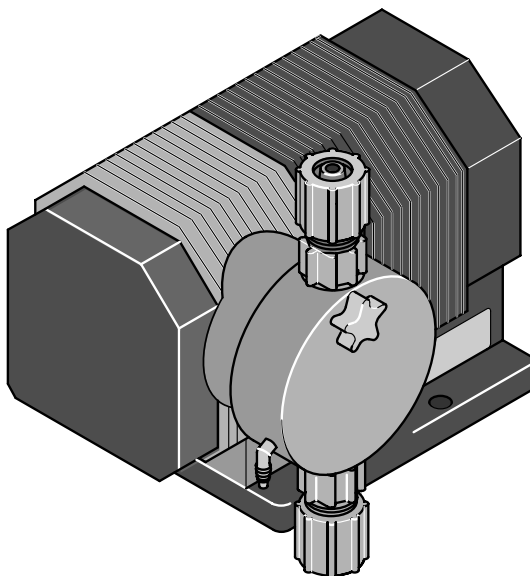


Operating Instructions
Motor-Driven Metering Pump
Diaphragm-Type
ProMinent® alpha ALPb

ALPa-001-D



ALPb _____

Please enter the identcode of the device here!

For safe and correct operation of ProMinent® alpha ALPb motor-driven metering pumps,
 two sets of Operating Instructions are required:
 The product-specific alpha ALPb Operating Instructions
 and ProMinent® motor-driven dosing pump Operating Instructions must be read together!

Please completely read through operating instructions first! · Do not discard!

The warranty shall be invalidated by damage caused by operating errors!

Tests

EC Conformity Declaration

We:

ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations.

Any modification to the product not approved by us will invalidate this declaration.

Product description:

Metering pump, Series Alpha

Product type:

ALPb ...

Serial number:

See type identification plate overleaf and on device

Relevant EC regulations:

EC machine regulation (89/392/EEC) subsequently 93/44/EEC
EC low voltage regulation (73/23/EEC)
EC - EMC - regulation (89/336/EEC) subsequently 92/31/EEC

Harmonised standards used,
in particular:

EN 292-1, EN 292-2, EN 809, EN 563
EN 60335-1, EN 60335-2-41
EN 50081-1/2, EN 50082-1/2, EN 55014, EN 55104

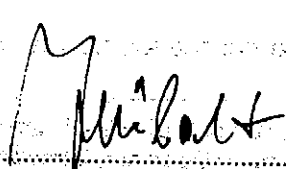
National standards and
technical specifications used,
in particular:

DIN VDE 0700 T1
DIN VDE 0700 T41
DIN VDE 0700 T500

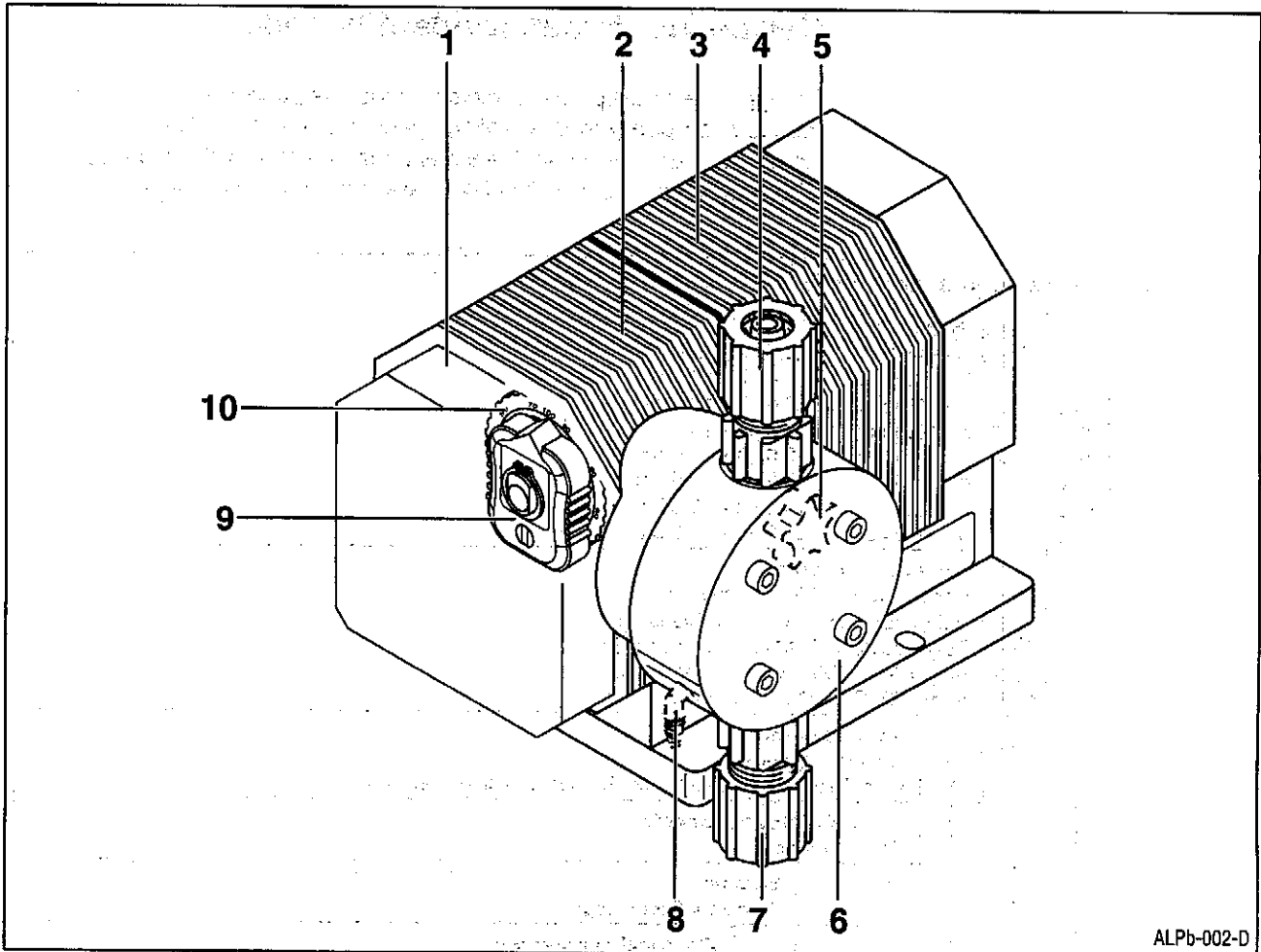
Date/manufacture's signature:

07.11.1997

The undersigned:


Mister Manfred Hüholt, factory manager

Explanation of Devices and Operating Parts



ALPb-002-D

More detailed information
on pages:

1	Cover	14, 15, 17, 18, 23, 25, 28
2	Motor support	5, 28
3	Enclosure	5, 28
4	Discharge connection	11, 28
5	Bleed valve with fine bleed screw	12, 13, 15, 16, 19, 20, 25, 28
6	Liquid end	5, 19, 20, 22 - 24, 28
7	Suction connection	11, 28
8	Bypass hose nozzle	12, 28
9	Locking bar	8, 14, 15, 18, 23 - 25, 28
10	Eccentric plate with scale	8, 14, 15, 18, 23, 28

Device identification/identity code

Device identification/identity code

The type identification plate affixed on the title page is identical to that on the supplied pump thus enabling specific allocation between operating instructions and the pump. Please enter the identity code specified under "Type" on the type identification plate in the grey entry field below.

ALPb		range: alpha, version b	
Pump type:			
Capacity at 50 Hz		Capacity at 60 Hz	
1001	1.2 l/h - 10.0 bar	1.4 l/h - 10.0 bar	
1002	2.4 l/h - 10.0 bar	2.9 l/h - 10.0 bar	
1003	3.5 l/h - 10.0 bar	4.2 l/h - 10.0 bar	
0804	4.0 l/h - 7.5 bar	5.0 l/h - 7.5 bar	
0808	8.0 l/h - 7.5 bar	9.5 l/h - 7.5 bar	
0612	12.0 l/h - 5.5 bar	14.0 l/h - 5.5 bar	
0419	18.5 l/h - 4.0 bar	21.5 l/h - 4.0 bar	
Liquid end material:			
PP1	Polypropylene/EPDM with bleed valve		
PP2	Polypropylene/FPM A with bleed valve		
PP3	Polypropylene/FPM B with bleed valve		
NP3	Acrylic/PVC/FPM B with bleed valve		
NP6	Acrylic/PVC/FPM without bleed valve		
Valve springs:			
0	No valve springs		
1	With 2 valve springs approx. 0.1 bar, stainless steel 1.4571		
Hydraulic connectors:			
0	Standard		
Version:			
0	With ProMinent® logo		
Electrical connectors:			
A	230 V, 50/60 Hz, 2 m, Euro. plug		
B	230 V, 50/60 Hz, 2 m, Swiss plug		
C	230 V, 50/60 Hz, 2 m, Austral. plug		
D	115 V, 50/60 Hz, 2 m, USA plug		
Ancillary equipment:			
0	No ancillary equipment		
1	With foot and dosing valve		
2	As 1, additional 2 m PVC and 3 m PE hose		
4	As 2, additional 100 l PE tank		
FPM = Fluorine Rubber			

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15 Disposal of old parts	28
16 Cross section of pump	28

Imprint:

Operating Instructions alpha ALP b metering Pump

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Subject to alterations

Printed in Germany

Introduction/Functions

1 Introduction

ProMinent® alpha are motor-driven metering pumps diaphragm-type, for continuous or non-continuous metering of fluids.

