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EASYDOS Concept Peristaltic Pump

Installation and operating instructions



Englisch

CE

Subject to technical changes
2010-200-63 / 0408

Notes:

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1 General Information**1.1 General**

This handbook contains instructions for the installation, commissioning, maintenance and repair of the described metering pump.

The safety instructions and notes in bold type are to be observed at all times!!

1.2 Notes in bold

In this technical information, the bold headings **CAUTION**, **WARNING** and **NOTE** have the following meaning:

CAUTION: This heading is used if failure to observe the operating or working instructions or prescribed procedures, or incorrect observation of such instructions and the like can lead to accident or personal injury.

WARNING: This heading is used if failure to observe the operating or working instructions or prescribed procedures, or incorrect observation of such instructions and the like can lead to damage to the equipment.

NOTE: This heading is used to draw special attention to important points.

1.3 Warranty

The manufacturer guarantees the operating safety and reliability of the system only if the following conditions are observed:

- Installation, connection, setting, maintenance and repairs are carried out only by authorised and qualified specialist personnel.
- Only original replacement parts are used for repairs.
- The metering pump is used in accordance with the instructions given in this manual.

WARNING: *The use of concentrated hydrochloric acid in the immediate vicinity of the unit invalidates the guarantee.*

1.4 Safety instructions

The equipment has been manufactured and tested in accordance with DIN 57411/VDE 0411 Part 1, Protective measures for electrical equipment, and left the factory in a safe condition. In order to maintain this condition and to ensure a continued safe operation, the user must observe the notes and warnings contained in this technical information. If it must be assumed that a safe operation is no longer possible, the system must be switched off and taken out of service, and made safe against accidental operation.

This is the case:

- if the system shows visible evidence of damage
- if the system is apparently no longer in working order
- after longer periods of storage under unfavourable conditions.

2 Construction and Operation

2.1 Operation

The EASYDOS Concept peristaltic metering pump is a high-quality, microprocessor-controlled peristaltic metering pump for dosage of liquid media. Due to different operating modes and the use of diverse pump hoses, the pump is versatile and suitable for a large number of applications.

Equipment: Genuinely speed-controlled metering pump (GCL technology), Pump delivery capacity from 5ml/h (min.) up to 9,000 ml/h (max.), depending on pump hose

Operating mode 1: Pump delivery capacity adjustable rough/fine by means of potentiometer
Potential-free contact input

Operating mode 2: Pump delivery capacity adjustable by means of external power signal 4-20mA (4mA = min, 20mA=max), capacity range of current activation adjustable by means of potentiometer

Operating mode 3: Pump delivery capacity by means of external power signal 20-4mA (20mA=min, 4mA=Max), capacity range of current activation adjustable by means of potentiometer

Function LEDs:	Operation:	LED green (power)
	Dosage:	LED green flashes (delivery)
	Fault:	LED red flashes

- ☞ Button for manually triggering the dosage pump for filling the supply hoses
- ☞ Possibility for connecting a suction lance with empty alarm (suction lance not included in the delivery)
- ☞ Potential-free relay contact (change-over contact) for display of deficiency/error
- ☞ Lever lid for a simple and fast replacement of the pump hose
Compact housing, protection class IP 54
- ☞ Safety shutdown in case of a broken hose in the pump housing (provided a conductive medium is used)

3 Technical Data

3.1 Technical data / characteristics

Protection class:	II
Mains connection:	230-240VAC, +/- 10%, 50/60 Hz
Power consumption:	approx. 15 VA max.
Pump delivery: (max. counter pressure 1.6 bar)	Pump hose OD = 4.0 mm: approx. 5 - 200ml/h Pump hose OD = 4.8 mm: approx. 15 - 1000 ml/h Pump hose OD = 6.4 mm: approx. 45 - 4500 ml/h Pump hose OD = 8.0 mm: approx. 120 - 9000 ml/h
Pump duty cycle of pump:	Rotation speed \leq 1/3 max.: 100 % Rotation speed $>$ 1/3 max.: 50 %
Empty warning connection:	Normally closed contact or normally open contact (set Jumper (4))

3.2 Further technical properties

Dimensions (w x h x d):	90 x 170 x 130 mm
Weight:	approx. 1.25 kg
Ambient temperature:	10 ⁰ C – 55 ⁰ C max.
Connections suction/dosing lines:	DN4, 6 x 4 mm

