



Operator's Manual

Minibooster 1, 2, 3

Doppelbooster

Minibooster 2 HD, 3 HD, 2 HD C, HDSR

Code:

Please keep for future reference!

Revision			
Date	Chapter	Reason	Responsible
21.03.2006	Alles	Neuerstellung	Schnitzer

This manual has been created to the best of our knowledge. Should you find any mistakes please let us know. Moreover, we will be thankful for any advice or proposal you might offer us.

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1 General Information

1.1 Extent of delivery

1.1.1 Standard extent

The following components are standard.

Pos.	Components
1	Reservoir
2	Air filter
3	Lubricant for set-up
4	Keys for metal box

Please check if consignment is complete.

1.1.2 Accessories

See annex 10.1, accessories external lubrication

1.2 Liability, Guarantee, Warranty

Warranty on ACCU-LUBE MiniBoosters is 2 years, valid from date of purchase, not including hoses, nozzles and reservoir.

Warranty will expire, if

- There are damages caused by an accident, incorrect installation, wilful destruction, incorrect use and/or
- The Minibooster is operated with lubricants not approved by ACCU-LUBE Manufacturing GmbH

Should warranty claims be effective, the faulty parts will be replaced free of charge.

Before returning the defective MiniBooster, please call us. You will find the contact addresses under chapter 7.2, „contact addresses“.

2 Safety

2.1 Intended use

Operational safety of the Minibooster is guaranteed only when used intendedly .

Intended use

Minibooster are used for dispersion and supply of lubricants for **internal lubrication** for the following operations:

- Metal processing operations, like drilling, milling, bending
- Assembly of components etc.

Combination of Minibooster and an applicator for external lubrication. Only specified lubricants can be dispersed and supplied.

It is possible to supply only compressed air without any lubricant, for example to blow out chips from workpieces or tools.

Incorrect use

Incorrect use means, if

- Lubricants other than the specified ones are used
- The Minibooster is operated at pressures higher than stated under “technical data”

The Minibooster is not for designed for external lubrication. Should it be used for external lubrication please follow the safety instructions.

2.2 Personal Safety Equipment

Personal safety equipment comprises protective gloves and possibly respiration protection.

2.3 Safety Instructions



Warning!

Ignoring the information in this operator's manual can lead to injuries of persons and defects at the Minibooster.

The operator's manual, especially the safety instructions, must be read and observed by each person who operates the Minibooster.



Attention!

The company's internal safety and health regulations must be observed .



Attention!

Use suitable lifting gear for the transport of the Minibooster.

Start with installation only after Minibooster has been mounted safely.

Wear safety shoes during transport!.



Attention!

Do not lean, hang or rest upon on Minibooster.



Attention!

The Minibooster must be operated only at an input pressure of 6-8 bar.



Attention!

Do not mount the Minibooster with magnets if it is moved during operation.



Attention!

When filling the reservoir, make sure no lubricant is spilled. If lubricant has been spilled, please remove it immediately.



Warning!

Using the Miniboosters for external lubrication will set aerosoles free.

Operate the Minibooster only in closed machine tools.

Wear respiration protection when opening the machine tool.

2.4 Requirements for personnel, Care

- The operators must read and understand the operator's manual
- Operators must be instructed how to use the Minibooster and must be familiar with its principle
- Personnel must wear personal safety equipment

3 Technical Data

Mechanical Data¹		
Dimensions (L x B x H) / mm x mm x mm	minimum	300 x 150 x 670
	maximum	400 x 200 x 780
Weight / kg	Depending on type	13 to 29

Electrical Data		
Operating current	Standard:	24 V DC
	optional:	110 V AC, 230 V AC

Pneumatic Data		
Air pressure	bar	6 – 8
Operational pr.	bar	6
Back pressure	bar	Should not exceed 4 bar

Lubricants	Contents	Packing Units
LB 2000	Natural contents	1, 5, 20 and 203 ltr
LB 5000	Fatty alcohol	1, 5, 20 and 207 ltr
LB 8000	Ester	1, 5, 20 and 207 ltr

¹ The actual dimensions can vary depending on special configurations.

Frequency Generator

pneumatic	strokes/min	5-200
electric	strokes/min	1-120

Reservoir

Volume	ltr	1.0, 2.0
Level indicator	optional	

4 Product Description

4.1 Scope

Miniboosters are designed to disperse and supply lubricants for internal lubrication through the tools, using minute quantities of lubricant .

With external minimum quantity lubrication a determined quantity of lubricant is supplied to the tool by a Accu-Lube-precision applicator. Minimum quantity lubrication is optimized by using the correct lubricant, the dosage and optimum positioning of the nozzles.

4.2 Principle of funtion

The lubricant is transported to the booster chamber by the pump. There the aerosol is produced, then transported to the reservoir and from there to the cutting edge.

For the external lubrication with model MB II HD C the lubricant is supplied from the pump directly to the nozzle where it is dispersed by a concentric air stream.

4.3 Overview

Miniboosters are available in different versions according to their function.

Model		Components
MB I	Minibooster 1	1 Pump 1 Booster chamber 1 Frequency generator
MB II	Minibooster 2	2 Pumps 2 Booster chambers 2 Frequency generators
MB III	Minibooster 3	3 Pumps 3 Booster chambers 3 Frequency generators
	Double booster 2 ²	4 Pumps 4 Booster chambers 2 Frequency generators
MB II HD	Minibooster 2 Heavy Duty	3 Pumps 2 Booster chambers 2 Frequency generators
MB III HD	Minibooster 3 Heavy Duty	4 Pumps 3 Booster chambers 2 Frequency generators
MB II HD C	Minibooster 2 Heavy Duty with external lubrication	Internal lubrication: 3 Pumps 2 Booster chambers 3 Frequency generators External lubrication: 3 Pumps 3 Frequency generators

² This Minibooster consists of two systems in one metal box

MB II HD SR	Minibooster 2	3 Pumps
	Heavy Duty sensor regulated	2 Booster chambers
		2 Frequency generators

Basic System – MB 1

This system is for turning lathes without turning tools and for milling and drilling operations, always using the same tool or tool diameter.

For tool diameters between 1,2 -≤ 5mm

Basic System – MB 2

This system is for turning lathes with rotating tools and CNC-machines with different tool diameters. Covers a larger range of tool diameters.