Correct use

- The pump must be used for liquids only!
- The pump may be used only in compliance with the technical data and specifications given in the operating manual!
- All other uses and modifications are forbidden!
- The pump is not suitable for dosing gases or solids!
- The pump must only be used by trained and authorised personnel!

Sound intensity level

The sound intensity level is <70 dB (A) at maximum stroke, maximum stroke rate, maximum back pressure (water) in accordance with:
DIN EN ISO 3744 (Reproducibility 2 Determining Sound intensity level)
PR DIN EN 12639 (Metering Pump Noise Measurement)
DIN 45635-24 (Machine Noise Measurement).

They feature very good priming capacity, soft discharge stroke and constantly accurate metering with the lowest mechanical load of the pump diaphragm in the capacity range of 1.2 to 18.5 l/h and from 4 to 10 bar.

This sophisticated technology is usually only offered for metering pumps in the top performance range.

2 Functions

2.1 Functional principle

alpha metering pumps basically consist

of a power end

with enclosure, gear split-pole motor with thermal safety device, stroke length adjustment with eccentric

and connecting rod,

as well as of a liquid end with liquid end, suction and discharge connection, pump diaphragm and intermediate disk.

The eccentric for the stroke movement is guided in an eccentric plate thus the recuperating spring common for this size of pump can be dispensed with. The suction stroke and discharge stroke are force-guided.

The feed procedure takes place in batches: the stroke length is max. 2 or 3 mm.

The stroke length adjustment can be made using a locking bar (9) in 10% steps from 100% to 0. The diaphragm deflection always takes place from the neutral centre position - this results in a soft sinus shaped stroke curve.

The metering pumps can be retrofitted to suit customers' needs (options).

alpha metering pumps are available with a Euro motor (230 V/50 Hz) and a multiple range motor (100 - 120 V and 200 - 240 V at 50/60 Hz).

Functions

2.2 The pump components

- The enclosure** The enclosure consists of PPE with 20% glass fibre. Protection against foreign bodies (> 12 mm dia.) and spray water (at an angle up to 60°).
- The power end** The single-phase split-pole motor drives an eccentric through the gear. The eccentric is guided in an eccentric plate which is directly connected with the connecting rod and pump diaphragm.
- Thus the suction and discharge strokes are force-guided, without a recuperating spring for the suction stroke. The feed process of the suction and discharge stroke is executed in batches in a sinus shaped stroke curve.
- During the discharge stroke the pump diaphragm displaces the medium in the liquid end by means of a head valve, and the balls on the suction side close. After the front end position is reached the diaphragm is led back to the initial position via the eccentric and the ball valve on the discharge side closes. There is now a vacuum in the liquid end, the balls on the suction side open and the medium is sucked into the liquid end (suction stroke).
- The capacity per stroke can be set in 10% steps using the locking bar (9). In doing so the eccentricity is altered; this means that the diaphragm deflection always takes place from the neutral centre position. The stroke length adjustment takes place when the pump is idle.
- The stroking rates according to the pump type are 27, 54, 82 or 120 strokes per minute at 50 Hz, or 32, 63, 94 or 142 strokes per minute at 60 Hz.
- Thermal safety device** The drive motor is equipped with a thermal safety device which automatically switches off the motor if the motor overheats more than 106°C; after the motor has cooled down the safety device switches the pump on again.
- The liquid end** Liquid ends for alpha pumps are available in two material versions:
- Polypropylene (PP)
 - Acrylic/PVC (NP)
- with double ball valve on the suction and discharge sides.
- The liquid ends of the PP1, PP2, PP3 and NP 3 version additionally feature a combined bleed valve with fine adjustment for continuous, automatic bleeding. It enables priming and bleeding without the discharge line having to be interrupted and relieved of pressure.
- For highly viscous media spring-loaded valves are available (recommendation: from approx. 200 mPas viscosity).
- Pump diaphragm** A DEVELOPAN® compound diaphragm with long service life from high quality fabric reinforced EPDM material, vulcanised steel core and PTFE layer on the media-contacted side.

Technical Data

3 Technical data

Pump type ALPb	Max. capacity at max. counter pressure		Max. capacity at medium counter pressure		Stroking rate Strokes/min	Connection size o. dia. x i. dia. mm	Suction lift mWC	Priming mWC	Max. perm. starting pressure bar
	bar	l/h	bar	l/h					
50 Hz version									
1001	10	1.2	5	1.3	30	8x5	6	2.5	10
1002	10	2.4	5	2.6	58	8x5	6	2.5	10
1003	10	3.5	5	3.8	88	8x5	6	2.5	10
0804	7.5	4.0	4.0	4.4	30	8x5	6	4	7.5
0808	7.5	8.0	4.0	8.5	58	8x5	6	4	7.5
0612	5.5	12	3.0	12.7	88	8x5	6	4	5.5
0419	4	18.5	2.0	19.8	128	8x5	6	4	4
60 Hz version									
1001	10	1.4	5	1.6	36	8x5	6	2.5	10
1002	10	2.9	5	3.2	69	8x5	6	2.5	10
1003	10	4.2	5	4.5	105	8x5	6	2.5	10
0804	7.5	5.0	4.0	5.4	36	8x5	6	4	7.5
0808	7.5	9.5	4.0	10	69	8x5	6	4	7.5
0612	5.5	14	3.0	15.2	105	8x5	6	4	3.5
0419	4	21.5	2.0	23.5	154	8x5	6	4	2.5

*) Suction lift with empty liquid end, valves dampened.

The capacity was established using water and a metering pump warm from operating. Metering deviances for all material versions $\pm 10\%$. Metering reproducibility $\pm 5\%$ with constant conditions, minimum counter pressure 1 bar, stroke adjustment 40 to 100% and media similar to water, during short time intervals (approx 5 min.).

Please note:

For types 1001, 1002 and 1003 at a stroke length of 20% and counter pressure > 4 bar the capacity can converge towards zero.

Permissible temperature of the medium for PP 60 °C and for NP 45 °C.

