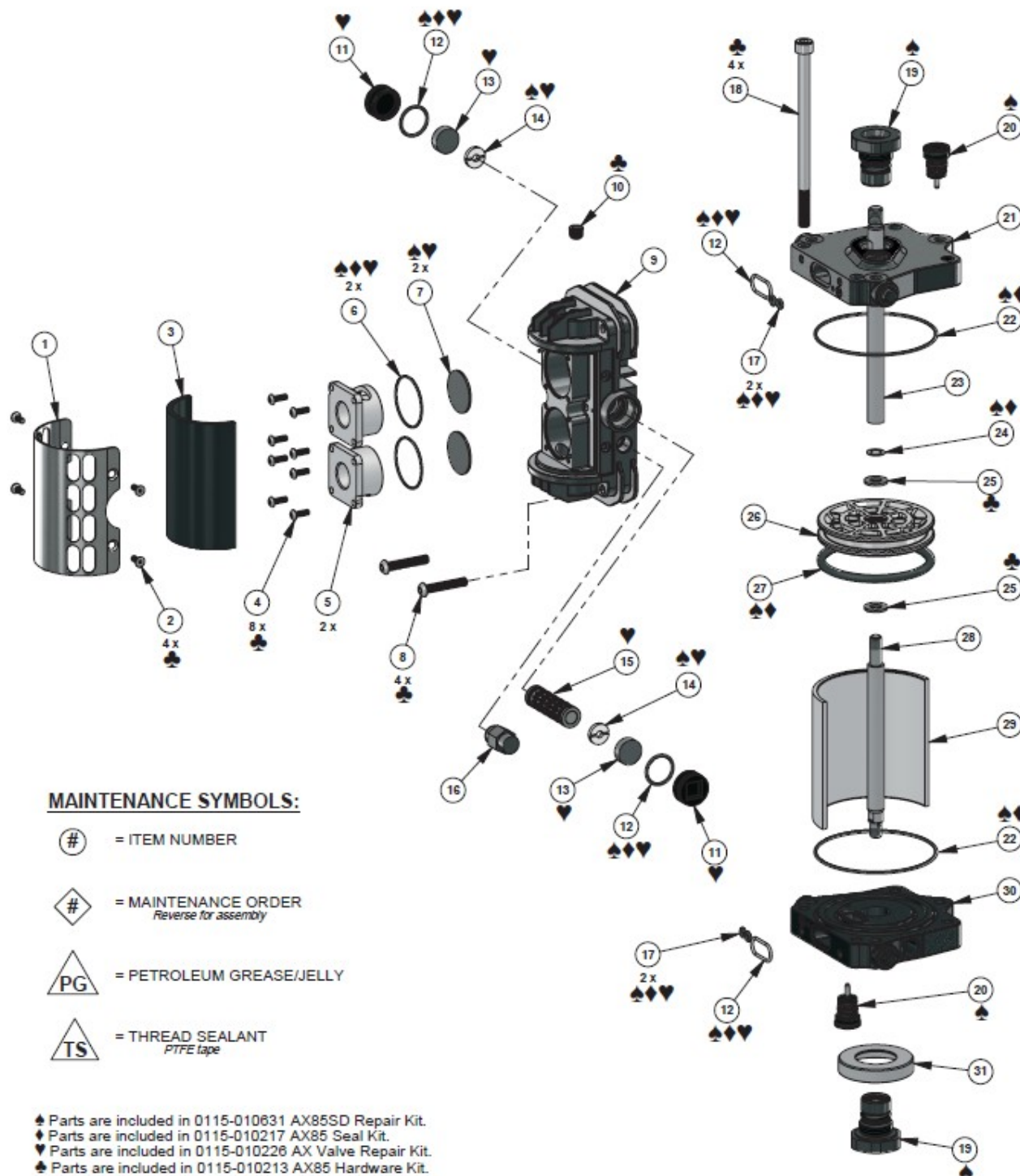


No.	Art. No.	Part description		Qty.	Comments
1	029-8050	Mutter	Nut	2	-
2	029-1313	U-Scheibe	Flat washer	6	-
3	029-8051	Mutter, selbstsichernd	Self-locking nut	3	-
4	029-8052	Schraube	Screw	4	-
5	029-8053	U-Scheibe	Flat washer	12	-
6	029-8054	Pumpenträger Peroxidpumpe, hinten	Rear peroxide pump bracket	1	-
7	029-8055	Hebelarm	Lever arm	1	-
8	029-8056	Stift	Pin	1	-
9	029-8045	Peroxidpumpeneinheit	Peroxide pump unit	1	-
10	029-8057	Abstandhalter	Spacer	3	-
11	029-8059	Schraube	Screw	2	-
12	029-1341	Schraube	Screw	3	-
13	029-8060	Pumpenträger Peroxidpumpe, vorne	Front peroxide pump bracket	1	-
14	029-8066	Harzpumpeneinheit Delta3.3	Resin pump unit Delta3.3	1	-
15	029-8062	Schraube	Screw	4	-
16	029-8063	Doppelnippel	Double nipple	1	-
17	029-8064	Pumpenträger	Pump bracket	1	-
18	029-8065	Mutter, selbstsichernd	Self-locking nut	8	-

4.3 Air motor unit 029-5339



SPECIFICATIONS	
Maximum air inlet pressure:	116 psi (8 bar)
Maximum recommended continuous cycle rate:	20 cycles/min
Air consumption @ 20 cycles/min and 116 psi (8 bar) air inlet pressure:	5.2 SCFM (147 LPM)
Maximum operating temperature:	160°F (71°C)
Air inlet connection:	3/8" BSP (F)
Piston diameter:	3.3 in (85 mm)
Stroke length:	3 in. (75 mm)
Sound level:	96.2 dB
Weight:	6.5 lbs (2.9 kg)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	0115-010023	EXHAUST COVER SCREEN	1
2	0115-010024 ♣	M4 x 10 FLAT HEAD SCREW	4
3	0115-010022	EXHAUST COVER	1
4	0115-010073 ♣	M4 X 12 BUTTON HEAD SCREW	8
5	0115-010019	QUICK EXHAUST VALVE CAGE	2
6	0115-010021 ♠♦♥	O-RING	2
7	0115-010020 ♠♥	DIAPHRAGM	2
8	0115-010026 ♣	M6 x 35 BUTTON HEAD SCREW	4
9	0115-010097	VALVE BLOCK ASSEMBLY	1
10	0115-010107 ♣	1/8 BSPT PIPE PLUG	1
11	0115-010018 ♥	VALVE BLOCK END CAP	2
12	0115-010049 ♠♦♥	O-RING	4
13	0115-010017 ♥	MAGNET	2
14	0115-010016 ♠♥	BUMPER	2
15	0115-010015 ♥	SPOOL AND SLEEVE ASSEMBLY	1
16	0114-014774	SAFETY VALVE	1
17	0115-010051 ♠♦♥	O-RING	4
18	0115-010029 ♣	M8 X 135 CAP SCREW	4
19	0115-010392 ♠	MOTOR ROD CARTRIDGE ASSEMBLY	2
20	0115-010037 ♠	POPPET ASSEMBLY	2
21	0115-010328	UPPER END CAP	1
22	0115-010050 ♠♦	O-RING	2
23	0115-010395	UPPER MOTOR ROD	1
24	0115-010036 ♠♦	SEALING RING	1
25	0115-010035 ♣	M8 WASHER	2
26	0115-010336	PISTON ASSEMBLY	1
27	0114-014466 ♠♦	O-RING	1
28	0115-010034	MOTOR ROD	1
29	0115-010003	CYLINDER	1
30	0115-010006	LOWER END CAP	1
31	101-9442	SHROUD ADAPTER	1

♠ Parts are included in 0115-010631 AX85SD Repair Kit.