For tool diameters between 3 -≤ 8mm

Basic System – MB 3

This system is for turning lathes with rotating tools and CNC-machines with a multiple number of different tool diameters or larger cooling channels.

For tool diameters between 3 -≤ 13mm

Heavy-Duty-Systems

These systems allow to add bigger oil particles to the oil/air mixture. This is necessary for larger tool diameters to get a sufficient lubricant film.

For tool diameters between 1-≤ 25mm

Heavy-Duty-Systems with External Lubrication

These systems are a combination of the Heavy-Duty-System for internal lubrication and an applicator for external lubrication. They allow simultaneous internal and external lubrication for heavy-duty operations. These systems cover all the cutting operations on a CNC-machine.

For tool diameters between 1-≤ 25mm

Heavy-Duty-Systeme sensor regulated

These systems are appropriate for coolant fed tools in CNC-machines and CNC-turning lathes.

For coolant fed tool with diameters between: 1 - ≤ 25mm

4.4 Components

Below the structure of a Miniboosters, here shown as an example our model 2 HD C. The structure of the other models correspond with this model, whereas particular components can be missing. For example the components for external lubrication can only be found on this model.

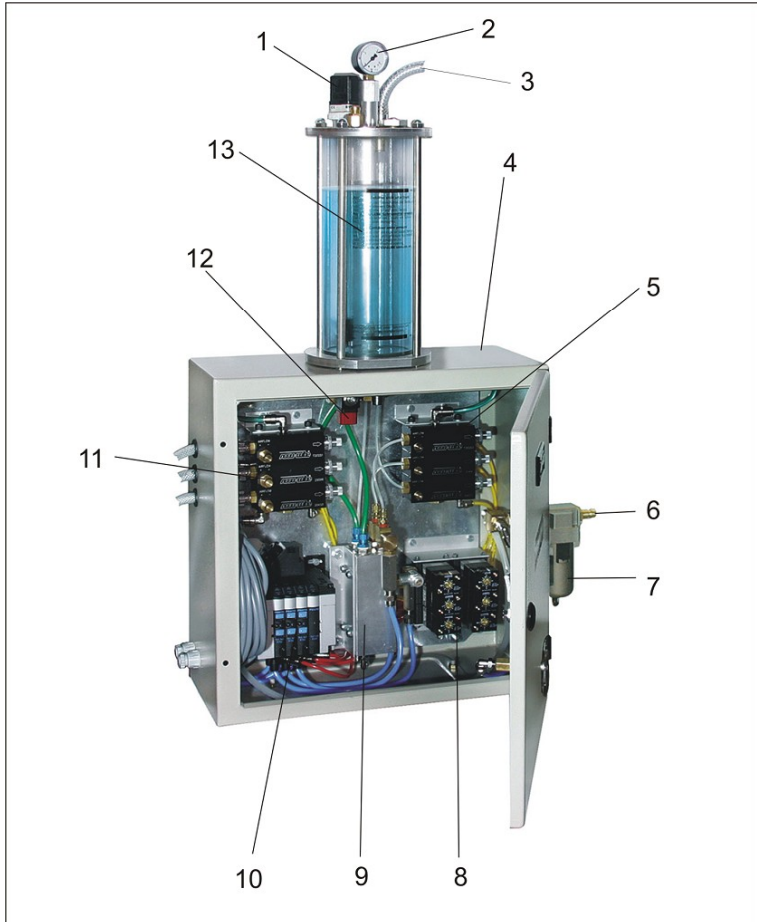


Illustration 1 Overview Minibooster 2 HD C

Overview Minibooster 2 HD C

Pos. Components		
1	Level indicator	Control of lubricant level in reservoir by a signal
2	Pressure gauge	Display of pressure in reservoir
3	Hose connection	Hose connection to spindle (rotative joint)
4	Metal box	Housing for components
5	3 aluminium pumps for internal lubrication	Supply of lubricant
6	Compressed air connection	Supply with compressed air
7	Air filter	Elimination of moisture or impurities in the compressed air
8	Frequency generator Standard: pneumatic Alternatively: electronic	Sends air impulses to pump
9	Booster chamber	Dispersion of lubricant
10	Valve terminal	Actuation of Minibooster
11	3 Aluminium pumps for external lubrication	Supply of lubricant
12	2/2 way valve	Control of Minibooster
13	Reservoir	Tank for lubricant



Information

The 2/2-way-valve must be connected to the solenoid valve used for external lubrication.

4.5 Actuation

A Minibooster can be actuated by different kinds of actuators:

- Solenoid valve
- Toggle switch
- Roller valve
- Slide valve
- Foot pedal

4.6 Minibooster MB II HDSR

The Minibooster MB II HDSR is equipped with a pressure sensor, which measures the feedback pressure from the tool.

When the Minibooster is switched on, all three pumps are activated. Once a pressure of 1,8 bar is reached, the pump for additional lubrication switches off. Reaching a pressure of 4,1 bar, the Minibooster switches off completely.

Should the pressure fall below 4,1 bar, the Minibooster switches on again. Below 1,8 bar the pump for additional lubrication is activated as well.

4.7 Mounting

Miniboosters have four pre-drilled bores on the rear side to mount the device by screws or magnets.

5 Transport



Attention!

Wear protective gloves during transport.

5.1 Transport to customer

The Minibooster is wrapped in air cushion foil and dispatched by the manufacturer with styropor packaging material in a cardboard box.

5.2 Unpacking the Minibooster

Please proceed as follows:

- > Open the cardboard box and remove the styropor packaging.
- > Take out the Minibooster packed in air cushion foil.
- > Remove the air cushion foil.
- > Avoid damaging the Minibooster.

5.3 Checking the consignment

Check consignment for

- completeness (see chapter 1.1, page 1-1)
- damage in transit

In case the consignment is not complete, please inform us immediately.

Should you notice a damage caused in transit, please report it immediately to the forwarding agent.

5.4 Transport to operation site

For transport only use transport material with sufficient load carrying capacity. For weights please see chapter 3 „Technical data“, page 3-1.

6 Installation and Set-up

6.1 Safety instructions



Attention!

Make sure Minibooster is mounted properly. Start with set-up procedures only when the MiniBooster has been mounted properly.

