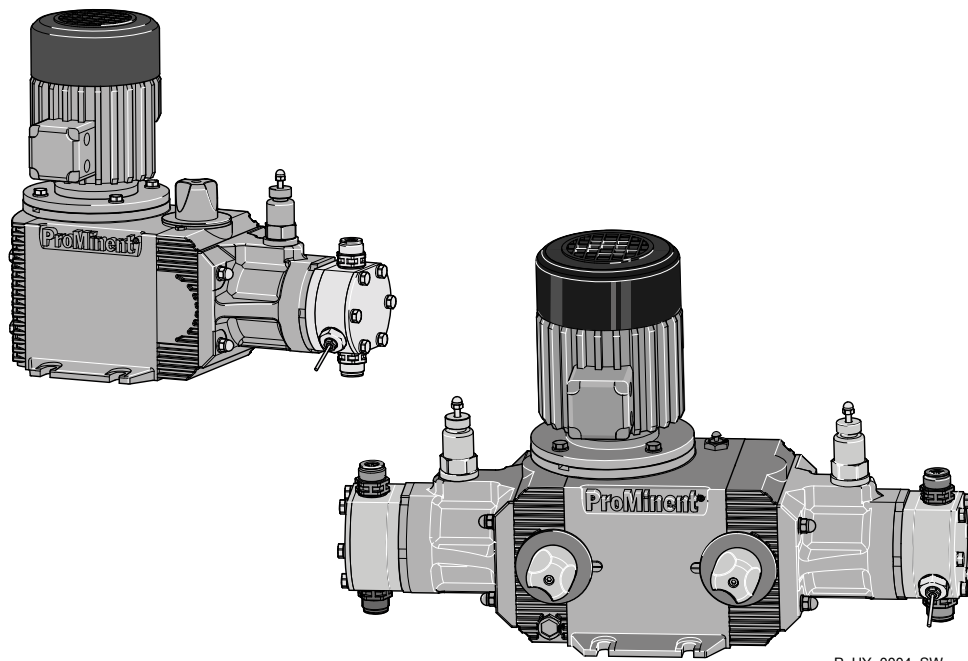


Operating instructions

Metering pumps

Hydro/ 2 and Hydro/ 3



P_HY_0004_SW

Two sets of operating instructions are required for the safe, correct and proper operation of the ProMinent® Hydro metering pumps:

These Hydro product-specific operating instructions and the "General Operating Instructions for ProMinent® motor-driven metering pumps and hydraulic accessories"; the two are only valid in conjunction with each other.

Please carefully read these operating instructions before use! · Do not discard!
The operator shall be liable for any damage caused by installation or operating errors!
Technical changes reserved.

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Internet: www.prominent.com

987507, 2, en_GB

Supplementary information



Fig. 1: Please read!

Read the following supplementary information in its entirety! Should you already know this information, you have an even greater need of the Operating Instructions.

The following are highlighted separately in the document:

■ Enumerated lists

➔ Operating instructions

Information



This provides important information relating to the correct operation of the unit or is intended to make your work easier.

Safety information

Safety information is identified by pictograms - see Safety Chapter.

User information

Two sets of operating instructions are required for the safe, correct and proper operation of the metering pumps: The product-specific operating instructions and the "General Operating Instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories".

Both sets of operating instructions are only valid when read together.

Please carefully read these operating instructions before use! Do not discard!

State the identcode and serial number

Please state identcode and serial number, which you find on the nameplate when you contact us or order spare parts. This enables the device type and material versions to be clearly identified.

EX pumps only

The type plate stuck on the cover page is identical with the pump supplied so that a clear assignment is given between the operating instructions and the pump.

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1 Identcode

HP2a	Hydro/ 2, version a									
	Drive types									
	H	Main drive								
	D	Main drive, double head version								
	E	Main drive for add-on drive								
	F	Main drive double head version for add-on drive								
	A	Add-on drive								
	B	Add-on drive double head version								
	Type *									
	Dosing head material									
	SS	Stainless steel								
	PV	PVDF								
	HC	Hastelloy C								
	Seal material									
	T	PTFE								
	Displacement									
	0	Standard multi-layer safety diaphragm with rupture signalling								
	Dosing head version									
	0	No valve spring (standard)								
	1	With valve spring								
	D	Double ball valve (only for SST and HCT)								
	H	HV version for (only for 025019 ... 025060)								
	Hydraulic connector									
	0	Standard threaded connector (in line with technical data)								
	E	With DIN ISO flange								
	F	With ANSI flange								
	Version									
	0	With ProMinent® logo (Standard)								
	1	Without ProMinent® logo								
	M	Modified*				* order-related version, for pump features see paper-work for order				
	Electric power supply									
	S	3 ph, 230 V/400 V 50/60 Hz, 0.37 kW								
	L	3 ph, 230 V/400 V, 50 Hz, (Exe, Exde), 0.37 kW								
	P	3 ph, 265 V/440 V, 60 Hz, (Exe, Exde), 0.37 kW								
	R	3 ph, variable speed motor, 230/400 V, 0.37 kW								
	V(0)	Variable speed motor with integrated Frequency converter 1 ph, 230 V, 50/60 Hz								
	V(2)	Variable speed motor with integrated Frequency converter (Exd)								
	Z	Speed control complete 1 ph, 230 V, 50/60 Hz (control motor + frequency converter)								

HP2a	Hydro/ 2, version a										
										3	No motor, with B 5 flange, size 71 (DIN)
										4	No motor, with C 56 flange (NEMA)
										0	Add-on drive
										Degree of protection	
										0	IP 55 (Standard) ISO class F
										1	Exe version ATEX-T3
										2	Exde version ATEX-T4
										A	ATEX power end
										Stroke sensor	
										0	No stroke sensor (standard)
										1	Stroke sensor (EX zone capable)
										Stroke length adjustment	
										0	Manual (standard)
										1	With servomotor, 230 V, 50/60 Hz
										2	With servomotor, 115 V, 60 Hz
										A	With control motor 0...20 mA 230 V, 50/60 Hz
										B	With control motor 4...20 mA 230 V, 50/60 Hz
										C	With control motor 0...20 mA 115 V, 60 Hz
										D	With control motor 4...20 mA 115 V, 60 Hz
										Hydraulic oil	
										0	Standard
										1	Food approval for oil
										2	Low temperature to -25 °C

* Type, power (at 50 Hz)

Type	Power		Type	Power		Type	Power	
	bar	l/h		bar	l/h		bar	l/h
100003	100	3	064007	64	7	025019	25	19
100006	100	6	064015	64	15	025040	25	40
100007	100	7	064018	64	18	025048	25	48
100009	100	9	064022	64	22	025060	25	60
100010	100	10	064025	64	25	025068	25	68

HP3a	Hydro/ 3, version a										
	Drive types										
	H	Main drive									
	D	Main drive, double head version									
	E	Main drive for add-on drive									
	F	Main drive double head version for add-on drive									
	A	Add-on drive									
	B	Add-on drive double head version									
	Type *										
		Dosing head material									
		SS	Stainless steel								
		PV	PVDF								
		HC	Hastelloy C								
			Seal material								
			T	PTFE							
				Displacement							
			0	Standard multi-layer safety diaphragm with rupture signalling							
				Dosing head version							
			0	No valve spring (standard)							
			1	With valve spring							
			D	Double ball valve (for 100010 ... 100035, 064019 ... 064060 and SST / HTC)							
			H	HV version for (for 064019 ... 064068, 025048 ... 025170)							
				Hydraulic connector							
			0	Standard threaded connector (in line with technical data)							
			E	With DIN ISO flange							
			F	With ANSI flange							
				Version							
			0	With ProMinent® logo (Standard)							
			1	Without ProMinent® logo							
			M	Modified*					* order-related version, for pump features see paperwork for order		
				Electric power supply							
			S	3 ph, 230 V/400 V 50/60 Hz, 0.75 kW							
			L	3 ph, 230 V/400 V, 50 Hz, (Exe, Exde), 0.75 kW							
			P	3 ph, 265 V/440 V, 60 Hz, (Exe, Exde), 0.75 kW							
			R	3 ph, variable speed motor, 230/400 V, 0.75 kW							
			V(0)	Variable speed motor with integrated Frequency converter 1 ph, 230 V, 50/60 Hz							
			V(2)	Variable speed motor with integrated Frequency converter (Exde)							
			Z	Speed control complete 1 ph, 230 V, 50/60 Hz (control motor + frequency converter)							
			3	No motor, with B 5 flange, size 80 (DIN)							

HP3a Hydro/ 3, version a																			
									4	No motor, with C 56 flange (NEMA)									
									0	Add-on drive									
																		Degree of protection	
									0	IP 55 (Standard) ISO class F									
									1	Exe version ATEX-T3									
									2	Exde version ATEX-T4									
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									1	With servomotor, 230 V, 50/60 Hz									
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									A	With control motor 0...20 mA 230 V, 50/60 Hz									
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									C	With control motor 0...20 mA 115 V, 60 Hz									
									D	With control motor 4...20 mA 115 V, 60 Hz									
																		Hydraulic oil	
									0	Standard									
									1	Food approval for oil									
									2	Low temperature to -25 °C									

* Type, power (at 50 Hz)

Type	Power		Type	Power		Type	Power	
	bar	l/h		bar	l/h		bar	l/h
100010	100	10	064019	64	19	025048	25	48
100021	100	21	064040	64	40	025100	25	100
100025	100	25	064048	64	48	025120	25	120
100031	100	31	064060	64	60	025150	25	150
100035	100	35	064068	64	68	025170	25	170

2 Safety chapter






Explanation of the safety information

The following signal words are used in these operating instructions to identify different severities of a hazard:

Signal word	Meaning
WARNING	Denotes a possibly hazardous situation. If this is disregarded, you are in a life-threatening situation and this can result in serious injuries.
CAUTION	Denotes a possibly hazardous situation. If this is disregarded, it could result in slight or minor injuries or material damage.

Warning signs denoting different types of danger

The following warning signs are used in these operating instructions to denote different types of danger:

Warning signs	Type of danger
	Warning – hand injuries.
	Warning – high-voltage.
	Warning – flammable substances.
	Warning – hot surface.
	Warning – danger zone.

Correct and proper use

- The pump may only be used to dose liquid metering chemicals.
- In potentially explosive atmospheres in zone 1, device category II 2G of explosion group II C, the pump must only be operated according to the with the relevant nameplate (and the respective EC Declaration of Conformity) for pumps for potentially explosive atmospheres complying with Directive 94/9/EC in accordance with the European guidelines. The explosion group, category and protection class declared on the marking must correspond with or be better than the given conditions in the intended field of application.
Only the following identity code variants are suitable for use in hazardous locations:
"Electric power supply" Characteristic values, L, P + "degree of protection": Characteristic values 1, 2 plus value pair V2
"Electric power supply" Characteristic values 0,1,3 4 + "degree of protection": Characteristic value A
- The pump may only be started up after it has been correctly installed and commissioned in accordance with the technical data and specifications contained in the operating instructions. When working at temperatures arising using a heating cartridge, bear in mind their effect.
- The general limitations with regard to viscosity limits, chemical resistance and density must be observed - see also ProMinent resistance list (In the product catalogue or at www.prominent.com)!