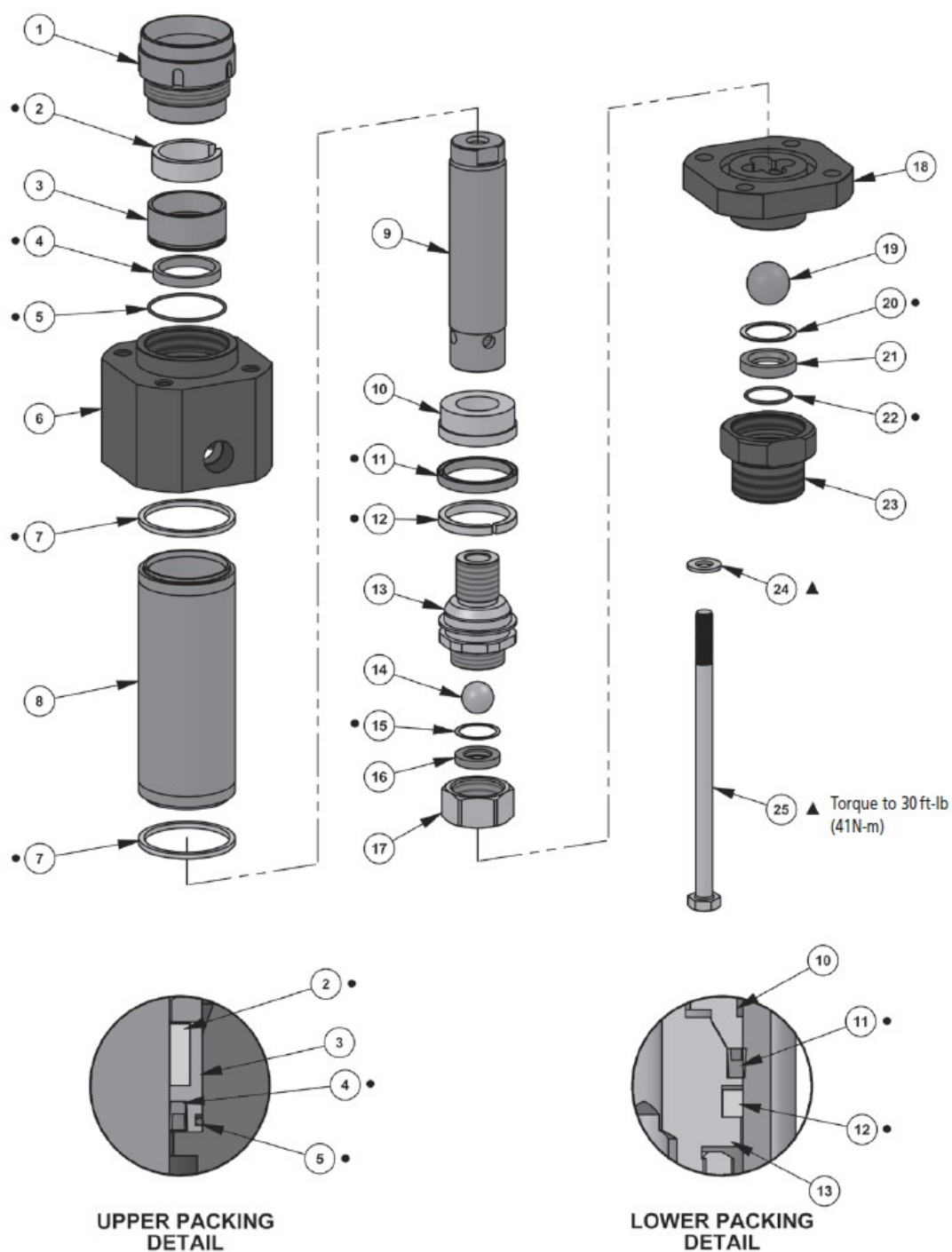
♦ Parts are included in 0115-010217 AX85 Seal Kit.

♥ Parts are included in 0115-010226 AX Valve Repair Kit.

♣ Parts are included in 0115-010213 AX85 Hardware Kit.

4.4 Resin pump 029-8000**SPECIFICATIONS**

Output @ 60 cycles/min:	2.0 gal/m (7.6 l/m)
Maximum fluid pressure:	2000 psi (138 bar)
Maximum operating temperature:	160°F (71°C)
Displacement per cycle:	4.3 oz (127 cc)
Stroke length:	3 in (76 mm)
Fluid inlet size:	1 – 1 1/2 NPT (F) / 1 1/4 – 1 1/2 NPT (M)
Fluid outlet size:	1/2 – 14 NPT (F)
Weight:	10.4 lbs (4.7 kg)
Wetted parts materials of construction:	Stainless Steel, Tungsten Carbide, Hard Chrome, PTFE, Polyethylene



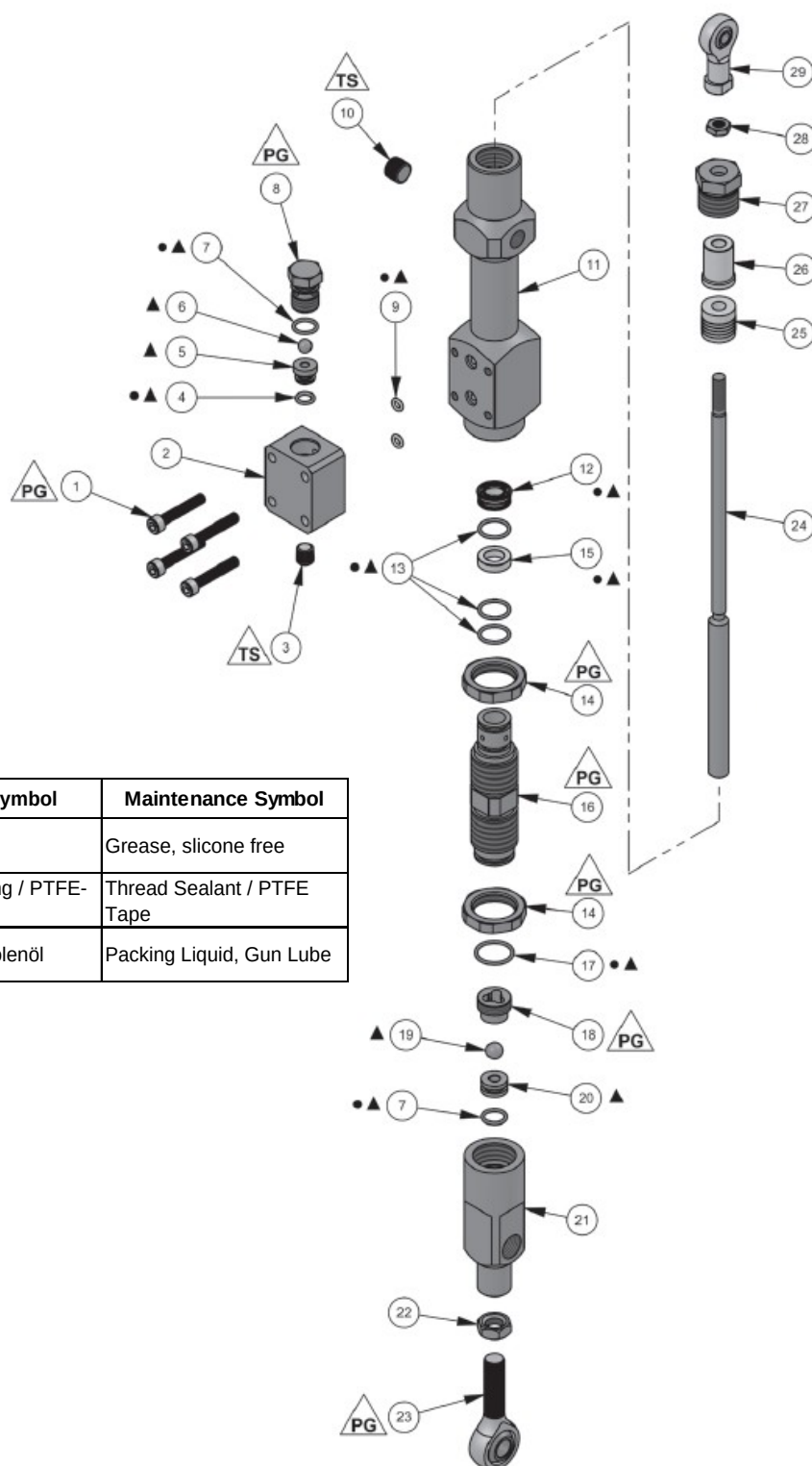
Nr. No.	Art.-Nr. Art. No.	Artikelbeschreibung	Part Description	Stck. Qty.	Bemerkungen Comments
	029-8000	Harzpumpe	Resin pump		
1	029-8001	Packungsmutter	Packing nut	1	•
2	029-8002	Obere Führung	Upper guide	1	
3	029-8003	Oberes Dichtungsgehäuse	Upper seal housing	1	
4	029-5109	Obere Dichtung "U-Cup"	Upper seal "U-cup"	1	•
5	029-8004	O-Ring	O-ring	1	•
6	029-8005	Auslass	Outlet	1	
7	029-0411	Dichtung	Seal	2	•
8	029-8006	Zylinder	Cylinder	1	
9	029-8007	Schaft	Shaft	1	
10	029-8008	Dichtungshalter	Seal holder	1	
11	029-5104	Kolbendichtung	Piston seal	1	•
12	029-5102	Untere Führung	Lower guide	1	•
13	029-8009	Kolbendichtung "U-Cup"	Piston seal "U-cup"	1	
14	029-0249	Kugel	Ball	1	
15	029-0654	Dichtung	Seal	1	•
16	029-8010	Sitz	Seat	1	
17	029-8011	Mutter	Nut	1	
18	029-8012	Fußventilkörper	Foot valve body	1	
19	029-0275	Kugel	Ball	1	
20	029-0367	Sitzdichtung	Seat seal	1	•
21	029-0377	Sitz	Seat	1	
22	029-0290	O-Ring	O-Ring	1	•
23	029-8013	Fußventil	Foot valve	1	
24	029-8014	U-Scheibe	Flat washer	4	▲
25	029-8017	Schraube	Screw	4	▲

