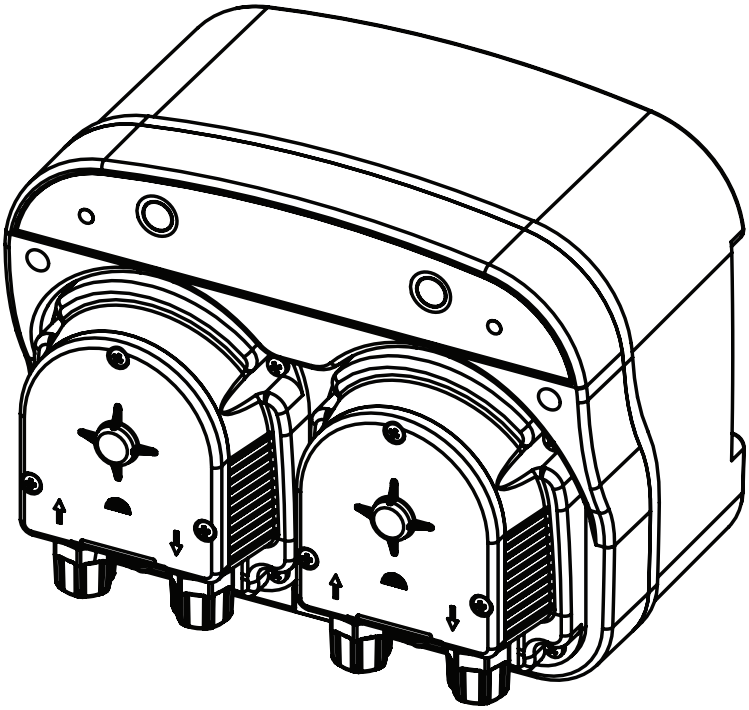
# PER 150
# USER MANUAL



KK_KK_019_R0

## 1 Table of Contents


**1 Table of Contents 1**
**2 Introduction 2**
2.1 Explanations of Security Warnings 2
2.2 User competencies 3
**3 Safety and Responsibility 4**
3.1 General Safety Warnings 4
3.2 Dangerous due non-observance of safety instructions. 5
3.3 Safe operation 5
3.4 Personel protective equipment 5
3.5 Qualification of staff 5
**4 Suitable and desired use 6**
4.1 Notes on product warranty 6
4.2 Production purpose 6
4.3 Principles 6
4.4 Prohibited dosage substance 6
4.5 Predictable Misues 6
4.5.1 Improper montage 6
4.5.2 Improper installation 6
4.6 Improper electrical installation 6
**5 Product Description 7**
5.1 Product Definition 7
5.2 PER150 Feature-Function 7
5.2.1 Supplying 7
5.3 Motor drive 7
5.4 Run 7
5.4.1 Prime 7
5.4.2 Alarms 7
5.4.3 Alarm Control 7
5.4.4 Led 7
5.5 Scope of delivery 7
**6 Technical Data 8**
6.1 Capacity information 8
6.2 Working environment conditions and limits 8
6.3 Electrical information 8
6.4 Other Information 8
**7 Dimensions 9**
**8 Mechanical installation 10**
**9 Electrical Installation 11**
**10 Hidrolic Installation 12**
10.1 Hose Fitting 12
10.2 Compression set montage 12
10.3 Metalic compression set montage 12
10.4 Metalic compression set hose end montage 12
**11 Use 13**
11.1 Buttons 13
11.2 Speed adjustment with Trimpot 13
11.3 Functions 13
11.4 Running 13
11.5 Error Conditions 13
**12 Maintenance-Repair/Scope of warranty 14**
12.1 Maintenance 14
12.2 Repair 14
12.2.1 Pump hose replacement 14
12.3 Scope of warranty 14
**13 List of components 15**

Figure 1 Front size 9
Figure 2 Side size 9
Figure 3 Sub size 9
Figure 4 Hanger wall - talk 9
Figure 5 Mechanical installation 10
Figure 6 Electrical installation 11
Figure 7 Hose fitting 12
Figure 8 Compression set montage 12
Figure 9 Metalic compression set montage 12
Figure 10 Metalic compression set hose end montage 12
Figure 11 Protection Cover Screws Removal 14
Figure 12 Removing the Protection Cover 14
Figure 13 Removing the Hose Transition Sleeve 14
Figure 14 Hose Removing 14
Figure 15 List of components 15
Figure 16 OEM 5,1L/0,5B Component List of the Head 16
Figure 17 OEM 2,8L/3B Component List of the Head 16

# 2 Introduction

Please read the following information carefully and completely. This information will help you get the most out of the user guide.

