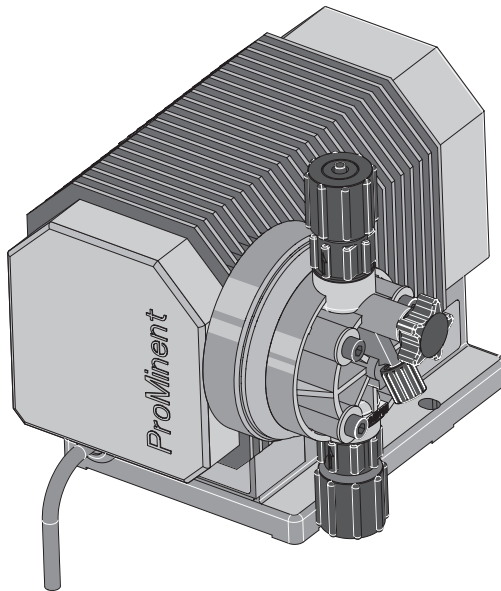


Operating Instructions

Motor Diaphragm Metering Pump alpha ALPc



ALPc

Please enter the Identcode of your system here!

For a safe and proper operation of the ProMinent® alpha ALPc metering pumps, two operating instructions are required: The product-specific operating instructions alpha ALPc and the General Operating Instructions ProMinent® solenoid metering pumps.

Both are only valid in connection with each other.

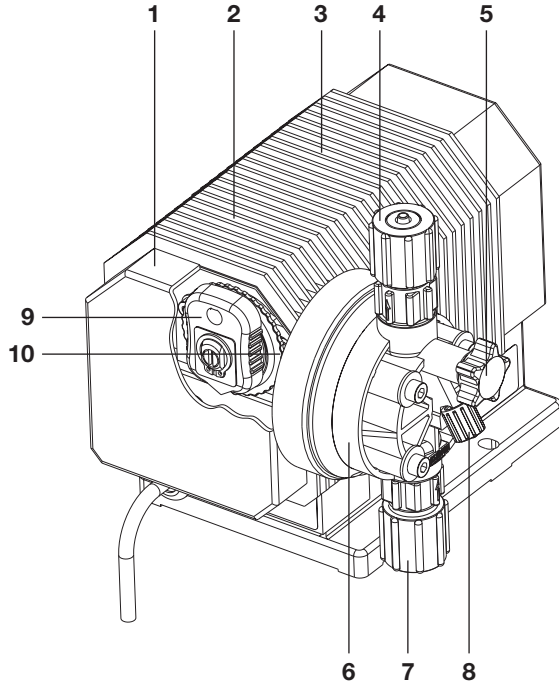
Please completely read through operating instructions! · Do not discard!
The operator shall be liable for any damage caused by installation or operating errors!

Device Identification / Identcode

The rating plate affixed to the title page is identical to the rating plate of the delivered pump such that a clear connection between the operating instructions and the pump is guaranteed. Please enter the Identcode listed on the rating plate under "Type" into the grey box below.

ALPc	Series alpha, version c	
	Pump type:	
	Capacity 50 Hz	Capacity 60 Hz
1001	0.9 l/h 10 bar	1.1 l/h 10 bar
1002	1.8 l/h 10 bar	2.2 l/h 10 bar
1004	3.5 l/h 10 bar	4.1 l/h 10 bar
1008	7.7 l/h 10 bar	8.9 l/h 10 bar
0707	6.9 l/h 7 bar	8.3 l/h 7 bar
0417	17.0 l/h 4 bar	20.6 l/h 4 bar
0230	29.7 l/h 2 bar	34.4 l/h 2 bar
	Liquid end material:	
	PPE	PP/PP/EPDM
	PPB	PP/PP/FPM-B
	NPE	Plexiglass/PVC//EPDM
	NPB	Plexiglass/PVC/FPM
	PVT	PVDF/PVDF/PTFE
	Valve spring:	
	2	without valve spring, with bleeding
	3	with 2 valve springs approx. 0.1 bar, material 1.4571, with bleeding
	Hydraulic connection:	
	0	Standard according to technical data
	Design:	
	0	with ProMinent® label
	Electrical connection:	
	A	230 V, 50/60 Hz, 2 m, Euro connector
	B	230 V, 50/60 Hz, 2 m, Swiss connector
	C	230 V, 50/60 Hz, 2 m, Austral. connector
	D	115 V, 50/60 Hz, 2 m, USA connector
	Accessories:	
	0	without accessories
	1	with foot and metering valve, 2 m PVC suction line, 5 m PE metering line
	FPM = fluororubber	
ALPc	---	---

Description of the Units and Operating Elements



61_01-101_00_70-02

Detailed description
on the pages:

1	Cover	17 et seq., 28 et seq., 34
2	Motor support	7, 34
3	Housing	7, 34
4	Pressure connection	13, 34
5	Bleed valve with fine bleed screw	15 et seq., 25 et seq., 34
6	Liquid end	7, 25 et seq., 34
7	Suction connection	13, 34
8	Bypass hose nozzle	15, 34
9	Latched slide	11, 14 et seq., 28 et seq., 34
10	Eccentric disc with scale	11, 14 et seq., 28 et seq., 34

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Corporate information:

Operating instructions metering pump alpha ALPc

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1 Preamble

alpha metering pumps are motor diaphragm metering pumps for continuous or discontinuous metering of liquids.

2 Functions

2.1 Functional Principle

alpha metering pumps mainly consist of:

- a pump drive
with housing, split pole motor with gearbox and thermal fuse, stroke length adjustment with eccentric and connecting rod
- as well as a delivery unit
with liquid end, suction and pressure port, metering diaphragm, and end disc.

The eccentric for stroke movements is guided in an eccentric disc. Pumps of this size thus do not require any return spring – the suction and pressure stroke are positively driven.

The delivery is made intermittently; the stroke length is max. 2 or 3 mm.

The stroke length can be adjusted via a latched slide (9) from 100 % to 0 in increments of 10%. The diaphragm is always deflected from the neutral centre position – this ensures a smooth, sinusoidal stroke motion.

The metering pumps can be upgraded as desired by the customer (options). alpha metering pumps are available with Euro motor (230 Volt – 50 Hz) and multi-range motor (100 – 120 Volt and 200 – 240 Volt at 50/60 Hz).