•	029-8015	Teile in Dichtungssatz enthalten	Parts included in Seal Kit
▲	029-8016	Teile in Kleinteilesatz enthalten	Parts included in the Hardware Kit

4.5 Peroxide pump 029-8045

SPECIFICATIONS

Maximum working pressure:	2000 psi (138 bar)
Inlet connection:	1/4" NPT (F)
Outlet connection (2x):	1/8" NPT (F)
Maximum stroke:	2.95" (75 mm)
Output / cycle @ max. stroke:	.17 oz. (5.1 cc)
Wetted parts (materials of construction):	Stainless Steel, PTFE, Silicone Rubber

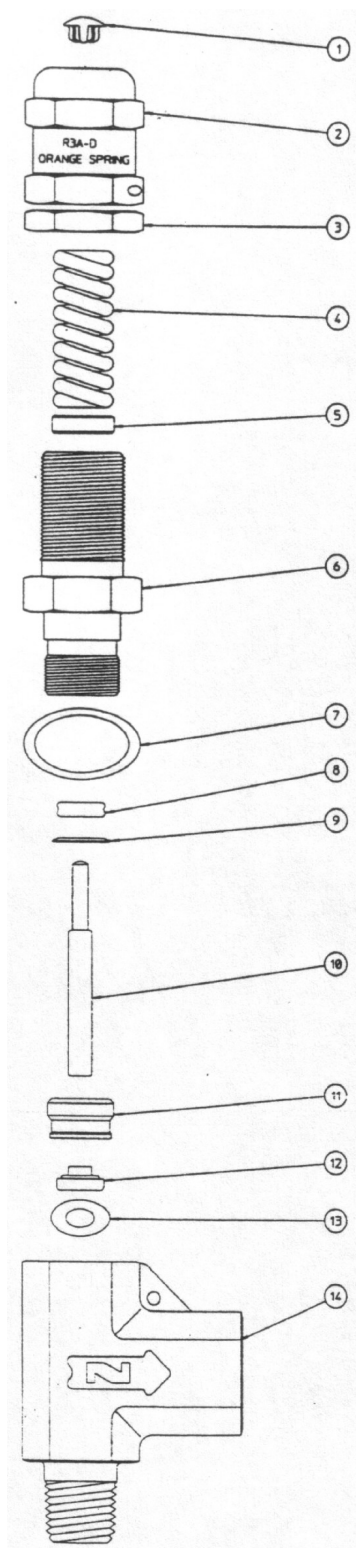


	Wartungssymbol	Maintenance Symbol
	Fett, silikonfrei	Grease, silicone free
	Gewindedichtung / PTFE-Dichtband	Thread Sealant / PTFE Tape
	Gleitmittel, Pistolenöl	Packing Liquid, Gun Lube

Nr. No.	Art.-Nr. Art. No.	Artikelbeschreibung	Part description	Stck. Qty.	Bemerkungen Comments
	029-8045	Peroxidpumpeneinheit	Peroxide pump unit		
1	029-8020	Schraube	Screw	4	
2	029-8021	Ventilblock	Valve block	1	
3	029-5340	Rohrstopfen	Pipe plug	1	
4	029-5333	O-Ring	O-Ring	1	▲●
5	029-8022	Oberer Sitz	Upper seat	1	▲
6	029-5331	Oberere Kugel	Upper ball	1	▲
7	029-3463	O-Ring	O-Ring	2	▲●
8	029-8023	Oberer Kugelkäfig	Upper ball cage	1	
9	029-4601	O-Ring	O-Ring	2	▲●
10	029-8024	Rohrstopfen	Pipe plug	1	
11	029-8025	Oberes Rohr	Upper pipe	1	
12	029-8026	Untere Dichtung	Lower seal	1	▲●
13	029-3418	O-Ring	O-ring	3	▲●
14	029-8027	Kontermutter	Lock nut	2	
15	029-8028	Kolbenführung	Piston guide	1	▲●
16	029-8029	Unteres Rohr	Lower pipe	1	
17	029-8030	O-Ring	O-ring	1	▲●
18	029-8031	Unterer Kugelkäfig	Lower ball cage	1	
19	029-8032	Untere Kugel	Lower ball	1	▲
20	029-8033	Unterer Sitz	Lower seat	1	▲
21	029-8034	Fußventil	Foot valve	1	
22	029-8035	Kontermutter	Lock nut	1	
23	029-8036	Lager	Bearing	1	
24	029-8037	Pumpenkolben	Pump piston	1	
25	029-8038	Obere Packungseinheit	Upper packing unit	1	▲●
26	029-8039	Lager	Bearing	1	▲●
27	029-8040	Packungsmutter	Packing nut	1	
28	029-8041	Mutter	Nut	1	
29	029-8042	Lager	Bearing	1	

●	029-8043	Teile in Dichtsatz enthalten	Parts included in Seal Kit
▲	029-8044	Teile in Reparatursatz enthalten	Parts included in Repair Kit

5. Overflow valve 029-3449



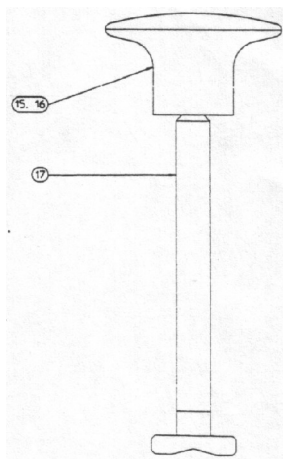
Nummer / No.	Artikelbezeichnung	Part description
1	Stopfen	Cap plug
2	Justierkappe	Adjustment cap
3	Kontermutter	Lock nut
4	Feder lilä	Spring
5	Unterlegscheibe	Washer
6	Haube	Hood
7	O-Ring	O-ring
8	Ring	Upper seal ring
9	Sicherungsring	Securing ring
10	Spindel	Spindle
11	Spannschraube	Clamping screw
12	Einsatz	Insert
13	O-Ring	O-ring
14	Gehäuse	Housing
15	Griff	Handle
16	Einstellschraube	Adjusting screw
17	Zugstange	Pull rod