- Any other uses or modifications are prohibited.
- Pumps without the relevant nameplate (and the respective EC Declaration of Conformity) for pumps for potentially explosive atmospheres must never be operated in potentially explosive atmospheres.
- The pump is not intended for the metering of gaseous media or solids.
- The pump is not intended to meter explosive substances and mixtures.
- The pump is not intended for unprotected outside use.
- The pump should only be operated by trained and authorised personnel.
- You are obliged to observe the information contained in the operating instructions at the different phases of the device's service life.

Safety information

Safety information



WARNING!

Warning of hazardous or unknown feed chemical

Should a hazardous or unknown feed chemical be used, it may escape from the hydraulic components when working on the pump.

- Take appropriate protective measures before working on the pump (protective eyewear, protective gloves, ...). Read the safety data sheet on the feed chemical.
- Drain and flush the liquid end before working on the pump.



CAUTION!

Warning of feed chemical spraying around

Feed chemical can spray out of the hydraulic components if they are manipulated or opened due to pressure in the liquid end and adjacent parts of the system.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.
- Depressurise the system before commencing any work on hydraulic parts.



CAUTION!

Warning of feed chemical spraying around

An unsuitable feed chemical can damage the parts of the pump contacted by the chemical.

- Take into account the resistance of the materials which will come into contact with the chemical when selecting the feed chemical - refer to the ProMinent resistance list in the product equipment catalogue under www.prominent.com.



CAUTION!

Danger of personnel injury and material damage

The use of untested third party parts can result in personnel injuries and material damage.

- Only fit parts to metering pumps, which have been tested and recommended by ProMinent.



CAUTION!

Danger from incorrectly operated or inadequately maintained pumps

Danger can arise from a poorly accessible pump due to incorrect operation and poor maintenance.

- Ensure that the pump is accessible at all times.
- Adhere to the maintenance intervals.



CAUTION!

Warning of illegal operation

Observe the regulations that apply where the unit is to be installed.

Information in the event of an emergency

In the event of an electrical accident, disconnect the mains cable from the mains or press the emergency cut-off switch fitted on the side of the system!

If feed chemical escapes, also depressurise the hydraulic system around the pump as necessary. Adhere to the safety data sheet for the feed chemical.

Qualification of personnel

Activity	Qualification level
Storage, transport, unpacking	Instructed person
Assembly, installation of hydraulic system	Technical personnel, service
Installation, electrical	Electrical technician
Operation	Instructed person
Maintenance, repair	Technical personnel, service
Decommissioning, disposal	Technical personnel, service
Troubleshooting	Technical personnel, electrical technician, instructed person, service

Explanation of the terms:

Technical personnel

A qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognise possible dangers based on his/her technical training, knowledge and experience, as well as knowledge of pertinent regulations.

Note:

A qualification of equal validity to a technical qualification can also be gained by several years employment in the relevant work area.

Electrical technician

Electrical technicians are deemed to be people, who are able to complete work on electrical systems and recognize and avoid possible dangers independently based on their technical training and experience, as well as knowledge of pertinent standards and regulations.

Electrical technicians should be specifically trained for the working environment in which they are employed and know the relevant standards and regulations.

Electrical technicians must comply with the provisions of the applicable statutory directives on accident prevention.

Instructed person

An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him/her and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.

Customer Service department

Customer Service department refers to service technicians, who have received proven training and have been authorised by ProMinent or Pro-Maqua to work on the system.

Safety information relative for the operating instructions

Prior to commissioning of the system or system component, the system operator is obliged to obtain the latest safety data sheet for the chemicals / resources to be used with the system from the supplier. Based on the information provided in the data sheets concerning health and safety, water and environmental protection and taking into consideration the actual operating environment on site, the operator must create the legal framework for safe operation of the system or system component, such as for example the preparation of operating instructions (operator duties).

Fixed, isolating protective equipment

During use of the pump all such parts should be secured in their position.

Protective equipment	May only be removed by*:
Protective cowlings above the motor fan	Service
Terminal box cover, motor	Qualified electrician, service
Flange cover, side	Service
Only with add-on power end: Motor connection cover	Service
Only with protective devices: their corresponding parts	Technical personnel, service

* Only if the mains cable remains disconnected (no mains voltage).

Sound pressure level

Sound pressure level $L_{pA} < 70$ dB in accordance with EN ISO 20361:2010-10

at maximum stroke length, maximum stroke rate, maximum back pressure (water)

3 Storage, transport and unpacking

Safety information


WARNING!

The transporting of pumps which have been used with radioactive feed chemicals is forbidden!

They will also not be accepted by ProMinent!


WARNING!

Only return the metering pump for repair in a cleaned state and with a flushed liquid end - refer to the chapter "Decommissioning"! Should safety precautions nevertheless be necessary, in spite of carefully emptying and cleaning the pump, the requisite information must be completed in the Declaration of Decontamination Form!

The Declaration of Decontamination form constitutes an integral part of an inspection / repair order. A unit can only be inspected or repaired when a Declaration of Decontamination Form is submitted that has been completely correctly and in full by an authorised and qualified person on behalf of the pump operator.

The "Decontamination Declaration Form" can be found in the "General operating instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" or at www.prominent.com.


CAUTION!
Danger of material damage

The device can be damaged by incorrect or improper storage or transportation!

- The unit should only be stored or transported in a well packaged state - preferably in its original packaging.
- The packaged unit should also only be stored or transported in accordance with the stipulated storage conditions.
- The packaged unit should be protected from moisture and the ingress of chemicals.


CAUTION!
Danger of environmental damage

Pumps with liquid end are supplied filled with oil.

- When transporting, take care that no oil can escape.

Storage

Personnel: ☐ Technical personnel

1. ➞ Place the caps on the valves.
2. ➞ Check if the red gear bleeding plug is pushed in.
3. ➞ Preferably place the pump standing vertically on a pallet and secure against falling over.
4. ➞ Cover the pump with a tarpaulin cover - allowing rear ventilation.

Store the pump in a dry, sealed place under the ambient conditions according to chapter "Technical Data".

4 Overview of device / control elements

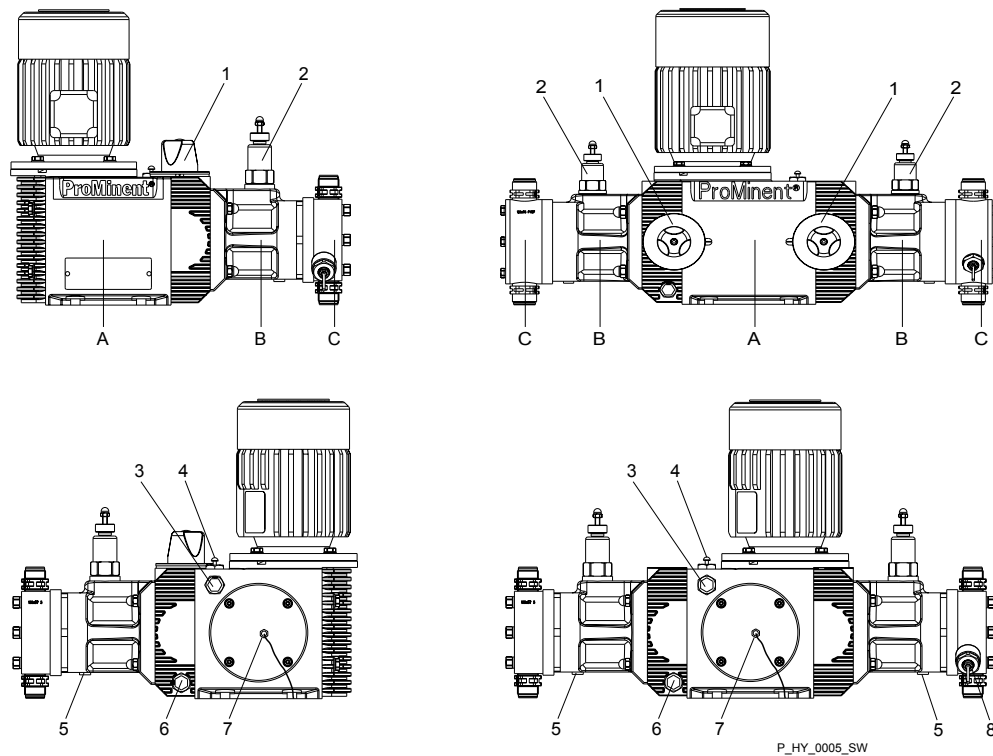


Fig. 2: Hydro, single head and double head versions

- A Drive
- B Hydraulic end
- C Liquid end
- 1 Stroke adjustment knob
- 2 Safety relief valve
- 3 Oil level indicator

- 4 Gear bleeding plug
- 5 Oil drain plug
- 6 Oil drain screw
- 7 Stroke sensor (Option)
- 8 Diaphragm rupture sensor

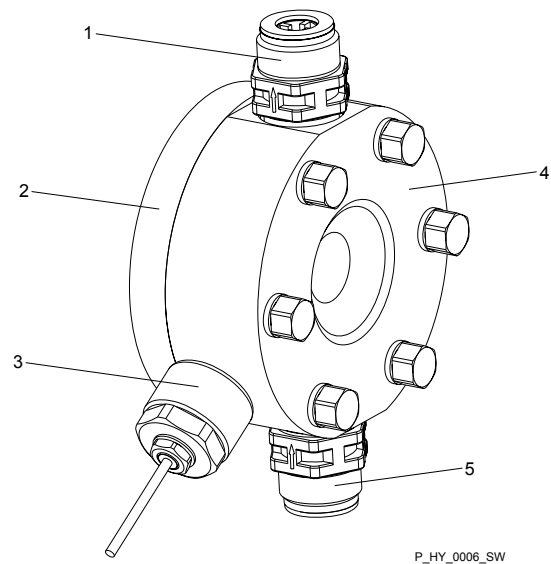


Fig. 3: Liquid end

- 1 Discharge valve
- 2 Diaphragm mounting plate
- 3 Diaphragm rupture sensor
- 4 Suction valve
- 5 Liquid end

5 Functional description

Drive

The Hydro pump is a motor-driven metering pump with hydraulically operated multi-layer diaphragm (7). It works in a similar way to a conventional motor-driven pump, the motor moves the piston (4) forward via a worm gear and cam (1). As the piston (4) is not attached to the cam (1), the piston spring (6) is required to push it back into the hydraulic section. The forward motion pushes the piston (4) into the hydraulic end and creates pressure in the hydraulic oil in the hydraulic end. As a result the hydraulic oil pushes the multi-layer diaphragm (7) into the dosing head. The hollow bored piston (4) has so-called control borings to adjust the stroke length. The adjustable control sleeve (3) seals these borings at each discharge stroke. Depending upon the control sleeve (3) setting, it seals the borings earlier or later. While the control borings are free, a discharge stroke can cause hydraulic oil to escape from the hydraulic end into the power end housing, in which case the multi-layer diaphragm is not forced into the dosing head. If the control borings are then sealed, the piston (4) can create pressure in the hydraulic end and the multi-layer diaphragm (7) is forced into the dosing head. As the hydraulic oil can escape from the hydraulic end (into the power end housing), the multi-layer diaphragm is operated to a lesser degree. The suction stroke causes the hydraulic oil to flow out of the drive housing through the control borings and back into the hydraulic end. For pumps with externally mounted drive, both drives work in push-pull mode. The pump has a fixed safety relief valve (5) installed in the hydraulic section. The safety relief valve provides protection for the pump power end and the diaphragm if the liquid feed pressure becomes too high. If the discharge side of the liquid end becomes blocked, the safety relief valve (5) opens at a pre-set pressure and allows the hydraulic oil to flow into the drive housing. The safety relief valve is not guaranteed to protect the system from excess positive pressure! A safety relief valve should nevertheless be fitted in the case of the EX-pump!