6.2 Assembly

6.2.1 Assembly

For assembly please proceed as follows:

The aerosol tube (pos. 3) must be connected to the rotating unit or spindle.

- > Fix the air filter
Make sure it is fixed properly (partially pre-assembled)

6.2.2 Mounting of Minibooster

Please proceed as follows:

- > Choose suitable mounting location, so that
 - The Minibooster is mounted horizontally,
 - There is easy access to fill the reservoir

Mounting with screws

The Minibooster can be mounted permanently to a site with four screws through the bores at the rear side of the metal box.

Mounting with magnets

To mount the Minibooster, four magnets can be fixed at the bores on the rear side of the metal box. The Minibooster can then be mounted to any ferrous surface.

6.3 Connection Power Supply

6.3.1 Electric power supply

For the electrical connection a wire with a length of 5 meters is supplied.

- > Adjust the length of the wire to your requirements.

Minibooster with 24 V connection

- > Connect the wire according to the following illustration

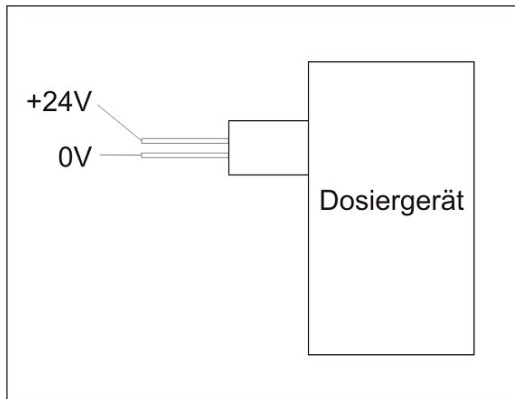


Illustration 2. 24V Connection

- > When connecting the wires make sure correct polarity is used.
- > After connecting the wires check the function of the Minibooster. Disconnect confused connections and change them.

Minibooster with 110/230V connection

Electrical connection must be carried out only by authorized personnel.



Attention!

Always connect the earth wire to the earth of the complete device.

6.3.2 Pneumatic connection

The connection for the compressed air for all the Miniboosters is on the right hand side of the metal box.

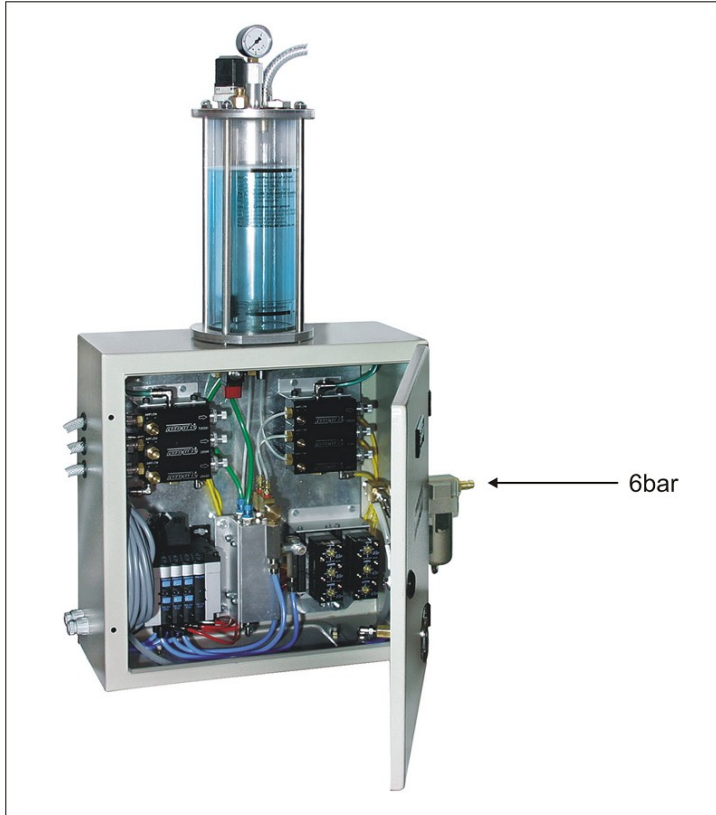


Illustration 2: Pneumatic connection; here shown on Minibooster MB II HD C

Make sure

- The air filter has been drained
- Only compressed air according to the information under “technical data” is connected



Attention!

Use only ACCU-LUBE lubricants. Other lubricants or coolants, not approved by the manufacturer, can destroy the seals.

6.3.3 Lubricants

To fill the reservoir please proceed as follows:

- > Depressurize Minibooster.



Attention!

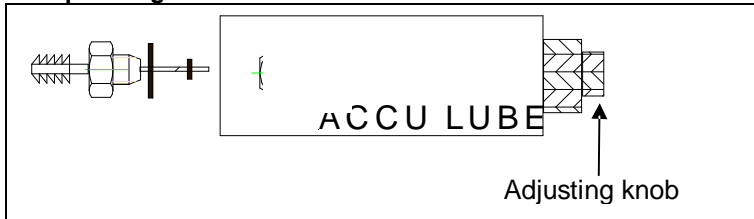
Opening the reservoir under pressure can lead to severe injuries.

Before opening the reservoir make sure the pressure is „0“.

- > Fill the reservoir with lubricant to maximum level through the filler
- > Screw in filler cap tightly by hand
- > Before switching on the Minibooster check filler cap for possible leaks.

6.4 Set-up

6.4.1 Pump setting internal lubrication



Adjusting the pump

The oil volume is regulated with the help of the adjusting knob.

- Turn adjusting knob clock-wise: reduce oil volume.
- Turn adjusting knob anti-clock-wise: increase oil volume.

Basic setting:

The adjusting knob is turned to maximum open position. Then half a revolution to the right. This is the basic setting.

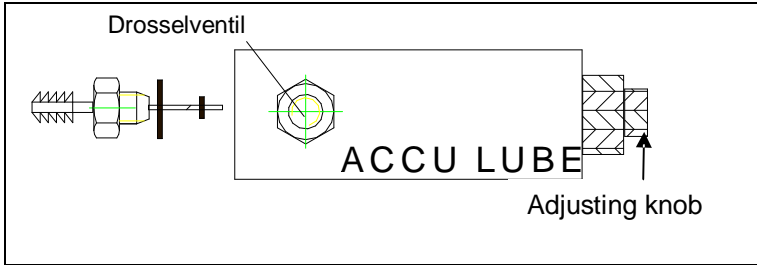
6.4.2 Frequency generator internal lubrication

The frequency generator gives an air impulse to the pump, so that a pre-determined oil volume is supplied at defined intervals.