Dichtungssatz / Seal Kit 029-3531

Beinhaltet 2 O-Ringe (7) (13), Ring (8), Sicherungsring, Viton und Anleitung
 Contains 2 O-rings (7) (13), ring (8), securing ring, Viton and instructions

Federsatz / Spring Kit 029-3912

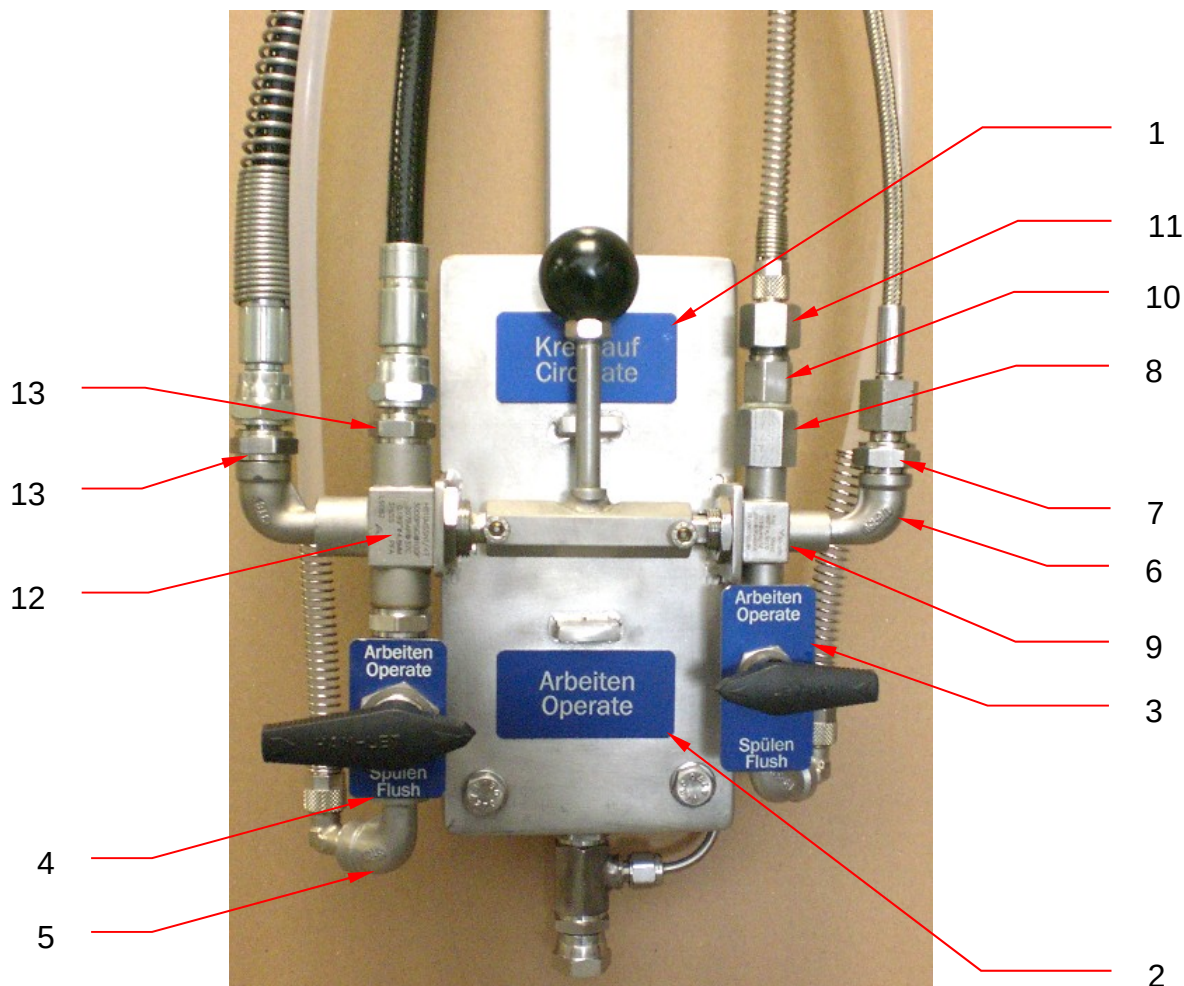
Beinhaltet Feder (4), Unterlegscheibe (5), Draht, Etikett, Versiegelung und Anleitung
 Contains springs (4), washer (5), wire, label, seal and instructions



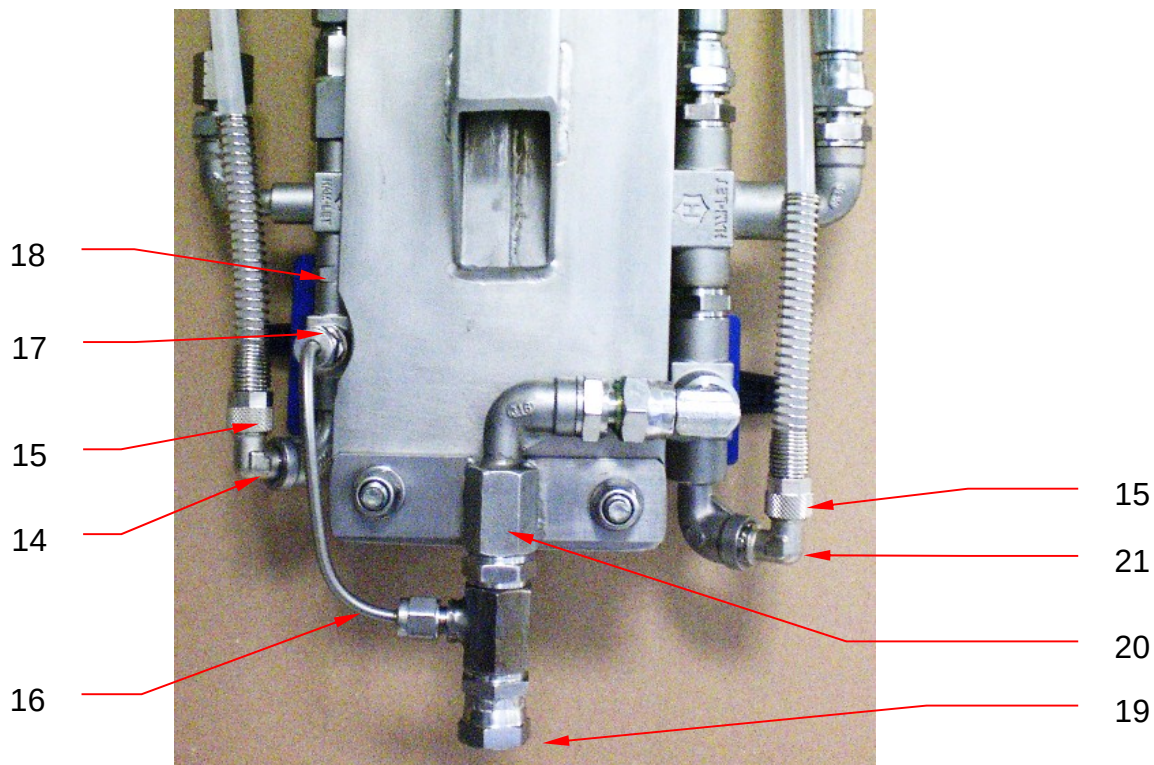
Griffsatz / Handle Kit 029-3451

Beinhaltet Griff (15), Einstellschraube (16) und Zugstange (17)
 Contains handle (15), adjusting screw (16) and pull rod (17)