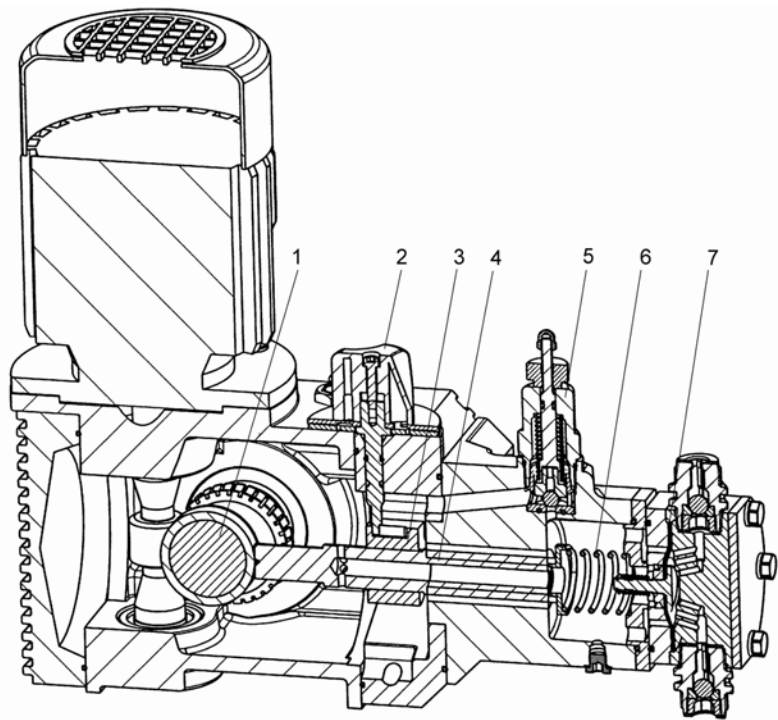


Fig. 4: Section of the pump

Liquid end

The heart of the liquid end is a highly resistant multi-layer diaphragm (1). It hermetically seals the delivery chamber of the dosing head (4) and produces a displacement in the dosing head at each pump stroke. The suction valve (6) and the discharge valve (3) provide the feed in conjunction with the diaphragm action. The diaphragm (1) is tightly stretched between the dosing head (4) and a diaphragm mounting plate (2). As the diaphragm is hydraulically activated - it is not attached to the piston - it always works in

balance with the pump and is therefore well suited to high feed pressures. The return to the starting position after a stroke is guaranteed by an in-built diaphragm return spring (7). The diaphragm (1) is designed as standard as a multi-layer diaphragm. The diaphragm anchors (5) and a film of liquid join the sandwiched diaphragm layers.

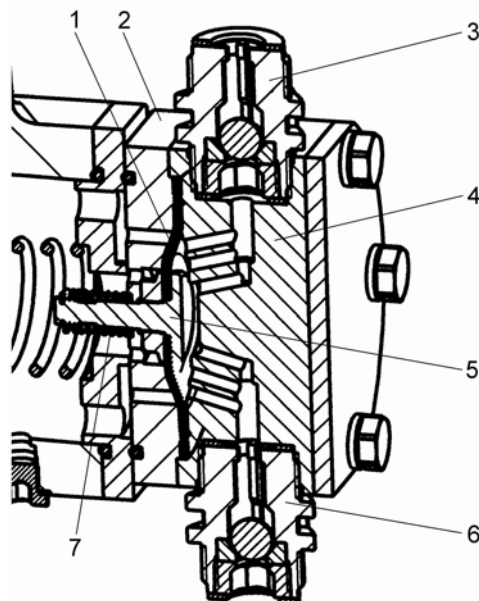


Fig. 5: Cross-section through the liquid end

Diaphragm rupture sensor

The diaphragm rupture signal function monitors the sealing capacity of the multi-layer diaphragm. The middle diaphragm layer of the multi-layer diaphragm is fitted with slits which connect to a diaphragm rupture signal sensor (2) via a channel in the dosing head (1). If one of the outer diaphragm layers ruptures, metering chemicals or hydraulic oil can pass to the sensor, which generates a signal. The multi-layer diaphragm prevents metering chemicals from mixing with hydraulic oil in event of diaphragm rupture.

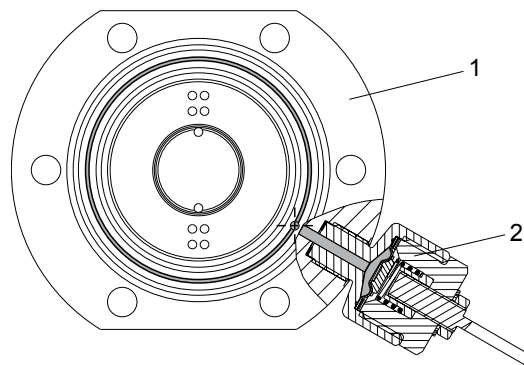


Fig. 6: View of the dosing head dismantled with cross-section

6 Assembly



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



CAUTION!

Warning about personal and material damage

Also observe the "General Operating Instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!



CAUTION!

Danger of environmental and material damage

The unit can be damaged or oil may escape due to incorrect or improper storage or transportation!

- The unit should only be stored or transported in a well packaged state - preferably in its original packaging.
- Only transport the unit with the locking screw - not the bleed plug - fitted to the oil filling opening.
- The packaged unit should also only be stored or transported in accordance with the stipulated storage conditions.
- The packaged unit should be protected from moisture and the ingress of chemicals.



CAUTION!

Warning about personal and material damage

Personal and material damage may be caused if the unit is operated outside of the permissible ambient conditions.

- Please observe the permissible ambient conditions - refer to the chapter entitled "Technical Data".

Supporting floor

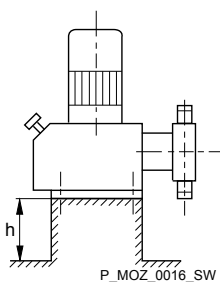


Fig. 7



WARNING!

Risk of electric shock

If water or other electrically conducting liquids penetrate into the drive housing, an electric shock may occur.

- Position the pump so that drive housing cannot be flooded.



WARNING!

The pump can break through the supporting floor or slide off it

- The supporting floor must be horizontal, smooth and permanently load-bearing.



Capacity too low

Vibrations can disturb the valves of the liquid end.

- The supporting floor must not vibrate.

Space requirement

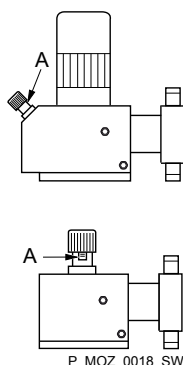


Fig. 8

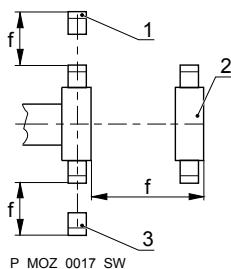


Fig. 9

Liquid end alignment



Capacity too low

If the valves of the liquid end do not stand upright, they cannot close correctly.

- The discharge valve must be upright.

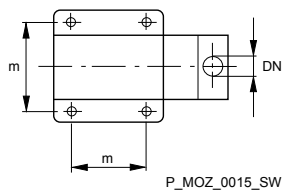
Fastening



Capacity too low

Vibrations can disturb the valves of the liquid end.

- Secure the metering pump so that no vibrations can occur.



Take the dimensions (m) for the fastening holes from the appropriate dimensional drawings or data sheets.

Fasten the pump base to the supporting floor using suitable screws.

Fig. 10

7 Installation



CAUTION!

Danger of personnel injury and material damage

Disregarding the technical data when installing may lead to personal injuries or damage to property.

- Observe the technical data- refer to chapter "Technical Data" and, where applicable, the operating instructions of the accessories.

7.1 Installation, hydraulic



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



WARNING!

Warning of feed chemical reactions to water

Feed chemicals that should not come into contact with water may react to residual water in the liquid end that may originate from works testing.

- Blow the liquid end dry with compressed air through the suction connector.
- Then flush the liquid end with a suitable medium through the suction connector.



WARNING!

The following measures are an advantage when working with highly aggressive or hazardous feed chemicals:

- Install a bleed valve with recirculation in the storage tank.
- Install an additional shut-off valve on the discharge or suction ends.



CAUTION!

Warning of backflow

A back pressure valve or a spring-loaded injection valve do not represent absolutely leak-tight closing elements.

- For this purpose use a shut-off valve, a solenoid valve or a vacuum breaker.



CAUTION!

Warning about personal and material damage

Also observe the "General Operating Instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!



CAUTION!

Warning against the discharge line bursting

With a closed discharge line (e.g. from a clogged discharge line or by closing a valve), the pressure that the metering pump generates can reach several times more than the permissible pressure of the system or the metering pump. This could lead to lines bursting resulting in dangerous consequences with aggressive or hazardous feed chemicals.

- Install a relief valve that limits the pressure of the pump to the maximum permissible operating pressure of the system.



CAUTION!

Warning against the discharge line bursting

Hose lines with insufficient pressure rating may burst.

- Only use hose lines with the required pressure rating.



CAUTION!

Warning against lines disconnecting

With suction, discharge and relief lines installed incorrectly can loosen / disconnect from the pump connection.

- Only use original hoses with the specified hose diameter and wall thickness.
- Only use clamping rings and hose nozzles that correspond with the respective hose diameter.
- Always connect the lines without mechanical tension.
Only connect steel piping via a flexible piping section to a plastic valve body - see the following figure.

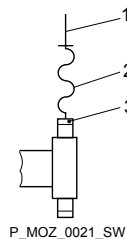


Fig. 11: Connect the steel piping to the plastic pump body as shown

- 1 Steel pipeline
- 2 Flexible pipe section
- 3 Plastic valve body

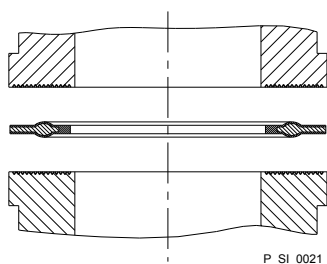


Fig. 12: Moulded composite seals with corrugated insert

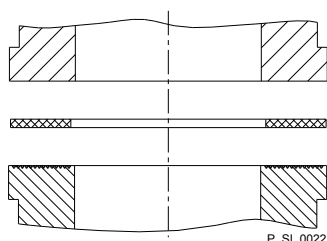


Fig. 13: Elastomer flat seal for a smooth insert



CAUTION!

Warning against leaks

Leaks can occur on the pump connection depending on the insert used.

- The pump is supplied with PTFE moulded composite seals with a flare, which are used for the pump connections. They seal the connections between grooved pump valves and the grooved inserts from ProMinent - see .
- However, in the event that a smooth insert is used (e.g. third party part), an elastomer flat seal must be used - see .



CAUTION!

Warning of feed chemical spraying around

PTFE seals, which have already been used / compressed, can no longer reliably seal a hydraulic connection.

- New, unused PTFE seals must always be used.



CAUTION!

Danger due to incorrect use of the safety relief valve

The safety relief valve can only protect the motor and the gear, only against illegal positive pressure that is monitored by the metering pump itself. It cannot protect the system against positive pressure.

- Protect the motor and gear of the system against positive pressure using other mechanisms.
- Protect the system against illegal positive pressure using other mechanisms.