These instructions describe the technical data of the appliance.

## 2.1 Explanations of Security Warnings

These use instructions provide information on the technical data and functions of the product and detailed safety information.

Safety warnings and notes are categorized as follows. Here, different, case-adapted pictograms were used. The pictograms mentioned here are only examples.

**DANGER!**
**Type and source of danger**
**Result: Death or severe injury.**
Measures to be taken to prevent this danger.

Identifies the direct threat. Death or serious injury can occur if not avoided.

**WARNING!**
**Type and source of danger**
**Possible result: Death or severe injury.**
Measures to be taken to prevent this danger.

Identifies a potentially danger situation.
Death or serious injury can occur if not avoided.

**ATTENTION!**
**Type and source of danger**
**Possible result: Slight or minor injuries.**
**Material damage.**
Measures to be taken to prevent this danger.

Identifies a potentially danger situation.
Slight or minor injuries can occur if not avoided.
It can also be used for material damage warning.

**NOTE!**
**Type and source of danger**
**Possible result: Damage of product or its surroundings.**
Measures to be taken to prevent this danger.

**Identifies a potentially damaging situation. If not avoided, the product or its surroundings may be damaged.**

**INFORMATION!**

Tips for use and additional information.
Information source. Additional measures.

Describes usage tips and other useful information.
Not for a dangerous or harmful situation.

## 2.2 User competencies

**WARNING!**
**Danger of injury due to insufficient competencies of staff!**
**The operator of the plant / appliance is responsible for observing competencies. Dangers such as serious injury and property damage may occur if unprofessional personnel work with the unit or if the unit is in a dangerous area.**
– All activities must be performed by competent personnel
– Keep unauthorized personnel away from danger zones

| Training | Description |
|---|---|
| Informed person | The person who has been informed of the dangers and the obligations of improper conduct and who has been trained in the necessary cases and informed of the necessary protective appliances and measures is referred to as an informed person. |
| Trained user | Persons who meet the requirements of the informed person and have received training from the manufacturer or another authorized distributor are referred to as trained users. |
| Trained expert | The person who can assess the tasks assigned to him and identify potential hazards is defined as an expert on the basis of his or her knowledge of training, knowledge and experience and the associated rules. An expert is defined as the person who is capable of assessing the tasks entrusted to him and recognizing possible dangers based on his knowledge, experience and knowledge of the relevant rules<br>When evaluating expert training, long-term activities in the relevant business area can be taken into account. |
| Electrician | The person who is able to work in electrical installations and recognize and prevent possible dangers based on their knowledge, experience and knowledge of applicable standards and regulations is defined as an electrician. Electricians are particularly trained in their field of work and have knowledge of important standards and regulations. The electrician must comply with the provisions of the applicable legal regulations on accident prevention. |
| Customer Services | Service technicians who are trained and certified by the manufacturer for the work on the plant are identified as customer service. |

# 3 Safety and Responsibility

## 3.1 General Safety Warnings

The following warnings are intended to help you avoid dangers that may occur when using the product. Risk prevention measures always apply regardless of any specific action.
Safety instructions that alert you to risks from certain activities or situations can be found in the relevant sub-sections.



**DANGER**

**Life threatening due to electric shock**
Incorrectly connected, idle or damaged cables can injure you.
Replace damaged cables without delay.
Do not use an extension cord.
Do not bury cables.
Secure the cables to prevent damage to other equipment.



**DANGER**

Never use the product in explosive areas.



**WARNING**

**Caustic burns or other burns caused by dosage!**

After connecting the mains supply, the dosing process starts.

Connect the dosing lines before connecting the main supply.

Ensure that all screw connections are correctly tightened and proofed.



**WARNING**

When working on the dosing head, valves and connections, you can contact dosing fluid.
Use adequate personal protective equipment.
Rinse the product with a liquid (eg. water) that has no risk. Make sure the liquid is compatible with the dosage agent. Never look at the open ends of installed hoselines and valves without protective goggles.