6. Mixing head 028-1220

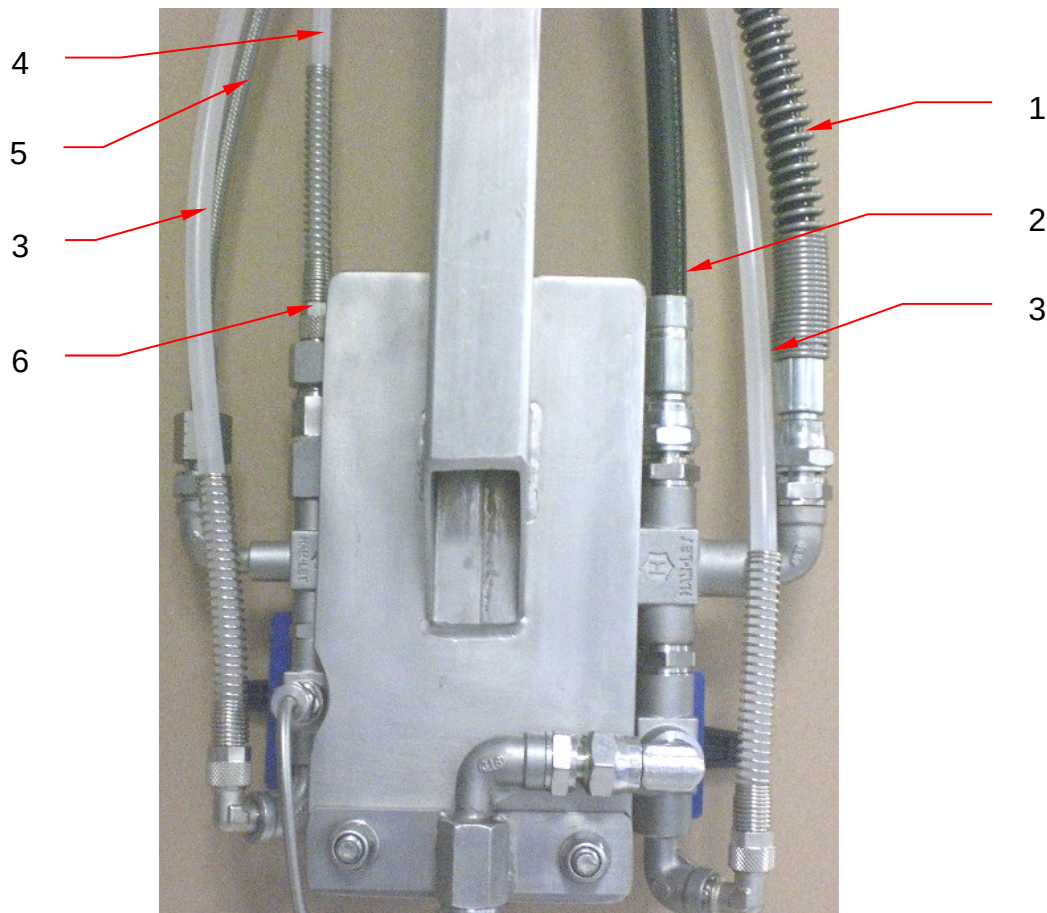


Nr. No.	Artikelnr. Art. No.	Artikelbeschreibung	Part description	Anzahl Quantity	Bemerkungen Comments
1	029-6227	Etikett "Kreislauf / Circulate"	Label "Kreislauf / Circulate"	1	-
2	029-6225	Etikett "Arbeiten / Operate"	Label "Arbeiten / Operate"	1	-
3	029-6224	Etikett "Arbeiten / Operate" - "Spülen / Flush"	Label "Arbeiten / Operate" - "Spülen / Flush"	1	-
4	029-3994	Etikett "Arbeiten / Operate" - "Spülen / Flush"	Label "Arbeiten / Operate" - "Spülen / Flush"	1	-
5	029-1791	Winkel 90°	Elbow 90°	1	-
6	029-3993	Winkel 90°	Elbow 90°	1	-
7	029-3082	Doppelnippel VA	Double nipple SS	1	-
8	029-5549	Nippel 1/4"-1/8"A	Nipple 1/4"-1/8"O	1	-
9	029-1840	3-Wegekugelhahn VA 1/8"	3-way ball valve SS 1/8"	2	-
10	029-0311	Rückschlagventil 10 psi, VA	Check valve 10 psi, SS	1	-
11	029-4753	Nippel 1/8"-6/4	Nipple 1/8"-6/4	1	-
12	029-1946	3-Wegekugelhahn VA 1/4"	3-way ball valve SS 1/4"	2	-
13	029-0097	Doppelnippel VA	Double nipple SS	2	-



Nr. No.	ArtikelNr. Art. No.	Artikelbeschreibung	Part description	Anzahl Quantity	Bemerkungen Comments
14	029-4799	Einschraubwinkel 1/8"-8/6	Screw connection elbow 1/8"-8/6	1	-
15	029-1131	Knickschutzverschraubung	Kink protection screw connection	2	-
16	028-0539	Zulaufrohr Peroxid	Peroxide feed pipe	1	-
17	028-0495	Peroxidanschluß mit RSV	Peroxide connection with check valve	1	-
18	029-3811	Doppelnippel	Double nipple	1	-
19	029-4578	Verschraubung	Screw connection	1	-
20	029-070	Platten-Rückschlagventil	Plate check valve	1	Nicht abgebildet Not shown
21	029-1118	Einschraubwinkel 1/4"-8/6	Screw connection elbow 1/4"-8/6	1	

7. Hoses



Nr. No.	Artikelnr. Art. No.	Artikelbeschreibung	Part description	Anzahl Quantity	Bemerkungen Comments
1	029-5380	HD-Schlauch 1/4"-1/4", 5 m	HP hose 1/4"-1/4", 5 m	1	-
2	0295360	Rücklaufschlauch 1/4", 2,5 m	Return hose 1/4", 2.5 m	2	-
3	029-0804	PE-Schlauch 8x6	PE hose 8 x 6	6 m (x 2)	-
4	029-3448	PE-Schlauch 6x4	PE hose 6 x 4	6 m	-
5	029-5486	Peroxidschlauch PTFE-HD 5.0 m, NW 3,0	Peroxide hose PTFE-HP 5 m, DN 3.0	1	-
6	029-4786	Knickschutzverschraubung	Kink protection screw connection	1	-

8. Filter regulator 029-4057



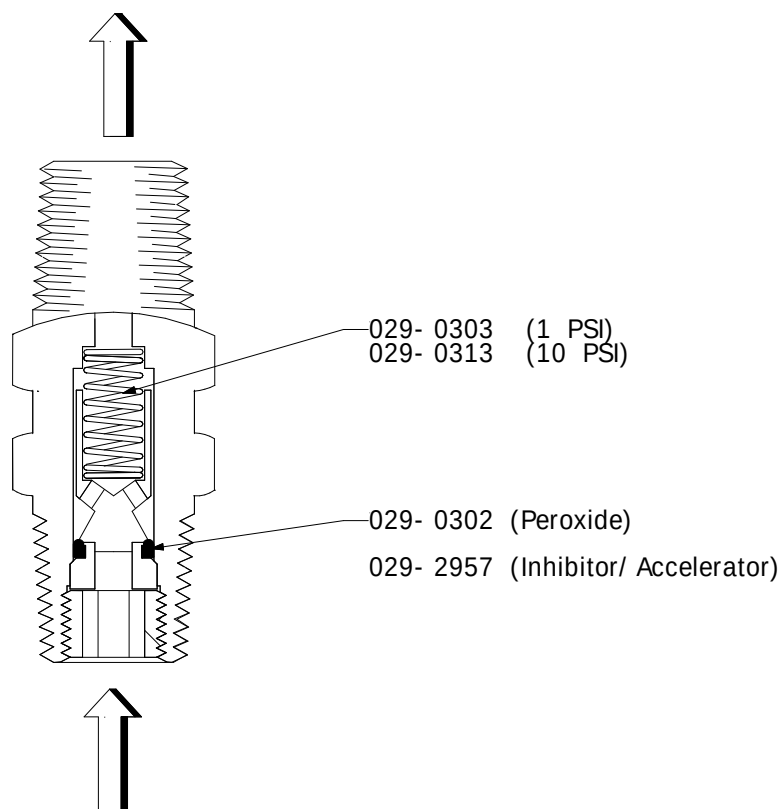
1739

Nummer No.	Artikelbezeichnung	Part description	Artikelnummer Art. No.
1	Filterregler ½" komplett	Filter regulator ½" complete	029-4057
2	Verschleißteilesatz	Wearing part kit	029-4091
	Bestehend aus: - Membrane komplett - Ventilkegel komplett - O-Ring 50x2	Consisting of: - diaphragm, complete - valve plug, complete - O-ring 50 x 2	
3	Filterelement 5 µm	Filter 5 µm	029-4092