- *Precise metering is only possible when the back pressure is maintained above 1 bar at all times.*
- *If metering at atmospheric pressure, a back pressure valve should be used to create a back pressure of approx. 1.5 bar.*



- *For chemicals with a particle size greater than 0.3 mm, the valves may no longer close properly.*
- *Install a suitable filter in the suction line.*

Personnel:

■ Technical personnel

Diaphragm rupture sensor



CAUTION!

Danger resulting from unnoticed diaphragm rupture

The electric diaphragm rupture sensor must be able to indicate a diaphragm rupture.

- Screw the enclosed diaphragm rupture sensor into the liquid end - do not forget the seal.



CAUTION!

Warning of unnoticed diaphragm rupture

Only above approximately 2 bar system back pressure is a signal generated upon a diaphragm rupture.

- Only rely on the diaphragm rupture sensor at back pressures greater than 2 bar.

7.2 Installation, electrical



WARNING!

Danger of electric shock

Unprofessional installation may lead to electric shocks.

- All cable cores cut to length must be provided with cable end sleeves.
- The Installation, electrical of the device may only be undertaken by technically trained personnel.



WARNING!

Danger of electric shock

In the event of an electrical accident, it must be possible to quickly disconnect the pump, and any electrical ancillaries which may possibly be present, from the mains.

- Install an emergency cut-off switch in the mains supply line to the pump and any electrical ancillaries which may be present or
- Integrate the pump and electrical ancillaries which may be present in the emergency cut-off management of the system and inform personnel of the isolating option.



WARNING!

Danger of electric shock

This pump is equipped with a protective earth conductor, to reduce the risk arising from an electric shock.

- Connect the PE conductor to "earth" with a clean and permanent electrical connection.



WARNING!

Danger of electric shock

A mains voltage may exist inside the motor or electrical ancillaries.

- If the housing of the motor or electrical ancillaries has been damaged, you must disconnect it from the mains immediately. The pump must only be returned to service after an authorised repair.



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



CAUTION!

Warning about personal and material damage

Also observe the "General Operating Instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!

Personnel: ■ Electrician

motor

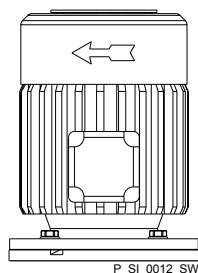


Fig. 14: Direction of rotation of motor



CAUTION!

Pump can be damaged

The pump can be damaged if the motor drives the pump in the wrong direction.

- When wiring the motor, pay attention to the correct direction of rotation indicated by the arrow on the fan cover, as indicated in the diagram.



CAUTION!

The motor may be damaged

The motor is not equipped with a fuse.

- Install a suitable motor protection switch.

1. ➔ Connect the terminal box of the motor with the mains voltage using a suitable cable.
2. ➔ Install an emergency cut-off switch or include the motor in the emergency cut-off management of the system.



- Key motor data can be found on the unit nameplate.
- Motor data sheets can be requested for more information.
- The terminal wiring diagram is located in the terminal box.
- Notes on the speed controlled motor with external fan and temperature monitoring can be found in the "General operating instructions for ProMinent® motor-driven metering pumps and hydraulic accessories"!

Diaphragm rupture sensor (Option)



WARNING!

Risk of electric shock

In event of a defect, there is a risk of electric shock when conductive feed chemical are used.

- For safety reasons we recommend connecting to a protective low voltage, e.g. in accordance with EN 60335-1 (SELV).



CAUTION!

Danger resulting from unnoticed diaphragm rupture

If the pump has been ordered with an electric diaphragm rupture sensor, it must also be electrically installed.

- Install the enclosed diaphragm rupture sensor electrically to a suitable monitoring device.

a) Diaphragm rupture sensor with switch contact



- *The cable can be poled as required.*

b) Namur sensor, inherently safe

The monitor / power supply installed by the customer must be able to evaluate the current variations of the Namur sensor for indicating a diaphragm rupture!

When using combustible media:



WARNING!

Risk of fire after a diaphragm rupture

The electric diaphragm rupture sensor must switch off the pump immediately after a diaphragm rupture.

- Connect the pump and the diaphragm rupture sensor to a control so that the pump is stopped immediately in the event of a diaphragm rupture.

Stroke sensor (Option)



Connect the stroke sensor to a suitable monitoring device according to the details in the chapter "Technical Data" - also observe their technical data!

The monitor / power supply installed by the customer must be able to evaluate the current variations of the Namur sensor for indicating a diaphragm rupture!

Heating cartridge



Install the heating cartridge according to its documentation. It must only be connected to the supplied power supply!

Other units



Install the other units according to their documentation.

8 Start up

Safety information



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



CAUTION!

Warning about personal and material damage

Also observe the "General Operating Instructions for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!



WARNING!

Hot surface

In event the drive motor is loaded excessively, its surface may become very hot.

- Avoid contact.
- If necessary, mount a guard plate.

Observe the technical data



CAUTION!

Danger of material damage

Observe the details in the chapter "Technical Data" (pressure, viscosity, resistance, ...).

Test the diaphragm rupture sensor



CAUTION!

Feed chemical can escape unnoticed

If the diaphragm rupture sensor does not stop the pump or no alarm is triggered, feed chemical can escape unnoticed.

- Trigger the diaphragm rupture indicator - see chapter "Repairs" and in so doing check the reaction of the analysis unit.

Checking the direction of rotation

When commissioning the unit, check whether the drive motor is rotating correctly - check this against the arrow on the motor housing or the diagram in the chapter entitled "Electrical Installation."



WARNING!

Risk of injury from the fan impeller

The fan impeller beneath motor's fan cowling can cause severe injuries while it is turning.

- The pump must only be connected to the mains voltage with the fan cowling closed.

Remove the gearbox vent stopper



CAUTION!

Possible environmental and material damage

In event the red gear bleeding plug is sealed, during operation it prevents any pressure compensation between the drive housing and the surroundings. This ensure that oil can be pushed from the drive housing.

- Remove the gear bleeding plug before commissioning.

Use the safety relief valve



CAUTION!

Danger due to incorrect use of the safety relief valve

The safety relief valve can only protect the motor and the gear, only against illegal positive pressure that is monitored by the metering pump itself. It cannot protect the system against positive pressure.

- Protect the motor and gear of the system against positive pressure using other mechanisms.
- Protect the system against illegal positive pressure using other mechanisms.

Avoid particles



For chemicals with a particle size greater than 0.3 mm, the valves may no longer close properly.

- *Install a suitable filter in the suction line.*

8.1 Bleeding the liquid end

When bleeding the liquid end or suction against pressure:

Relieve the suction and discharge line from pressure!

With dangerous or unknown feed chemicals, take suitable protective measures according to the safety data sheet!

1. ➤ Loosen the discharge line.
2. ➤ Install a piece of translucent hose.
3. ➤ Run the pump slowly until the feed chemical appears in the piece of hose.
4. ➤ Remove the piece of hose.
5. ➤ Mount the discharge line.

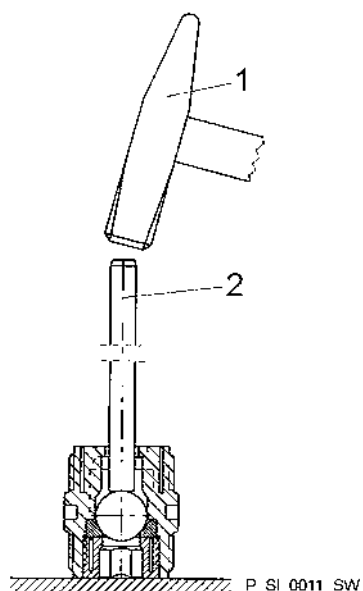


Fig. 15: Tapping the valve set disc



Eliminating suction problems (only for single ball valves with PTFE ball seat)

For suction problems occurring during start up:

- Exclude the possibility that there are foreign bodies in the valve.
- Place the valve on a stable surface.
- Using a hammer (1) and a brass bar (2), gently tap the PTFE ball seat above the valve ball - see figure below.
- Then with the valve in a damp condition allow it to prime.

8.2 Calibrate the stroke control drive (Option)

The stroke control drive is calibrated to the ordered metering capacity ex-factory. In event that you want the stroke control drive to be calibrated to another metering capacity, please contact ProMinent.

9 Maintenance

Safety information



WARNING!

It is mandatory that you read the safety information and specifications in the "Storage, Transport and Unpacking" chapter prior to shipping the pump.



CAUTION!

Warning of feed chemical spraying around

Feed chemical can spray out of the hydraulic components if they are manipulated or opened due to pressure in the liquid end and adjacent parts of the system.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.
- Depressurise the system before commencing any work on hydraulic parts.



WARNING!

Danger of an electric shock

When working on the motor or electrical auxiliary equipment, there is a danger of an electric shock.

- Before working on the motor, take note of the safety instructions in its operating instructions!
- Should external fans, servomotors or other auxiliary equipment be installed, these should also be disconnected and checked that they are voltage free.

Maintenance work:

Interval	Maintenance work	Personnel
Quarterly*	<ul style="list-style-type: none"> ■ EX pumps only: Special maintenance work, refer to the safety instructions for EX pumps. ■ Check that the metering lines are fixed firmly to the liquid end. ■ Check that the suction valve and discharge valve are correctly seated. ■ Check whether the diaphragm rupture sensor stops the pump or generates an alarm after it is triggered, see the chapter "Repairs". ■ Check for firm seating of the diaphragm rupture sensor. ■ Check the tightness of the entire liquid end - particularly around the leakage hole! ■ Check that the flow is correct: Allow the pump to prime briefly. ■ Check that the electrical connections are intact ■ Check that the dosing head screws are tight ■ Check the oil level. 	Technical personnel
After approx. 5,000 operating hours	Change hydraulic oil - refer to "Changing hydraulic oil" in this chapter.	Instructed personnel
After approx. 10,000 operating hours **	Diaphragm change - refer to "Diaphragm change" in the chapter "Repair".	Technical personnel

* Under normal loading (approx. 30 % of continuous operation)

Under heavy loading (e.g. continuous operation): Shorter intervals.

** under normal loading. With very unfavourable metering parameters: Shorter intervals.

Hydraulic oil change

**WARNING!****Risk of burns due to hot hydraulic oil**

The hydraulic oil may become very hot when the pump is exposed to extensive loading.

- When draining oil, avoid contact with the oil running out.

**WARNING!**

If the pump must be operated using hydraulic oil compatible with foodstuffs, then only foodsafe hydraulic oil must be used.

Drain the hydraulic oil

For the double-head versions, perform the following work simultaneously on both dosing heads.

1. ➤ Set the stroke adjustment knob (2) to "0".
2. ➤ Unscrew the gear bleeding plug (3).
3. ➤ Place an oil tray under the oil drain plug (5).
4. ➤ Unscrew the oil drain plug (5) out of the drive housing.
5. ➤ Allow the hydraulic oil to run out of the drive.
6. ➤ Place an oil tray under the hydraulic end.
7. ➤ Unscrew the oil drain plug (4) out of the hydraulic end.
8. ➤ Allow the hydraulic oil to run out of the hydraulic end.
9. ➤ Screw on the oil drain plug (5).
10. ➤ Screw in the oil drain plug (4) with a new seal.

