# Betriebsanleitung Operating Instructions Mode d'emploi Instrucciones de servicio

ProMinent<sup>®</sup> CONCEPT<sup>PLUS</sup>







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Please read the opertaing instructions through completely before commissioning this equipment! Do not discard! Any part which has been subject to misuse is excluded from the warranty!

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# **General user instructions**

Please read through the following user instructions carefully! They will help you get the best use out of the operating instruction manual.

The following are highlighted in the text:

- Enumerated points
- Instructions

Safety guidelines:



# WARNING

Describes a potentialy dangerous situation. If not avoided, could cause fatal or serous injury.



# IMPORTANT

Describes a potentialy dangerous situation. If not avoided, could cause damage to property.

This operating instructions manual is aimed at experts in metering pumps and their operation.

If you require detailed installation instructions please order "General Operating Instructions Manual, ProMinent<sup>®</sup> Solenoid Metering Pumps" (Order No. 987057).



# 2 Type overview/material details

Order No. CONCEPTPLUS, CNPa, 115 V versions

Pump type	np type liquid end material		
	PP (with EPDM*)	NP** (with Viton <sup>®</sup> *)	
1000	1022480	1022484	
1601	1022481	1022485	
1002	1022482	1022486	
0704	1022483	1022487	

Order No. CONCEPTPLUS, CNPa, 230 V versions

Pump type	liquid end material	
	PP (with EPDM*)	NP** (with Viton <sup>®</sup> *)
1000	1022452	1022476
1601	1022453	1022477
1002	1022474	1022478
0704	1022475	1022479

\* Seal material

\*\* Valve body material is PVC

The valve balls are made of ceramics.

# 3 Safety

# Correct use of equipment

- The pump may be used only for metering liquid media!
- All other uses or modifications are prohibited!
- The pump is not suitable for metering gaseous media or solids!
- The pump must be operated by appropriately trained and authorised personnel!

The personnel must be familiar with metering pumps and their operation!



# WARNING

• The pump may start to operate as soon as it connected to the mains power supply!

Ensure that no hazardous metering chemical can leak out! If you have not done so, set the multifunction switch to STOP or disconnect the pump from the mains immediately.

- The pump cannot be switched off! In the case of an electrical failure, disconnect the mains cable from the power supply.
- Disconnect the power cable from the mains before working on the pump.

- Risk of electric shock This pump is supplied with a grounding conductor and grounding-type attachment plug. To reduce the risk of electric shock, be certain that it is connected only to a properly grounding-type receptacle.
- Always depressurise liquid end before working on the pump.
- Always empty and rinse the liquid end before working on the pump if used with hazardous or unknown feed chemicals.
- Wear safety equipment appropriate to the metering chemical when working on the liquid end.
- Never let the pump work against a significantly increased operat ing pressure or a closed stop tap on the discharge-side. This can cause lines to burst.
- Avoid overfeed due to positive pressure difference between in take and discharge sides. E.g. use a ball check valve with at least 1.5 bar opening pressure with an atmospheric pressure outlet (not 0213).
- Assembly and installation of ProMinent<sup>®</sup> metering pumps with nonoriginal parts, which have not been checked and recommended by ProMinent is not allowed and can lead to harm to persons or property for which no liability can be accepted.
- Note all national directives which apply to the installation.

# Sound pressure level The sound pressure level is < 70 dB (A) at a distance of 1 m in accordance with EN 23741 or EN 23742 at maximum stroke, maximum stroke rate, maximum back pressure (water)

#### 4 Storage and transport

Ambient conditions for storage and transport:Storage and transport temperature:-10 to +50 °CHumidity:< 92 % rel. humidity,<br/>non-condensing

# 5 Assembly and installation

#### IMPORTANT

- The pump must not vibrate when installed.
- Solenoid metering pumps tend to overfeed if the back pressure is too low. In this case fit a ball check valve, a multifunction valve or a discharge valve with 1.5 bar opening pressure downstream from the pump (not 0213).

# Assembly and installation / Commissioning / Maintenance

- Use only original hoses with the specified diameter and wall thickness! It is not otherwise possible to ensure the durability of the connection to the pump valves!
- For tips on hydraulic installation, order the "General Operating Instructions Manual, ProMinent<sup>®</sup> Solenoid Metering Pumps" (Order No. 987057).
- Check that the mains power supply and frequency match the values specified on the rating plate!
- Note all national directives which apply to the installation!
- Mount metering pump on a tank or bracket using screws and washers (Ø 6 mm).
- ► Keep suction height and length of suction hose as short as possible. Install suction hose in an ascending position.