9. Check valve VA

Versions:

- 029-0301 1 PSI
- 029-0311 10 PSI
- 029-4059 einstellbar/adjustable 1-6 bar



Designation/

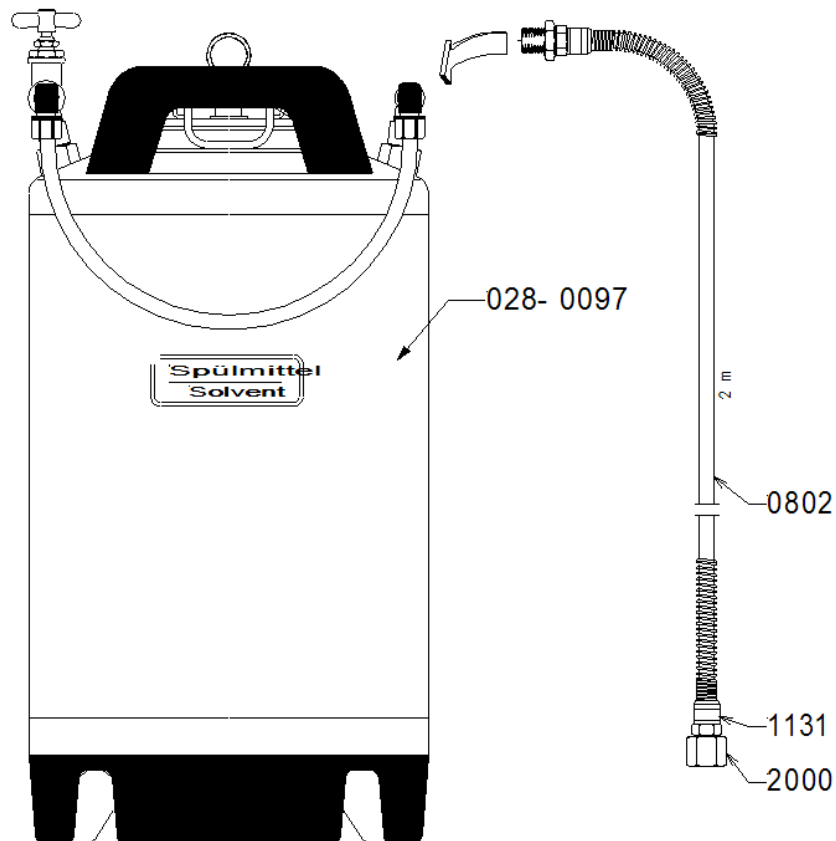
BÜFA Tec Delta3.3 RTM

BÜFA

Art. No.:

028-4469

10. Flushing tank 10 l, VA / SS 028-0097



Bestell-Nr.: 029-xxxx

Order No.: 029-xxxx

BÜFA Composite Systems GmbH & Co. KG
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A member of the BÜFA group

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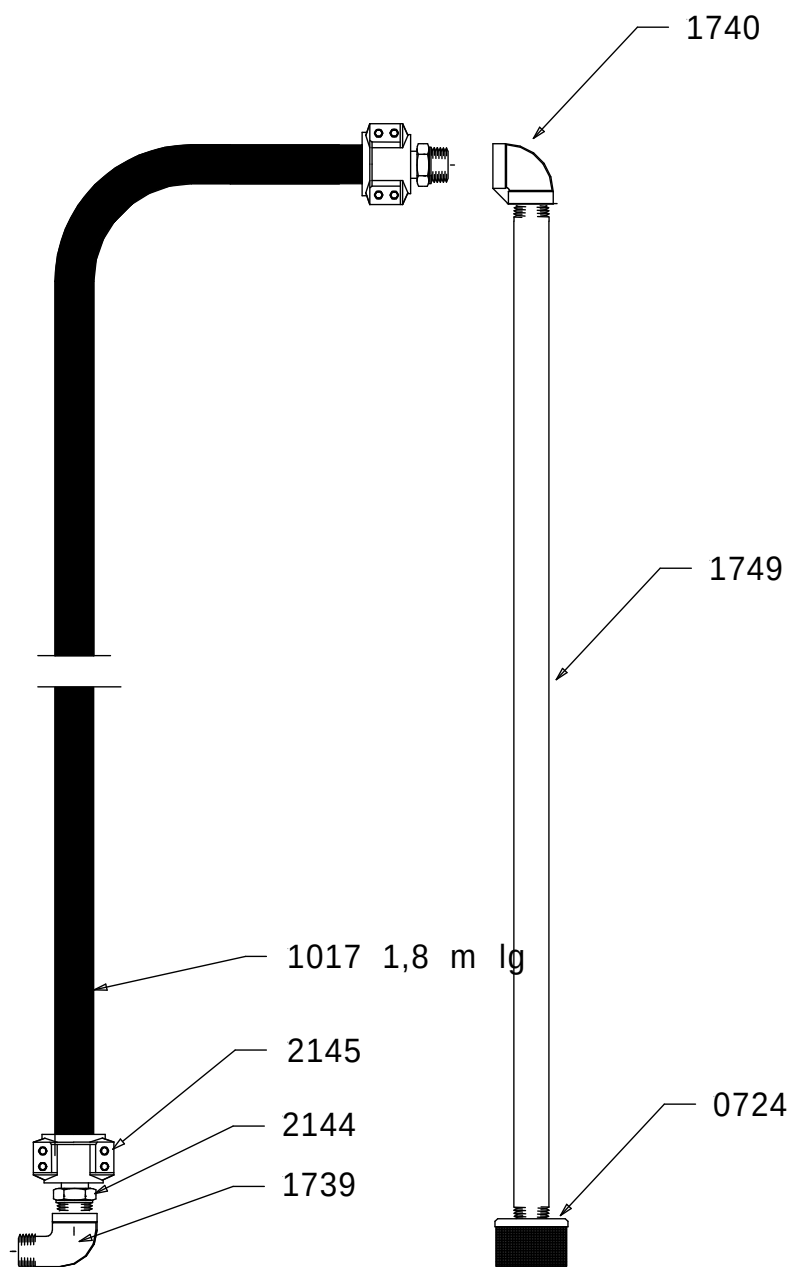
Replaces: Rev1-05.07.2013

Page

34 /
50

11. Resin drum suction unit 1" 028-0246

Replacement: 0291739 and 0292144 are replaced by 0293790



Bestell-Nr.: 029-xxxx

Order No.: 029-xxxx

12. Remedy in case of a problem

12.1 Material härtet nicht aus / Material does not cure:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognisable by	Abhilfe / Remedy
Härteraugschlauch ist geknickt / There is a kink in the hardener suction hose	Schlauchverlauf / Check course of hose	Schlauch knickfrei anbringen / Connect hose knick-free
Kein bzw. nicht genug Härter eingefüllt / No hardener or an insufficient quantity has been filled in	Saugschlauch nicht gefüllt / Suction hose is not filled	Härter mindestens bis über den Filter an der Ansauggarnitur füllen / Fill hardener to at least above the filter on the suction assembly.
Härterpumpe nicht entlüftet / Hardener pump not vented	Luftblasen im Saugschlauch / Air bubbles in suction hose	Siehe Punkt „Enlüftung der Peroxidpumpe“ See chapter “Venting the Peroxide Pump”
Härteranteil zu niedrig (0%) eingestellt / Hardener rate is set too low (0%)	% - Skala an Härterpumpe / % - scale on hardener pump	Härterkreis entlasten durch Ziehen des roten Knopfes. Härterpumpe abziehen. Gewünschte Prozentzahl durch Drehen des unteren blauen Rädchens einstellen. / Relieve pressure in hardener circulation by pulling the red knob. Disconnect the hardener pump. Set the desired percentage by turning the lower blue adjustment cog.
Härterpumpe defekt / Hardener pump is defective		Pumpe auswechseln / Replace pump.
Peroxid-Injector verklebt oder defekt / Peroxide injector is clogged or defective		Injector säubern oder erneuern / Clean or renew the injector.
Härterpumpe nicht angeschlossen / Hardener pump is not connected	Härterpumpe läuft nicht / Hardener pump does not work	Härterkreis entlasten durch Ziehen des roten Knopfes. Härterpumpe an den Schaft der Harzpumpe anschliessen Relieve pressure in hardener circulation by pulling the red knob. Connect the hardener pump to the shaft of the resin pump.
Härteraugschlauch zieht Luft / Hardener suction hose draws air	Luftblasen im Saugschlauch / Air bubbles in suction hose	Schlauch abdichten/austauschen / Seal or exchange hose.