The air impulse moves the piston forward. After ventilation a spring will move the piston back into the starting position.

6.4.4 Pump setting external lubrication

The following description is valid only for devices with external lubrication (MB II HD C).



Adjusting the pump

Oil volume

The oil volume can be regulated with the help of the adjusting knob.

- Turn adjusting knob clock-wise: reduce oil volume.
- Turn adjusting knob anti-clock-wise: increase oil volume.

6.4.5 Frequency generator external lubrication

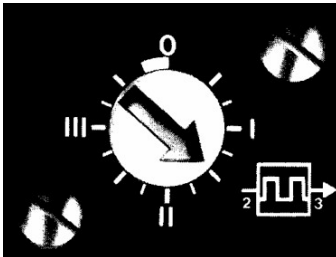
The following description is valid only for devices with external lubrication (MB II HD C).

The frequency generator sends an air impulse to the pump, so that a pre-determined oil volume is supplied at defined intervals.

The air impulse moves the piston forward. After ventilation a spring will move the piston back into the starting position.

Basic setting:

The basic setting of the frequency generator is regulated with the help of the adjusting screw.



Scale

0 – III

0 = Frequency generator OFF

- Turn clockwise: reduction of cycle time
- Turn anti-clock-wise: increase of cycle time

Setting for external lubrication is at 1,5.

7 Trouble Shooting

7.1 Table for defect diagnosis

Defect	Possible cause	Action
No oil film at the cutting edge	Defective pump	Check the pump
	No compressed air	Check compressed air connection
	Defective tubes or lines	Check tubes or lines
	Oil tubes (with external lubrication) defective or cut off	Check oil tubes
	Pump closed	Turn adjusting knob to the left
Frequency generator does not function	Frequency is set to "OFF"-position	Turn adjusting screw to the required setting
	No compressed air	Check compressed air connection
	Defective tube	Check the tubes
	Adjusting screw (illustration 4) has been turned to stop clock-wise -> piston does not move	Check position of adjusting screw, adjust if required
Temporarily oil is not supplied	Air in the oil supply line	See following description

7.2 Contact addresses

Accu-Lube is at your disposal for any questions concerning the Miniboosters at the following numbers:

Contact	
Phone	+49 (0) 7043 – 5612
Fax	+49 (0) 7043 – 907098
E-mail	info@accu-lube.com

Abroad our distributors are at your disposal. For contact addresses please see our website www.accu-lube.com à Vertrieb (distribution)
à Vertriebspartner (distribution partners).

8 Maintenance

8.1 Safety instructions for maintenance and servicing

Before starting with the maintenance procedures make sure you have:

- Proper protective gloves ready
- Tools and auxiliaries ready

Should there be any skin contact with lubricant during the maintenance procedures wash with soap and water afterwards.

8.2 Maintenance

Action	Frequency
Draining of air filter	When required
Mounting, check especially with magnetic mounting	When required
Check condition of nozzles, replace if required	When required
Check hoses and lines for leaks and defects	When required
Check area below Minibooster for lubricant, if required check for leakage and repair	When required

Apart from this the Miniboosters do not need any maintenance.

8.3 Draining of air filter

To drain the air filter please proceed as follows:

- > Depressurize Minibooster
- > Disconnect compressed air
- > Open the drain screw
- > Drain water out of air filter glass
- > Screw in the drain screw
- > Re-connect compressed air

9 Disassembly and Disposal

9.1 Temporary decommissioning

- Switch off Minibooster
- Switch off compressed air
- Clean Minibooster



Information

After temporary decommissioning all the set-up procedures must be repeated

9.2 Storage

Short or medium term storage (up to 2 years) is possible without any special measures.

Long-term storage will require corrosion protection measures.

9.3 Final decommissioning

- Switch off Minibooster
- Disconnect wires at electronic control box and fix them safely to the Minibooster
- Stop compressed air supply to Minibooster and disconnect the line
- Empty the reservoir and drain the oil out of the oil system

9.4 Disposal of components/lubricant

Before transport the device must be decommissioned as described in chapter 9.3.

For transport see chapter 5, "transport".

Mechanical and electrical components must be separated and disposed of correctly.

Should you have any queries please contact the manufacturer.

10 Annexes

10.1 Accessories external lubrication

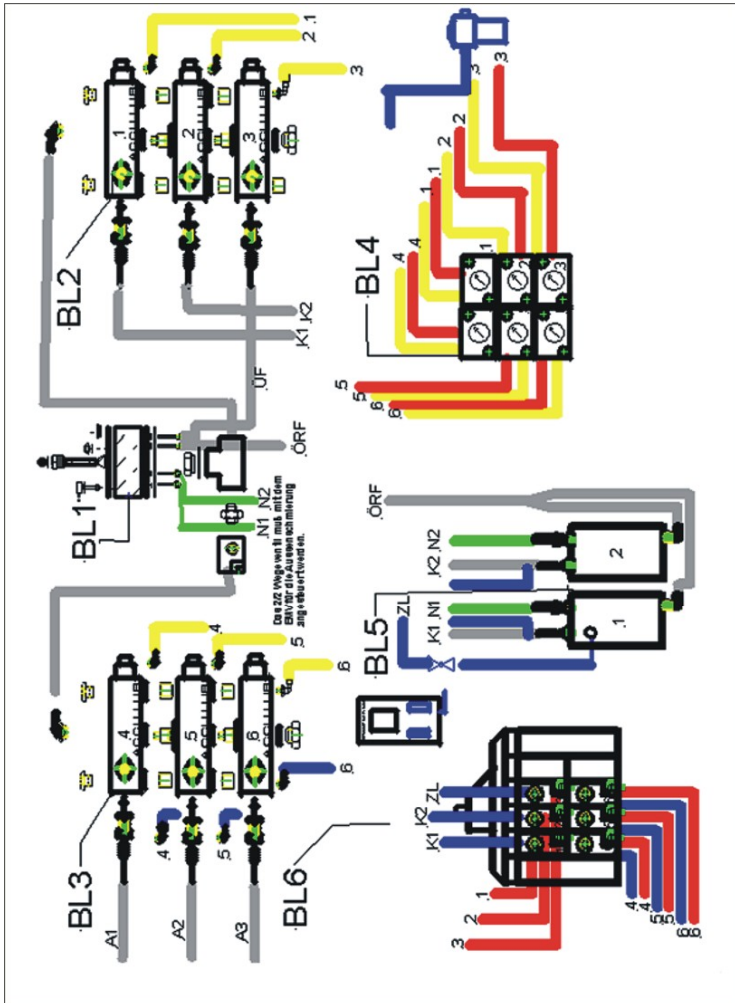
The following table shows the accessories available for external lubrication.