Power supply Standard version 230 V $\pm 10\%$; 50 Hz

Power drain 57 W - 0.5 A

DIN/VDE Electrical technical safety according to DIN VDE 0700/EN 60335

Permissible ambient temperature -10 °C to 45 °C

Shipping weight 3.0 kg

Media-contacted materials for version

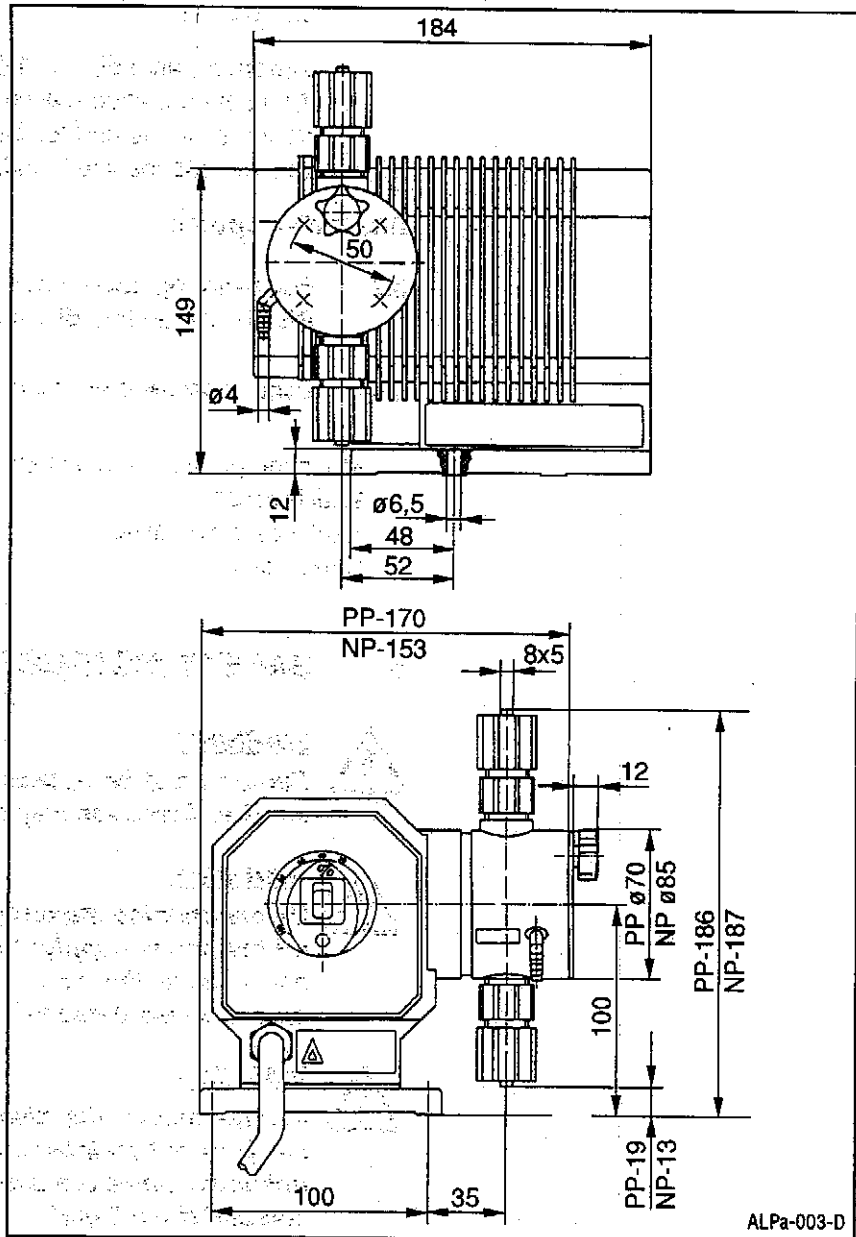
Liquid end

	PP1	PP2 / PP3	NP3	NP6
	polypropylene with bleed valve	polypropylene with bleed valve	Acrylic with bleed valve	Acrylic without bleed
	polypropylene	polypropylene	PVC	PVC
Seals	EPDM	Viton®	Viton®	Viton®
Balls	ceramic	ceramic	ceramic	ceramic

DEVELOPAN® = pump diaphragm with PTFE layer

Viton® (FKM) is a registered trademark of DuPont Dow Elastomers.

4 Installation dimensions



5 Accessories



WARNING

ProMinent® metering pumps may not be assembled with third-party parts which have not been tested and recommended by ProMinent. Failure to observe this can lead to personal injury and damage to property for which no liability is accepted.

Accessories/SAFETY INSTRUCTIONS

Ordering using identity code

5.1 Foot valve dia. \varnothing 8

With suction filter and ball check valve to connect at the end of the suction line.

Injection valve dia. 8 - 1/2"

With spring-loaded ball check valve for metering into open and closed systems and for fastening the discharge line: assembly directly onto the liquid end.

Alternative option:

5.2 Foot and injection valve with 2 m PVC suction line and 3 m PE discharge line dia. \varnothing 8 x 5 mm

5.3 Other accessories from the series program

- Mounting plate for supply tank
- Wall bracket
- Back-pressure valves
- Supply tank

6 SAFETY INSTRUCTIONS



WARNING:

Pumps must be accessible at all times for operation and service. Accesses may not be closed off or blocked!



WARNING:

Before opening the pump pull out the mains plug or switch off the power supply! Check that the pump is voltage-free and ensure the power cannot be switched on again by unauthorised persons!



WARNING:

Always relieve the discharge line of pressure first when carrying out maintenance or repair work! If hazardous or unknown media are used, always first empty out the liquid end and rinse it out!

Observe the safety data sheets of the fluids!

When working on the liquid end protective clothing must be worn (glasses, gloves)!

ATTENTION:

The stroke length may only be set when the pump is switched off!

ATTENTION:

The stroke adjustment device - locking bar (9) and eccentric plate (10) - can heat up in the event of continuous operation, high ambient temperature, overvoltage or high counter pressure! If necessary, wear protective gloves to adjust the stroke!

SAFETY INSTRUCTIONS/Order Specifications

PLEASE NOTE:

Only use the gripper rings and hose nozzles specified for the respective hose diameter as well as original hoses with specified hose dimensions and wall thickness as otherwise the stability of the connection is not guaranteed!

Avoid reducing the hose sizes!

For long lines and viscous media the next highest line diameter 12 x 9 mm should be used!

For the connection of 12 x 9 mm lines the 12 mm connection set is needed.

7 Order specifications

The following table provides an overview of the pump features which can be ordered using the IDENTITY CODE.

The type of pump with counter pressure and capacity, the liquid end material, the valve spring, the connection, the version and the electrical connection can be selected.

ALPb	range	alpha	version	b
Pump type:				
	capacity at 50 Hz		capacity at 60 Hz	
1001	1.2 l/h - 10.0 bar		1.4 l/h - 10.0 bar	
1002	2.4 l/h - 10.0 bar		2.9 l/h - 10.0 bar	
1003	3.5 l/h - 10.0 bar		4.2 l/h - 10.0 bar	
0804	4.0 l/h - 7.5 bar		5.0 l/h - 7.5 bar	
0808	8.0 l/h - 7.5 bar		9.5 l/h - 7.5 bar	
0612	12.0 l/h - 5.5 bar		14.0 l/h - 5.5 bar	
0419	18.5 l/h - 4.0 bar		21.5 l/h - 4.0 bar	
Liquid end material:				
PP1	Polypropylene/EPDM with bleed valve			
PP2	Polypropylene/FPM A (Viton® A) with bleed valve			
PP3	Polypropylene/FPM B (Viton® B) with bleed valve			
NP3	Acrylic/PVC/FPM B (Viton® B) with bleed valve			
NP6	Acrylic/PVC/FPM (Viton®) without bleed valve			
Valve springs:				
0	no valve springs			
1	with 2 valve springs approx. 0.1 bar, stainless steel 1.4571			
Hydraulic Connectors:				
0	standard			
Version:				
0	with ProMinent® logo			
Electrical connectors:				
A	230 V, 50/60 Hz, 2 m, Euro. plug			
B	230 V, 50/60 Hz, 2 m, Swiss plug			
C	230 V, 50/60 Hz, 2 m, Austral. plug			
D	115 V, 50/60 Hz, 2 m, USA plug			
Ancillary equipment:				
0	no ancillary equipment			
1	with foot and dosing valve			
2	as 1, additional 2 m PVC and 3 m PE hose			
4	as 2, additional 100 l PE tank			
ALPb	0808	PP1	0	0 0 A 1

Viton® is a registered trademark of DuPont Dow Elastomers.

Unpacking



8 Unpacking

ATTENTION:

Polystyrene parts are reusable, they should therefore not be disposed of in the household waste but rather separately (special waste acceptance centres)!

Secondary packaging

It is best if you keep secondary packaging complete with the polystyrene so that you can send the metering pump and accessories back in case of repair or warranty cases!

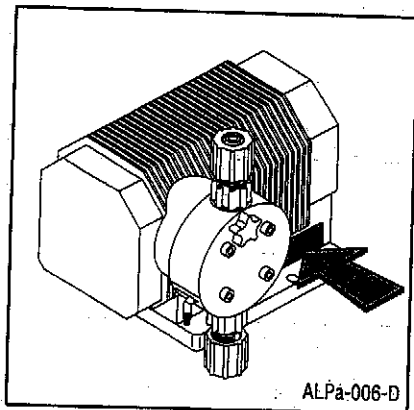
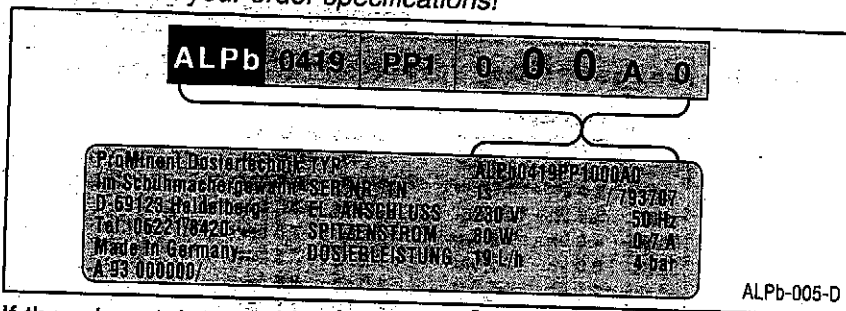
Compare the delivery note with the contents of the package.

Delivery scope

- Metering pump with 2 m mains cable and plug
- 8 mm connection set for the hose connection in accordance with the identity code
- Operating instructions and short operating instructions pushed into the base of the pump

ATTENTION:

Check if the specifications on the name plate of the pump match your order specifications!



If they do not, immediately notify the Pröminent

subsidiary or representative responsible for you!

(Addresses can be found on the back page/page 32 of these operating instructions.)

Each alpha metering pump is provided with a name plate. This can be found on the base of the pump.

In addition to the technical basic data the Identity Code and the serial no. are specified. Both numbers are to be stated during any enquiry or when ordering spare parts as they permit a clear identification of the type of pump and material variant.