2.2 The Pump Components

The housing made of PPE with 20 % glass fibre. Protection against foreign particles (> 12 mm ø) and spray (at an angle of up to 60°).

The drive The single-phase split pole motor drives an eccentric via the gearbox. The eccentric shaft is guided in an eccentric disc which is directly linked to the connecting rod and the metering diaphragm.

The suction and the metering strokes are thus positively driven, without any return spring for the suction stroke. The delivery process of suction and metering stroke is made intermittently with a sinusoidal stroke movement.

During the metering stroke, the metering diaphragm expels the medium from the liquid end through the pressure valve and the balls on the suction side close. When the diaphragm reaches the front end position, it is returned to the initial position via the eccentric and the ball valve on the pressure side closes. A vacuum is created in the liquid end, the balls on the suction side open and the medium is suctioned into the liquid end (suction stroke).

The output per stroke can be adjusted via a latched slide (9) in increments of 10 %. In this process, the eccentricity is changed; this means that the diaphragm deflection is always made from the neutral centre position. The stroke length is set when the pump is stopped.

The stroke frequencies are – depending on the pump type – 58 or 128 strokes/min. at 50 Hz or 69 or 154 strokes/min. at 60 Hz.

Thermal fuse The drive motor is equipped with a thermal fuse which automatically stops the motor if it overheats by more than 106 °C; the safety device starts the pump again after the motor has cooled down.

The delivery unit

Liquid end Liquid ends for alpha pumps are available in three types of material
 – Polypropylene (PP)
 – Polyvinylidene fluoride (PVDF)
 – Plexiglass/PVC (NP)

with double ball valve on the suction and pressure side

The liquid ends in the types PP, PV and NP have a combined bleed valve with fine adjustment for continuous, automatic bleeding. This permits suctioning and bleeding without having to interrupt and de-pressurise the metering line.

The PP liquid ends are also available without bleed valve.

For media of higher viscosity, the valves can be spring-loaded (recommendation: from a viscosity of approx. 200 mPa • s).

Metering diaphragm

A compound diaphragm with a long service life made of high-quality, fabric-reinforced EDPM material, plastic core vulcanised in and PTFE coating on the side coming into contact with the media.

3 Technical Data

Pump type ALPc	Max. output at max. backpressure		Max. output at max. backpressure		No. of strokes Strokes/min.	Connection size øD x iø	Suction height mWC	Priming mWC	Max. perm. starting pressure bar	Max. perm. pre-pressure suction side bar
	bar	l/h	bar	l/h						
50 Hz version										
1001	10	0.9	5	1.0	58	6x4	5.0	2.6	10	5
1002	10	1.8	5	2.1	58	6x4	5.0	3.6	10	5
1004	10	3.5	5	3.9	58	8x5	5.0	3.6	10	5
1008	10	7.7	5	8.6	128	8x5	5.0	3.6	10	5
0707	7	6.9	3	7.7	58	8x5	4.0	4.1	7	3.5
0417	4	17.0	2	18.3	128	8x5	4.0	4.1	4	2
0232	2	29.7	1	32.7	128	12x9	3.0	3.1	2	1

Technical Data

60 Hz version

1001	10	1.1	5	1.3	69	6x4	5.0	2.6	10	5
1002	10	2.2	5	2.6	69	6x4	5.0	3.6	10	5
1004	10	4.1	5	4.7	69	8x5	5.0	3.6	10	5
1008	10	8.9	5	10.4	154	8x5	5.0	3.6	7	5
0707	7	8.3	3	9.2	69	8x5	4.0	4.1	7	3.5
0417	4	20.6	2	21.9	154	8x5	4.0	4.1	2.5	2
0232	2	34.4	1	39.2	154	12x9	3.0	3.1	1	1

*) Suction height with empty liquid end, valves wetted.

The output was determined using water and metering pump at operating state temperature.

Performance range of the series: $\pm 10\%$.

Reproducibility: $\pm 2\%$ given consistent conditions, minimum backpressure 1 bar, stroke setting 40 – 100 %, and water-like medium for short time intervals (approx. 5 min.)

NOTE

for the types 1001, 1002 and 1004, the output at stroke length 20 % and backpressure > 4 bar may converge to zero.

El. connection "A", "B", "C" 230 VAC (220-240 V)

System frequency	50 Hz	60 Hz
Output	50 W	45 W
Power consumption	0.4 A	0.35 A

El. connection "D", 115 VAC (108-134 V)

System frequency	50 Hz	60 Hz
Output	60 W	50 W
Power consumption	0.9 A	0.7 A

*Protection
against moisture
and accidental
contact*

IP 23 according to DIN VDE 0470 Part 1
with horizontal pump base and vertically installed pump

*Permissible
ambient
temperature*

-10 °C to 45 °C

*Permissible
medium
temperature*

for PP 50 °C, for PV 50 °C, and for NP 45 °C.

Shipping weight 3.0 kg

Viscosity The metering pumps are typically suited up to a viscosity of:
200 mPas for standard delivery unit
500 mPas for standard delivery unit with valves with valve spring

*Materials in
contact
with media*

Liquid end	Material	Suction/pressure port	Gaskets	Balls
PPE	Polypropylene (PP)	Polypropylene (PP)	EPDM	Ceramic
PPB	Polypropylene (PP)	Polypropylene (PP)	FPM-B	Ceramic
NPE	Plexiglass (PMMA)	PVC	EPDM	Ceramic
NPB	Plexiglass (PMMA)	PVC	FPM-B	Ceramic
PVT	PVDF	PVDF	PTFE	Ceramic

Metering diaphragm with PTFE coating for all types

4 Replacement Parts and Accessories



WARNING

The assembly of ProMinent metering systems using third-party components which are not verified and recommended by ProMinent is not permitted and may lead to personal injury and damage to property for which ProMinent will not accept any liability!