3.3 European Directive

This equipment has been manufactured and tested in accordance with the following European Directives:

Immunity	
Electrostatic discharge ESD:	IEC 801-4-2
Switched inductance EF-f	
Immunity to conducted radio frequency disturbances:	IEC 801-4-4 (1)
SURGE:	IEC 801-4-5 (3)
Interruptions and potential difference:	IEC 801-4-11
Emitted interference	
Interference voltage on power line	EN 55011 (A)
Perturbing radiation:	EN 55011 (A)

4 Areas of application / Dosing media

The EASYDOS Concept peristaltic pump can be used for the dosing of liquid, non-abrasive and non-inflammable media under strict consideration of the following data and information.

4.1 Chemical resistance

The chemical resistance of parts in contact with the media is dependent on the medium, the temperature of the medium and the operating pressure.
See our list of stability in this respect (request list, if required).

WARNING: The use of concentrated hydrochloric acid in the immediate vicinity of the unit invalidates the guarantee.

5 Installation

5.1 Installation site

The permissible ambient temperature (0 °C to + 40 °C) in the installation room must be ensured. In case of installation in moist or wet rooms, the protection class of the pump must be considered appropriately.

5.2 Important details on setting up and installation

Caution In case the pump is used for hazardous substances, all appropriate regulations, directives, guidelines and danger warnings for handling and storage of the particular hazardous substances must be observed! In particular, appropriate measures must be taken in case of leakage (e.g. collection container)! Hazardous substances are, amongst others: liquid chlorine, active oxygen, lye and acids!

5.2.1 Suction lift and dimensions of suction lines

- **Priming height** The max. priming height of 1.80 m must not be exceeded

The nominal width of the suction line (DN 4) must be ensured over the entire length.

5.2.2 Fastening the dosage pump

The device is to be installed in a location where it is safe from mechanical damage, vibration, water and vapours, lyes and acids. If required, a double- enclosure must be provided! Take care during the installation that the housing is not warped. The screw-type fasteners in the wall housing are to be protected with the covers included in the delivery!

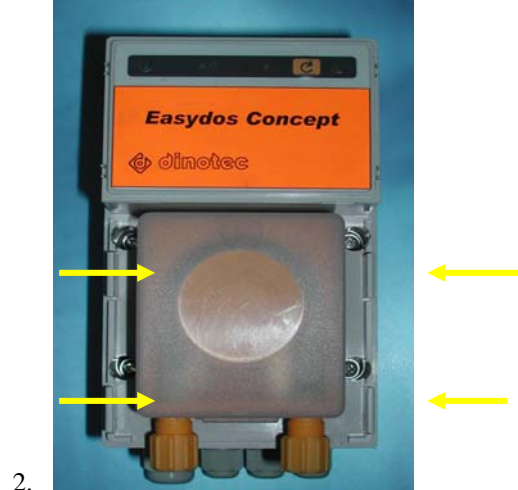
Installation position:

The device is to be installed in a position above the level of the supply containers.
Pump housing vertically, hose connections pointing downward.

5.2.3 Opening the pump housing

Caution Disconnect the pump before opening the housing!

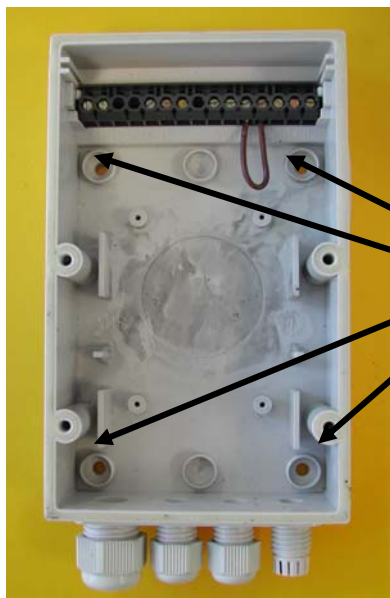
1. Use a screwdriver to exert a slight pressure on the lock device at the bottom of the inside of the inside (next to the hose connections), then remove the cover completely.