Please make a note of the following details of the pump delivered so that these are always available when required:

IDENTITY CODE

Serial number

Place of installation

Metering application

Commissioning

Installation

9 Installation

9.1 Installing the pump: mechanical part

9.1.1 Pump installation with console or tank

- Assemble metering pump onto a tank or a console with screws and washers (dia. \varnothing 5 mm).

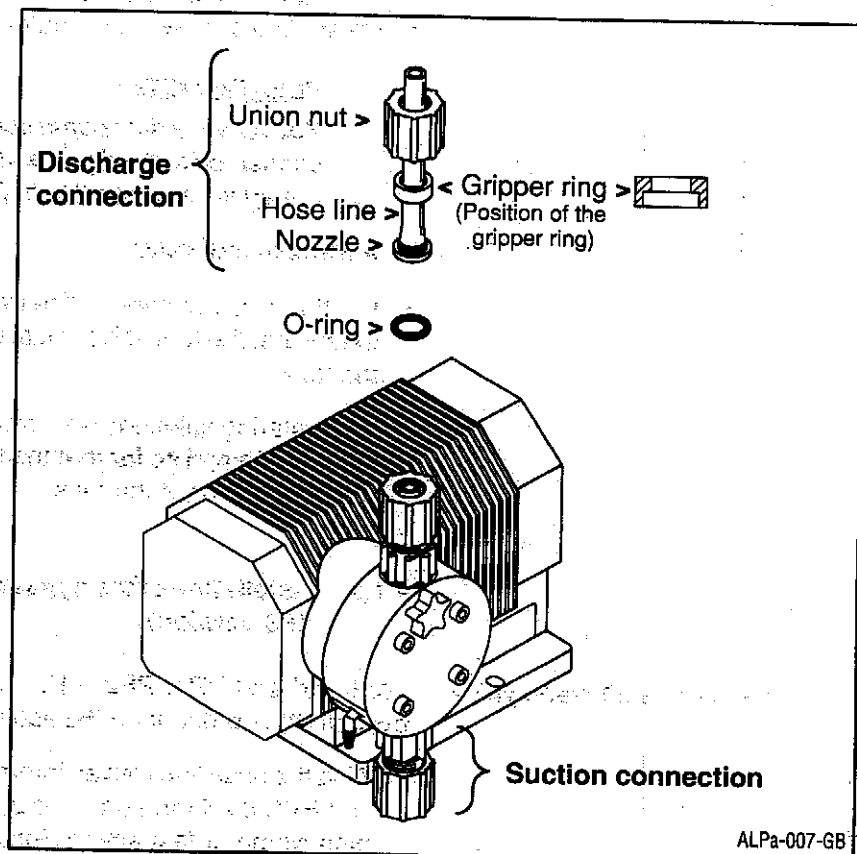
PLEASE NOTE:

The pump must be fastened in such a way that no vibrations can arise!

The valves of the liquid end must always be kept upright in order to guarantee that they function smoothly!

9.1.2 Connection of suction/discharge line to the pump

Arrangement of the individual parts:



PLEASE NOTE:

Always shorten the suction line to the necessary length and lay ascending!

IMPORTANT:

Height (h) x density (d) \leq max suction lift in mWC!

Installation

- If the suction/discharge connection is closed with a plug please remove this.
- Shorten the hose to the necessary length with a straight cut.
- Pull the union nut and gripper ring over the hose line.
- Push the shortened hose end over the nozzle until it stops.
- If necessary widen the hose end a little.
- If attached several times shorten the hose end by approx. 10 mm with a straight cut.

PLEASE NOTE:

Only use the gripper rings and hose nozzles for the respective hose diameter as well as original hoses with specified hose dimensions and wall thickness. If this is not observed the stability of the connection is not guaranteed!

Avoid reducing the hose sizes!

For long lines and viscous media the next highest line diameter 12/9 should be used!

- Press on the hose and simultaneously tighten the union nut.

PLEASE NOTE:

You obtain a rigid pump connection if you pull briefly on the line connected to the liquid end and subsequently tighten the union nut again until hand tight (retighten)!

- Assemble foot valve.
- For this purpose shorten the free end of the suction line to such an extent that the foot valve is just hanging slightly above the bottom of the tank.
- For metering solutions with impurities or feculency shorten the free suction line end so far that the foot valve is hanging at least 50 mm above the floor of the tank.

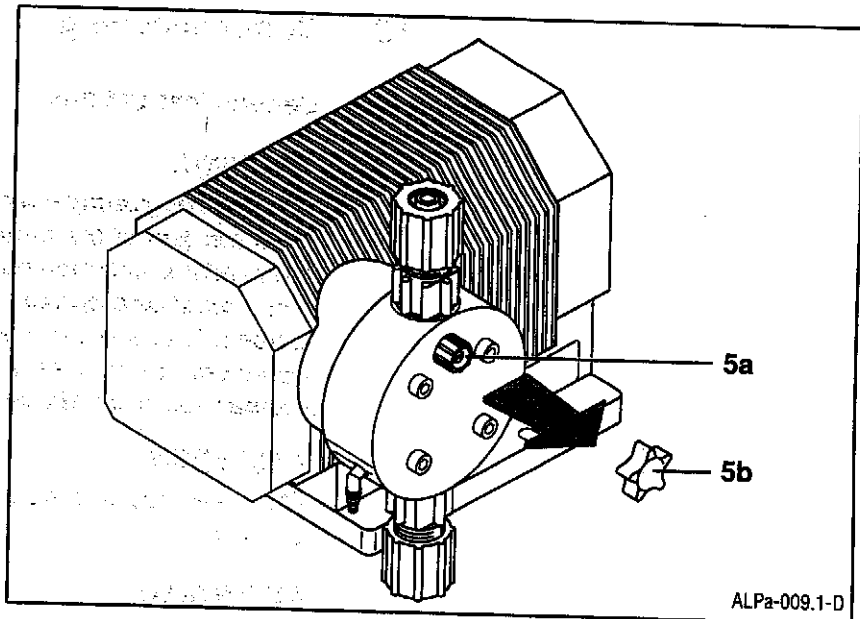
9.1.3 Installation of the bypass hose line (only for PP1, PP2, PP3, NP3 version)

Liquid end with bleed valve

For liquid end PP1, PP2, PP3, NP3 versions a bleed valve (5) with bypass (8) is present on the liquid end.

- Plug the hose line with an internal diameter of \varnothing 4 - 5 mm (preferably soft PVC 6 x 4 mm) onto the bypass hose nozzle and secure with a pipe clamp or fast action clamp.
- Lead the free end of the line back into the metering tank.
- Connect the discharge line directly to the discharge connection and injection valve.

Installation



- Open the bleed valve (5) by turning it one turn anticlockwise.
- Now the path is open for the coarse suction bleeding using the bleed valve.

PLEASE NOTE:

For media which easily emit vapours the fine bleeding can be switched on continuously! As a result a partial flow of the metering quantity is constantly fed back into the supply tank! The feedback quantity should be approx. 20% of the metering quantity!

PLEASE NOTE:

If the backfeed line ends above the fluid level, the fine bleeding valve operates as a vacuum breaker and prevents the supply tank from being sucked empty if vacuum leaks out in the discharge line!

9.2 Installation pump: electrical part

9.2.1 Electrical connection



WARNING:

Only connect the pump to the mains supply with the corresponding mains cable and plug!

Observe VDE 0165 (abroad: the respective national regulations in your country)!



WARNING:

As there is no on/off switch on the pump the pump starts immediately after plugging in the mains plug or turning on the power supply!

	<u>Mains voltage:</u>
Power supply	Standard version 230 V \pm 10%; 50 Hz
Power drain	57 W - 0.5 A
Power supply	Multi-range motor (100 - 120 V and 200 - 240 V at 50/60 Hz)

Commissioning

10 Commissioning

10.1 General Instructions



WARNING:

The metering pump may still contain water in the liquid end from the test at the factory!

For media which may not come into contact with water, the water must be emptied from the liquid end before the pump is used. For this purpose turn the pump 180° and empty the liquid end, then rinse with a suitable agent via the suction connection from above.

ATTENTION:

The metering pump may only be operated when the cover (1) is closed!

ATTENTION:

The stroke length may only be adjusted when the pump is switched off!

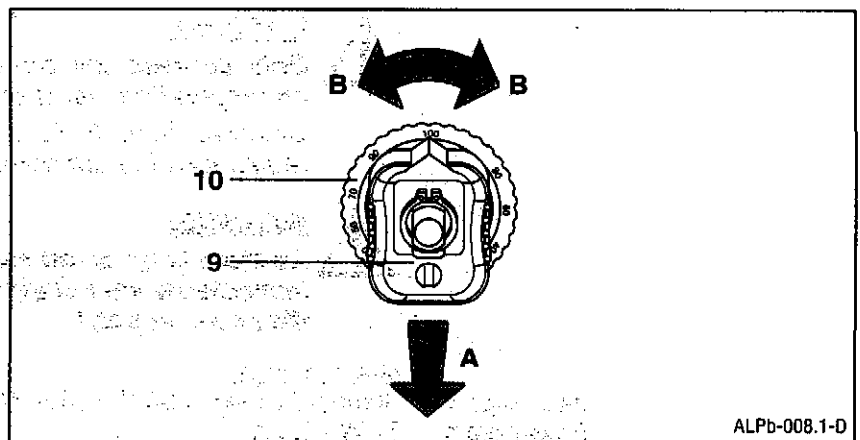
10.2 Commissioning NP6 version

- Connect the suction and discharge lines securely.