4.1 Accessories via Identcode

The accessories are delivered in a bag. This bag contains:

- 1 metering valve R 1/2"
- 1 foot valve
- 2 m hose, soft PVC
- 5 m hose, PE

4.2 Other Accessories from the Series Programme

- Mounting plate for metering tank
- Wall bracket
- Pressure-retaining valves
- Metering tank

4.3 Replacement Parts

Replacement parts kit for alpha consisting of:

- 1 metering diaphragm
- 1 suction valve compl.
- 1 pressure valve compl.
- 2 valve balls
- 1 kit gaskets
- 1 connecting kit

Replacement Parts and Accessories

Replacement parts kit alpha c

Type	Materials in contact with media	Order no.
type 1001	PPE	1001646
	PPB	1001654
	NPE	1001715
	NPB	1001723
	PVT	1023109
type 1002, 1004, 1008	PPE	1001647
	PPB	1001655
	NPE	1001716
	NPB	1001724
	PVT	1023110
type 0708, 0417	PPE	1001649
	PPB	1001657
	NPE	1001718
	NPB	1001726
	PVT	1023112
type 0230	PPE	1001650
	PPB	1001658
	NPE	1001719
	NPB	1001727
	PVT	1023113

Replacement diaphragms

Type	Order no.
for alpha c 1001	1000246
for alpha c 1002, 1004, 1008	1000247
for alpha c 0707, 0419	1000249
for alpha c 0230	1000250

5 Safety Chapter

Proper Use

- The pump may only be used for the metering of liquid media!
- The pump may only be used in compliance with the technical data and specifications stated in the operating instructions!
- All other uses or modifications are prohibited!
- The pump must not be used to meter gaseous media or solids!
- The pump is not designed for use in Ex areas.
- The pump may not be used for the metering of flammable liquids!
- Do not use the pump without any further protection (case, protective roof) in the open!
- The pump may only be operated by specially trained and authorised personnel!

Sound Pressure Level

The sound pressure level is < 70 dB (A) at maximum stroke, maximum stroke frequency and maximum backpressure (water) according to:

DIN EN 12639 (noise measurement at liquid pumps)



WARNING

The pumps must be accessible any time for operation and maintenance, access may not be hindered or blocked!



WARNING

Disconnect the mains plug or isolate the feed line before opening the pump!

Check if de-energised and protect against unauthorised restart!



WARNING

First de-pressurise the metering line before starting any maintenance and repair work!

Always empty and flush the liquid end first if hazardous or unknown metering media are used!

Observe the safety data sheets of the metering liquids!

When working at the liquid end, protective clothing (goggles, gloves ...) must be worn!



WARNING

The stroke length may only be adjusted if the pump is stopped!



IMPORTANT

The stroke adjustment unit – latched slide (9) and eccentric disc (10) – can get hot in case of permanent operation, high ambient temperatures, overvoltage or high backpressure!

If required, wear work gloves to adjust the stroke!

NOTE:

Only use the clamping rings and hose nozzles specified for the corresponding hose diameter as well as genuine hoses of the specified hose dimensions and wall thicknesses. Otherwise, the stability of the connection is not guaranteed!

Avoid reducing the hose sizes!

In case of long lines and viscous media, the next higher line cross-section, e.g. 12 x 9 mm, should be used!

The connection of 12 x 9 mm lines requires the connecting kit 12 mm.

Safety devices

Cover

During operation, the cover (1) prevents anything from being crushed, caught or pulled in in the area of the eccentric disc (10).

Warning decal

The warning decal (17) must always be legibly fixed at the pump:

Switch off pump
before opening

6 Unpacking

IMPORTANT

Please observe the relevant local regulations for the disposal of packaging elements made of polystyrene (styrene, polystyrene)!

Outer packaging

Please keep the outer packaging complete with polystyrene parts to be able to return the metering pump and accessories in case of repair or warranty claims!

First compare the delivery note and the package contents.

Scope of delivery

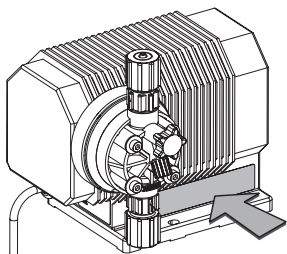
- Metering pump with mains cable 2 m according to Identcode
- Connecting kit for hose connection according to Identcode
- Operating instructions

IMPORTANT

Please check whether the data on the pump's rating plate match your order data!

If not, please immediately contact your local ProMinent branch or agency (the addresses are listed on the back of these operating instructions)!

All alpha metering pumps are equipped with a rating plate. This is fixed at the base of the pump.



alpha_5

The technical data as well as the Identcode and the serial number are listed. These two numbers are to be used for any contact and replacement part orders because they facilitate a unique identification of the pump type and the material type.

Please note the following data of the delivered pump to be able to immediately provide these data when needed:

IDENTCODE _____

Serial number _____

Installation location _____

Metering insert _____

Commissioning _____

7 Assembly / Installation

7.1 Pump Installation: Mechanical



WARNING

When assembling, provide for sufficient space around the pump for operation, maintenance, repair and quick disconnection of the mains plug.

CAUTION

The protection against contact and moisture IP 23 only applies to horizontal pump base and upright installed pump!

7.1.1 Pump Assembly with Bracket or Tank

- Mount the metering pump onto a tank or a bracket using screws and U washers (\varnothing 5 mm).

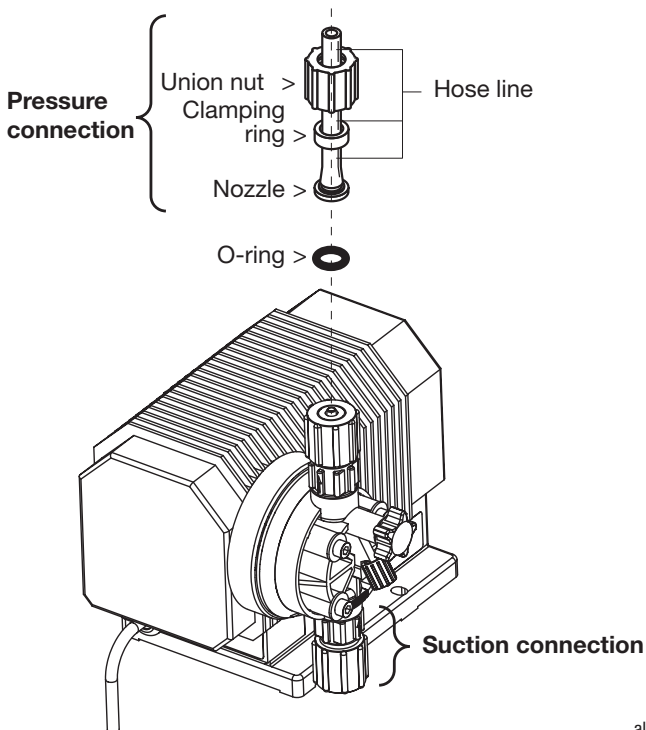
NOTE

The pump must be fixed such that no vibrations may occur!