12.2 Material härtet zu langsam aus / Material cures too slowly:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognisable by	Abhilfe / Remedy
Härteranteil zu niedrig (0%) eingestellt / Hardener rate is too low (0%)	% - Skala an Härterpumpe / % - scale on hardener pump	Härterkreis entlasten durch Ziehen des roten Knopfes. Härterpumpe abziehen. Gewünschte Prozentzahl einstellen. / Relieve pressure in hardener circulation by pulling the red knob. Disconnect the hardener pump. Set the desired percentage of hardener.
Härtersaugschlauch ist geknickt / There is a kink in the hardener suction hose	Schlauchverlauf / Check course of hose	Schlauch knickfrei anbringen / Connect hose knick-free.
Härtersaugschlauch zieht Luft / Hardener suction hose draws air	Luftblasen im Saugschlauch / Air bubbles in suction hose	Schlauch abdichten/austauschen / Seal or exchange hose.
Peroxid-Injector verklebt oder defekt / Peroxide injector is clogged or defective		Injector säubern oder erneuern / Clean or renew the injector.
Härterpumpe defekt / Hardener pump is defective		Pumpe auswechseln / Replace pump.
Peroxidnadel in der Pistole defekt / Peroxide needle in the gun is defective /		Nadel auswechseln / Replace needle.
Überströmventil defekt/verschmutzt / Overflow valve is defective/soiled		Ventil reinigen/auswechseln / Clean/replace overflow valve
Härterpumpe nicht entlüftet / Hardener pump not vented	Luftblasen im Saugschlauch / Air bubbles in the suction hose	Siehe Punkt „Enlüftung der Peroxidpumpe“ / See chapter “Venting the Peroxide Pump”. /
Material zu kalt / Material is too cold		Temperatur erhöhen (Fassheizung / Durchlauferhitzer). / Increase temperature (drum heating / continuous heater)./

12.3 Material härtet unregelmäßig aus (Fleckenbildung) / Material cures irregularly (spotting):

Mögliche Ursache / Possible Cause	Erkennbar an / Recognisable by	Abhilfe / Remedy
Härteraugschlauch ist geknickt / There is a kink in the hardener suction hose	Schlauchverlauf / Check course of hose	Schlauch knickfrei anbringen / Connect hose knick-free.
Härteraugschlauch zieht Luft / Hardener suction hose draws air	Luftblasen im Saugschlauch / Air bubbles in suction hose	Schlauch abdichten/austauschen / Seal or exchange hose.
Härterpumpe nicht entlüftet / Hardener pump not vented	Luftblasen im Saugschlauch / Air bubbles in suction hose	Siehe Punkt „Enlüftung der Peroxidpumpe“ / See chapter “Venting the Peroxide Pump”.
Peroxidnadel in der Pistole defekt / Peroxide needle in the gun is defective /		Nadel auswechseln / Replace needle.
Überströmventil defekt/verschmutzt / Overflow valve is defective/soiled		Ventil reinigen/auswechseln / Clean/replace overflow valve
Härteranteil zu hoch eingestellt / Hardener rate is too high	% - Skala an Härterpumpe / % - scale on hardener pump	Härterkreis entlasten durch Ziehen des roten Knopfes. Härterpumpe abziehen. Gewünschte Prozentzahl einstellen. / Relieve pressure in hardener circulation by pulling the red knob. Disconnect the hardener pump. Set the desired percentage of hardener.

12.4 Material härtet zu schnell aus / Material cures too quickly:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognisable by	Abhilfe / Remedy
Härteranteil zu hoch eingestellt / Hardener rate is too high	% - Skala an Härterpumpe / % - scale on hardener pump	Härterkreis entlasten durch Ziehen des roten Knopfes. Härterpumpe abziehen. Gewünschte Prozentzahl einstellen. / Relieve pressure in hardener circulation by pulling the red knob. Disconnect the hardener pump. Set the desired percentage of hardener.
Harzpumpe saugt Vakuum / Resin pump draws a vacuum		Ansaugsieb reinigen. Saugseite auf Verengung/Verschluss prüfen. / Clean the suction strainer. Check the suction side for narrowing/closure.

12.5 Harzpumpe läuft nicht / Resin pump does not work:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognisable by	Abhilfe / Remedy
Druckluftzufuhr nicht geöffnet / Compressed air inlet is not open		Drucklufthähne zur Maschine und zur Harzpumpe öffnen / Open the compressed air valves on the machine and the resin pump.
Pumpendruck zu gering / Pump pressure is too low		Druck erhöhen / Increase pressure.
System eingehärtet / System has cured		Reinigen, Schläuche ersetzen / Clean, replace hoses.

12.6 Harzpumpe bleibt stehen / Resin pump stops:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognizable by	Abhilfe / Remedy
Schläuche teilweise eingehärtet / Material has cured in parts of the hoses		Schläuche ersetzen / Replace hoses.
Schläuche durch abgelöste, ausgehärtete Harzreste verstopft / Hoses clogged with detached remains of cured resin		Schläuche ersetzen / Replace hoses.

Designation/

BÜFA Tec Delta3.3 RTM



Art. No.:

028-4469

12.7 Peroxidpumpe nicht von der Harzpumpentransmission abziehbar / The peroxide pump cannot be disconnected from the resin pump:

Mögliche Ursache / Possible Cause	Erkennbar an / Recognizable by	Abhilfe / Remedy
Härterdruck nicht (genügend) abgelassen/ Hardener pressure not (sufficiently) relieved		Härterkreis entlasten durch Ziehen des roten Knopfes. / Relieve pressure in hardener circulation by pulling the red knob.

13. EC Declaration of Conformity in accordance with EC Machinery Directive 2006/42/EC, Annex II

We herewith declare that the design and construction of the machinery designated below complies with the basic safety and health requirements of the EC Machinery Directive.

Designation of the machine: Injection unit Delta3.3 RTM
 Intended use: Injection of polyester resin systems
 Machine type: 028-4496
 Machine number: _____

The following health and safety relevant standards are applicable for the above named machine:

- In accordance with EC Machinery Directive 2006/42/EC
 - o EN ISO 12100:2010
Safety of machinery - Basic concepts, general principles for design
- in accordance with the ATEX Safety Directive 2014/34/EU
 - o EN 1127-1:2011
Explosive atmospheres — Explosion prevention and protection
Part 1: Basic concepts and methodology

Address of manufacturer: BÜFA Composite Systems GmbH & Co. KG
 BÜFA Tec
 Hohe Looe 2-8
 26180 RASTEDE

Commissioning of this machine is prohibited until it is established that the final product fulfils the requirements of the EC Machinery Directive 2006/42/EC.

This declaration ceases to be valid if the machine is not used as intended or if the machine is modified without our consent.

Rastede, July 30, 2015

Signature:
 (i.V. Lars Franke, Head of BÜFA Tec)

14. Safety and operating instructions for operating the Delta3.3 RTM

14.1 Before commissioning

Compressed air lines and power cables must be properly laid and installed. Fittings, screwed connections as well as length, cross section and quality of hose lines must meet specifications.



The machine may only be operated if all devices relevant to protection and safety, e.g. suction devices, earthing cable, etc. are installed and functional and safety distances are observed.



Before using, the machine must always be connected to an earthing cable; otherwise explosive electrostatic charges may form during operation.

14.2 During operation

Always observe the safety instructions given on the machine!