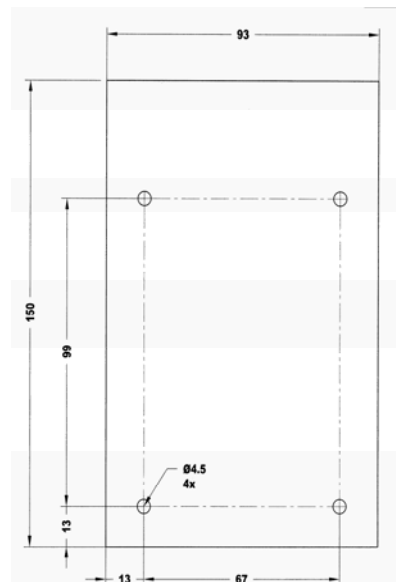
2.

2. Loosen the 4 screws, then remove the entire pump housing.

Fix the wall mounting plate on the wall



Wall fixing



Mounting template

5.2.4 Connections - connecting to the mains

WARNING: Before connecting the mains supply, check whether the data of the mains voltage stated on the identification plate does correspond to local conditions!

Disconnect the mains voltage before carrying out any installation works!

Electrical connection only by an authorised specialist electrician!

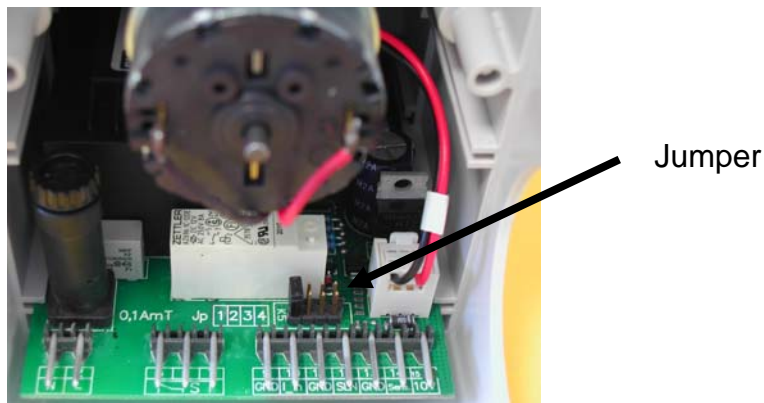
The respective standards, safety regulations and technical connection conditions of the local utilities must be strictly observed at all times!

The connection is to be made according to the terminal designation.

In case of cable runs in a wall case, it must be ensured that the installation cables are not laid in the area of the geared motor (the geared motor is located within the circular section of the wall mounting plate).

Implement the electrical connections according to the following drawings.

The operating mode of the pump is adjusted with the jumper in the pump housing in the area of the connecting pins. The device is connected to the mains voltage via terminals 1-2 .