The valves of the liquid end must always be installed in a vertical position to guarantee proper functioning.

7.1.2 Connection Pump + Suction/Pressure Line

Arrangement of the individual components:



alpha_2

NOTE

Always cut the suction line to the required length and route as riser!

IMPORTANT

Height (h) x density (d) ≤ max. suction height in mWC!

- If the suction/pressure port at the liquid end is closed with a plug, remove the plug
- Cut the hose to the required length
- Position union nut and clamping ring onto the hose line
- Push the cut hose end onto the nozzle up to the stop
- If required, expand the hose end slightly

NOTE

Only use the clamping rings and hose nozzles specified for the corresponding hose diameter as well as genuine hoses of the specified hose dimensions and wall thicknesses. Otherwise, the stability of the connection is not guaranteed!

Avoid reducing the hose sizes!

In case of long lines and viscous media, the next higher line cross-section, e.g. 12/9, should be used!

- Press on the hose and simultaneously tighten the union nut

NOTE

The hose connection will be safely fixed if you pull briefly at the line connected to the liquid end and then tighten the union nut again “finger-tight” (re-tightening)!

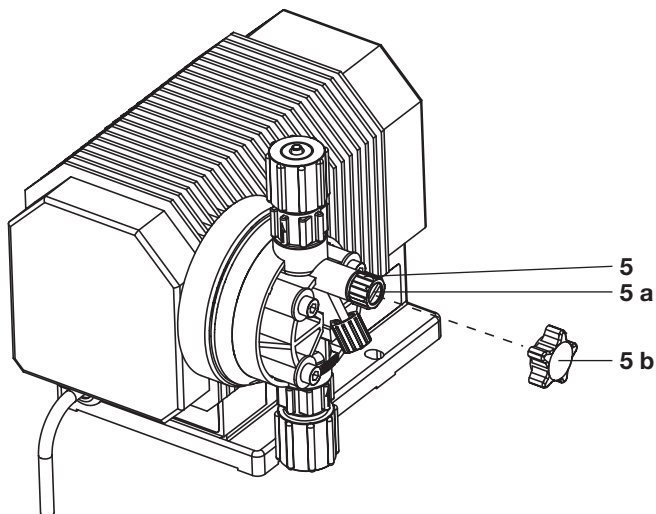
- Mount the foot valve
- Cut the free suction line end such that the foot valve is positioned shortly above the bottom of the tank
- For metering solutions with contaminations or sediment, cut the free suction line end such that the foot valve is positioned at least 50 mm above the tank bottom

7.1.3 Installation of Bypass Hose Line

Liquid end with bleed valve

Almost all liquid end types possess a bleed valve **(5)** with bypass **(8)** at the liquid end

- Slip the hose line with inner diameter 4-5 mm (preferably soft PVC 6 x 4 mm) onto the bypass hose nozzle and secure with pipe clip or quick fastener
- Return the free end of the line to the metering tank
- Directly connect the pressure line to the pressure port and the metering valve



alpha_7_2

- Open the bleed valve (5) by 1 turn anti-clockwise
- Now, coarse suction bleeding through the bleed valve is possible

NOTE

For slightly outgassing media, the fine bleeding can be permanently turned on!

This causes a constant partial flow of the metering volume returning to the storage tank!

The returned volume should amount to approx. 20 % of the metering volume!

NOTE

If the return line ends above the liquid level, the fine bleeding valve acts like a vacuum breaker and prevents that the storage tank is suctioned empty if vacuum is released into the metering line!

7.2 Pump Installation: Electrical

7.2.1 Electrical Connection



WARNING

Only connect the pump to the power supply using the delivered mains cable and plug!

Observe the valid national regulations!

For pumps without mains plug:



WARNING

It must be possible to switch off the pump using the emergency switch of the system in which it is integrated!



WARNING

The pump has no on/off switch and thus starts immediately after connecting the mains plug or activating the mains line!

8 Commissioning

8.1 General Information



WARNING

The metering pump may still contain residual water in the liquid end resulting from the test at the facility!

Remove any water from the liquid end before commissioning if metering media are used which may not come into contact with water! For this purpose, rotate the pump by 180 ° and empty the liquid end, then rinse with a suitable medium from top via the suction connection.



WARNING

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



WARNING

The stroke length may only be adjusted if the pump is stopped!

8.2 Commissioning without Bleed Valve

- If possible, proceed as described in “Commissioning with Bleed Valve”. If this is not possible, then:
- Safely connect the suction and metering line

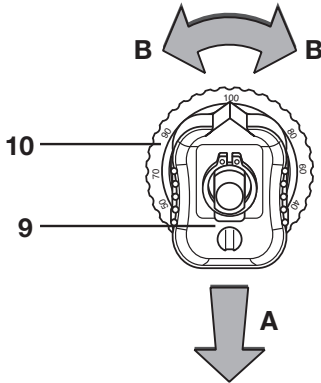
NOTE

Do not connect the metering line to the metering valve but only to the pressure port (4) of the pump!

- The suction tank contains liquid
- Remove the cover (1) and check whether the stroke length is set to 100 %

Commissioning

- If not, then
 - A: Slide the latched slide **(9)** back onto the eccentric disc
 - B: Set the eccentric disc **(10)** to 100 %
 - C: Re-engage the latched slide



ALPb-008.1-D

- Re-attach the cover **(1)**



WARNING

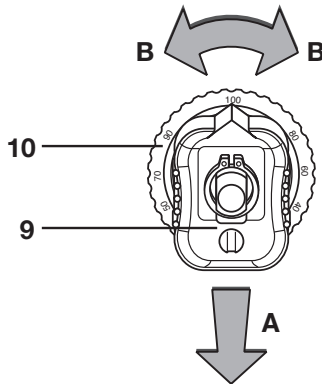
The metering pump may only be operated with closed cover (1)!