Type	Accessory	Item-no.
Hose	PVC-hose	800 530
	Oil tube	800 515
	Metal protected hose	800 510
Nozzles	Loc-line nozzle 300 mm length	800 966
	Loc-line nozzle 450 mm length	800 954
	Loc-line nozzle 600 mm length	800 958
	Flexible metal spray nozzle 320 mm	800 943
	Flexible metal spray nozzle 400 mm	800 942
	Copper nozzle 150 mm w/connecting parts	802 032
	Copper nozzle 300 mm w/connecting parts	802 035
	Copper nozzle 450 mm w/connecting parts	802 038
	Copper nozzle 600 mm w/connecting parts	802 043
	Steel nozzle 150 mm w/connecting parts	802 046
	Steel nozzle 300 mm w/connecting parts	802 047
	Steel nozzle 450 mm w/connecting parts	802 048
Steel nozzle 600 mm w/connecting parts	802 044	

	Nozzle for bandsaws with a width between 13 bis 25 mm	802 120
	Nozzle for bandsaws with a width between 27 and 34 mm	802 125
	Nozzle for bandsaws with a width between 19 and 25 mm	802 110
	Nozzle for bandsaws with a width between 34 and 41 mm	802 127
	Nozzle for bandsaws with a width between 41 and 54 mm	802 130
	Nozzle for bandsaws with a width between 54 and 67 mm	802 132
	Nozzle for circular saws	802 135
	Miniature nozzle	802 255
Mounting blocks	Single with screws and nuts	801 175
	Double with screws and nuts	801 170
Nozzle tips for copper and steel nozzles	Wide angle nozzle tip	800 980
	Standard nozzle tip \varnothing 3 mm	800 981
	Point nozzle tip \varnothing 1,5 mm	800 982

10.2 Spare part list

10.2.1 Overview of Combi-Minibooster



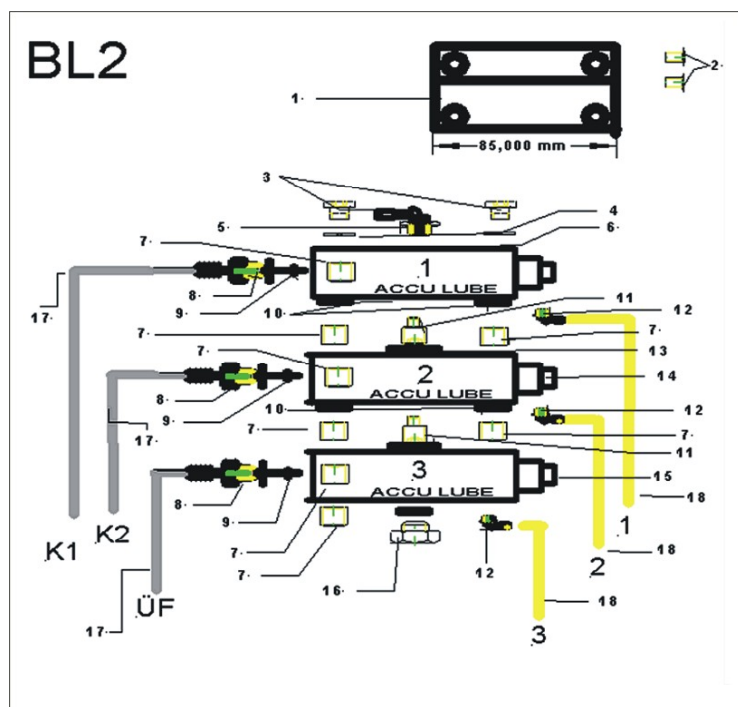
Overview of spare parts for Minibooster MB II HD C

10.2.3 Spare parts reservoir

BL 1		Components for reservoir 2 litres MB2HDC	
Pos.	Qty.	Description	Item-no.
1	1	Pressure gauge 0-16 bar,G 1/8	801 630
2	1	Seal ring 1/8	801 081
3	1	Filler cap M12x1/8	803 605
4	1	Seal ring	803 615
5	1	Mini-safety valve G1/8	801 730
6	1	Rod for 2 L reservoir	803 070
7	1	Level indicator total L=270 opener version	801 521
		Closer version	801 520
8	1	Filler cap with DIN-SYM	801 685
9	4	Cap nut M8	803 085
10	1	Top lid for Minibooster with 4 bores	803 667
11	4	Stainless steal rod M10 300 mm	803 059
12	2	Seal rings PERB.65	803 030
13	1	PVC-glass for 2 litre reservoir L=270MM	803 015
14	4	Nut M8	801 046
15	1	Bottom lid for Minibooster with 4bores	803 661
16	2	Fogging tube 260 MM	803 656
17	2	Oil return line 260 MM	803 651
18	1	Washer	800 932
19	1	Ermeto-reduction piece	803 095
20	2	Oil tube	800 515
21	2	Festo tube green	800 527
22	1	T-piece	800 863
23	2	Hose barb 1/8	800 435

24	1	Double-threaded nipple 1/4x1/8	800 795
25	1	2/2-way solenoid valve 1/8	800 107