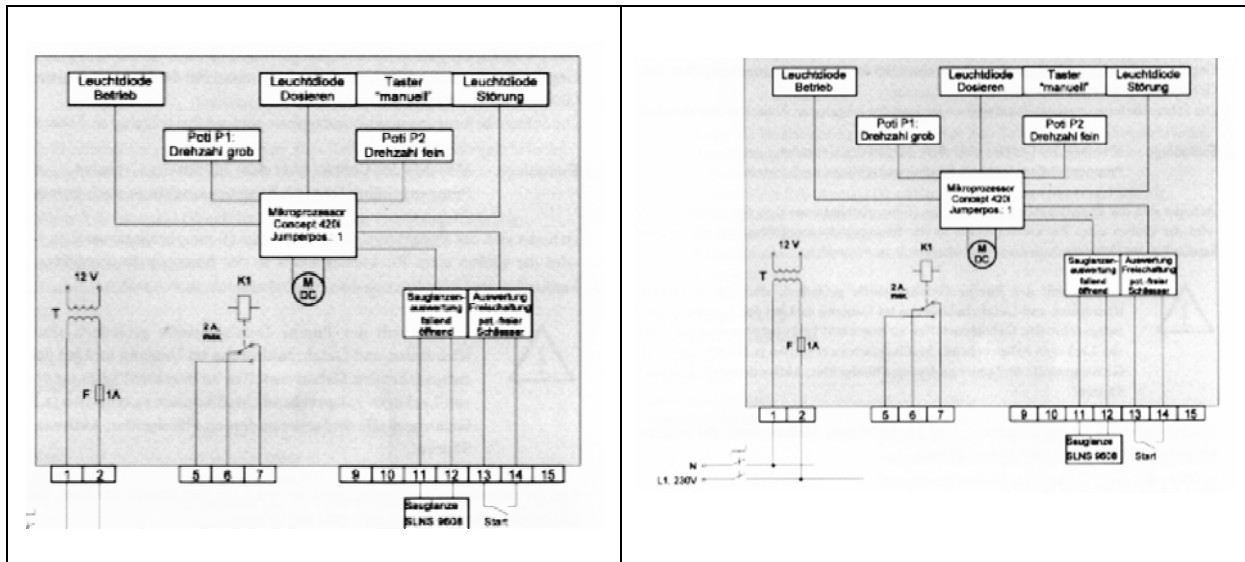


5.2.5 Operating mode 1 via voltage-free contact

Jumper on Pos. 1

The set point for the rotation speed is set with potentiometers P1 (rough rotation speed) and P2 (fine-tuned rotation speed). The set point adjusted with P2 is added to the set point adjusted with P1. The pump is started by making contact (potential-free contact) (terminals 13, 14) (see photo).

Terminal strip EASYDOS Concept peristaltic pump Operation mode 1: via voltage-free contact (pulse/pause (pulse length) or ON/OFF)										Jumper: <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>█</td> <td>•</td> <td>•</td> <td>•</td> </tr> <tr> <td></td> <td>•</td> <td>•</td> <td>•</td> </tr> </table>					1	2	3	4	█	•	•	•		•	•	•
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						Empty warn. Dosing interrupted in case of normally closed contact *			Start, pulse/pause or ON/OFF (from measuring and control unit)																	



5.2.6 Operating modes 2, 3 (Jumper on pos. 2 or 3)

Terminal strip EASYDOS Concept peristaltic pump Operation modes 2 + 3: via current signal 4-20mA or 20-4mA										Jumper: <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>•</td> <td>█</td> <td>█</td> <td>•</td> </tr> <tr> <td>•</td> <td></td> <td></td> <td>•</td> </tr> </table>					1	2	3	4	•	█	█	•	•			•
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						- + Current signal 4 – 20 mA			Empty warn. Dosing interrupted in case of normally closed contact *			Bridge														

- * If no level sensor or empty signal is connected, a bridge must be set or jumper 4, respectively.

Jumper on position 2: the rotation speed increases from 4mA - 20mA (4mA: pump off).
 Jumper on position 3:- the rotation speed goes down from 4mA - 20mA (20mA: pump off).

The rotation speed is set by means of an external signal 4.-20mA. The delivery capacity range can be varied using potentiometers P1 and P2.

P1 is used to set the rotation speed at 4mA + 2 digits (approx. 4.04 mA). P2 is used to set the delivery capacity at 20 mA. The delivery capacity via the power activation results in a straight line through points that are adjusted at 4mA and at 20mA with potentiometers P1 and P2. This feature allows an adjustment of the pump to meet different requirement as to the delivery capacity.

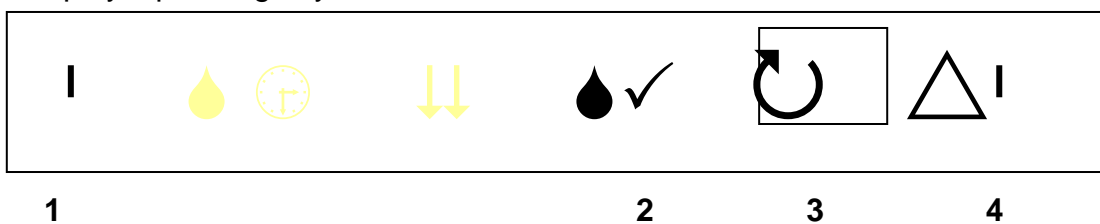
NOTE: No frequency control possible!

5.2.5 Empty warning connection

The empty warning connection (terminal 11/12) works as normally closed contact. If it is to work as normally open contact (contact in case of empty container), the jumper must be set to 4. If a further function is to be switched in addition that deactivates the dosage (e.g. measuring water alarm), a corresponding NC contact must be set parallel to terminals 11/12.