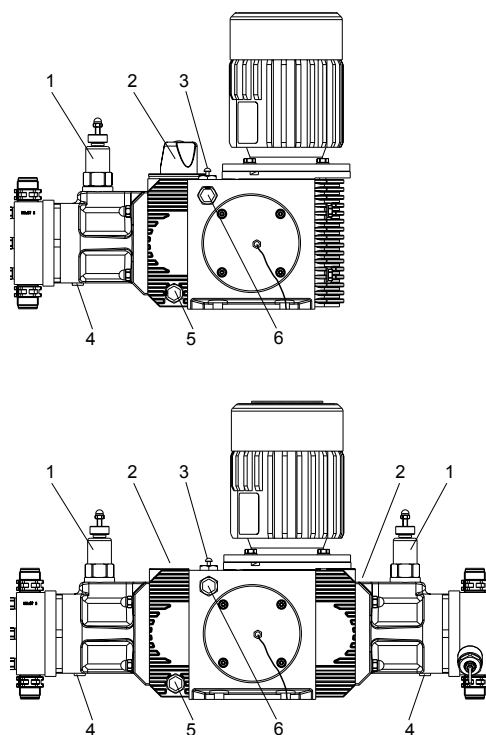


Fig. 16

Fill with hydraulic oil

For the double-head versions, perform the following work simultaneously on both dosing heads.

1. ➤ Set the stroke adjustment knob (2) to "100 %" and open the safety relief valve (1) - tighten the knurled screw.
2. ➤ Slowly fill hydraulic oil through the opening for the gear bleeding plug (3) until the oil level indicator (6) is covered to 1/3.
3. ➤ Start up the pump.
4. ➤ Allow the pump to run for a further 1... 2 minutes.
5. ➤ Top up with hydraulic oil if necessary.
6. ➤ Screw the gear bleeding plug (3) back in. Do not close the bleed valve!
7. ➤ Close the safety relief valve (1) - loosen the knurled screw.

10 Repairs

Safety information

**WARNING!****Warning about personal and material damage**

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.

**WARNING!**

It is mandatory that you read the safety information and specifications in the "Storage, Transport and Unpacking" chapter prior to shipping the pump.

**WARNING!****Warning of hazardous or unknown feed chemical**

Should a hazardous or unknown feed chemical be used, it may escape from the hydraulic components when working on the pump.

- Take appropriate protective measures before working on the pump (protective eyewear, protective gloves, ...). Read the safety data sheet on the feed chemical.
- Drain and flush the liquid end before working on the pump.

**WARNING!****Risk of fingers being crushed**

Under unfavourable conditions, the stroke axle or displacement body can cause crushing of the fingers.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.

**WARNING!****Risk of injury from the fan impeller**

The fan impeller beneath motor's fan cowling can cause severe injuries while it is turning.

- The pump must only be connected to the mains voltage with the fan cowling closed.

**WARNING!****Hot oil and hot components**

The hydraulic oil and the hydraulic end may become very hot when the pump is exposed to heavy loading.

- Allow the pump to cool before starting work.



CAUTION!

Warning of feed chemical spraying around

Feed chemical can spray out of the hydraulic components if they are manipulated or opened due to pressure in the liquid end and adjacent parts of the system.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.
- Depressurise the system before commencing any work on hydraulic parts.

10.1 Cleaning valves



Unsuitable spare parts for the valves may lead to problems for the pumps.

- *Only use new components that are especially adapted to fit your valve (both in terms of shape and chemical resistance).*
- *Use the correct spare part kits. In case of doubt, refer to the exploded views and ordering information contained in the "Supplementary information CD for ProMinent® pump operating instructions".*



Clean the discharge and suction valves only one after another as they cannot be differentiated using the arrow markings.

For orientation: Should you have a dismantled liquid end in front of you, the suction valve is on the side of the diaphragm rupture sensor.

Personnel:

■ Technical personnel

Cleaning a discharge valve (double ball)

Taking the discharge valve apart

1. ➤ Loosen the discharge line.
2. ➤ Unscrew the discharge valve from the liquid end and rinse out.
3. ➤ Remove the remaining parts from the dosing head.
4. ➤ Allow the parts from the valve body (1) to fall as far as possible.
5. ➤ Using an Allen key or similar, insert it through the hole of the valve body (1) and push the remaining parts out of it.
6. ➤ Remove the last seal (2) and the last ball seat (3) from the valve body (1) using a small screwdriver.
7. ➤ Rinse and clean all parts.
8. ➤ Replace the worn parts and seals.

Assembling the discharge valve



When assembling, take note of the orientation of the valve seats (3). The valve seats (3) are used as a ball seat on the fine machined side and as a ball cage and spring guide on the other side. The fine machined side must point in the flow direction with all valve seats.

When assembling the valves, take note of the sequence:

Teflon – Metal – Teflon – Metal - ...

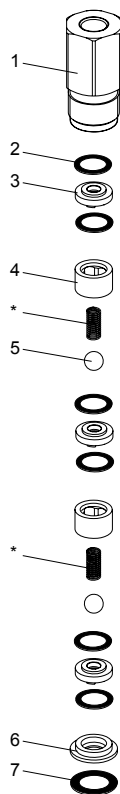


Fig. 17

Cleaning a suction valve (double ball)

1. Slide into the valve body (1) one after another:

- one seal (2) and one valve seat (3) - correct!
- one seal (2) and one valve sleeve (4)
- (If fitted: allow one spring (*) to slide into the spring guide of the valve seat (3))
- slide one ball (5) into the valve body (1)
- one seal (2) and the second valve seat (3, correct!)
- one seal (2) and the second valve sleeve (4)
- (If fitted: allow the second spring (*) to slide into the spring guide of the valve seat (3))
- slide the second ball (5) into the valve body (1)
- one seal (2), the third valve seat (3) - (correct!) and a further seal (2)

2. Position the insert disc (6) with the flare on the packing.



The distance between the edge of the valve body and the insert disc (6) is due to the construction.

3. Place the larger seal (7) between the insert disc (6) and the dosing head.

4. Screw in the valve until the stop.

5. Fix the discharge line.

A suction valve is dismantled, cleaned and assembled in the same way as a discharge valve.



Please note, however, that when assembling, the valve seat (3) must be aligned in the other direction. The fine machined side must point in the flow direction with all valve seats (3).

10.2 Replacing the membrane



WARNING!

Observe the safety instructions at the beginning of the chapter.



CAUTION!

A diaphragm rupture may remain unnoticed

Should the multi-layer diaphragm be treated incorrectly, the diaphragm rupture signal function may fail.

- Take the multi-layer diaphragm from the packaging immediately before installing.
- No impurities must contact the multi-layer diaphragm.
- Do not "inspect" the insert disc.

For the double-head versions and add-on power ends, perform the following work simultaneously on both dosing heads.

Drain the hydraulic oil from the hydraulic end

Position numbers - see chapter "Maintenance"

1. Turn the stroke adjustment knob (2) more than 100% to the stop.
2. Unscrew the gear bleeding plug (3).
3. Place an oil tray under the hydraulic end.
4. Unscrew the oil drain plug (4) out of the hydraulic end.
5. Allow the hydraulic oil to run out of the hydraulic end.
6. Screw in the oil drain plug (4) with a new seal.

Replacing the membrane

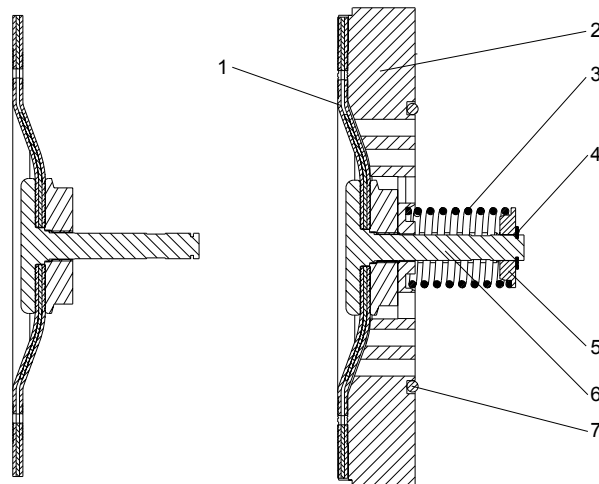


Fig. 18

1. Relieve the suction and discharge line from pressure.
2. Unscrew the suction and discharge line from the liquid end. Is the hydraulic oil drained - see above?
3. Remove the liquid end with dosing head screws from the hydraulic end.
4. Release the diaphragm mounting plate (2) with diaphragm (1) from the dosing head.

5. ➤

**WARNING!****Warning of injury to eyes**

The spring (3) and the spring plate (5) on the diaphragm core (6) may spring away when loosening the securing ring (4).

- Wear protective glasses.

Release the safety ring (4) and the spring (3) with the spring plate (5) from the diaphragm core

6. ➤ Remove the diaphragm / diaphragm core combination from the diaphragm mounting plate (2).
7. ➤ Place the new diaphragm / diaphragm core combination into the diaphragm mounting plate (2).
8. ➤ Place the diaphragm spring (3) with the spring plate (5) onto the diaphragm core (6) and fasten with the safety ring (4).
9. ➤ Replace the O-ring (7) between the diaphragm mounting plate (2) and the hydraulic end.
10. ➤ Place the diaphragm (1) with the diaphragm mounting plate (2) inside the hydraulic end
11. ➤ Position the liquid end with screws so that the suction connector is pointing downwards - diaphragm sensor must be at the bottom.
12. ➤ First gently tighten the dosing head screws and then tighten cross-wise, tightening torque - ⚙ *"Tightening torques" on page 37.*
13. ➤ Test the diaphragm rupture sensor - see ⚙ *Chapter 10.3 "Repair the diaphragm rupture sensor" on page 38*
14. ➤ Screw the suction and discharge line on to the liquid end.

Tightening torques

Data	Value	Unit
Tightening torque for screws:	20.0	Nm

Fill hydraulic oil in the hydraulic end

For the double-head versions, perform the following work simultaneously on both dosing heads.

1. ➤ Set the stroke adjustment knob (1) to "100%" and open the safety relief valve (2) - tighten the knurled screw.
2. ➤ Slowly fill hydraulic oil through the opening for the gear bleeding plug (4) until the oil level indicator (3) is covered to 1/3.
3. ➤ Start up the pump.
4. ➤ Allow the pump to run for 1... 2 minutes.
5. ➤ Screw the gear bleeding plug (3) back in. Do not close the bleed valve!
6. ➤ Close the safety relief valve (1) - loosen the knurled screw.
7. ➤ Check the pump for tightness by using maximum back pressure.



Check the tightening torque of the dosing head screws again after 24-hours of operation!

10.3 Repair the diaphragm rupture sensor



WARNING!

Warning of feed chemical

After diaphragm rupture, additional metering chemical will be present in the diaphragm rupture sensor and the inlet channel in the dosing head!

- If using hazardous or unknown metering chemicals are used then protect yourself against the metering chemical accordingly. Observe the safety data sheet.