10.2.4 Overview of pump assembly for internal lubrication

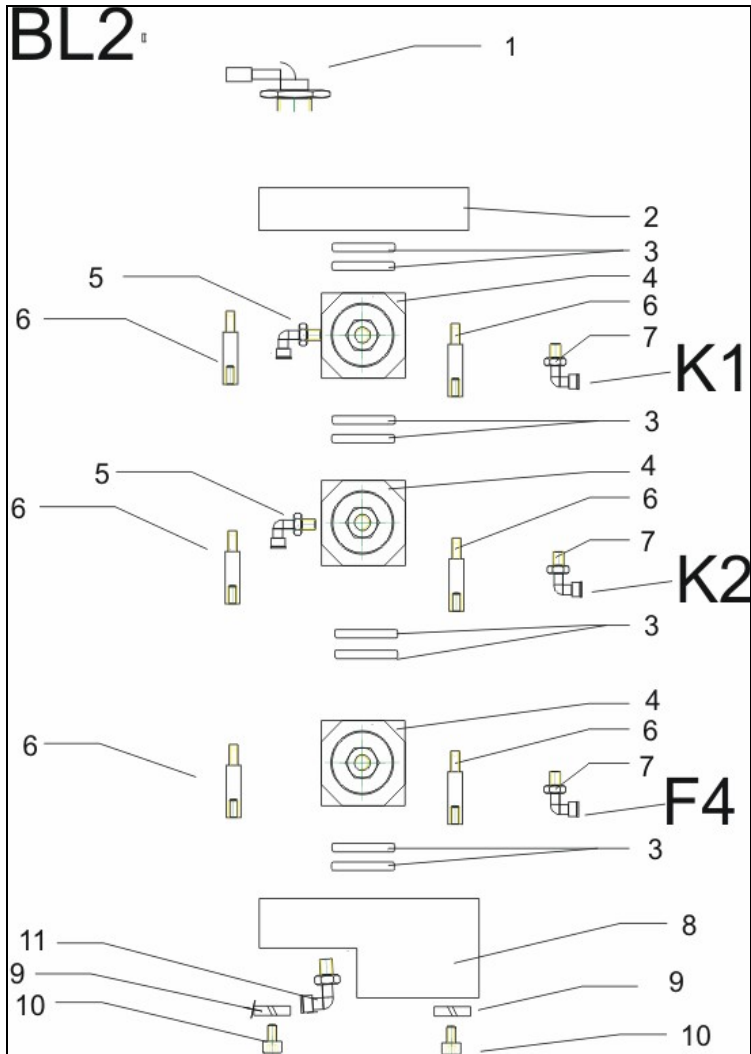


Overview of pump assembly for internal lubrication

10.2.5 Spare parts for pump assembly for internal lubrication

BL 2		Components for assembly with 3 pumps for Booster	
Pos.	Qty.	Description	Item-no.
1	1	Aluminium angle	806 515
2	2	M6x12	801 012
3	2	Inner hex screw	804 026
4	4	Washer	801 024
5	1	Screw-in/plug-in-elbow piece	801 690
6	1	Top aluminium pump for separate control	803 685
7	8	Inner hex plug	800 780
8	3	Hose barb for aluminium pump	800 506
9	3	O-ring for oil tube	804 050
10	4	Seal	801 116
11	2	Adapter kit for centre aluminium pump	804 035
12	3	Screw-in/plug-in-elbow piece	800 315
13	1	Centre aluminium pump for separate control	803 686
14	1	Bottom aluminium pump	803 687
15	1	Plug for aluminium pump.	804 055
16	3	Oil tube	800 515
17	3	Festo tube yellow 4x0,75	800 522

10.2.6 Overview of brass pump assembly for internal lubrication

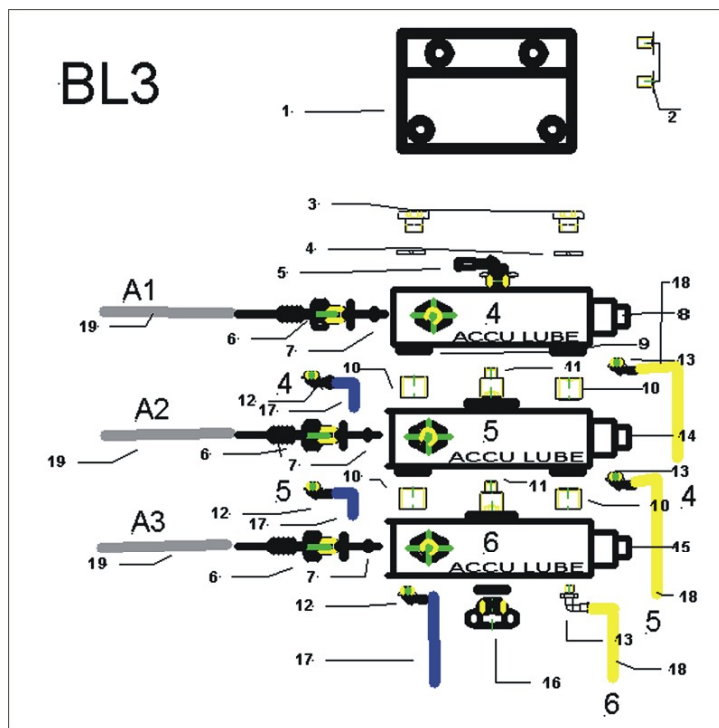


Overview of brass pump assembly for internal lubrication

10.2.7 Spare parts for brass pump assembly for internal lubrication

Position	Qty.	Description	Item-no.
1	1	Screw-in/plug-in/elbow piece	801 690
2	1	Base plate	800 066
3	8	Seal 14x23/1,5	800 533
4	3	Brass pump	800 080
5	2	Screw-in/plug-in/elbow piece	801 055
6	6	Distance piece	800 068
7	3	Screw-in/plug-in/elbow piece	800 333
8	1	Cover plate	800 067
9	2	Spring washer for steel screw	801 006
10	2	Steel screw	801 005
11	1	Screw-in/plug-in/elbow piece	800 320