6. Operation and functions

Display/Operating keys



- | | | |
|---|---------------|---|
| 1 | Operation LED | Light when operating voltage is applied |
| 2 | Dosage LED | Lights during dosing |
| 3 | "Manual" key | For a manual commissioning |
| 4 | Fault LED | E.g. dosing medium escapes at the pump housing or container empty warning |

7 Commissioning

7.1 Initial commissioning

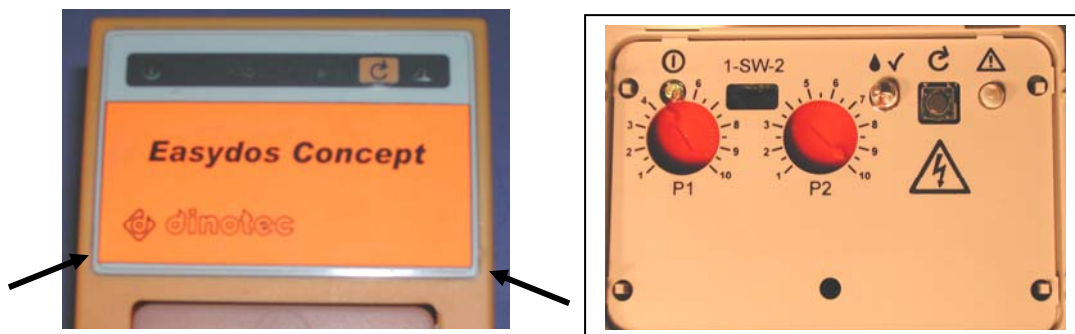
Prior to initial commissioning, suction line and dosing line must be connected.


Caution: We recommend using water as dosing medium for initial commissioning, for a control of the entire dosing system and for adjustment of the pump. Only after you found that everything is working properly, the appropriate dosing medium should be used.

7.1.2 Activating the operating voltage

Caution: The operating voltage for the dosage pump must be interlocked with the circulation pump (filter control).

7.1.3 Remove the cover plate carefully



7.1.4 Press  key (3) continuously until suction line and pump hose are completely filled with the medium

7.1.5 Apply analog signal 20 mA at analog input (terminals 9-10). Set the desired **maximum** delivery capacity at potentiometer P2 (depending on the used hose kit according to chapter 3.1)

7.1.6 Apply analog signal 4 mA to analog input (terminals 9-10). Set the desired **minimum** delivery capacity at potentiometer P1 (depending on the used hose kit according to chapter 3.1)

7.1.7 Re-insert cover

7.1.8 Check the external control 4 – 20 mA

7.1.9 Connect the dosing medium

7.2 Troubleshooting




Error / Failure	Cause	What to do
Pump not running	<ul style="list-style-type: none"> ● No mains connection ● Incorrect mains voltage ● Electrical failure 	<ul style="list-style-type: none"> ☞ Check supply voltage ☞ Check fuse in pump ☞ Send pump to the works for repair
Pump not running	<ul style="list-style-type: none"> ● Container empty, empty alert responded ● No request from measuring device 	<ul style="list-style-type: none"> ☞ Fill or replace container ☞ Check measuring and control device: dosing activated?
Pump not priming	<ul style="list-style-type: none"> ● Leaky suction line ● Cross section of suction line too narrow or too long ● Suction line blocked ● Foot valve in sump ● {0>Suction line bent down<}0{>Suction line bent <0} ● Crystalline deposits in valves ● Dosing head not ventilated ● Diaphragm torn or diaphragm tappet torn out or defective (worn) 	<ul style="list-style-type: none"> ☞ Replace or seal suction line ☞ Check against factory data ☞ Rinse suction line or replace ☞ Place suction line higher ☞ Lay suction line properly, check for damage ☞ Clean lines ☞ Ventilate suction line and dosing head ☞ Replace diaphragm
No dosage	<ul style="list-style-type: none"> ● Dosing valve blocked ● Dosing line blocked ● Dosing line leaky ● Counter pressure at injection point too high 	<ul style="list-style-type: none"> ☞ Check for above errors ☞ Check injection point, clean if required ☞ Check dosing line, replace if required ☞ Check overall pressure of system (max. 1.5 bar)

8 Maintenance and repair works

The most important precondition for a correct function and accuracy of the dosage pump is an impeccable condition of the pump hose.