30 V version

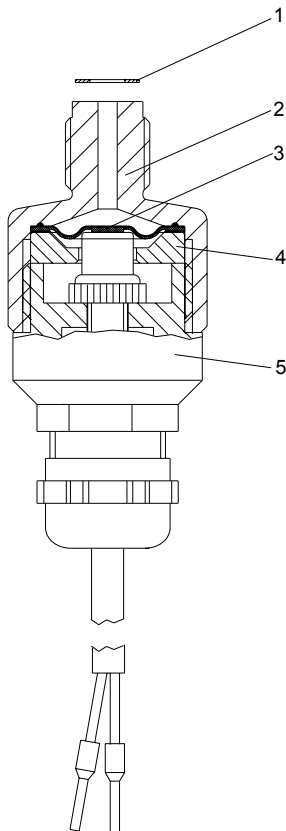


Fig. 19

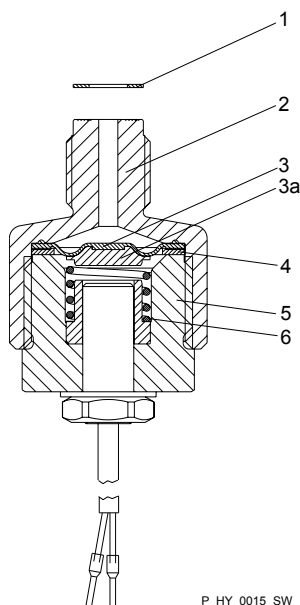
Check diaphragm rupture sensor

1. ➤ When changing the diaphragm, unscrew the diaphragm rupture sensor from the dosing head.
2. ➤ Check for electrical continuity:
3. ➤ Using a blunt insulating probe (Ø 2 ... 3 mm, no sharp edges), press into the channel of the diaphragm rupture sensor.
 - ⇒ Check that there is no electrical continuity
4. ➤ Release the pin again.
 - ⇒ Electrical continuity must be re-established.
5. ➤ Repeat the test several times.
6. ➤ If everything is working correctly, screw the diaphragm rupture sensor into the dosing head with a new seal (1).
7. ➤ If not, go to the next section.

Replace separating diaphragm of the diaphragm rupture sensor

1. ➤ Disconnect the diaphragm rupture sensor from the power supply.
2. ➤ When changing the diaphragm, unscrew the diaphragm rupture sensor from the dosing head.
3. ➤ Grasp the upper section (2) of the diaphragm rupture sensor.
4. ➤ Hold the body (5) in place with an open-ended spanner.
5. ➤ Unscrew the top of the diaphragm rupture sensor.
6. ➤ Clean the soiled parts.
7. ➤ Lay the new separating diaphragm (3) with the light side (PTFE) down into the upper section (2).
8. ➤ Lay the plate (4) with the uneven side down into the upper section (2).
9. ➤ Screw the body (5) into the upper section and screw tighten.
10. ➤ Check the diaphragm rupture sensor as described in "Check diaphragm rupture sensor".

EX Version



P_HY_0015_SW

Fig. 20

11. If the diaphragm rupture sensor does not operate clearly and reliably, then a new diaphragm rupture sensor must be used without fail.

Check diaphragm rupture sensor

1. When changing the diaphragm, unscrew the diaphragm rupture sensor from the dosing head.
2. Check that the monitor does not indicate a diaphragm rupture:
3. Using a blunt insulating probe (\varnothing 2 ... 3 mm, no sharp edges), press into the channel of the diaphragm rupture sensor.
 - ⇒ The monitor device must indicate a diaphragm rupture.
4. Release the pin again.
 - ⇒ The monitor device must no longer indicate a diaphragm rupture.
5. Repeat the test several times.
6. If everything is working correctly, screw the diaphragm rupture sensor into the dosing head with a new seal (1).
7. If not, go to the next section.

Replace separating diaphragm of the diaphragm rupture sensor

1. Disconnect the diaphragm rupture sensor from the monitor device.
2. When changing the diaphragm, unscrew the diaphragm rupture sensor from the dosing head.
3. Grasp the upper section (2) of the diaphragm rupture sensor.



Do not manipulate the lacquer-protected nut.

4. Hold the body (5) in place with an open-ended spanner.
5. Unscrew the top of the diaphragm rupture sensor.
6. Clean the soiled parts.
7. Lay the new separating diaphragm (3) with the light side (PTFE) down into the upper section (2).
8. Place the disc (4) in the upper section (2).
9. Place the spring inside the body (5).
10. Move the body (5) close to the upper section (2).
 - ⇒ The spring (6) must sit correctly on the spring seat (3a).
11. Screw the body (5) into the upper section and screw tighten.
12. Connect the diaphragm rupture sensor back to the monitor device.
13. Check the diaphragm rupture sensor as described in "Check diaphragm rupture sensor".
14. If the diaphragm rupture sensor does not operate clearly and reliably, then a new diaphragm rupture sensor must be used without fail.

10.4 Calibrate metering capacity

It is only worth calibrating if you wish to carry out particularly precise feeds at a completely different back pressure.

The metering capacity of the hydraulic diaphragm metering pump is only dependent upon back pressure to a minimal extent. And the pumps are calibrated on the factory premises to the maximum operating pressure. (Values of the maximum operating pressures - see the pressure level on the indicating dial or safety relief valve).

The plant or production facility can calibrate each pump to a back pressure that is lower than the nominal pressure ordered. Possible pressure ratings are 10, 16, 25, 40, 64 and 100 bar.



WARNING!

EX pumps only: Take suitable precautions in potentially explosive atmospheres regarding the feed chemical in the open measuring cylinder - see handling instructions below.



The metering capacity can only be calibrated when discharge line is connected and under normal operating conditions. As the metering capacity is dependent upon the actual back pressure.

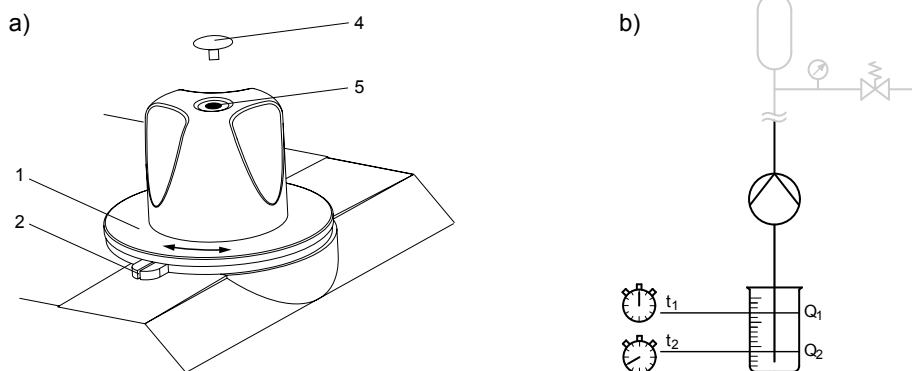


Fig. 21: a) Adjust indicating scale, b) Schematic assembly for calibration

Materials required:

- Measuring beaker
- Stop watch

1. ➤ Switch off the pump.
2. ➤ Turn the stroke adjustment knob to maximum, beyond 100 % to the stop.
3. ➤ Remove the cover (4) from the stroke adjustment knob and slacken off the screw (3) beneath slightly.
4. ➤ Guide the suction line into a measuring beaker - see Fig. 21.
5. ➤ Fill the measuring beaker with feed chemical.
6. ➤ Start up the pump.
7. ➤ As soon as the system back pressure of the system has been reached, determine the fill level Q_1 and start the stopwatch.
8. ➤ Run the pump for a while.
9. ➤ Simultaneously determine the fill level Q_2 and stop the stopwatch.
10. ➤ Calculate the metering capacity value.
11. ➤ Reduce the metering capacity using the stroke adjustment knob and repeat steps 7 to 10 until the required value is reached.

- 12.** ➤ Turn the indicating scale (1) only until the 100 % marking is precisely above the indicating slot (2).
- 13.** ➤ Carefully tighten the screw (3) in the stroke adjustment knob and replace the cover (4).

11 Troubleshooting

Safety information



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



WARNING!

Danger of an electric shock

Personnel working on electrical parts can be electrocuted if all electrical lines carrying current have not been disconnected.

- Disconnect the supply cable before working on the motor and prevent it from being reconnected accidentally.
- Any separately driven fans, servo motors, speed controllers or diaphragm rupture sensors fitted should also be disconnected.
- Check that the supply cables are de-energised.



WARNING!

Warning of hazardous or unknown feed chemical

Should a hazardous or unknown feed chemical be used, it may escape from the hydraulic components when working on the pump.

- Take appropriate protective measures before working on the pump (protective eyewear, protective gloves, ...). Read the safety data sheet on the feed chemical.
- Drain and flush the liquid end before working on the pump.



WARNING!

Risk of injury from the fan impeller

The fan impeller beneath motor's fan cowl can cause severe injuries while it is turning.

- The pump must only be connected to the mains voltage with the fan cowl closed.



CAUTION!

Warning of feed chemical spraying around

Feed chemical can spray out of the hydraulic components if they are manipulated or opened due to pressure in the liquid end and adjacent parts of the system.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.
- Depressurise the system before commencing any work on hydraulic parts.

Tasks

Fault description	Cause	Remedy	Personnel
Pump fails to pressurise or does not prime in despite full stroke motion and bleeding	The valves are dirty or worn.	Repair the valves - see chapter entitled "Repair".	Technical personnel
	The feed chemical has particles larger than 3 mm.	Install a suitable filter in the suction line.	Technical personnel
	Safety relief valve is open.	Unscrew knurled screw in safety relief valve.	Instructed personnel
	Safety relief valve is heavily worn as discharge line is greatly constricted.	Replace safety relief valve and remove blockage from discharge line	Technical personnel
	Insufficient hydraulic oil in the drive.	Refill with hydraulic oil until oil level indicator is 1/3 covered - see "Diaphragm change" in the chapter "Repair".	Instructed personnel
	Indicating scale is set incorrectly.	Set indicating dial - see "Calibrate metering capacity" in the chapter "Repair".	Technical personnel
	The motor is wired incorrectly.	1. Check the mains voltage and mains frequency. 2. Wire the motor correctly.	Electrician
	The mains voltage has failed.	Eliminate the cause.	Electrician
	Operating diaphragm ruptured and alarm has not sounded.	<ul style="list-style-type: none"> ■ Replace multi-layer diaphragm immediately - see "Diaphragm change" in the chapter "Repair". ■ Replace separating diaphragm of the diaphragm rupture sensor- see "Replacing the separating diaphragm, diaphragm rupture sensor" in the chapter "Repair". 	Technical personnel
The diaphragm rupture sensor has triggered.	The operating diaphragm has ruptured.	<ul style="list-style-type: none"> ■ Replace multi-layer diaphragm immediately - see "Diaphragm change" in the chapter "Repair". ■ Replace separating diaphragm of the diaphragm rupture sensor- see "Replacing the separating diaphragm, diaphragm rupture sensor" in the chapter "Repair". 	Technical personnel
The drive motor is very hot.	The discharge line is seriously constricted.	<ul style="list-style-type: none"> ■ Rectify any constriction of the discharge line. ■ Have the safety relief valve checked. 	Technical personnel
All other faults.	Other causes.	Call the ProMaqua customer services.	

12 Decommissioning and disposal

12.1 Decommissioning



WARNING!

Warning about personal and material damage

EX pumps only: When operating in EX areas, certain subjects must be observed.

- The chapter "Important supplements for metering pumps in EX zones" of the "General Operating Instructions on ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories" must be observed in all cases.



WARNING!

Danger of an electric shock

When working on the motor or electrical auxiliary equipment, there is a danger of an electric shock.

- Before working on the motor, take note of the safety instructions in its operating instructions!
- Should external fans, servomotors or other auxiliary equipment be installed, these should also be disconnected and checked that they are voltage free.



WARNING!

Danger from chemical residues

There is normally chemical residue in the liquid end and on the housing after operation. This chemical residue could be hazardous to people.