**WARNING**

The materials of the product and the hydrdaulic parts of the system must be suitable for the dosing fluid used. Make sure that the materials that are used are suitable for the dosage agent.



**ATTENTION**

**Increased risk of accident because of insufficient qualification of staff!**
Products and accessories must only be installed, operated and maintained by qualified personnel.
Ensure that all actions are taken by qualified and qualified personnel only.
Prevent access to the system for unauthorized persons.



**ATTENTION**

**Risk of personal injury and damage to property!**
**Changing the dosage fluid can lead to unpredictable reactions.**
Thoroughly clean the dosing pump and hoses to prevent chemical reactions.

## 3.2 Dangerous due non-observance of safety instructions.

Failure to observe the safety instructions may pose a risk not only to the personnel but also to the environment and the unit.
Results may be as following:
Failure of the vital functions of the product and the system,
Failure of necessary maintenance and repair methods,
Danger for individuals due to dangerous dosage
Danger to the enviroment due to substances leaking from the system.

## 3.3 Safe operation

In addition to the safety instructions, more safety regulations that must applied and observed:
Safety and operating provisions of accident prevention regulations,
Safety measures for the use of dangerous substances ,
Environmental protection provisions,
Applicable standards and legislation,

## 3.4 Personel protective equipment

You may be exposed to contact with the dosing fluid. Depending on the degree of risk and the type of work you do, you should use the appropriate protective equipment.
The following protective equipment is recommended as a minimum:



Protective clothing



Protective gloves



Protective goggles

During these tasks, the responsible person must use protective equipment:
To take into service,
During the work of the product,
Disassembly, maintenance works, destruction.

## 3.5 Qualification of staff

Any personnel working on the product must have appropriate special knowledge and skills.
Anyone who works with the product must meet the following conditions:
- Participation in all training courses offered,
- Personal appropriateness for the relevant work,
- Qualification required for the relevant job,
- Training in the use of the product,
- Information about safety of the equipment and work of the equipment,
- the knowledge of these Operating Instructions, in particular the relevant safety instructions and parts of the work,
- Knowledge of basic regulations related to health, safety and accident prevention.

All persons should generally have the following minimum qualifications:
- To be trained as a specialist in order to work on uncontrolled products,
- Adequate training to be able to work under the guidance of a trained expert.

These Instruction manual differentiate user groups:
(see User Competencies Page 3)

# 4 Suitable and desired use

## 4.1 Notes on product warranty

Any unspecified use of the product may endanger its function or intended protection. This will invalidate any warranty claims!

Please note that the user is under the obligation in case of the following situations:

• Use of the product in a way that is not consistent with the instructions for use named `suitable and desired use`, especially safety

- Unauthorized changes in the appliance by the user
- Use of dosing agent different from those specified in the order
- The user does not use dosing fluid under conditions agreed with the manufacturer, such as modified concentration, density, temperature, contamination etc.

## 4.2 Production purpose

Dosing unit controlling dishwashing chemicals used in dishwashers according to the signal received from the dishwasher.

## 4.3 Principles

- Prior to delivery, the manufacturer controlled and operated the product under specific conditions (with a specific dosage agent at a given density and temperature, specific hose sizes, etc.).
- Information on use and the environment (see Technical Data on page 8).
- The materials of the hydraulic parts of the product and the system must be suitable for the dosage agent used. Note that in this context, the resistance of the components may vary depending on the temperature of the dosing agent and the working pressure.
- The product is not intended for outdoor use unless proper protective measures are taken.
- Avoid liquid and dust leakage into the product and avoid direct exposure to sunlight.
- Never operate the product in a potentially explosive atmosphere unless there is an appropriate EC Declaration of Conformity for potentially explosive atmospheres.

## 4.4 Prohibited dosage substance

The product should not be used for:

- Gaseous substances,
- Flammable substances,
- Radioactive substances,
- Solids.

## 4.5 Predictable Misues

Information about product applications not intended for use or related equipment applications are given below. This section is intended to detect and prevent possible misuse.

The presumed misuse affects the life of the product:

### 4.5.1 Improper montage

Incorrect or loose screwing of the product.

### 4.5.2 Improper installation

Incorrect installation of suction and compression lines.

Incorrect connection of hoses due to incorrect material or improper connections.