The pump hose kits are not installed at the works. They are to be installed right before initial commissioning according to the following description.

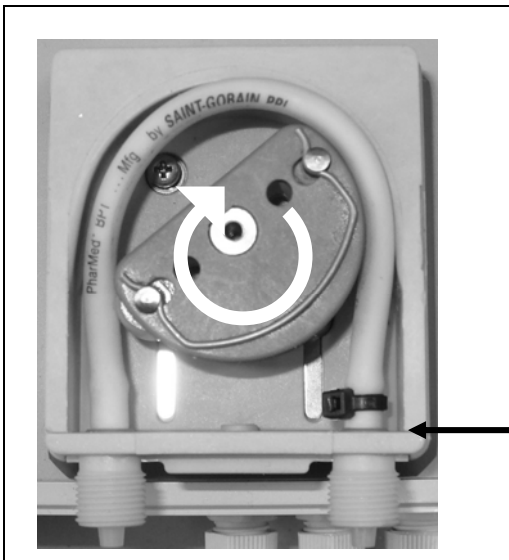
Assembly of pump hose kit:

	<p>Pump hose kits (complete with holder, hose and connection fitting) as well as roller rotors are wearing parts and are available as spare parts.</p>
	<p>Remove the transparent cover and the yellow rotor cover from the pump.</p>
	



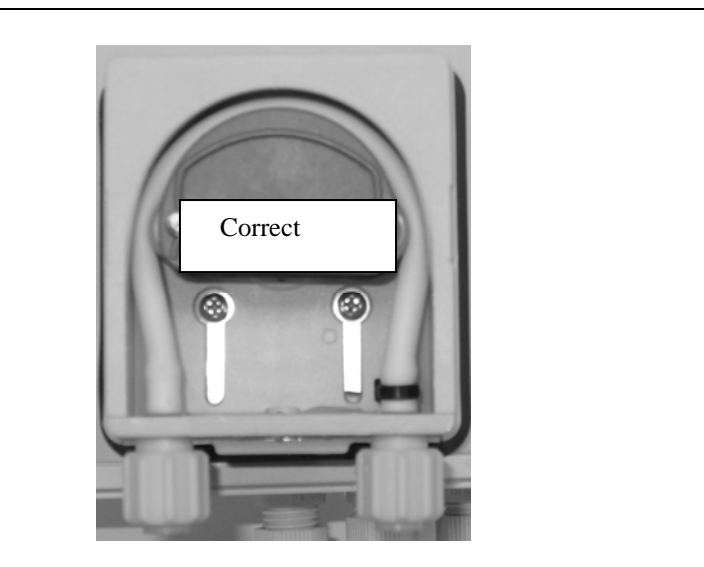
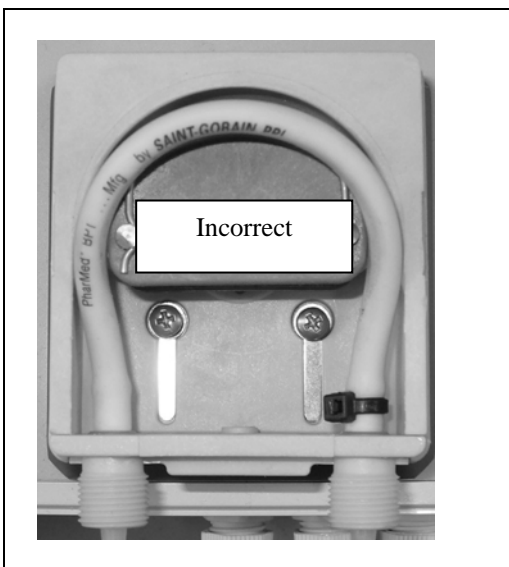
Press the holder plate of the pump hose kit into the guide notch of the pump housing.


The pressure connection - which can be identified by the black cable clip - must be placed on the right side.



Thread the pump hose into the pump housing by turning the rotor at the same time.