- ► Cut the suction and pressure pipe to the required length.
- Push union nut and clamping ring onto the hose.
- Push the cut hose onto the grommet up to the stop.
- Press on hose and tighten the union nut.
- Mount the foot-actuated valve.

(section)

For this purpose, cut the free suction hose end such that the footactuated valve is suspended close above the tank bottom. In case of metering solutions with contaminations or residues, cut the free suction hose end such that the foot-actuated valve is suspended at least 50 mm above the tank bottom.

# 6 Commissioning

Precision metering is possible only within a stroke length range of 30-100 %.

# 7 Maintenance

Service interval Quarterly at normal load (approx. 30 % continuous operation)

- Check the pump diaphragm for damage
- Check that the discharge and suction valves and the discharge lines are seated firmly
- Check the overall tightness of the liquid end (in particular leakage opening between suction value and drive housing)
- Check liquid end screws are tight Tightening torque for liquid end screws: 4.5 to 5 Nm

# 8 Repair

Repairs which may be carried out by qualified persons (according to safety instructions):

- Cleaning a valve
- Replacing the diaphragm (installation instructions included with replacement diaphragm)

For all other repairs consult your ProMinent® Subsidiary.

# 9 Troubleshooting

#### The pump does not prime despite full stroke action and venting

*Cause:* Crystalline deposits on the ball seat due to valves drying out. *Remedy:* Remove suction hose from the supply tank and rise liquid end thoroughly.

If unsuccessful, dismantle valves and clean.

#### Fluid is leaking from the head washer

*Cause:* The liquid end is leaking at the pump diaphragm. *Remedy:* Screw in the liquid end anti-clockwise (torque: 4.5 to 5 Nm) If unsuccessful, replace the diaphragm (installation instructions included with the diaphragm).

#### Error/operating indicator not lit

*Cause:* No or incorrect mains voltage. *Remedy:* Use mains voltage as specified on the rating plate.

#### Error/operating indicator lit red

Cause: Liquid level in the supply tank has reached "low liquid level".

Remedy: Top up supply tank.

Cause: Electronic failure.

Remedy: Send pump away for repair.

#### 10 Decommissioning and disposal



#### IMPORTANT

- When decommissioning a pump, clean all traces of chemicals and dirt from the housing and particularly the liquid end.
- Observe all relevant disposal directives for your area (particularly with regard to electronic waste)

# 11 Technical data

Pump type	Minimum delivery rate at maximum back pressure		Minin a ba	num feed t medium ck pressi	l rate 1 ure	Max. stroke rate	Connection size ext. Ø x int. Ø	Priming lift	Priming lift <sup>**</sup>	Admissible priming pressure Intake	
	bar	l/h	ml/ stroke	bar	l/h	ml/ stroke	strokes/ min	mm	m Wc	m Wc	bar
1000	10	0.6	0.07	5	0.8	0,08	180	6x4	6	1.8	8
1601	16	1.0	0.10	8	1.4	0.13	180	6x4	6	2.0	8
1002	10	2.0	0.18	5	2.6	0.24	180	6x4	5	2.5	5.5
0704	7	3.9	0.39	3.5	4.5	0.42	180	6x4	4	3.0	3
0308	3	8.0	0.74	1.5	10.8	1.00	180	8x5	2	2.0	1
0213	1.5	13.5	1.42	1.0	15.5	1.4	180	8x5	1.5	1.5	0.5

Performance table 230 V version

- \* Suction lift with filled suction line and liquid end
- \*\* Priming lifts with clean and wetted valves, metering fluid, water (20 °C), at 100 % stroke length, 180 strokes/min, atmospheric pressure outlet and/or open venting valve and correctly installed lines.

#### Materials

Liquid end material specification: see type code Housing: PPE, glass fibre reinforced

#### **Electrical data**

Mains frequency:

50 Hz / 60 Hz

230 V/AC version	CNPa
Wattage:	10 W
Current I eff:	0.12 A
Peak current	0.5 A
Switch-on peak current	< 4 A for < 0.1 ms
Fuse*:	0.16 AT

115 V/AC version	CNPa
Wattage:	11 W
Current I eff:	0.26 A
Peak current	1.2 A
Switch-on peak current	< 3 A for < 0.1 ms
Fuse*:	0.315 AT

\* Fuses must have approvals according to VDE, UL and CSA.