- It is mandatory that the safety information relating to the "Storage, Transport and Unpacking" chapter is read before shipping or transporting the unit.
- Thoroughly clean the liquid end and the housing of chemicals and dirt. Adhere to the safety data sheet for the feed chemical.



WARNING!

Warning of hazardous or unknown feed chemical

Should a hazardous or unknown feed chemical be used, it may escape from the hydraulic components when working on the pump.

- Take appropriate protective measures before working on the pump (protective eyewear, protective gloves, ...). Read the safety data sheet on the feed chemical.
- Drain and flush the liquid end before working on the pump.

**CAUTION!****Warning of feed chemical spraying around**

Feed chemical can spray out of the hydraulic components if they are manipulated or opened due to pressure in the liquid end and adjacent parts of the system.

- Disconnect the pump from the mains power supply and ensure that it cannot be switched on again by unauthorised persons.
- Depressurise the system before commencing any work on hydraulic parts.

**WARNING!****Hot oil and hot components**

The hydraulic oil and the hydraulic end may become very hot when the pump is exposed to heavy loading.

- Allow the pump to cool before starting work.

**CAUTION!****Danger of damage to the device**

The device can be damaged by incorrect and improper storage or transportation.

- Take into account the information in the "Storage, Transport and Unpacking" chapter if the system is decommissioned for a temporary period.

Personnel: ■ Technical personnel

1. ➤ Disconnect the pump from the mains power supply.
2. ➤ Depressurise and bleed the hydraulic system around the pump.
3. ➤ Flush the liquid end with a suitable medium - Observe the safety data sheet! Flush the dosing head thoroughly when using hazardous feed chemicals!
4. ➤ Drain the hydraulic oil - see chapter "Maintenance".
5. ➤ Thoroughly clean the liquid end and the housing of chemicals and dirt.
6. ➤ Possible additional work - see chapter "Storage, Transport and Unpacking".

12.2 Disposal

Personnel: ■ Technical personnel

**CAUTION!****Environmental hazard due to hydraulic oil**

The pump contains hydraulic oil, which can cause damage to the environment.

- Drain the hydraulic oil from the pump.
- Note the local guidelines currently applicable in your country!

13 Technical data

Only for "M - modified" version:



WARNING!

Risk of personal injuries

Please observe the "Supplement for modified version" at the end of the chapter!

It replaces and supplements the technical data!

13.1 Performance data

HP2a at 50 Hz operation

Type	Minimum pump capacity at maximum back pressure			Maximum stroke rate	Suction lift	Permissible priming pressure, suction side	Connector size
	bar	l/h	ml/stroke	Strokes/min	m WS	bar	G-DN
100003*	100	3	0.8	60	3	5	Rp 3/8" - 10
100006*	100	6	0.8	125	3	5	Rp 3/8" - 10
100007*	100	7	0.8	150	3	5	Rp 3/8" - 10
100009*	100	9	0.8	187	3	5	Rp 3/8" - 10
100010*	100	10	0.8	212	3	5	Rp 3/8" - 10
064007	64	7	2.0	60	3	5	G 3/4" - 10
064015	64	15	2.0	125	3	5	G 3/4" - 10
064018	64	18	2.0	150	3	5	G 3/4" - 10
064022	64	22	2.0	187	3	5	G 3/4" - 10
064025	64	25	2.0	212	3	5	G 3/4" - 10
025019	25	19	5.3	60	3	5	G 3/4" - 10 **
025040	25	40	5.3	125	3	5	G 3/4" - 10 **
025048	25	48	5.3	150	3	5	G 3/4" - 10 **
025060	25	60	5.3	187	3	5	G 3/4" - 10 **
025068	25	68	5.3	212	3	5	G 3/4" - 10 **

* Material version SST / HCT with double ball valve

Alternative double ball valve SST with RP 3/8

** HV version for G1-DN 15

Maximum back pressure for liquid ends in material version PVT: 25 bar!

The metering capacity can deviate from the details above with the HV version.

All figures refer to water at 20 °C.

Priming lift / priming pressure (dry) determined for empty suction line and empty liquid end and as well as clean and moistened valves (the figures are lower with valve springs).

The suction lift / suction pressure applies to filled suction lines and filled liquid end - when installed correctly.

HP2a at 60 Hz operation

Type	Minimum pump capacity at maximum back pressure				Maximum stroke rate	Suction lift	Permissible priming pressure, suction side	Connector size
	bar	psi	l/h	gph	Strokes/min	m WS	bar	G-DN
100003*	100	1,450	3.6	1.0	72	3	5	Rp 3/8" - 10
100006*	100	1,450	7	1.8	150	3	5	Rp 3/8" - 10
100007*	100	1,450	8	2.1	180	3	5	Rp 3/8" - 10
100009*	100	1,450	11	2.9	224	3	5	Rp 3/8" - 10
064007	64	928	8.4	2.2	72	3	5	G 3/4" - 10
064015	64	928	18	4.8	150	3	5	G 3/4" - 10
064018	64	928	21	5.5	180	3	5	G 3/4" - 10
064022	64	928	26	6.9	224	3	5	G 3/4" - 10
025019	25	362	23	6.1	72	3	5	G 3/4" - 10 **
025040	25	362	48	12.7	150	3	5	G 3/4" - 10
025048	25	362	58	15.3	180	3	5	G 3/4" - 10
025060	25	362	72	19.0	224	3	5	G 3/4" - 10

* Material version SST / HCT with double ball valve

Alternative double ball valve SST with RP 3/8

** HV version for G1-DN 15

Maximum back pressure for liquid ends in material version PVT: 25 bar!

The metering capacity can deviate from the details above with the HV version.

All figures refer to water at 20 °C.

Priming lift / priming pressure (dry) determined for empty suction line and empty liquid end and as well as clean and moistened valves (the figures are lower with valve springs).

The suction lift / suction pressure applies to filled suction lines and filled liquid end - when installed correctly.

HP3a at 50 Hz operation

Type	Minimum pump capacity at maximum back pressure			Maximum stroke rate	Suction lift	Permissible priming pressure, suction side	Connector size
	bar	l/h	ml/stroke	Strokes/min	m WS	bar	G-DN
100010*	100	10	2.8	60	3	5	Rp 3/8" - 10
100021*	100	21	2.8	125	3	5	Rp 3/8" - 10
100025*	100	25	2.8	150	3	5	Rp 3/8" - 10
100031*	100	31	2.8	187	3	5	Rp 3/8" - 10
100035*	100	35	2.8	212	3	5	Rp 3/8" - 10
064019	64	19	5.3	60	3	5	G 3/4" - 10 **
064040	64	40	5.3	125	3	5	G 3/4" - 10 **
064048	64	48	5.3	150	3	5	G 3/4" - 10 **
064060	64	60	5.3	187	3	5	G 3/4" - 10 **
064068	64	68	5.3	212	3	5	G 3/4" - 10 **
025048	25	48	13.4	60	3	5	G 1" - 10 ***
025100	25	100	13.4	125	3	5	G 1" - 10 ***
025120	25	120	13.4	150	3	5	G 1" - 10 ***
025150	25	150	13.4	187	3	5	G 1" - 10 ***
025170	25	170	13.4	212	3	5	G 1" - 10 ***

* Material version SST / HCT with double ball valve

Alternative double ball valve SST with RP 3/8

** HV version 1 1/4" - DN 20

*** HV version G 1" - DN 15

Maximum back pressure for liquid ends in material version PVT: 25 bar!

The metering capacity can deviate from the details above with the HV version.

All figures refer to water at 20 °C.

Priming lift / priming pressure (dry) determined for empty suction line and empty liquid end and as well as clean and moistened valves (the figures are lower with valve springs).

The suction lift / suction pressure applies to filled suction lines and filled liquid end - when installed correctly.

HP3a at 60 Hz operation

Type	Minimum pump capacity at maximum back pressure				Maximum stroke rate	Suction lift	Permissible priming pressure, suction side	Connector size
	bar	psi	l/h	gph	Strokes/min	m WS	bar	G-DN
100010*	100	1,450	12	3.2	72	3	5	Rp 3/8" - 10
100021*	100	1,450	25	6.6	150	3	5	Rp 3/8" - 10
100025*	100	1,450	30	7.9	180	3	5	Rp 3/8" - 10
100031*	100	1,450	37	9.8	224	3	5	Rp 3/8" - 10
064019	64	928	23	6.1	72	3	5	G 3/4" - 10 **
064040	64	928	48	12.7	150	3	5	G 3/4" - 10 **
064048	64	928	58	15.3	180	3	5	G 3/4" - 10 **
064060	64	928	72	19.0	224	3	5	G 3/4" - 10 **
025048	25	362	58	15.3	72	3	5	G 1" - 10 ***
025100	25	362	120	31.7	150	3	5	G 1" - 10 ***
025120	25	362	144	38.0	180	3	5	G 1" - 10 ***
025150	25	362	180	47.6	224	3	5	G 1" - 10 ***

* Material version SST / HCT with double ball valve

Alternative double ball valve SST with RP 3/8

** HV version 1 1/4" - DN 20

*** HV version G 1" - DN 15

Maximum back pressure for liquid ends in material version PVT: 25 bar!

The metering capacity can deviate from the details above with the HV version.

All figures refer to water at 20 °C.

Priming lift / priming pressure (dry) determined for empty suction line and empty liquid end and as well as clean and moistened valves (the figures are lower with valve springs).

The suction lift / suction pressure applies to filled suction lines and filled liquid end - when installed correctly.

13.2 Metering precision

13.2.1 Reproducibility

Data	Value	Unit
Reproducibility	±1	% *

* - for measurements taken under constant conditions, minimum 20 % stroke rate and water at 20 °C - when installed correctly

13.3 Viscosity

The liquid ends are suitable for the following viscosity ranges:

Version	Range	Unit
no valve springs	0 ... 200	mPa
with valve springs	200 ... 500	mPa
HV (for highly viscous feed chemicals)	500 ... approx. 3000 *	mPa

* Only when the installation is correctly adjusted

13.4 Weight

Pump	Version	Weight
		kg
HP2a	Single head	31
	Double head	41
	Add-on drive	24
	Add-on drive double head	34
HP3a	Single head	41
	Double head	55
	Add-on drive	34
	Add-on drive double head	48

For pumps with add-on drive.

13.5 Wetted materials

Material version	Liquid end	Suction/dis-charge connector	Seals	Ball seat	Valve balls
SST	Stainless steel 1.4571/1.4404	Stainless steel 1.4581	PTFE	ZrO ₂	Ceramic
PVT	PVDF	PVDF	PTFE	PTFE	Ceramic
HCT	Hastelloy C	Hastelloy C	PTFE	Hastelloy C	Ceramic

13.6 Ambient conditions

13.6.1 Temperatures

Pump, compl.