Damage to hoselines due to bending or tightening too much.

Use of damaged parts, exceeding the permissible pressure on the suction and discharge sides.

## 4.6 Improper electrical installation

Unsafe mains or mains voltage that does not comply with standards.

Incorrect connection cables for mains voltage.

Installation in which it is not possible to cut the power supply immediately or easily.

# 5 Product Description

## 5.1 Product Definition

The appliance evaluates the washing and rinsing signals entered on the electronic card and manages the pumps according to the set parameters.

## 5.2 PER150 Feature-Function

17-27V AC (24-40V DC) Input voltage

On / off switch

1A Glass fuse

Microcontroller control

2 PWM controlled Motor drive (Detergent, Rinse, Pumps

Current monitoring of motor drives

2 pcs color user LED

2 User buttons

2 Pcs Driver LED

UART Communication + Supply Port

### 5.2.1 Supplying

Supply is provided through AC input
The supply can be cut off with a switch.
The circuit is protected by a 1A fuse.

## 5.3 Motor drive

Motor speed is set with trimpot. Motors are driven with the PWM according to the adjusted pump speed

## 5.4 Run

Pumps run at constant speed as long as there is power.

### 5.4.1 Prime

When the Prime button on the left is pressed, the detergent pump works at maximum capacity. When the Prime button on the right is pressed, the rinse pump operates at maximum capacity.

### 5.4.2 Alarms

If the measured current from the motor drives exceeds the overcurrent value, the motor is stopped and an Overcurrent fault is generated. The error is cleared when the signal is interrupted.

If the measured current from the motor drives is below the low current value, a low current error is generated for the respective motor.

If the measured DC BUS voltage is above the high voltage value (40V DC), a ‘’High voltage error’’ error is generated. If the measured DC BUS voltage is below the low voltage value (20V DC), a ‘’Under voltage error’’ error is generated.

### 5.4.3 Alarm Control

See error conditions table. 11.4 ERROR CONDITIONS page 13

### 5.4.4 Led

If the device is energized but the pump is not running, the LED will light green continuously.

Depending on the running pump, the corresponding LED flashes green quickly. (150 split second)
Refer to the table for operation in error conditions.
11.4 ERROR CONDITIONS page 13

## 5.5 Scope of delivery

Per 150
User Manual
Hose assembly
Suction set 4X6 ASPENDOSE
Pressing set ASPENDOSE 4X6 PVDF
Metalic pressing set 2X4 V
Montage set ASPENDOSE
Hose End Apparatus ASPENDOSE
Wall hanging element PER 200

Transformer 12W 23V
SCREW 3,5X6 YMB PLASTIC

Terminal Piggyback Faston
Cable Ring

# 6 Technical Data

## 6.1 Capacity information

| Description | Value | Detergent | Rinse |
|---|---|---|---|
| Maximum Flow Under Pressure | L/h | 5,1 | 2,8 |
| | ml/speed | 72,86 | 40 |
| Maximum Pressure | Bar | 0,5 | 3 |
| Maximum Speed | RPM | 70 | 70 |

## 6.2 Working environment conditions and limits

| | |
|---|---|
| Ambient temperature | 0-50ºC |
| Relative humidity | Max. 85%rh |

## 6.3 Electrical information

| | |
|---|---|
| Supply voltage | 24V AC |
| Power | 8W |
| Maximum current | 0.5A |

## 6.4 Other Information

| | |
|---|---|
| Weight | 894 gr |
| Packing weight | 2007 gr |
| Protection Class | IP32 |

## 7 Dimensions

The following figures show the mounting holes of the appliances.

Before starting the pump installation, the surface on which the pump will be mounted is marked according to the pattern.

Make sure that the surface on which the pump is to be installed is dry and clean.