#### **Temperature details**

Storage and transport temperature:	-10 °C+50 °C
Function at ambient temperature:	-10 °C+45 °C
Admissible feed chemical temperature:	-10 °C+35 °C

Material feed unit	Long term at max. back pressure	max. 15 min. at max. 2 bar
PP	50 °C	100 °C
NP	45 °C	60 °C

#### Climate

Admissible relative air humidity: 92 %, non condensing. Load in wet and alternating climate: FW 24 in accordance with DIN 50016.

#### Enclosure rating and safety class

Contact and moisture protection: IP 65 in accordance with IEC 529, EN 60529, DIN VDE 0470 Part 1 Safety class 1 - electric mains with earth

#### Sound pressure level

Sound pressure level: < 70 dB(A) at a distance of 1 m in accordance with EN 23741 or EN 23742 at maximum stoke, maximum stroke rate, maximum back pressure (water)

#### Shipping weight

Shipping weight: 1.8 kg

# 12 Accessories

Suction lances	Suction lance for 200 I drum, tank opening 2" DIN 570, PPE	1022511
	Suction lance for 200 I drum, tank opening 2" DIN 570, PCB	1022512
	Suction lance for tank 5-50 I drum, tank opening d50, PPE	1022645
	Suction lance for tank 5-50 I drum, tank opening d50, PCB	1022644

Adjustable suction lance with single-stage level switch, closing in the event of lack of chemicals.

The delivery scope also includes the parts required for connecting the pump.

Retrofit kits	Retrofit kit External + level CNP	1022099
	Retrofit kit level switch CNP*	1022115

\*connecting parts given suction lances and tanks provided by the customer

# Technical data



\* dimensions for pump type 0308, 0213

	EC Declaration of Conformity
We,	ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5 - 11 D - 69123 Heidelberg
hereby declare that, on the basis of circulation by us, the product spect and health stipulations laid down to Any modification to the product no	of its functional concept and design and in the version brought into ified in the following complies with the relevant, fundamental safety y EC regulations. t approved by us will invalidate this declaration.
Product description :	Metering pump, Series Concept <sup>Plus</sup>
Product type :	CNPa
Serial number :	see type identification plate on device
Relevant EC regulations :	EC - machine regulation (98/37/EC) EC - low voltage regulation (73/23/EEC) EC - EMC - regulation (89/336/EEC subsequently 92/31/EEC)
Harmonised standards used, in particular	DIN EN 292-1, DIN EN 292-2, DIN EN 809, DIN EN 50106, DIN EN 60335-1, DIN 60335-2-41, DIN EN 61000-4-2/3/4/5/6/11, DIN EN 61000-3-2/3
Date/manufacturer's signature :	22.08.2003 Marin luly-
The undersigned :	Dr. Rainer V. Dulger, Executive Vice President R&D and Production

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#### Instructions for fitting float switch retrofit kit CNP\_ (Order No. 1022115) Connection for level warning indicator



ProMinent

- 1 cable gland
- 1 nut
- 1 connector
- 1 Torx spanner, TX9

A contact or an electronic switch for signalling low liquid levels in the supply tank can be connected to the two-core cable. If the contact is made (liquid level low) the pump stops after 2 s and the error/operating indicator changes from green to red. If the contact is broken (liquid level OK) the pump restarts after 2 s and the error/operating indicator changes from red to green.

Installation, electric:



# WARNING

- Retrofit kit must be installed by trained and authorised personnel!
- Disconnect the pump from the mains power supply and prevent from being switched on again!



#### IMPORTANT

- Keep this sheet with the operating instructions for the pump!
- It is now part of the operating instructions!
- Mark the breakout opening on the front of the pump, bottom right of the cover.
- Unscrew the cover.
- Break out the marked opening using a punch.
- ▶ Push the nut into the recess in the cover and screw the lower part of the cable gland until watertight.
- Thread the suction lance cable through the cable gland.
- Connect the connector to the cable (the cable polarity is arbitrary).
- Push connector into the right-hand circuit board recess in the pump (see illustration).
- Screw the cover back onto the pump.
- ▶ Tighten the cable gland and pull cable outwards once.
- Screw the cable gland tight.



View of connector inserted in the opened pump

Technical data

Voltage, contacts open:	5 V DC ± 0.5 V
Input resistance:	12 k ± 0.5 k
Short-circuit current:	0.5 mA ± 0.05 mA
Maximum level for "0"-signal:	1.0 V
Minimum level for "1"-signal:	3.5 V
Reaction time:	2 s
Contact made (liquid level low): Contact broken (liquid level OK):	Pump stops Pump starts again
Subject to technical changes.	