- Switch on the pump and run it at 100 % stroke length until the liquid end has been completely and bubble-free filled with the medium
- This is the case when the medium becomes visible in the metering line
- Switch off the metering pump
- Connect the metering line to the metering valve
- The pump is now ready for operation

8.3 Commissioning with Bleed Valve

- Safely connect the suction and metering line
- The suction tank contains liquid
- Remove the cover **(1)** and check whether the stroke length is set to 100 %

- If not, then
 - A: Slide the latched slide **(9)** back onto the eccentric disc
 - B: Set the eccentric disc **(10)** to 100 %
 - C: Re-engage the latched slide



ALPb-008.1-D

- Re-attach the cover **(1)**



WARNING

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

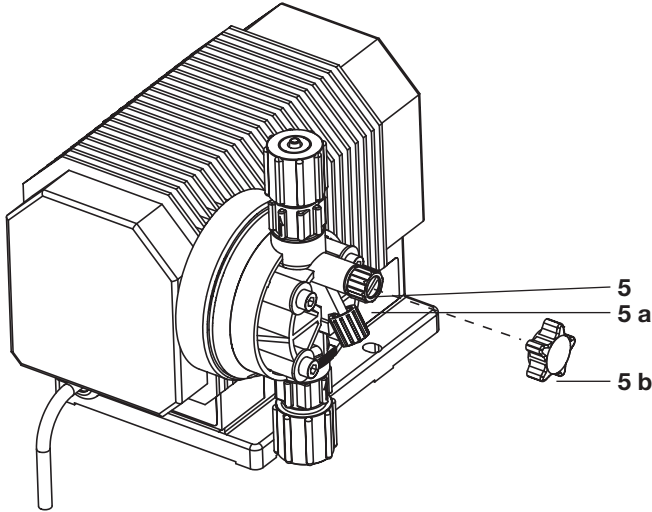
Coarse bleeding

- Open the bleed valve **(5)** by 1 turn anti-clockwise
- Now, coarse suction bleeding through the bypass is possible
- Switch on the pump and run it at 100 % stroke length until the liquid end has been completely and bubble-free filled with the medium
- This is the case when the medium becomes visible in the metering line or bleed line
- Switch off the metering pump
- Close the bleed valve **(5)** by 1 turn clockwise
- The pump is now ready for operation

Commissioning

For slightly outgassing media, the fine bleeding (only PP and NP) can be permanently turned on:

- For this purpose, remove the installed star handle (5b) and open the screw in the interior of the bleed valve (5a) approx. 1 turn anti-clockwise



alpha_7_2

- This causes a constant partial flow of the metering volume returning to the storage tank
- The returned volume should amount to approx. 20 % of the metering volume
- The media must have a low viscosity and may not have any solids



WARNING

The above mentioned measures guarantee no absolutely reliable metering after stop of the pump!

A regular check is thus absolutely necessary!

- Re-attach the star handle (5b)

NOTE

Re-tighten the screws in the liquid end crosswise after approx. 24 hours of operation.

IMPORTANT

Observe the tightening torques for the screws! Tightening torque for screws M5: 4.5 - 5 Nm!

9 Operation

9.1 General



WARNING

When handling hazardous substances, protective goggles and protective gloves, ... must be worn!



WARNING

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



IMPORTANT

The motor may overheat and be damaged!

Obstacles in the cooling air system prevent a sufficient cooling!

The ventilation slot at the front below the cover and the slot at the back in the pump base must never be obstructed!

NOTE

- Check for correct assembly (see Chapter 9 “Assembly / Installation”)!
- Do not exceed the maximum permissible suction height!
- Metering pumps may work against considerably increased operation pressure for a short time without a response of the electrical safety devices (e.g. if the metering line is closed or blocked)!

A safety overflow valve with return to the storage tank is to be installed as overload protection!

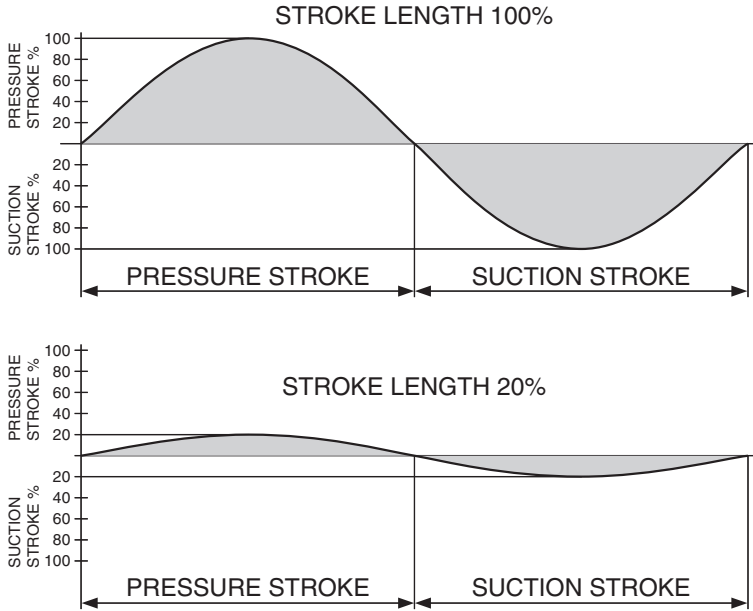
9.2 Setting of the Output



WARNING

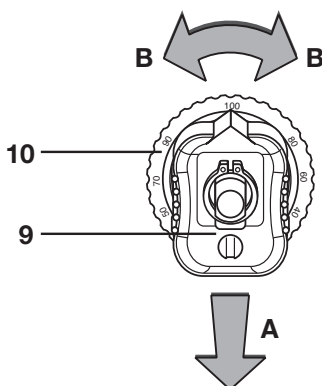
The stroke length may only be adjusted if the pump is stopped!

- The desired output can be seen from the diagram “Output depending on the stroke length of the backpressure”



ALPb-014-GB

- Stop pump
- Remove the cover (1)
- **A:** Slide the latched slide (9) back onto the eccentric disc,
- **B:** Set the eccentric disc (10) to the desired stroke length (in %) (the arrowhead must be exactly positioned on the desired engraving at the eccentric disc) – the output can be set from 100 to 10 % in increments of 10 %
- **C:** Re-engage the latched slide



ALPb-008.1-D

- Re-attach the cover (1)

10 Maintenance



WARNING

Metering pumps and their peripherals may only be maintained by trained and authorised persons.