10.2.8 Pump assembly for external lubrication

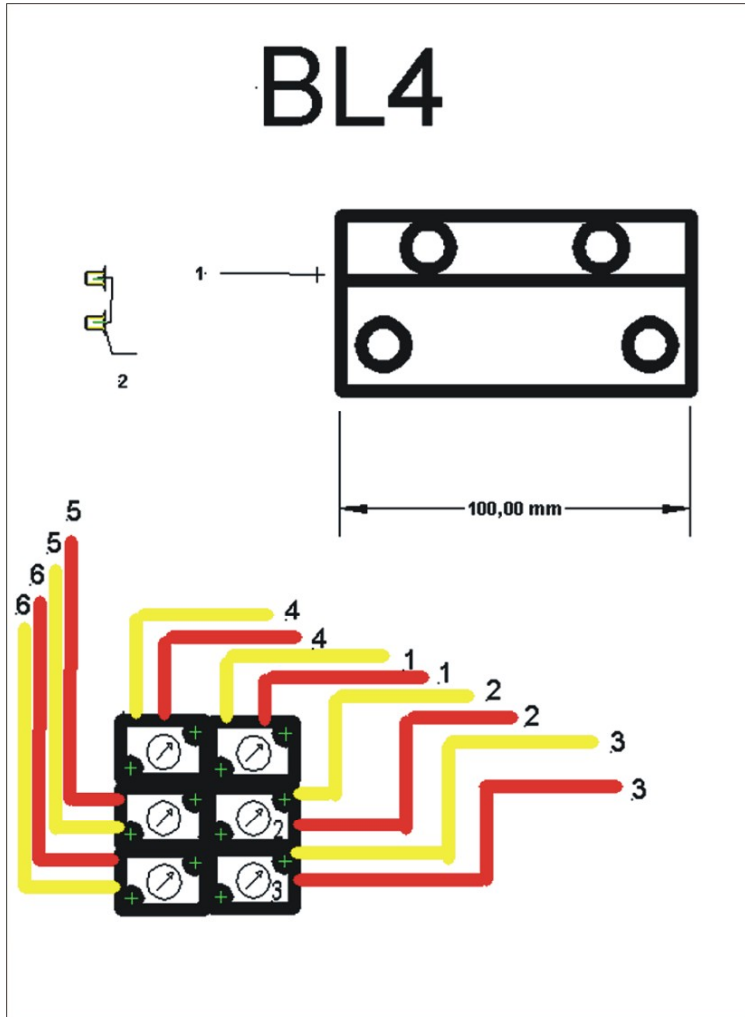


Pump assembly for external lubrication

10.2.9 Spare parts for pump assembly for external lubrication

BL 3		Components for assembly with 3 pumps for external lubrication with separate control	
Pos.	Qty.	Description	Item-no.
1	1	Aluminium angle	806 515
2	2	Thread-forming screw	801 015
3	2	Inner hex screw	804 026
4	4	Washer	801 024
5	4	Screw-in/plug-in-elbow piece	801 690
6	3	Hose barb for aluminium pump	800 506
7	3	O-ring for oil tube	804 050
8	1	Top aluminium pump with separate control	804 610
9	4	Inner hex plug	800 780
10	3	Screw-in/plug-in -elbow piece	800 315
11	2	Adapter kit for aluminium pumps	804 035
11	1	Centre aluminium pump for separate control	804 615
12	1	Bottom aluminium pump	804 605
13	1	Plug for aluminium pump	804 055
14	3	Oil tube	800 515
15	3	Festo tube yellow 4X0,75	800 522
16	4	Seal 13,00mm	801 116

10.2.10 Overview frequency generators

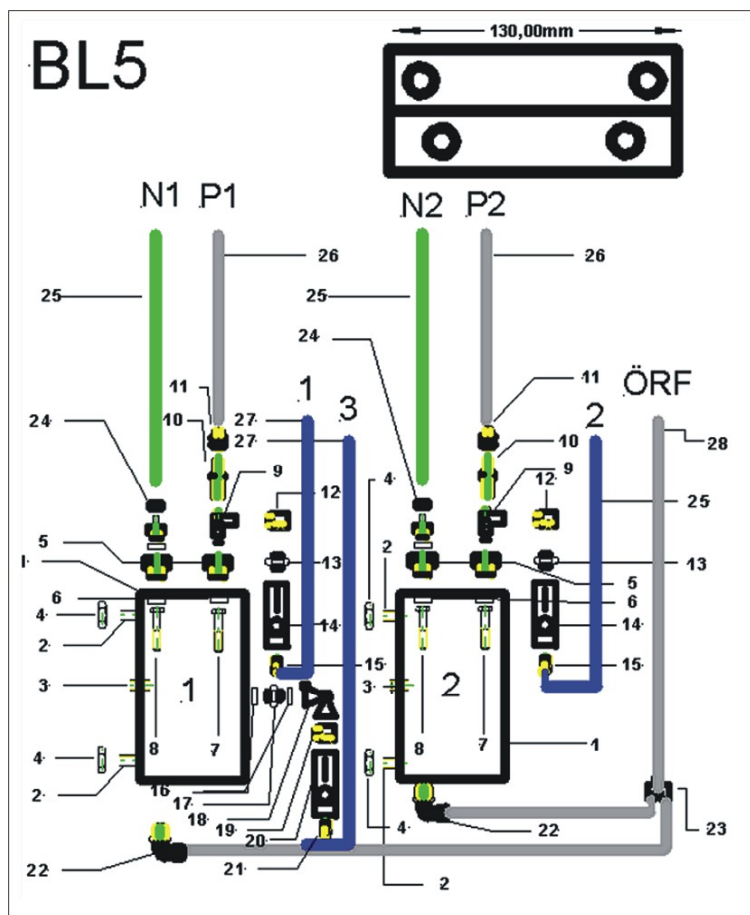


Overview of frequency generators

10.2.11 Spare parts for frequency generators

BL 4			
Pos.	Qty.	Description	Item no.
1		Aluminium angle	806 510
2		M6x12	801 012
3	6	Frequency generator	800 099
4	6	Base plate	800 095