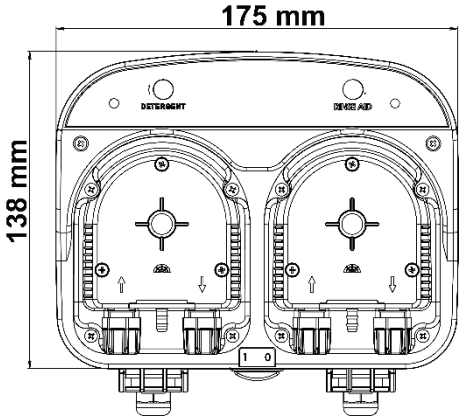



Figure 1 Front size

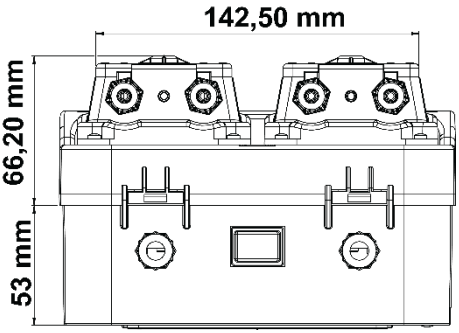



Figure 3 Sub size

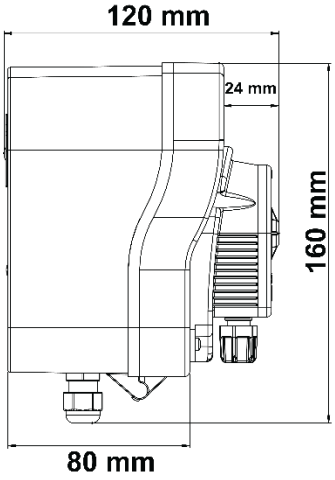



Figure 2 Side size

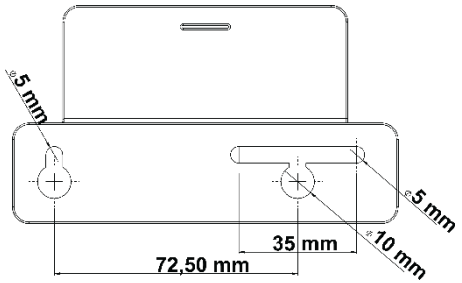



Figure 4 Hanger wall - talk

## 8 Mechanical installation

Use the hanger bracket hole template to mount the product on the Wall. Mark the surface that you intend to install the hanger.

Bole a maximum 7 mm hole on the wall to hammering the 8 mm dowels from the accessories..

After mounting the dowels, place the holes of the brackets on each other.

Fasten with screws.

Place the pump on its tabs as shown at the side, from top to bottom.

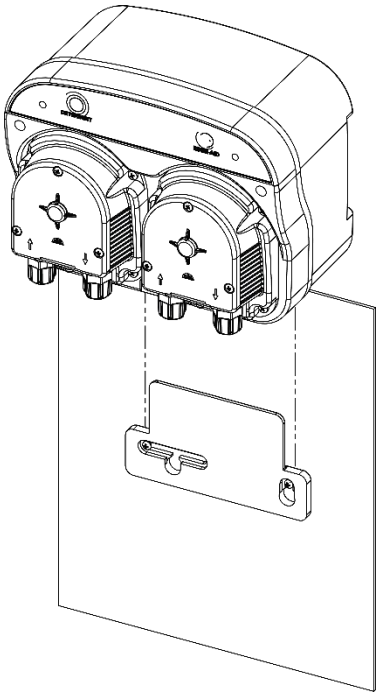


Figure 5 Mechanical installation

# 9 Electrical Installatıon

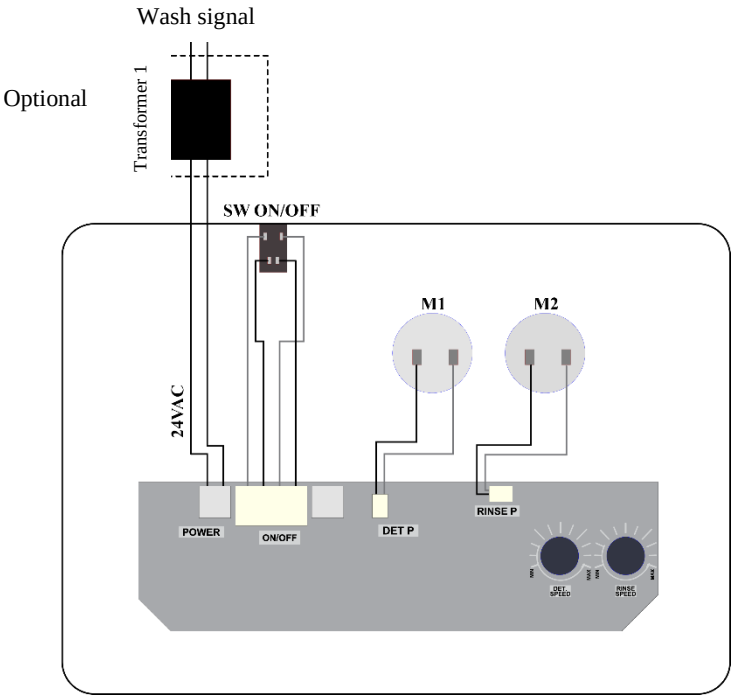



Figure 6 Electrical installation

The Appliance connection diagram should be made according to the template given above.