Before switching on/starting the machine, always make sure that no one can be injured by the running machine.



Never point spraying equipment or spraying guns at people and never hold your hand or finger in front of the nozzle or spray head! Secure guns by locking after working and during work pauses!



Personal protective equipment must be prescribed by the operator of the machine and provided; as a minimum, equipment should consist of protective glasses and protective gloves.



Tightly fitting work clothes are recommended and the wearing of jewellery should be prohibited since there is a risk of injury by getting caught or pulled in.



Do not switch-off or remove extraction and ventilation devices while the machine is running. If there is insufficient ventilation, the use of respiratory protection is recommended.

The permissible operation pressures given on the type plate should not be exceeded.

Refrain from any manner of working that presents a risk to safety!

14.3 Inspections

Examine the machine at least once per shift for externally visible damage and defects!
All lines, hoses and screwed connections should be regularly examined at least once a year for leaks and externally visible damage!

The pressure tank is a component relevant to safety and must be inspected every 3 years by a qualified or authorised person in accordance with the requirements of industrial safety and health regulations.

Any changes that occur (including operational performance) must be immediately reported to the responsible person. At the slightest doubt, the machine should be immediately shut down and secured.

It is also recommended to keep records of inspections as well as modifications, malfunctions and repairs in a company log book.

Subject to technical modification!	Rev2-30.07.2015	Page
	Replaces: Rev1-05.07.2013	43 / 50

14.4 Maintenance and modifications

This type of work may only be carried out by expressly authorised, qualified personnel. In case of uncertainty, always check with your superior.

Operating personnel should always be informed before special or maintenance work is begun! A supervisor should be named.



Protective glasses and protective gloves must always be worn whenever modifications are made or maintenance work is carried out on the machine.

Before beginning repair work, all system sections and pressure lines should be de-pressurised and the system relieved.

When carrying out work, always observe the switch-on and switch-off procedures given in the operating instructions as well as in the instructions and notes given for maintenance work!

Before beginning maintenance work/repairs, clean or rinse off operating and care agents on the machine - especially at connections and screwed connection. Fibre-free cleaning rags can be used for this.

Use only silicone-free lubricants! The ingredients in silicone can cause defects on the surface and should therefore be kept away from production facilities.

Screwed connections that have become loose during maintenance work or repairs should be tightened again before operating.

If safety devices must be dismantled when modifying, maintaining or repairing, these devices must be immediately mounted again after maintenance and repairs have been carried out and examined to ensure that they function.

In case of changes to the machine or its operational performance that are relevant to safety, the machine should be shut down immediately and the responsible person notified of the malfunction. In this case, the machine may no longer be operated.



Make sure that operating aids and auxiliary agents as well as replaced parts are disposed of safely in compliance with environmental regulations!

14.5 Intended Use

The machine may only be used when it is in sound technical state and only for the intended purpose in a safety and danger-conscious manner according to operating instructions!
Especially malfunctions that could impair safety must be remedied immediately.

The manufacture/supplier will not be liable for any damage resulting from use other than the intended purpose. Risk is the sole responsibility of the user.
Observance of the operating instructions is an inherent part of the intended use.

14.6 Modifications /Changes

No changes, modifications or conversions may be made to the machine that impair safety without consent by the supplier!
This especially applies to the installation and adjustment of safety devices and safety valves.

14.7 Accessories and Spare Parts

Spare parts must meet the technical specifications stipulated by the manufacturer. This is always guaranteed with original, BÜFA Tec spare parts.

14.8 Handling hazardous substances (leaks, storage, etc.)

When operating, flammable products as well as peroxides are used in this machine that build pressure when warmed and may thus explode.

Always read the Operating Instructions and the Safety Data Sheets for the products first. The protective measures set out in these documents should be strictly observed.

Ingredients in the products evaporate very easily (styrene, acetone, etc.)

This presents two main risks:



1. **Health risk** by concentration of hazardous substances in breathing air
(see **Hazardous substances - Operating Instructions**)



2. **Risk of fire and explosion** through formation of explosive mixtures

- Containers should always be kept closed or covered (mixing container, acetone washing container, container for prior weighing, etc.)
- Always ensure good ventilation (extraction, fresh air, etc.).
- When filling from one container to another, all tanks and containers must be earthed (earthing clamps).
- Always make sure that no soil gets into the peroxide so that the peroxide cannot react uncontrolled; otherwise there is a risk of explosion.

If the unit leaks, the machine should be shut down immediately (switching off as well as interrupting compressed air supply) and the leak repaired.

15. Test record for spraying units

For safety testing by a qualified person in accordance with guideline BGV D 15 "Working with Liquid Blasters" issued by the [German] accident insurance associations organised by industry.

 BÜFA tec		BÜFA Composite Systems GmbH & Co. KG Hohe Looge 2-8 26180 Rastede GERMANY Phone +49 4402 975-0 Fax +49 4402 975-300 buefatec@buefa.de www.buefacompositesystems.com A member of the BÜFA group		Date: Tester:													
<u>STAMP OF DEALER:</u>			<u>ADDRESS OF OPERATOR:</u> Name: Street: Postal code/city: Contact: Telephone:														
<u>Tested device:</u> Manufacturer:			Device No.:														
Type:			Year made:														
<u>Components of the unit used:</u> <table border="0"> <tr> <td>☐ Spraying material pump</td> <td>☐ Pump holder</td> <td>☐ Chassis</td> <td>☐</td> </tr> <tr> <td>☐ Airless gun</td> <td>☐ Tripod</td> <td></td> <td>☐</td> </tr> <tr> <td>☐ Spraying material line</td> <td>☐ Wall bracket</td> <td></td> <td>☐</td> </tr> </table>						☐ Spraying material pump	☐ Pump holder	☐ Chassis	☐	☐ Airless gun	☐ Tripod		☐	☐ Spraying material line	☐ Wall bracket		☐
☐ Spraying material pump	☐ Pump holder	☐ Chassis	☐														
☐ Airless gun	☐ Tripod		☐														
☐ Spraying material line	☐ Wall bracket		☐														
Tested components	Meets requirements	Not tested	Does n o t meet requirements	Retrofitting recommended													
General state of the unit																	
<u>Liquid blaster</u>																	
Device type plate																	
Safety valve																	
Pressure measuring device																	
Pressure relief valve																	
<u>Liquid blaster with heater</u>																	
Temperature limiter/regulator																	
Temperature display																	
<u>Spraying unit</u>																	
Label max. pressure																	
Label device no.																	
Functionality																	
Safety equipment																	
<u>Hoses and fittings</u>																	
Label hose																	
Label fittings																	
<u>Earthing</u>																	
Between components																	
Total unit																	
<u>Operating Instructions</u>																	
<u>Function of entire unit</u>																	
<u>Notes for operator</u>																	
Technical state																	
Safety status																	
Health and safety devices																	
<u>Overall assessment of the test</u>																	
<u>Comments:</u>																	

16. Test certificates

[illegible]

17. Brief Instructions

(Does not replace the detailed Operating Instructions!)

Before injecting:

- Earth the unit
- Bring the temperature of the material to at least 18 ° C. Stir the material!
- Is there a sufficient quantity of peroxide in the tank? (Observe safety instructions!)
- Allow sufficient material to circulate ("Circulate").
- Set the number of strokes required on the stroke counter (1 double stroke = 127 ml).
- If applicable, repair leaks and damage.

During injection:

- Turn the ball valves on the mixing head in the "Operate" position.
- Control the peroxide pressure and peroxide volume flow rate.
- Flush after the injection process.

In case of malfunction:

- Switch off the air motor of the resin pump.
- Observe notes on safety!
- Relieve pressure in the unit.
- Repair the malfunction.
- Use only original BÜFA Tec parts.

After injecting

- Uncouple the air hose and relieve material pressure.
- Open the tank lid valve.
- Clean the mixing head thoroughly.

Designation/

BÜFA Tec Delta3.3 RTM



Art. No.:

028-4469

18. Notes

Subject to technical modification!	Rev2-30.07.2015	Page
	Replaces: Rev1-05.07.2013	50 / 50