PLEASE NOTE:

Do not connect the discharge line to the injection valve, only to the discharge connection (4)!

- There is fluid in the suction tank.
- Remove the cover (1) and check whether the stroke length is set to 100%.
- If not,
 - A:** push back locking bar (9) to eccentric plate,
 - B:** set eccentric plate (10) to 100%,
 - C:** slot in locking bar again.



- Refit the cover (1).

Commissioning

ATTENTION:

The metering pump may only be operated when the cover (1) is closed!

- Switch on the pump and allow it to operate at 100% stroke length until the medium has completely filled the liquid end without bubbles.
- This can be recognised when the medium can be seen in the discharge line.
- Switch off the metering pump.
- Connect the discharge line to the injection valve.
- The pump is now ready to operate.

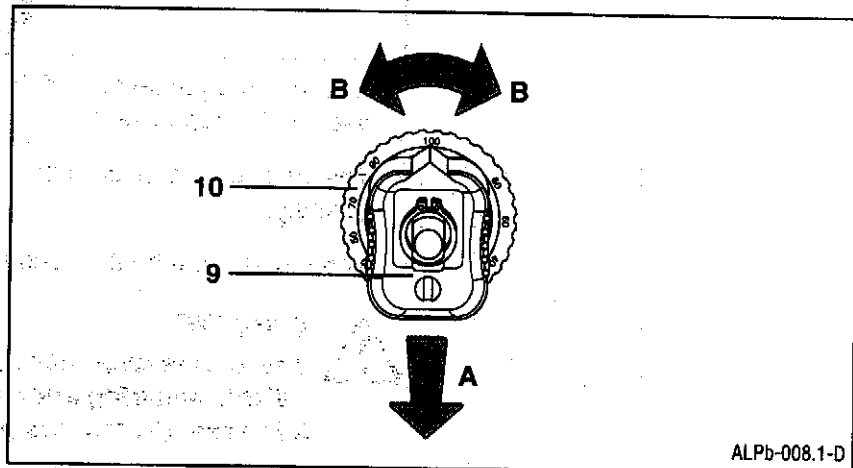
10.3 Commissioning PP1, PP2, PP3, NP3 version

- If possible, proceed as for NP6 version. If this is not possible:
- Connect the suction and discharge lines securely.
- There is fluid in the suction tank.
- Remove the cover (1) and check whether the stroke length is set to 100%.
- If not,

A: push back locking bar (9) to eccentric plate,

B: set eccentric plate (10) to 100%,

C: slot in locking bar again.



- Refit the cover (1).

ATTENTION:

The metering pump may only be operated when the cover (1) is closed!

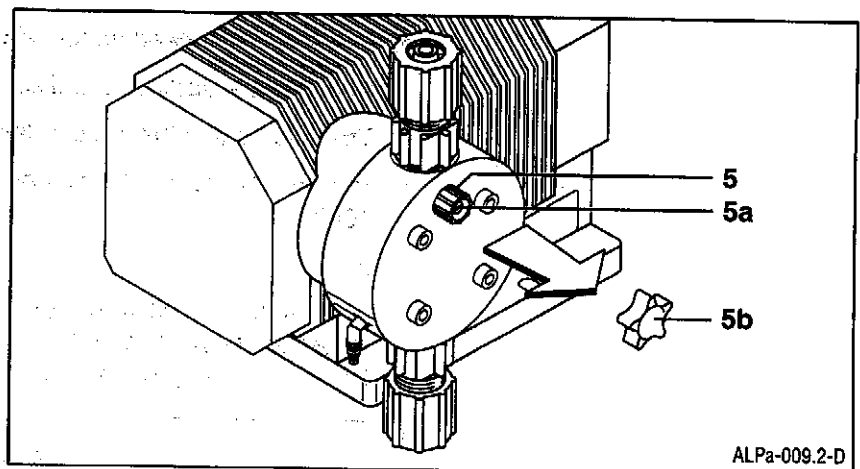
- Coarse bleeding**
- Open the bleed valve (5) by turning it one turn anti-clockwise.
 - Now the passage is open for coarse suction bleeding via the bypass.

Commissioning

- Switch on the pump and allow it to operate at 100% stroke length until the medium has completely filled the liquid end without bubbles.
- This can be recognised when the medium can be seen in the discharge line or bleed line.
- Switch off the metering pump.
- Close the bleed valve (5) by one turn clockwise. The pump is now ready to operate.

The fine venting facility can be permanently switched on when processing media with slight gas emission.

- For this purpose, after removing the attached star handle (5b), the fine bleed screw (5a) inside the bleed valve is opened approx. 1 turn anti-clockwise.



- As a result a partial flow of the metering quantity is constantly fed back to the supply tank.
- The backfeed quantity should be approx. 20% of the metering quantity.
- The media must be fluid and without any solid particles.



WARNING:

These measures above do not guarantee any absolute reliable metering after the pump has come to a standstill! It is essential that the pump is checked regularly!

- Refit the star handle (5b).

Please note:

After approx. 24 operating hours the screws in the liquid end are to be tightened crosswise.

Attention:

*It is essential that the torques of the screws are observed!
Torques for M5 screws: 4.5 to 5 Nm!*

Operation

11 Operation

11.1 General



DANGER:

When handling dangerous media protective glasses and gloves must be worn!

ATTENTION:

The metering pump may only be operated with the cover (1) closed!

PLEASE NOTE:

Check correct assembly (see chapter 9 "Installation" from page 11)!

PLEASE NOTE:

Metering pumps can for a short time in certain circumstances operate against excessively high operating pressure without the electrical safety devices responding (e.g. for closed or blocked discharge line)!

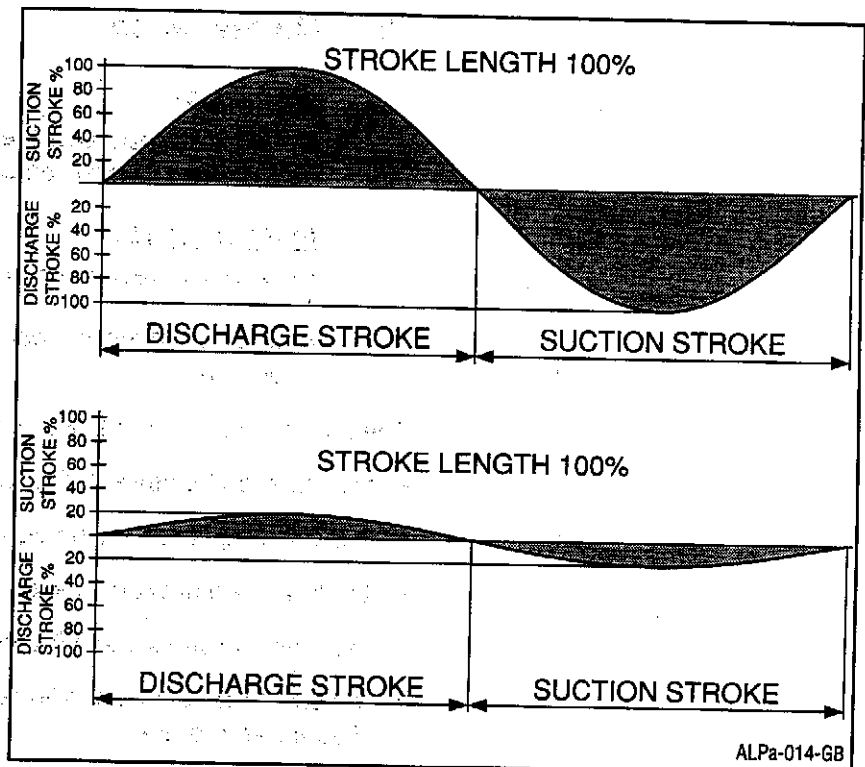
As an overload protection a safety relief valve with backfeed into the chemical tank is to be provided.