If power pupply input is 220VAC, the transformer will be used.
If power pupply input is 24VAC, the connection will be made directly.

# 10 Hidrolic Installation

## 10.1 Hose Fitting

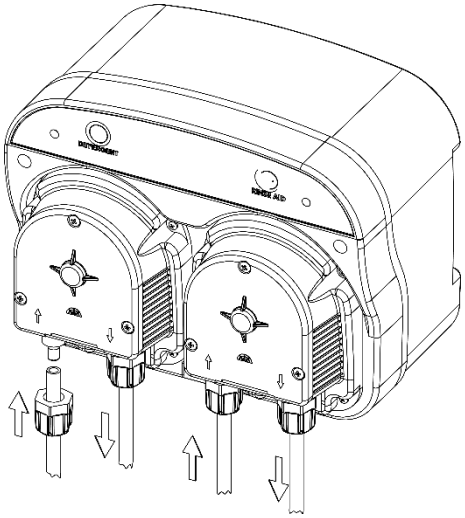


Figure 7 Hose fitting

## 10.2 Compression set montage

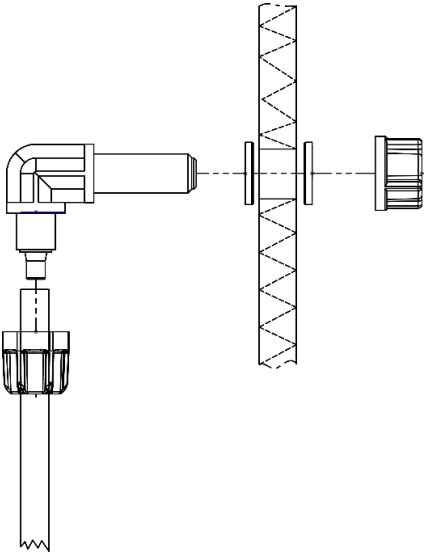


Figure 8 Compression set montage

## 10.3 Metalic compression set montage

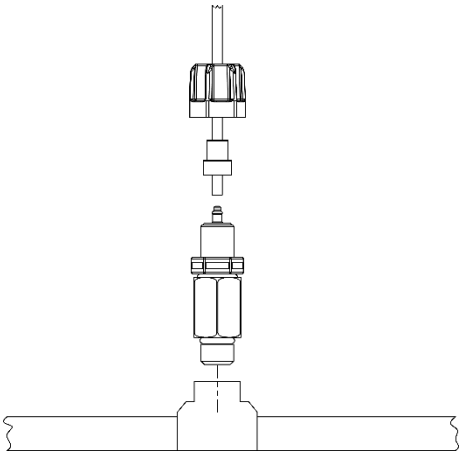


Figure 9 Metalic compression set montage

## 10.4 Metalic compression set hose end montage

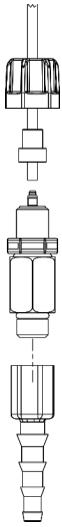


Figure 10 Metalic compression set hose end montage

# 11 Use

## 11.1 Buttons

There are 2 buttons on the appliance.
Left Prime Button: Used for Detergent Pump.
Right Prime Button: Used for Rinse Aid Pump.

## 11.2 Speed adjustment with Trimpot

The appliance cover opens. The speed of the pump related to the trimpot on the electronic board is adjusted manually or with a precission screwdriver. The cover of the device is closed

## 11.3 Functions

**Detergent Prime:**
Press and hold the Left Prime button to operate the Detergent Pump in Prime mode.

**Rinse Aid Prime:**
Press and hold the Right Prime button to operate the Rinse Aid Pump in Prime mode.

## 11.4 Running

Runs the pumps at a constant speed set by trimpot as long as ther is supply.