NOTE

Maintenance intervals: every three months!

Shorter intervals in case of heavy load (e.g. continuous operation)!

The maintenance of the alpha metering pump is limited to the inspection of:

- the liquid end screws (tightened securely, 4.5 - 5 Nm)
- the metering lines (tightened securely)
- pressure and suction valve (tightened securely)
- for PP type, of bleed valve (tightened securely)
- the leakage hole behind the rear of the liquid end (moisture may be a sign of diaphragm rupture)

11 Troubleshooting / Remedy

11.1 Malfunctions Which Can be Remedied by the User

NOTE

In order to be able to remedy minor defects any time, we recommend to keep ready a replacement part kit - consisting of diaphragms, valves, balls, and gaskets.

The order numbers for these kits are listed in the Chap. "Replacement Parts and Accessories" or in our equipment catalogue under "Replacement part kits for alpha"!



WARNING

Disconnect the mains plug or isolate the feed line before opening the pump!

Check whether the pump is de-energised!



WARNING

Always de-pressurise the metering line first before commencing any work at the pump!

Always empty and flush the liquid end!

Observe the safety data sheets of the metering media!



WARNING

Metering pumps and their peripherals may only be maintained by trained and authorised persons.



WARNING

Always flush the liquid end first before commencing maintenance and repair work if hazardous or unknown media are used!



WARNING

When metering hazardous or unknown metering media, suitable protective equipment (goggles, gloves ...) must be worn when working at the liquid end!



WARNING

The stroke length may only be adjusted if the pump is stopped!

11.1.1 Pump Works, but No Metering

Possible

cause: Air collected in the liquid end

Remedy for

pumps with

bleed valve:

Bleed the liquid end

- Switch off the pump
- Open the bleed valve **(5)** by 1 turn anti-clockwise
- Switch on the pump again and operate until a metering is performed with each metering stroke
- If the metering is still faulty, switch off the pump, set the stroke length to 100 % and bleed at a stroke length of 100 %
- Close the bleed valve **(5)** by 1 turn clockwise

Remedy for

pumps without

bleed valve:

Bleed the liquid end

- Switch off the pump
- De-pressurise the metering line by disconnecting the hose at the metering valve or relieving the overflow valve
- Switch on the pump again and operate until a metering is performed with each metering stroke
- If the metering is still faulty, switch off the pump, set the stroke length to 100 % and bleed at a stroke length of 100 %
- Stop the pump and reconnect the metering line to the metering valve or pressurise the overflow valve again

Further possible

causes for

pumps with

bleed valve:

The activated fine bleeding does not work because the bleed hole is blocked

Remedy:

- Remove the star handle **(5b)** from the bleed valve **(5)**
- Open the fine bleed screw **(5a)** by approx. 2 turns anti-clockwise with the pump in operation until the blockage is eliminated
- If this is not successful, remove the bleed valve **(5)** and the fine bleed screw **(5a)** from the liquid end **(6)** and clean all parts including the holes
- Then, re-install the bleed valve with fine bleed screw in the reverse order and restore the original settings

11.1.2 Pump does not Perform any Suction despite Full Stroke Movement and Bleeding

Possible

cause: Crystalline depositions because of drying up of the valves

- Remedy:*
- Remove the suction hose from the metering tank and thoroughly flush the liquid end
 - If required, reduce the suction height or support first suction action with filled suction hose in feed operation; the metering solution can also be suctioned in using a disposable syringe connected at the pressure valve
 - If the fault is not remedied, the valves are to be removed and cleaned
 - The valve assembly in the suction and pressure valve can be pushed out with a mandrel \varnothing 3mm

11.1.3 Pump Automatically Stops during Metering Operation

Possible

cause: The thermal fuse automatically stopped the motor because of high backpressure and because the motor heated up by more than 106 °C

- Remedy:*
- Switch off the power supply
 - Reduce backpressure
 - The safety device starts the pump again after the motor has cooled down
 - If this is not successful, check the metering line and the downstream pressure system as to whether the shut-off valve is closed or the line/system is obstructed or blocked
 - Remove obstruction / blocking
 - Switch on the power supply

Possible

cause: The thermal fuse automatically stopped the motor because the motor heated up by more than 106 °C due to an obstruction of the suction and discharge port of the motor cooling air

- Remedy:*
- Switch off the power supply
 - Remove the obstruction by cleaning the air suction port at the pump bottom and the discharge port at the bottom of the cover
 - The safety device starts the pump again after the motor has cooled down
 - If this is not successful, check the metering line and the downstream pressure system as to whether the shut-off valve is closed or the line/system is obstructed or blocked
 - Remove obstruction / blocking
 - Switch on the power supply

11.1.4 Pump does not Work despite Applied System Voltage

Possible

cause: The existing backpressure exceeds the permissible operating or starting pressure

Remedy:

- Reduce backpressure
- If this is not successful, check the metering line and the downstream pressure system as to whether the shut-off valve is closed or the line/system is obstructed or blocked
- Remove obstruction / blocking

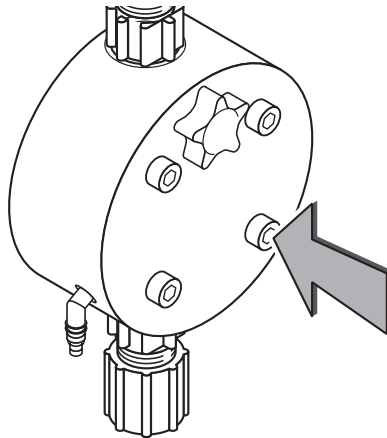
11.1.5 Liquid Leaks from the Recess at the Liquid End Support

Possible

cause: The delivery unit leaks at the metering diaphragm

Remedy:

- Re-tighten the screws (arrow) at the liquid end crosswise



ALPb-010-D

IMPORTANT

Observe the tightening torques for the screws of 4.5 to 5 Nm!

NOTE

Check the tightening torque of the liquid end screws after 24 hours of operation!

For PP pumps, check the tightening torques in addition again every three months!

- If liquid is still leaking, the diaphragm has ruptured and must be replaced.

NOTE

The metering diaphragm is a wearing part and its service life depends on

- the backpressure of the system
- the operating temperature
- the properties of the liquid to be metered!