10.2.12 Overview Minibooster chambers



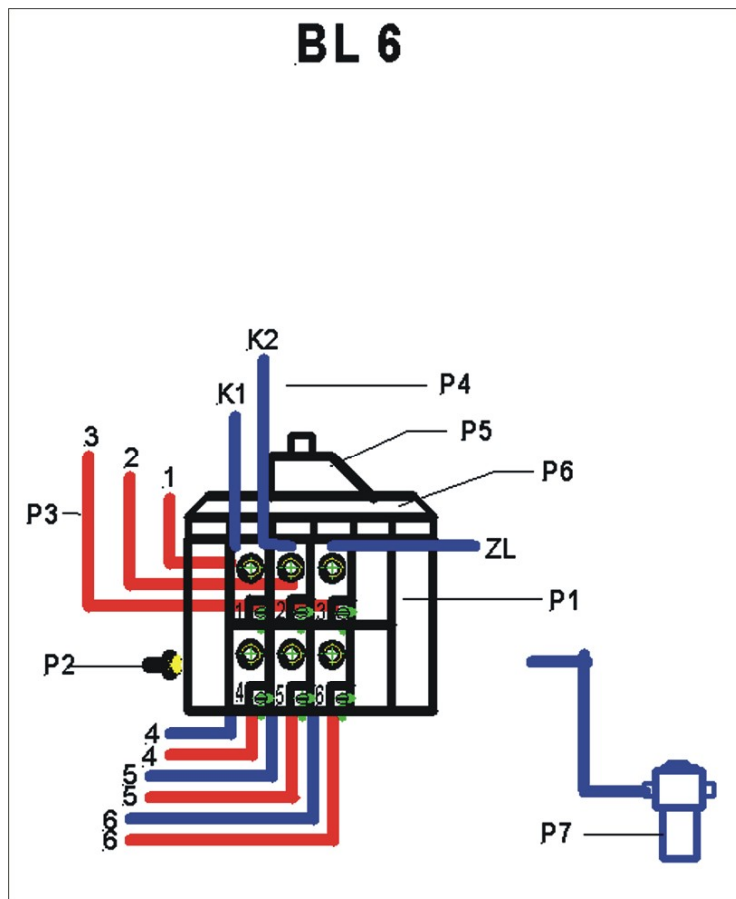
Overview Minibooster chambers

10.2.13 Spare parts for Minibooster chambers

BL 5		Components for Booster chamber 1+2	
Pos.	Qty.	Description	Item-no.
1	2	Mixing chamber for Minibooster 2	801 151
2	4	Threaded pin M6X14 with Inner hex and rounded end	801 118
3	2	Threaded pin M6X8 with Inner hex and rounded end	801 121
4	4	Safety nut with Nylon-Inner ring	801 024
5	4	Screw-in fitting 1/8 inch	800 255
6	4	Seal for solenoid valve	801 081
7	2	Large hose barb for Minibooster	803 630
8	2	Hose barb with outer thread	803 620
9	2	T-piece 1/8 inch IIO	800 270
10	2	Hermeto fitting	800 440
11	2	Compression ring with sleeve	800 465
12	2	L-fitting 1/8	800 866
13	2	Double-threaded nipple 1/4x1/8	800 795
14	2	Non-return valve 1/4	800 995
15	2	Hose barb 1/4	800 430
16	2	Seal ring 1/8	801 080
17	1	Double-threaded nipple 1/8	800 305
18	1	Non-return valve	801 680
19	1	L-fitting 1/8	800 866
20	1	Non-return valve 1/8	800 990
21	1	Hose barb 1/8	800 435

22	2	Screw-in/plug-in/elbow piece	800 333
23	1	Plug-in fitting	801 625
24	2	Fitting CK-1/8-PK-4	803 625
25	2	Festo tube 6x1 green	800 527
26	2	Oil tube	800 515
27	2	Festo tube 6x1 blue	800 526
28	2	Oil tube	800 515

10.2.14 Overview valve terminal



Overview valve terminal

10.2.15 Spare parts for valve terminal

BL 6		FESTO valve terminal	
Pos.	Qty.	Description	Item-no.
1	1	Valve terminal 6-fold 10P-14-3C-IC-N-V-3C+U6DB	800 129
2	1	Silencer	800 055
5	1	Multipole plug	800 045
6	1	Control unit	800 040
7		Festo solenoid valve 24 V	801 123
8		Plug for solenoid valve	801 122
9	1	Air filter	800 820

10.2.16 Installation of level indicator

Installation instructions for reservoirs equipped with a level indicator

- Änderungen vorbehalten -	<p>Anschlußbild mit Steckverbindung DIN 43650</p> <p>Schaltfunktion siehe Bestellbezeichnung L1 = unterer Schallpunkt L2 = oberer Schallpunkt</p>	<p>Montageanweisung</p> <p>Füllstandschalter KFH-F KFH-R KFH-V AB31-06</p> <p>Funktion: Zur Erfassung von Flüssigkeitshöhen in Behältern. Die Füllstandschalter arbeiten nach dem Prinzip Reedkontakt - Permanentmagnet.</p> <p>Einsatz: In Flüssigkeiten mit einer Vichte >0,7g/cm³. Die Materialien des Füllstandschalters müssen gegenüber der Flüssigkeit beständig sein. Verschmutzung und metallische Abriebe vermeiden. Temperaturbereich und Betriebsdruck nach den technischen Daten beachten.</p> <p>Montage: Vertikaler Einbau nach Datenblatt. Bei Schaltern ohne Schwallschutz Strömungen beachten, da die Funktion des Schwimmers beeinträchtigt werden kann. Schalter keinen starken Stößen und Biegungen aussetzen.</p> <p>Elektrische Anschlüsse: Elektrische Anschlüsse dürfen nur von Fachpersonal ausgeführt werden. Nur Leitungsdosen nach DIN verwenden. Maximaler Leitungsquerschnitt 1,5mm². Schutzleiteranschluß vorsehen. Kabelverschraubung fest anziehen. Leitungsdosen nach Anschluß festschrauben. Leitungsdosen nur im spannungsfreien Zustand stecken. Kontakte nicht überlasten (siehe technische Daten). Bei induktiver Belastung eine Schutzschaltung vorsehen. Bei Erstinbetriebnahme Funktion der Schalter überprüfen.</p>
	<p>Technische Daten - allgemein:</p> <p>Betriebsdruck max.: 1 bar</p> <p>Temperaturbereich: 0 + 90 °C</p> <p>Einbaulage: senkrecht ± 10°</p> <p>Werkstoff: Rohr F/R_AB31-06 CU-Legierung Rohr V 1.4301</p> <p>Schwimmer: PUR-Hartschaum</p> <p>Flansch: Alu Legierung</p> <p>Dichtung: NBR</p> <p>Schutzart: IP 65</p> <p>Steckverbindung: DIN 43650</p> <p>Gewicht bei L=300: 0,12kg</p>	<p>Technische Daten - Reedkontakt:</p> <p>Schaltspannung: 10+230 VUC</p> <p>Schaltstrom max.: 0,5 A</p> <p>Schaltleistung max.: 10/30 WVA</p>

Installation instructions for level indicator