11.2 Setting the capacity

ATTENTION:

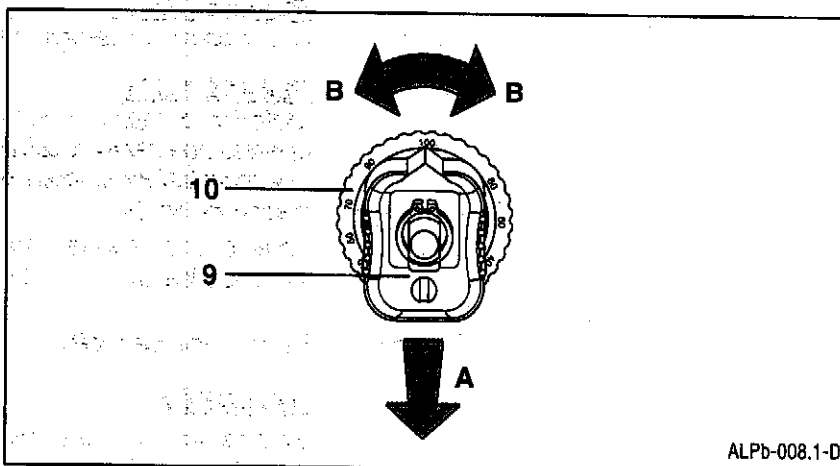
Settings to the stroke length may only be made when the pump is switched off!

- Read off the capacity required from the diagram "Capacity in relation to the stroke length of the counter pressure".



Operation/Maintenance

- Stop the pump.
- Remove the cover (1).
- A:** Push back the locking bar (9) to the eccentric plate.
- B:** Set the eccentric plate (10) to the stroke length desired (in %) (arrow head of the locking bar must point precisely to the graduation mark desired of the eccentric plate) - the capacity can be set in 10% steps between 100% to 10%.
- C:** Slot in the locking bar again.



- Replace cover (1).

12 Maintenance



WARNING:

Metering pumps and their peripheral equipment may only be serviced by trained and authorised personnel!

PLEASE NOTE:

Service intervals: every quarter of a year!

Shorter intervals for heavy duty operation (e.g continuous operation)!

The maintenance of the alpha metering pumps is limited to checking

- the liquid end screws (fitting tightly, 4.5 - 5 Nm)
- the discharge lines (fitting tightly)
- the head and suction valves (fitting tightly)
- the bleed valve for the PP version (fitting tightly)
- the drain bore behind the liquid end side (dampness can indicate a diaphragm rupture)

13 Troubleshooting/eliminating errors

13.1 Errors you can eliminate yourself

PLEASE NOTE:

In order to be able to rectify minor failures at any time we recommend that you always have a spare parts set available, consisting of diaphragms, valves, balls and seals!

The order numbers for these can be found in our product catalogue under "Spare parts kits for alpha"!



DANGER:

Before opening the pump pull out the mains plug or switch off the power supply! Check that the pump is voltage-free!



WARNING:

Always first relieve the discharge line of pressure before working on the pump!

Always empty the liquid end and rinse it out!

Observe the safety data sheets of the metering fluids!



WARNING:

Metering pumps and their peripheral equipment may only be serviced by trained and authorised personnel!



WARNING:

If hazardous or unknown metering media are used, always first empty out the liquid end and rinse it out for maintenance and repair work!



WARNING:

When metering hazardous or unknown metering media protective clothing (glasses, gloves) must be worn when working on the liquid end!

ATTENTION:

The stroke length may only be set when the pump is switched off!

13.1.1 Pump is operating but no metering takes place

Possible cause: Collection of air in the liquid end

Remedy by pumps PP/PE/NE:

- Bleed the liquid end.
- Switch off the pump.
- Open the bleed valve (5) by turning once anti-clockwise.
- Switch on the pump again and allow it to operate so long until metering takes place for every discharge stroke.

Troubleshooting/Eliminating Errors

- If the metering continues to operate incorrectly, switch off the pump, set the stroke length to 100% and execute the bleed procedure at a stroke length of 100%.
 - Close the bleed valve (5) by turning once clockwise.
- Remedy for NP6 pumps:*
- Bleed the liquid end.
 - Switch off the pump.
 - Remove pressure from the discharge line by removing the hose on the injection valve or relieving the relief valve.
 - Switch the pump on again and allow it to operate so long until metering takes place for every discharge stroke.
 - If the metering continues to operate incorrectly, switch off the pump, set the stroke length to 100% and execute the bleed procedure at a stroke length of 100%.
 - Stop the pump and connect the discharge line to the injection valve again or reload the relief valve.

Other possible cause for PP1-, PP2-, PP3-, NP3-version:

The fine bleeding connected is not working as the bleeding bore is blocked.

- Remedy:*
- Remove the star handle (5b) from the bleed valve (5).
 - Open the fine bleed screw (5a) with the pump operating by about two turns anti-clockwise until the blockage is rinsed clear.
 - If this is not successful, with the pump switched off, unscrew the bleed valve (5) with the fine bleed screw (5a) from the liquid end (6) and clean all parts including the bores.
 - Following this, screw in the bleed valve with the fine bleed screw in reverse order again and reset the original setting.

13.1.2 Pump does not prime in spite of full stroke movement and bleeding

Possible cause: Crystalline deposits due to dried out valves

- Remedy:*
- Remove suction hose from the supply tank and rinse the liquid end well.
 - Possibly decrease the suction lift or with the suction hose filled, support the initial priming by means of inlet operation: If the pump is idle, the media can also be sucked in by means of a disposable syringe applied to the head valve.
 - If no improvement occurs the valves should be disassembled and cleaned.
 - The valve set in the suction and discharge valve can be pushed out with a 3 mm mandrel.

Troubleshooting/Eliminating Errors

13.1.3 Pump switches off automatically during metering

Possible cause Due to too high counter pressure, the thermal safety device has switched off the motor automatically as the motor has overheated more than 106 °C.

- Remedy:*
- Switch off the mains.
 - Reduce counter pressure.
 - After the motor has cooled down the safety device automatically switches the pump on again.
 - If there is no success check the discharge line and the following pressure system to establish whether the stop valve is closed or if there is a blockage.
 - Eliminate the blockage.
 - Switch the mains on again.

Possible cause The thermal safety device has switched off the motor automatically as the motor has overheated more than 106 °C because the intake and drain opening of the motor cooling air are blocked.

- Remedy:*
- Switch off the mains.
 - Eliminate the blockage by cleaning the air intake opening at the bottom of the pump and the drain opening of the cover.
 - After the motor has cooled down the safety device automatically switches the pump on again.
 - If there is no success check the discharge line and following pressure system to establish whether the stop valve is closed or if there is a blockage.
 - Eliminate the blockage.
 - Switch on the mains again.

13.1.4 Pump does not operate in spite of activated power supply

Possible cause: The counter pressure applied is higher than the permissible working pressure or starting pressure.

- Remedy:*
- Reduce counter pressure.
 - If there is no success check the discharge line and the following pressure system to establish whether the stop valve is closed or if there is a blockage.
 - Eliminate the blockage.

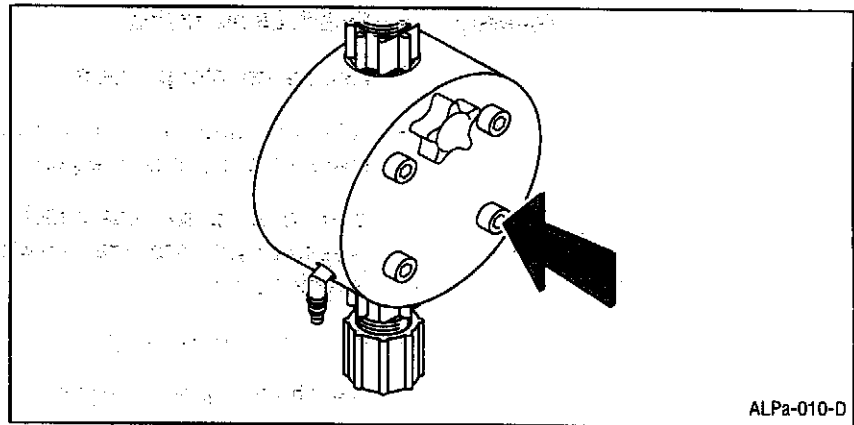
Troubleshooting/Eliminating Errors

13.1.5 Fluid is leaking out at the recess of the liquid end support

Possible cause: The liquid end is not leak-proof at the pump diaphragm.

Remedy:

- Tighten the screws (arrow) in the liquid end crosswise.



ATTENTION:

It is essential that the torques 4.5 to 5 Nm for the screws are observed!

PLEASE NOTE:

The torque of the liquid end screws is to be checked after 24 hours operation!

For PP pumps the torques are to be checked additionally every quarter of a year.

- If fluid is still leaking, the diaphragm has ruptured and must be exchanged.

PLEASE NOTE:

The pump diaphragm is a part subject to wear - its service life depends on counterpressure in the system operating temperature qualities of the medium to be metered!