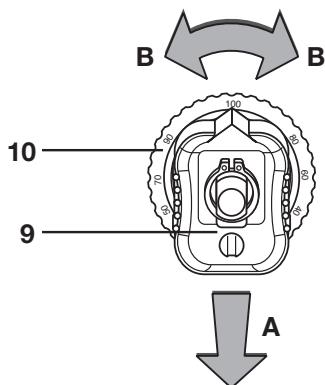
NOTE

In case of abrasive media, the service life of the diaphragm is limited and more frequent inspections are required!

Under these operating conditions, it is recommended to replace the metering diaphragm every year or every six months!

Replacement of the metering diaphragm

- Remove the cover (1)
- A: Slide the latched slide (9) back onto the eccentric disc
- B: Set the eccentric disc (10) to "0"



ALPb-008.1-D

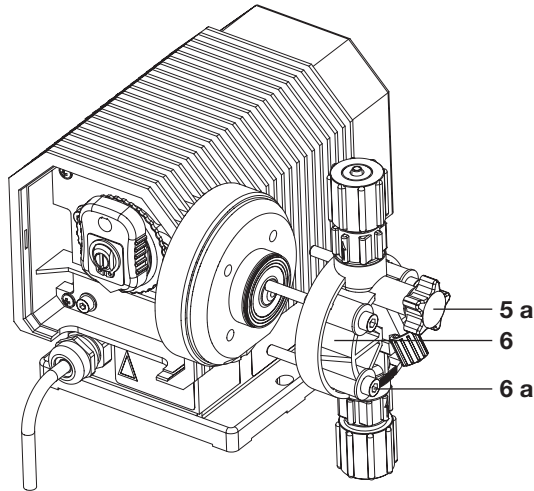
NOTE

The latched slide cannot be engaged in this position!

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

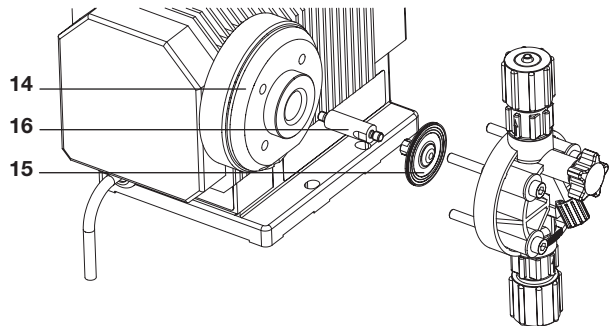
For PP type:

In addition, remove the star handle (5a) and the covering screen from the liquid end (6)



alpha_10

**Pump types 1001, 1002, 1004, 1008, 0707, 0417:
(diaphragm without holes, threaded rod without hexagon nut)**

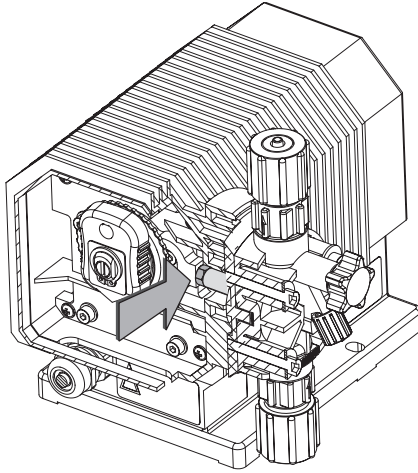


- ▶ Loosen the liquid end screws and remove the liquid end
- ▶ Loosen the diaphragm (**15**) by turning anti-clockwise – if necessary, use pliers
- ▶ If the threaded rod (**16**) came loose together with the diaphragm, remove the diaphragm from the threaded rod (turn anti-clockwise) - if necessary use pliers
- ▶ Screw the threaded rod onto the connecting rod thread and securely tighten at the width across flat using a flat wrench (SW9)
- ▶ Position the end disc (**14**) on the pump housing
- ▶ Screw the diaphragm onto the threaded rod and tighten finger-tight. The end disc may no longer be loose, however, must turn easily

- Fix the liquid end with the screws such that the suction port is pointing vertically to the bottom – observe the direction of the flow arrows on the valves

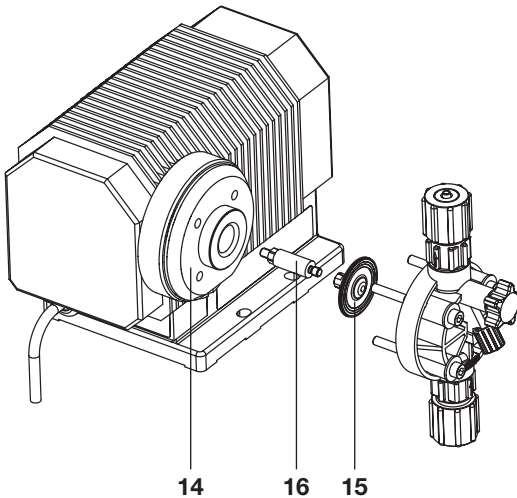
**Pump type 0230:
(diaphragm with holes, threaded rod with hexagon nut)**

- Loosen the hexagon nut (**arrow**) in front of the connecting rod by approx. one turn using the wrench SW 8



alpha_11_2

- Remove the metering diaphragm (**15**) with end disc (**14**) and threaded rod (**16**) from the motor support (**2**) by turning anti-clockwise



alpha_12_2

- Unscrew the threaded rod **(16)** from the diaphragm **(15)** (if required, hold the threaded rod with pliers and loosen the diaphragm by turning anti-clockwise)
- Screw the threaded rod **(16)** into a new diaphragm and screw in with pliers until it securely rests against the diaphragm

IMPORTANT

No gap may be visible between the diaphragm and the contact area of the threaded rod!

- Screw the hexagon nut **(17)** onto the threaded rod **(16)** up to the stop
- Insert new diaphragm with threaded rod into the end disc **(14)** and screw on the entire assembly onto the connecting rod **(18)** up to the stop (The stroke length must be set to 0)
- Turn back the diaphragm until the 4 holes in the diaphragm and end disc are exactly aligned!
- Position the liquid end **(6)** with screws **(6a)** onto the diaphragm and end disc – the suction port must point to the bottom – and tighten the screws crosswise

IMPORTANT

Observe the tightening torques for the screws of 4.5 to 5 Nm!