#### Installation instructions for External CNP\_retrofit kit (part number 1022099)

Connection for external actuation (operating mode external)



Supplied with:

- 1 cable, 2 m
- 1 cable gland
- 1 nut
- 1 plug
- 1 Torx spanner, TX9

A contact or an electronic switch (contact actuation e.g. contact water meter) can be attached to the two-core cable for external actuation of the pump. The pump responds when the contacts close.

Installation:



# WARNING

#### • Retrofit kits set must be installed by trained and authorised personnel!

• Disconnect the pump from the mains power supply and prevent from being switched on again!



# IMPORTANT

- Keep this sheet with the operating instructions for the pump!
- It is now part of the operating instructions!
- ▶ Mark the breakout opening, bottom left of the cover, on the front of the pump.
- Unscrew the cover.
- ▶ Break open the marked opening using a punch.
- ▶ Push the nut into the recess in the cover and screw the lower section of the cable gland until watertight..
- ▶ Thread the suction lance cable through the cable gland.
- Connect the plug to the cable (the cable polarity is arbitrary).
- ▶ Push plug into the left-hand circuit board recess in the pump (see illustration).
- Screw the cover back onto the pump.
- ▶ Tighten the cable gland and pull out 1X cable.
- Screw the cable gland tight.



View of plug inserted in the opened pump

Technical data

Voltage, contacts open: Input resistance: Short-circuit current: Maximum level for "0" signal: Minimum level for "1" signal: Minimum closing time:  $5 V DC \pm 0.5 V$   $12 k \pm 0.5 k$   $0.5 mA \pm 0.05 mA$  1.0 V 3.5 V20 ms

The pump responds when the contacts close.

Subject to technical changes.

#### Installation instructions for exchanging the ProMinent® CONCEPTPLUS diaphragm

#### Change diaphragm

# WARNING

- Retrofit kits set must be installed by trained and authorised personnel!
- Always take suitable precautions when using hazardous chemicals!
  - Ensure that the equipment is de-pressurised!
- Empty the liquid end (turn the unit upside down and let the feed chemical run out, rinse with a suitable material: rinse the liquid end thoroughly after use with hazardous materials!).
- When Pump is running set the stroke length to 0 % (the drive axis is then set).
- ▶ Switch off the Pump.
- ▶ Unscrew the hydraulic connectors from the discharge and suction side.
- Remove the screws (1).
- ► Loosen the liquid end (2) and the top plate (4) from the pump housing (6) (loosen only!).
- ▶ Hold the housing (6) in one hand and with the other, clamp the diaphragm (3) between the liquid end (2) and the top plate (4); release the diaphragm (3) from the drive spindle with a light anticlockwise turn of the liquid end (2) and top plate (4).
- ► Unscrew the diaphragm (3) completely from the drive spindle.
- Remove the top plate (4) from the housing (6).
- ▶ Check the condition of the safety diaphragm (5) and replace if necessary.
- Push the safety diaphragm (5) onto the drive axle until the outer edge lies flat on the pump housing (6) no further!
- Screw the new diaphragm (3) carefully up to the stop on the drive axis this must be exact to ensure correct metering!
- Unscrew the diaphragm (3) once more.
- Position the top plate (4) on the pump housing (6).



#### IMPORTANT

- The leakage hole must point downwards when the pump is fully assembled
- Position the top plate (4) correctly on the pump housing (6). Do not distort the top plate on the pump housing, otherwise the safety diaphragm (5) will not fit.
- Lay the diaphragm (3) into the top plate (4).
- Hold the top plate (4) and screw the diaphragm (3) in a clockwise direction until it is firmly in position (you will feel the resistance of the return spring).

#### IMPORTANT

• Do not over tighten the diaphragm (3) (particularly on type 1601).

• The top plate (4) must remain in position to prevent the safety diaphragm (5) from distorting.

- Set the stroke length to 100 %
- Place the liquid end (2) with the screws (1) on the diaphragm (3) and the top plate (4) (the priming connector must point downwards once the pump is fully assembled).
- Screw on screws (1) lightly and tighten (starting torque, see below).



- 1 Screws 2 Liquid end 3 Diaphragm 4 Top plate
- 5 Safety diaphragm 6 Pump housing

#### NOTE

- Check the screw torques after 24 hours in operation
- For PP liquid ends check the screw torques again after three months.

Screw torques: 4.5 to 5 Nm

Subject to technical changes.