PLEASE NOTE:

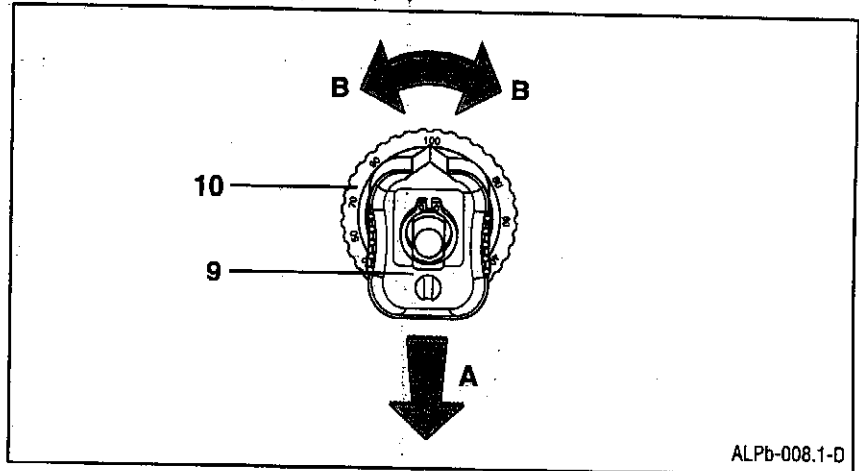
When using abrasive media the service life of the diaphragm is restricted and the diaphragm must be checked more often!

Under such operating conditions we recommend that the diaphragm is changed annually or every half a year!

Troubleshooting/Eliminating Errors

Exchanging the pump diaphragm

- Remove the cover (1).
- **A:** Push the locking bar (9) back onto the eccentric plate.
- **B:** Set the eccentric plate (10) to "0".



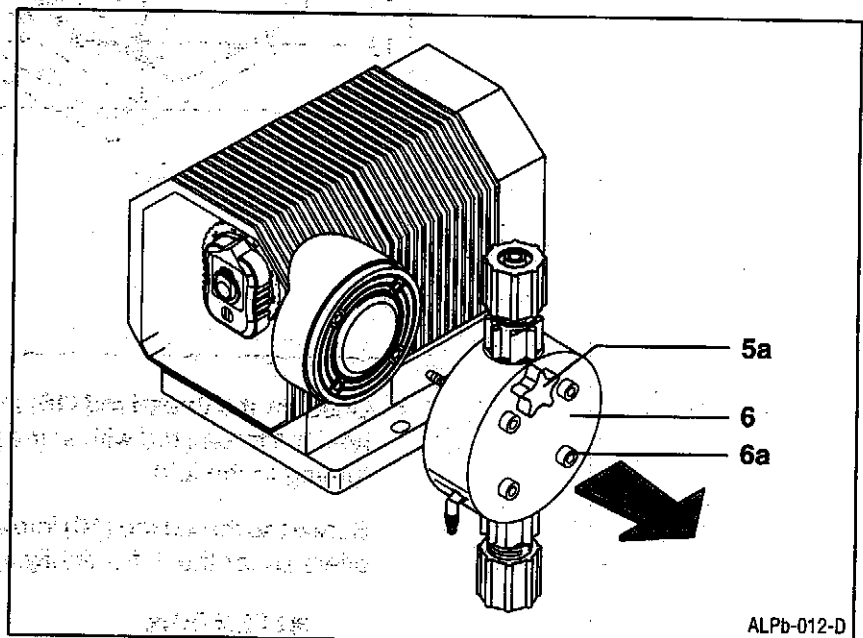
PLEASE NOTE:

The locking bar cannot be snapped in in this position!

- Loosen the fastening screws (6a) and completely remove the liquid end (6) from the motor support (2).

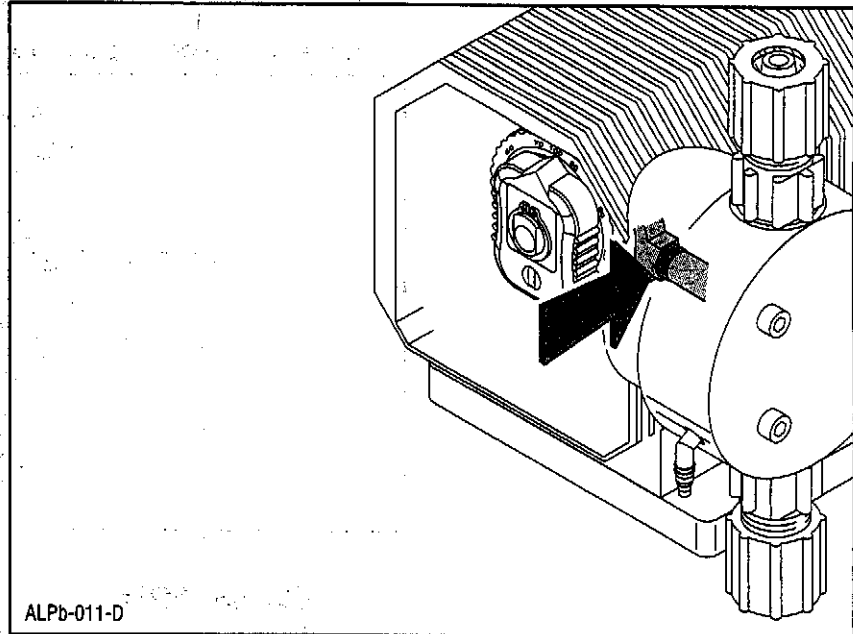
For PP version

Additionally, remove the start handle (5a) and the panel from the liquid end (6).

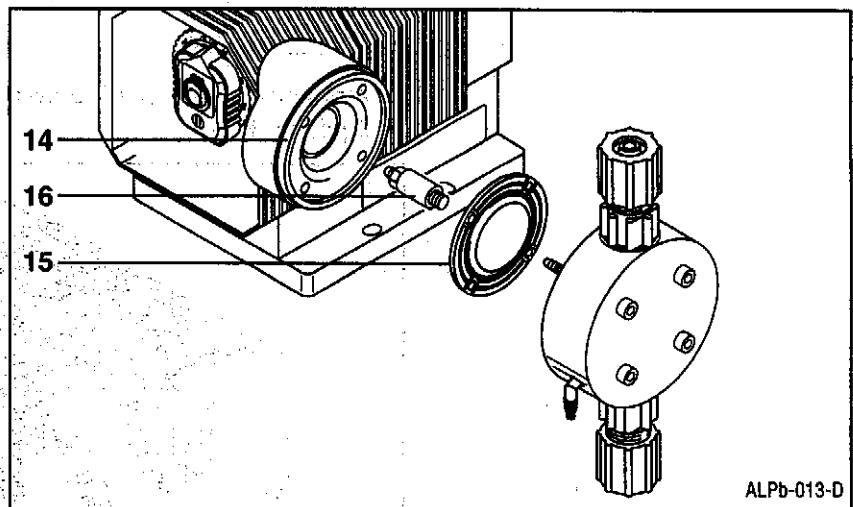


Troubleshooting/Eliminating Errors

- Loosen the hexagon nut (**arrow**) in front of the connecting rod with a size 8 spanner approx. 1 turn



- Remove the pump diaphragm (15) with intermediate disk (14) and threaded rod (16) from the motor support (2) by turning to the left.



- Unscrew the thread rod (16) from the diaphragm (15) (if necessary hold the thread rod with some pliers and remove the diaphragm by turning to the left).
- Screw the thread rod (16) into a new diaphragm and twist in with the pliers so far that it fits tightly in the diaphragm.

ATTENTION:

No gap may be visible between the diaphragm and the bearing surface of the thread rod!

Troubleshooting/Eliminating Errors

- Screw on the hexagon nut (17) until the stop onto the thread rod (16).
- Insert a new diaphragm with thread rod into the intermediate disk (14) and screw on the entire assembly onto the connecting rod (18) until the stop.
(The stroke length must be set to 0.)
- Turn back the diaphragm so far that the 4 bores of the diaphragm and intermediate disk match precisely!
- Place liquid end (6) - suction connection must point downwards - onto diaphragm and intermediate disk with screws (6a) and tighten screws crosswise.

ATTENTION:

It is essential that the torques of 4.5 to 5 Nm are observed for the screws!

- Twist the hexagon nut (17) against the connecting rod (18) and tighten lightly.
- Set the stroke length desired.
- Slot in the locking bar (9).
- Replace the cover (1).
- Bleed the pump in accordance with chapter 11.2 or 11.3 "Commissioning" pages 16 or 17.

PLEASE NOTE:

The torque of the liquid end screws is to be checked after 24 hours operation!

For PP pumps the torques are to be checked additionally every quarter of a year.

13.1.6 Exchanging the complete liquid end

PLEASE NOTE:

Complete liquid ends are delivered with the bleed valve open!

After priming and bleeding the fine bleed screw (5a) and the bleed valve (5) must be retightened!

Check that the suction and discharge valves fit firmly!

Troubleshooting/Eliminating Errors

13.2 Errors which require customer service assistance



DANGER:

Electrical repairs may only be carried out by trained electricians (safety regulations of the employers' insurance associations: VBG 4 and ZH 1/11)!



DANGER:

Before opening the pump pull out the mains plug or cut off the power supply!

Check that the pump is voltage-free!

During the repair work, ensure the power cannot be switched on again by unauthorised persons!