- Turn the hexagon nut **(17)** against the connecting rod **(18)** and tighten slightly
- Set the desired stroke length
- Engage the latched slide **(9)**
- Attach the cover **(1)**
- Bleed the pump as described in Chapter 11.2 or 11.3 “Commissioning”

NOTE

Check the tightening torque of the liquid end screws after 24 hours of operation!

For PP pumps, check the tightening torques in addition again every three months!

11.1.6 Replacement of the Liquid End Assembly

NOTE

Liquid end assemblies are delivered with open bleed valve!

After suctioning and bleeding, the fine bleed screw **(5b) and the bleed valve **(5)** must be retightened!**

Check whether the suction and pressure valves are tightly seated!

11.2 Malfunctions which Require Contacting the Customer Service



WARNING

Repairs of electrical component parts may only be performed by certified electricians (safety regulations of the accident prevention and insurance association: VGB 4 and ZH 1/11)!



WARNING

Disconnect the mains plug or isolate the feed line before opening the pump!
Check whether the pump is de-energised!
During repair work, the pump is to be protected against unauthorised restart!



WARNING

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

11.2.1 Power Supply Connection Line (Equipment Cable) with Thermal Fuse Damaged

- Remedy:*
- Have the connection line / thermal fuse replaced by an authorised customer service

12 Repair



WARNING

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

Customer service

Contact your local customer service!

Or contact your local

ProMinent branch or representation

(addresses are listed on the back of these operating instructions)!



WARNING

Pumps for radioactive media may not be shipped!

NOTE

Only return the metering pump for repair in a cleaned condition and with rinsed liquid end!

*Certificate of
compliance*

NOTE

The compliance with statutory occupational health and safety regulations – e.g. the German workplaces ordinance, the hazardous goods regulations, the accident prevention regulations and the environmental protection regulations (waste avoidance and management act or water resources act) - obliges all commercial entrepreneurs to protect their employees or humans and the environment against detrimental effects when handling hazardous substances!

An inspection or repair of pumps and their component parts will only be made if a certificate of compliance can be provided by authorised and qualified personnel of the pump operator and was correctly and fully completed.

If despite thorough emptying and cleaning of the pump any safety precautions should be required, the necessary information must be listed in the certificate of compliance!

The certificate of compliance is material part of the inspection/repair order. The appropriate form is included in the General Operating Instructions.

The right to refuse the acceptance of the order for other reasons remains reserved. Pumps operated in radioactive material will in principle not be accepted!

13 Disposal of Used Parts

IMPORTANT

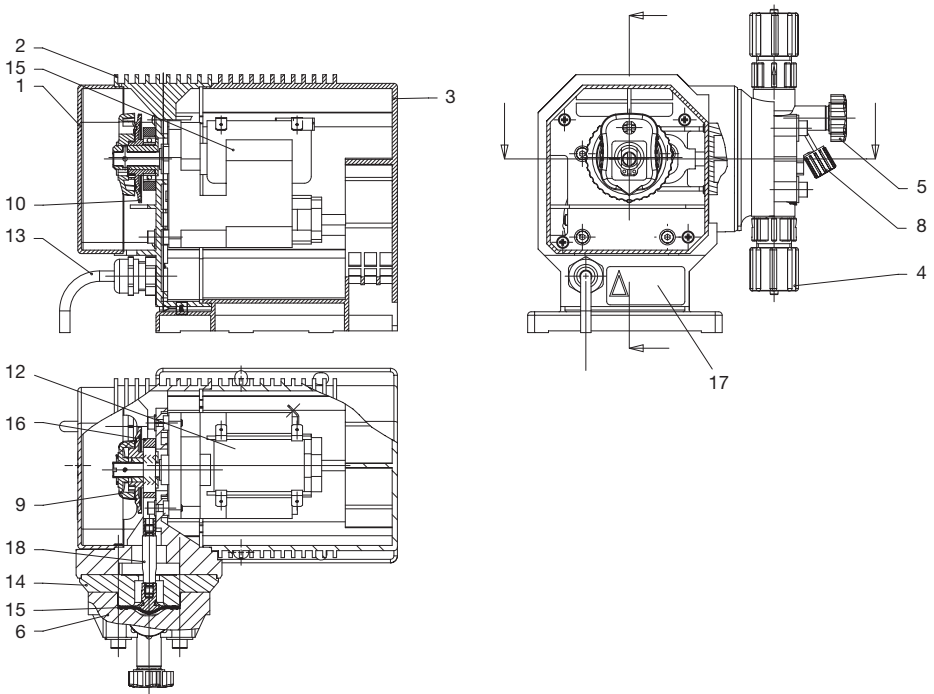
Never dispose of the metering pump in the dustbin (domestic waste)!

Plastics and mechanical parts may be special waste and must be recycled!

*Return of used
parts*

If you do not find any suitable recycling point, you can return your used parts **to your local ProMinent subsidiary or representation (addresses are listed on the back of these operating instructions)** against payment of a low fee!

14 Pump Section



This section shows the ALPc1001PVT200A0

- | | | | | | |
|---|---|----|---------------------------|----|--------------------|
| 1 | Cover | 6 | Liquid end | 14 | End disc |
| 2 | Motor support | 8 | Bypass hose nozzle | 15 | Metering diaphragm |
| 3 | Housing | 9 | Latched slide | 16 | Threaded rod |
| 4 | Connecting kit | 10 | Eccentric disc with scale | 17 | Warning decal |
| 5 | Bleed valve with star handle (5a) and fine bleed screw (5b) | 12 | Motor | 18 | Connecting rod |
| | | 13 | Mains connection | | |

EC Declaration of Conformity

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 : ***ALPc...***

Serial number : ***see type identification plate on device***

Relevant EC regulations : ***EC - machine regulation (98/37/EC)
EC - low voltage regulation (2006/95/EC)
EC - EMC - regulation (2004/108/EC)***

Harmonised standards used,
in particular : ***EN ISO 12100-1, EN ISO 12100-2, EN 809,
EN 60335-1, EN 61000-6-3***

Date/manufacture's signature : ***06.03.2009***



The undersigned : ***Joachim Schall, Head of R&D***

Die ProMinent Firmengruppe / The ProMinent Group

Stammhaus / Head office

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