## 11.5 Error Conditions

The appliance tries to protect itself or to warn the user in some cases by creating errors.

| Error | Reason | Condition of the Motors | Condition of the LEDs |
|---|---|---|---|
| Motor Over Current | The pump motor is jammed or draws excessive current. | Run of the relevant motor is stopped. | LED of the corresponding motor flashes red |
| Motor Low Current | Pump motor is not plugged or cable is torn. | | LED of the corresponding motor flashes yellow |
| High Voltage | | Run of all the motors is stopped. | Both LEDs are steady red |
| Low Voltage | | Motors continue to operate | Both LEDs are steady yellow |

# 12 Maintenance-Repair/Scope of warranty

## 12.1 Maintenance

**WARNING!**
**Mechanical Failures!**
**Possible result:** material damage that can cause the destruction of the appliance.
If the pump has not been used for a long time, make sure there is no blockage, adhesion or hardening in the pump hose before starting again.

**Approximately/**Every Three - Six Months
Check the suction line filter for obstruction.
Check the suction and discharge hose sleeves for loosening.
Check the Pump Hose for leaks.
Approx / Every Year: Change the pump dosing hose.

**According to used chemicals!**
Depending on the chemical dosage, maintenance and hose change may vary.

## 12.2 Repair

### 12.2.1 Pump hose replacement

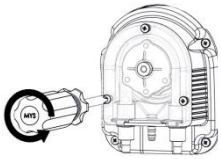


Figure 11 Protection Cover Screws Removal

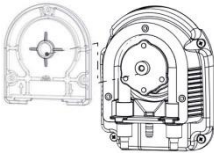


Figure 12 Removing the Protection Cover



Figure 13 Removing the Hose Transition Sleeve

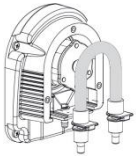


Figure 14 Hose Removing

- Remove the screws on the Protection Cover.
- Remove the pump hose from the suction side by pulling out the transition sleeve.
- Pull out the pump hose transition sleeve on the pump side.

**To replace the pump hose,**

1. Move the pump from the flow regulating port to the lowest speed.
2. Replace the hose transition sleeve on the suction side.
3. Give energy to the pump. In the meantime, turn the pump hose on the rollers and turn off the pump after 1 turn.
4. Replace the hose crossing record on the compression side.

**When Installing the Pump Hose!**
Lubricate with silicone grease when replacing the pump hose.

## 12.3 Scope of warranty

Rupture of the hose in the head or damages arising because of it are not covered by the Warranty.