Data	Value	Unit
Storage and transport temperature	-10 ... +50	°C
Ambient temperature in operation ("Standard" version, for drive):	-10 ... +40	°C
Ambient temperature in operation ("Low temperature" version, for drive):	-25 ... +40	°C

Data	Value	Unit
Ambient temperature in operation ("Low temperature Zone 2" version, for drive):	-20 ... +40	°C

* Only with heating cartridge

PVT liquid end

Data	Value	Unit
Max. temperature long-term at max. operating pressure	65	°C
Max. temperature for 15 min at max. 2 bar	100	°C
Minimum temperature "Standard"	-10	°C
Minimum temperature "Low temperature Zone 2"	-20	°C
Minimum temperature "Low temperature"	25	°C

SST liquid end

Data	Value	Unit
Max. temperature long-term at max. operating pressure	90	°C
Max. temperature for 15 min at max. 2 bar	120	°C
Minimum temperature "Standard"	-10	°C
Minimum temperature "Low temperature Zone 2"	-20	°C
Minimum temperature "Low temperature"	25	°C

HCT liquid end

Data	Value	Unit
Max. temperature long-term at max. operating pressure	90	°C
Max. temperature for 15 min at max. 2 bar	120	°C
Minimum temperature "Standard"	-10	°C
Minimum temperature "Low temperature Zone 2"	-20	°C
Minimum temperature "Low temperature"	25	°C

13.6.2 Air humidity

Data	Value	Unit
Maximum air humidity *:	92	% rel. humidity

*non-condensing (according to DIN IEC 60068-2-30)

13.7 Protection class housing

Data	Value
Protection against contact and humidity*	IP 55

*according to DIN VDE 470 (EN IEC 60529)

13.8 Motor data

Electrical data

Identity code specification	Phase, protection	Rated voltage	Mains supply frequency	Rated output HP2a	Rated output HP3a	Remarks
S	3 ph, IP 55	220-240 V / 380-420 V	50 Hz	0.37 kW	0.75 kW	
		250-280 V / 440-480 V	60 Hz	0.37 kW	0.75 kW	
L1	3 ph, II2GEEX-elIT3	220-240 V / 380-420 V	50 Hz	0.37 kW	0.75 kW	
L2	3 ph, II2GEEX-dIICT4	220-240 V / 380-420 V	50 Hz	0.37 kW	0.75 kW	with PTC, speed control range 1:5
P1	3 ph, II2GEEX-elIT3	250-280 V / 440-480 V	60 Hz	0.37 kW	0.75 kW	
P2	3 ph, II2GEEX-dIICT4	250-280 V / 440-480 V	60 Hz	0.37 kW	0.75 kW	with PTC, speed control range 1:5
R	3 ph, IP 55	230 V / 400 V	50/60 Hz	0.37 kW	0.75 kW	with PTC, speed adjustment range 1:20 with separate fan 1ph 230 V; 50/60Hz
V0	1 ph AC, IP 55	230 V \pm 10 %	50/60 Hz	0.37 kW	0.75 kW	Variable speed motor with integrated frequency converter
V2	3 ph, II2GEEX-dIICT4	400 V \pm 10 %	50/60 Hz	0.55 kW		EX variable speed motor with integrated frequency converter.



Motor data sheets, special motors, special motor flanges, external fan, temperature monitoring

- For further information for the motor with identity code specification "S", refer to the motor data sheet in the Appendix. Motor data sheets can be requested for all other motors.
- Special motors or special motor flanges are possible on request.
- Notes on the speed controlled motor with external fan and temperature monitoring can be found in the "General operating instructions for ProMinent® motor-driven metering pumps and hydraulic accessories"!

Data	Value
Insulation class	F

13.9 Stroke actuator

Manufacturer Aris

Voltage	Mains supply frequency
230 V ± 10 %	50/60 Hz
115 V ± 10 %	60 Hz

13.10 Stroke control drive

Manufacturer Aris

Voltage	Mains supply frequency
230 V ± 10 %	50/60 Hz
115 V ± 10 %	60 Hz

13.11 Diaphragm rupture sensor



Install the sensor according to the chapter "Installation, electrical".

Contact (standard)

Contact loading, max.

at voltage	Maximum current
30 V DC	1 A

The contact is an opener.

The contact is an potential-free.



- *For safety reasons we recommend connecting to a protective low voltage, e.g. in accordance with EN 60335-1 (SELV).*
- *The cable can be poled as required.*

Namur sensor (Specified for EX zones)

5–25 V DC, in accordance with Namur or DIN 19234, potential-free design.

Data	Value	Unit
Rated voltage *	8	VDC
Power consumption - active surface uncovered	> 3	mA
Power consumption - active surface covered	< 1	mA
Rated switching distance	1.5	mm

* Ri ~ 1 k Ω

Cable colour	Polarity
blue	-
brown	+

13.12 Stroke sensor

Namur sensor (identity code specification "Stroke sensor": 1)



Install the sensor according to the chapter "Installation, electrical".

Namur sensor (Specified for EX zones)

5–25 V DC, in accordance with Namur or DIN 19234, potential-free design.

Data	Value	Unit
Rated voltage *	8	VDC
Power consumption - active surface uncovered	> 3	mA
Power consumption - active surface covered	< 1	mA
Rated switching distance	1.5	mm

* Ri ~ 1 kΩ

Cable colour	Polarity
blue	-
brown	+

13.13 Heating cartridge



Install the heating cartridge according to the chapter "Electrical Installation".

Heating cartridge (standard)

With PTC.

Data	Value	Unit
Voltage	230	VAC
Performance	120	W

Heating cartridge (Option): Specified for EX versions)

With temperature limiter / controller.

Data	Value	Unit
Voltage	230	VAC
Performance	120	W

13.14 Safety relief valve

Opening pressure of the respective pressure rating:

Pressure rating*	10 bar	16 bar	25 bar	40 bar	64 bar	100 bar
Opening pressure**	14 bar	25 bar	36 bar	49 bar	80 bar	120 bar

* Marking on the indicating scale without valve housing

** back pressure generated by the pump when discharge side is blocked \pm 3 bar

13.15 Gear oil

Required amount of oil			Supplied amount of oil
Type	Single head version	Double head version	
HP 2:	approx. 2.5 l	approx. 2.9 l	3.0 l
HP 3:	approx. 3.5 l	approx. 4.0 l	4.0 l

13.16 Sound pressure level

Sound pressure level

Sound pressure level $L_{pA} < 70$ dB in accordance with EN ISO 20361:2010-10

at maximum stroke length, maximum stroke rate, maximum back pressure (water)

13.17 Compatibility

The hydraulic accessories of the hydraulic diaphragm metering pump Hydro is compatible with the plunger pumps Sigma and Meta.

The connecting dimensions of valves and dosing heads are the same size but have different materials. (This does not apply with different diaphragm materials).

13.18 Supplement for modified versions

(With Identcode specification "Version": "M" - "modified")

Technical data

Technical data of pumps in the modified version can deviate from those of the standard pumps. They can be queried by stating the details of the serial number.

motor

The motor data sheets for the modified version are valid. They may deviate from the standard motor data sheets.

Spare parts

With a modified version, it is absolutely necessary to specify the details of the serial number requesting and ordering the spare and replacement parts.

14 EC Declaration of Conformity

For pumps without explosion protection:

EC Declaration of Conformity

We hereby declare,

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

that the following designated product complies with the pertinent fundamental safety and health requirements of the EC Directive in terms of its design and construction and in terms of the version marketed by us.
 This declaration loses its validity in the event of a modification to the product not agreed with us.

Description of the product: ***Metering pump, series Hydro***

Product type: ***HP2a ... / HP3a ...***

Serial no.: ***refer to nameplate on the device***

Pertinent
EC Directives: ***EC Machinery Directive (2006/42/EC)***
EC Low Voltage Directive (2006/95/EC)
EC EMC Directive (2004/108/EC)

Applied harmonised standards
in particular: ***DIN EN 292-1, DIN EN 292-2, DIN EN 809, DIN EN 563, DIN EN 982***
DIN EN 60034-1/7/18, DIN EN 63335-1, DIN EN 60335-2-41
DIN EN 60204-1, DIN EN 50081-1/2, DIN EN 50082-1/2
DIN EN 55014-1/2


technical documents have
been compiled by: ***Norbert Berger***
Im Schuhmachergewann 5-11
DE-69123 Heidelberg

Date / Manufacturer - Signature : ***04.01.2010***



Details of the signatory: ***Joachim Schall, Head of Research and Development***

For pumps with explosion protection:

- Original -	
EC Declaration of Conformity for Machinery	
We,	ProMinent Dosiertechnik GmbH Im Schuhmachergewann 5 - 11 D - 69123 Heidelberg
hereby declare that, the product specified in the following complies with the relevant basic health and safety rules of the EC Directive, on the basis of its functional concept and design and in the version marketed by us. Any modification to the product not approved by use will invalidate this declaration.	
Description of the product:	Metering pump, Hydro series Version "Explosion protection" in accordance with "ATEX 95"
Product type:	HP2A- - - - - XY- - - HP3A- - - - - XY- - - Characteristic value "X" = "P" or "L", and characteristic value "Y" = "1" or "2" or "X" = "1, 3 or 4" and "Y" = "A" or "X" = "V" and "Y" = "2"
Serial no.:	Please refer to type plate on the device
Relevant EC Directives:	EC Machinery directive (2006/42/EC) EC EMC Directive (2004/108/EC) EC Ex Directive (94/9/EC)
Harmonised standards applied, in particular:	Pump without motor: EN ISO 12100-1/2, EN 809, EN 13463-1/5 Motor Ex "e": EN 50014, EN 50019 Motor Ex "d": EN 50014, EN 50018, EN 50019 Stroke sensor: EN 60079-0, EN 60079-11, EN 60079-26
The assembly of the components does not give rise to any new Ex-relevant dangers	
Ex-designations:	
Pump without motor:	II 2G c IIC T4 X
Motor (characteristic value "Y"="1") :	II 2G EEx e IIC T3
Motor (characteristic value "Y"="2") :	II 2G EEx de IIC T4
Diaphragm rupture sensor	II 1G Ex ia IIC T6
Overall system:	II 2G c IIC T3 X (for "Y"="1") or II 2G c IIC T4 X (for "Y"="2" or "A")
Technical documents have been compiled by:	Norbert Berger Im Schuhmachergewann 5-11 DE-69123 Heidelberg
Date / manufacturer's signature:	05.08.2011 
Details of the signatory:	Dr. Johannes Hartfiel, Assistant Development Director

The EC Declaration of Conformity for pumps for potentially explosive atmospheres is enclosed with the pump. The EC Declaration of Conformity, the EC type-examination certificates and the operating instructions for the individual components are also enclosed with the pump.

15 Decontamination Declaration

Declaration of Decontamination

(see download: www.prominent.com)

Because of legal regulations and for the safety of our employees and operation equipment, we need the „declaration of decontamination“, with your signature, before your order can be handled.

Please make absolutely sure to include it with the shipping documents, or – even better – attach it to the outside of the packaging.

Please return your products to:

Type of instrument / sensor: _____

Gerätetyp:

Serial number: _____

Seriennummer:

Process data:

Prozessdaten:

Temperature: _____

Temperatur:

[°C]

Pressure: _____

Druck:

[bar]

Mediums and warnings:

Warnhinweise zum Medium:



	Medium/ Concentration Medium/ Konzentration	Identi- fication CAS No.	flammable entzünd- lich	toxic giftig	corrosive ätzend	harmful/ irritant gesundheits- schädlich/reizend	other* sonstiges*	harmless unbedenklich
Process medium Medium im Prozess								
Medium for process- cleaning Medium zur Prozessreinigung								
Returned part cleaned with Medium zur Endreinigung								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive

* explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv

Please tick should one of the above be applicable, include security sheet and, if necessary, special handling instructions.

Reason for return:

Company data:

Company: _____

Contact person: _____

Street: _____

Address: _____

Phone number: _____

Fax: _____

E-Mail: _____

Your order No: _____

“We hereby certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free from any residues in dangerous quantities.”

Place, date _____

Company stamp and legally binding signature _____

Fig. 22