Black cable clip = pressure side



	<p>Place the rotor cover and the transparent housing cover back on the pump housing.</p>
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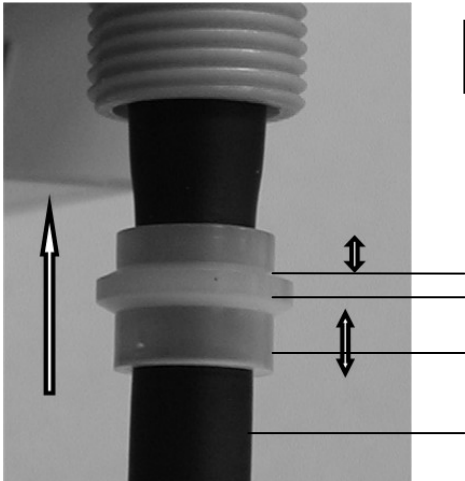

Demounting is carried out in reverse order:

WARNING: *Take care not to overstretch or bend the pump hose while inserting it.*

After the pump hose kit has been properly installed, the suction and pressure lines can be connected. In the direction of rotation of the pump (clockwise), the suction line is fixed on the left and the dosing line on the right. The pumps are self-priming, and shut off automatically on the pressure side.

Connection of suction and pressure line

Attach union nut and compression ring on the hose end (see illustration). Press the hose end firmly on taper and screw with union nut.

	<p>IMPORTANT!</p>	
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NOTE: Cut off 1 cm each from suction and pressure line every time you replace the pump hose.

NOTE: *The valve hoses of the dosage pumps have a limited working life. After a maximum of 1 year of operation, the pump hose kits are to be replaced, in case of heavy duty usage earlier!*

WARNING: **Non-observance of this instruction (replacement of pump hose kits are at regular intervals) invalidates the warranty!**

*If, on **initial commissioning** of the pump or on **replacement** of the pump hose kits, the pump does not start by itself, the drive shaft is to be turned manually for one complete revolution!*

WARNING: *The pumps work against a maximum counter-pressure of approx. 1.5 bar.*

If there is too much air in the suction or pressure line when dosing starts, the pump should be assisted. Loosen the dosage line at the injection point and allow the liquid to drip out into a plastic container. When the air has been completely bled out of the system, reconnect the hose with the injection point.

WARNING The pump hose kit/roller rotor are wearing parts and have a limited service life. After a maximum of 1 year of operation the pump hose kit must be replaced, in case of wear earlier!

Dismounting the pump hose kit

- Deactivate the device (no voltage)
- Put protective gloves and protect goggles on
- Take the coloured front lid off (for instructions see chapter 5.2.3)
- Remove pump housing cover
- Remove suction and pressure lines (under a cloth - **Warning:** Danger of splash!)
- Hold the holder of the hose with the hose pointing to the front and pull out of the pump housing
- Turn the rotor manually to remove the pump hose from the housing

Installing the pump hose kit

- If required, clean and dry the pump housing
- Slide the hose holder with the factory -installed hose into the pump housing
- Turn the rotor manually to insert the pump hose into the track
- Snap pump housing cover and front lid open
- Re-connect suction and pressure lines
- Re-activate the device (voltage on)

9 Spare part kits

Spare parts kits consisting of:

Pump hose kit consisting of hose holder with factory-assembled pump hose.

Order no.	Pump hose kit with:	Delivery capacity
0204-020-00	Pump hose Ø (outside) 4.0 mm	approx. 5 - 200 ml/h
0204-021-00	Pump hose Ø (outside) 4.8 mm	approx. 15 – 1000 ml/h
0204-022-00	Pump hose Ø (outside) 6.4 mm	approx. 45 – 4500 ml/h
0204-023-00	Pump hose Ø (outside) 8.0 mm	approx. 120 – 9000 ml/h

Pos.	Order no.	Item
	0204-026-00	Rotor compl. with spring
	0204-100-00	Suction lance complete with empty empty sensor
	0284-027-00	Covering (round) for rotor
	0204-028-00	Covering transparent

Warning: The empty warning connection works as **normally closed contact**. If no empty warning feature is connected, terminal 11 – 12 is to be bridged.
If Jumper 4 is set, the empty warning connection works as **normally open contact**.

Note: Use only accessories, parts and water care agents that have been tested and are recommended by dinotec, because these are adapted specifically to this area of use and are subject to constant quality controls.

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- Electro-chlorination systems
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