## 13 List of components

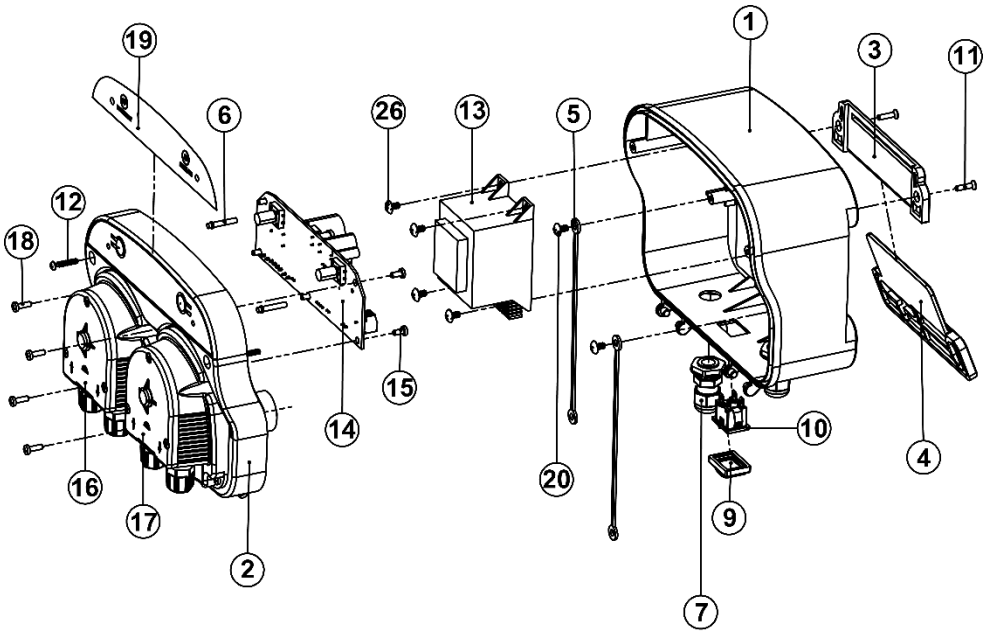



Figure 15 List of components

| Number | Name of component |
|---|---|
| 1 | TRANK PER 200 |
| 2 | COVER PER 200 |
| 3 | HANGER PER 200 TRANK |
| 4 | HANGER PER 200 WALL |
| 5 | STOPPER PER200 |
| 6 | LED BAR 3X19MM |
| 7 | CABLE SLEEVE PG7 |
| 8 | SEAL CAP 2,5MM |
| 9 | PROTECTION TIRE ON OFF TRANSPARENT |
| 10 | E ELC MECH SWITCH MINI ON-OFF 4P |

| Number | Name of component |
|---|---|
| 11 | SCREW M3X12 YHB PLASTIC |
| 12 | SCREW M3,5X16 YSB PLASTIC CHROME |
| 13 | E POWER DISTRIBUTION UNIT 12W 23V WITH CABLE ELKOM |
| 14 | ELC.CARD PER 150 V1.0 |
| 15 | SCREW M3X6,5 YSB PLASTIC |
| 16 | PER 200 OEM 5,1L/0,5B 2x4 24 |
| 17 | PER 200 OEM 2,8L/3B 24 |
| 18 | SCREW M3X9,5 YSB PLASTIC CHROME |
| 19 | PANEL LABEL PER 150 |
| 20 | SCREW 3,5X6 YMB PLASTIC |

OEM 5,1L/0,5B Component List of the Head

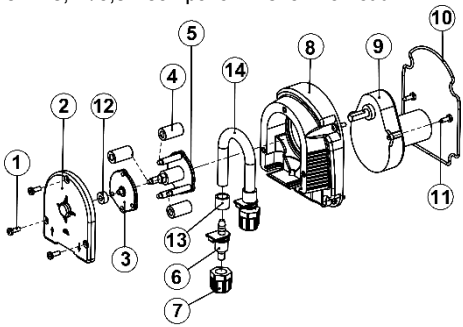



Figure 16 OEM 5,1L/0,5B Component List of the Head

OEM 2,8L/3B Component List of the Head

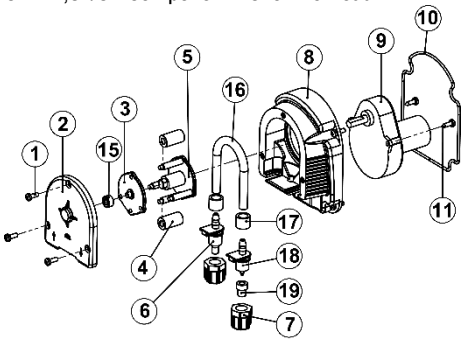



Figure 17 OEM 2,8L/3B Component List of the Head

| Number | Name of component |
|---|---|
| 1 | SCREW M3X8 YSB CHROME |
| 2 | ASPENDOSE UST KAPAK |
| 3 | ASPENDOSE ROLLER COVER |
| 4 | ASPENDOSE ROLLER 9,85MM |
| 5 | ASPENDOSE ROLLER TRANK |
| 6 | PERISTALTIC HOSE SLEEVE 5MM |
| 7 | SLEEVE COVER ASPENDOSE |
| 8 | PUMP HEAD ASPENDOSE OEM |
| 9 | MOTOR SET 70RPM 24V 89,28:1 |
| 10 | ORING 88,62x1,78 NBR |
| 11 | SCREW M3X9,5 YSB PLASTIK |
| 12 | BURC DERLIN COVER |
| 13 | HOSE 4,8X8 NORPRENE |
| 14 | HORTUM NOPRENE 4,8x8 A60F |
| 15 | RULMAN 684 ZZ |
| 16 | HORTUM TYGON 3,2x6,4 2001 |
| 17 | HOSE PRESSURE 3,2X6,4 TYGON |
| 18 | PER 200 HOSE SLEEVE 2X4-5MM |
| 19 | HOSE PRESSURE 2X4 PER 200 PP |