WARNING:

Metering pumps may only be repaired by trained and authorised persons!

13.2.1 Mains connection line (system cable) with thermal safety device damaged

Remedy: • Have the connection line/thermal safety device exchanged by an authorised customer service.

PLEASE NOTE:

Only use correct connection lines from the manufacturer with EURO plug.

For all alpha pump types:

Order no. 79.06.32.4

For all other mains cables see list of spare parts!

14 Repair



WARNING:

Metering pumps may only be repaired by trained and authorised persons!

Inform your customer service responsible!

Or contact the ProMInent subsidiary or representative responsible for you. (Addresses can be found on the back page/page 32 of these operating Instructions)!

Customer service



WARNING:

Pumps for radioactive media may not be sent.

Pumps for radioactive media

PLEASE NOTE:

Only send the metering pump back for repair once it has been cleaned and the liquid end has been rinsed!

PLEASE NOTE:

The legal regulations for occupational safety - e.g. the regulation governing places of work, hazardous substances, the prevention of accidents and environmental protection regulations (law governing waste or water resources) oblige all industrial entrepreneurs to protect their employees or people and the environment against damaging effects from handling hazardous substances!

An inspection or repair of pumps and their parts therefore only takes place if a correctly and completely filled in certificate confirming the quality as being recognised as safe can be submitted by authorised and qualified specialists of the pump operator!

If in spite of emptying and cleaning the pump carefully, safety measures are necessary, the necessary information must be listed in the certificate confirming the pump is recognised as being safe!

The certificate confirming the pump is recognised as being safe is a part of the inspection/repair contract. There is a standard form at the end of these operating instructions for this purpose!

We reserve the right not to accept the contract due to other reasons. Pumps which were operated with materials with a radioactive load are not accepted as a general rule!

Disposal of Old Parts/Pump Cross Section

15 Disposal of old parts

WARNING:

Never throw metering pumps in the bin (domestic refuse). Plastic and mechanical parts are special waste and must be recycled!

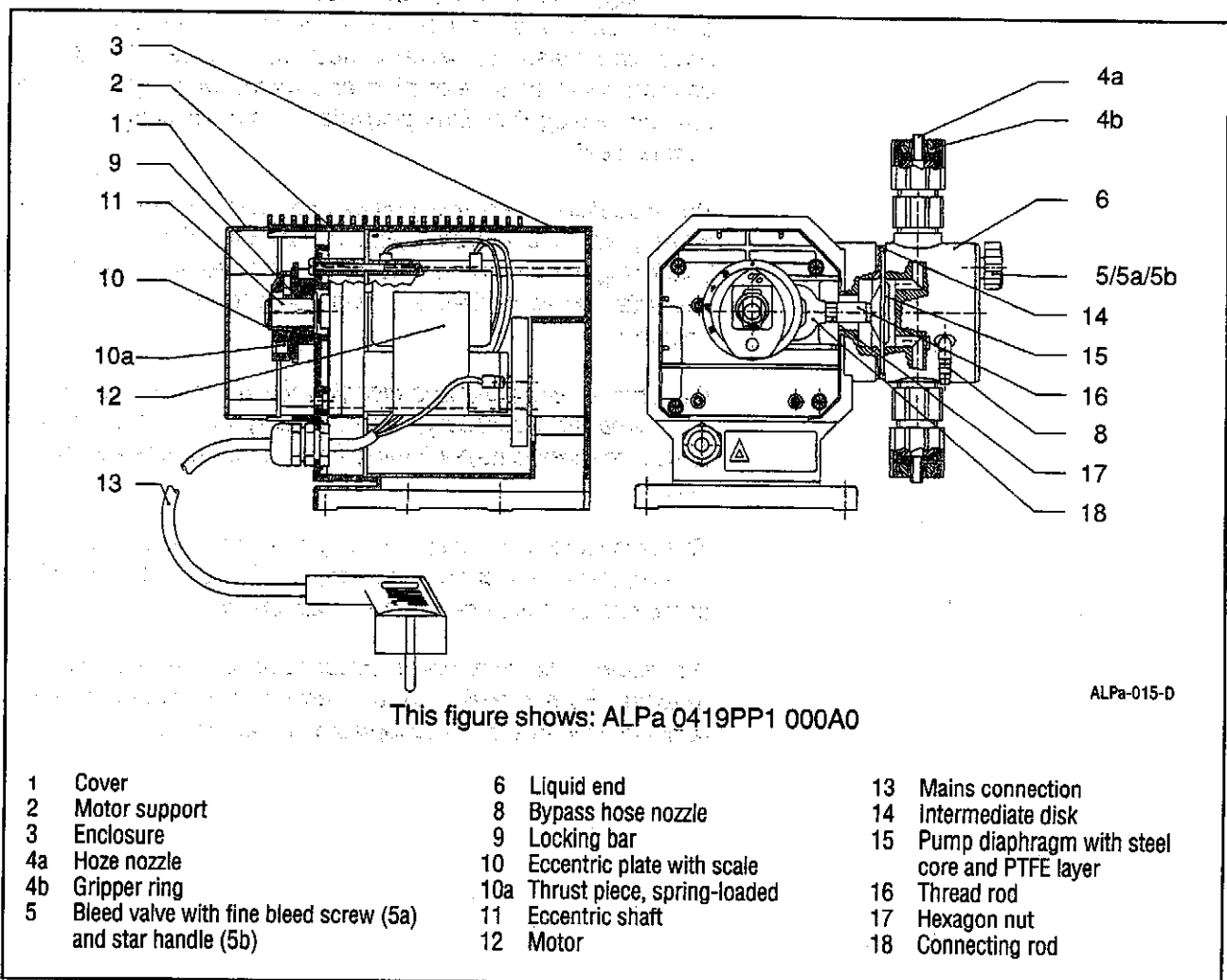
Abfg, AbfRestberwV

Waste (old parts) is to be disposed of in an "orderly manner for the common good especially the protection of the environment". Therefore old parts have to be disposed of in accordance with the (German) Waste Avoidance and Waste Management Act (Abfg) or recycled in accordance with the (German) Waste and Residual Materials Monitoring Act (AbfRestberwV).

Taking back old parts

If you should not find any appropriate collection point the ProMinent subsidiary or representative responsible for you will take back your old parts for a small fee (addresses can be found at the back/page 32 of these operating instructions)!

16 Cross section of the pump



Warranty Application

Please copy and send in with the pump.

If the pump breaks down within the warranty period please clean the pump and send it back along with the fully completed warranty application.

Please complete in full !

Warranty application for metering pumps

No

Company: Tel. no.: Date:

Address:

Clerk (customer):

Order no.: Delivery date:

Pump type/
identity code: Serial no.:

Short description of fault:

.....

.....

.....

Type of fault

1 Mechanical fault

- Unusual wear
- Parts subject to wear
- Rupture/other damage
- Corrosion
- Damage during transport

2 Electrical fault

- Connections such as plugs or cables loose
- Operating elements (e.g. switches)
- Control

3 Leakage

- Connections
- Liquid end

4 No or poor capacity

- Diaphragm defective
- Other

Application conditions of ProMinent pumps

Location/system description:

Pump accessories used:

.....

.....

Commissioning (date):

Running time (approx. operating hours):

Please specify set-up data and enclose sketch of the system!

Installation Data

Customer: _____	
Project no: _____	Date: _____ <input type="checkbox"/> Sketch enclosed _____
Metering pump	Type _____
	Capacity _____ l/h
	Stroking rate _____ s/min.
	Stroke length _____ %
	Valve spring pressure suction side _____ bar
	Valve spring pressure discharge side _____ bar
Medium	
	Designation, concentration _____ %
	Share of solids/size of particle _____ %/mm
	Material solid/hardness _____ Mohs
	Dynamic viscosity _____ mPas (cP)
	Density _____ kg/m ³
	Vapour pressure at operating temp. _____ bar/°C
System suction side	
	Pressure in suction tank _____
	Nominal width suction line _____ DN/mm
	Suction lift min/max _____ m
	Weir height min/max. _____ m
	Length suction line _____ m
	Number of angles/valves _____
	Accumulator <input type="checkbox"/> Bubble tank _____ ltr.
	<input type="checkbox"/> Accumulator _____ ltr.
System discharge side	
	Static system pressure min/max. _____ bar
	Nominal width discharge line _____ DN/mm
	Length discharge line _____ m
	Delivery head _____ m
	Number angles/valves _____
	Accumulator <input type="checkbox"/> Bubble tank _____ ltr.
	<input type="checkbox"/> Accumulator _____ ltr.

Safety certificate

Please copy and send in with the pump!

Safety certificate

We herewith certify that the enclosed device,

Type:

Serial no:

is free of

- chemical
- biological or
- radioactive substances

which are a health hazard.

The device has been thoroughly cleaned before being dispatched.

Date/signature

Company stamp

Die ProMinent Firmengruppe / The ProMinent Group

Stammhaus / Head office

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