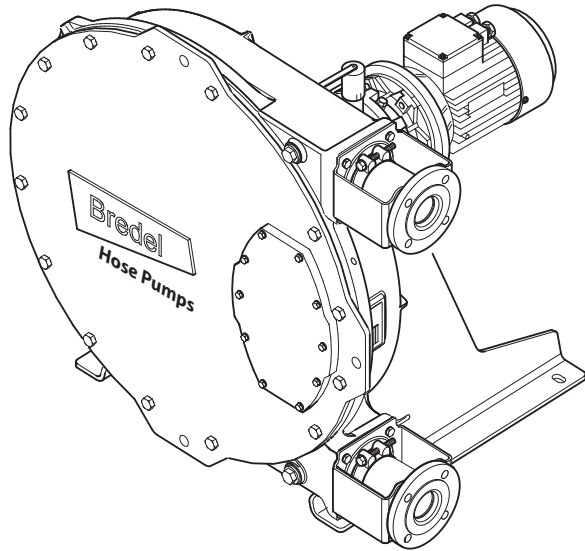


# Bredel 40-100 Operating Manual



# Contents

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<b>1 General</b>	<b>12</b>
1.1 How to use this manual	12
1.2 Original instructions	12
1.3 Other supplied documentation	12
1.4 Service and support	12
1.5 Environment and disposal of waste	13
<b>2 Safety</b>	<b>14</b>
2.1 Symbols	14
2.2 Intended use	14
2.3 Use in potentially explosive atmospheres	15
2.4 NSF/ANSI 61 certification	15
2.5 Responsibility	15
2.6 Qualification of the user	16
2.7 Regulations and instructions	16
<b>3 Warranty conditions</b>	<b>17</b>
<b>4 Description</b>	<b>18</b>
4.1 Identification of the product	18
4.2 Construction of the pump	22
4.3 Operation of the pump	23
4.4 Pump installation positions	24
4.5 Hose	25
4.6 Gearbox	27
4.7 Electric motor	27
4.8 Available options	28
<b>5 Installation</b>	<b>29</b>
5.1 Unpacking	29
5.2 Inspection	29
5.3 Installation conditions	29
5.4 Lifting and moving the pump	32
5.5 Placing the pump	33
<b>6 Commissioning</b>	<b>38</b>
6.1 Preparations	38

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6.2 Commissioning .....	39
<b>7 Operation .....</b>	<b>40</b>
7.1 Temperature .....	40
7.2 Power rating .....	40
7.3 Performance graphs .....	40
7.4 Dry running .....	44
7.5 Hose failure .....	45
7.6 Fluid leakage .....	47
<b>8 Maintenance .....</b>	<b>48</b>
8.1 General .....	48
8.2 Maintenance and periodic inspections .....	48
8.3 Additional maintenance in potentially explosive environments .....	50
8.4 Cleaning the hose .....	51
8.5 Changing lubricant .....	52
8.6 Changing oil in the gearbox .....	53
8.7 Changing the hose .....	54
8.8 Exchanging replacement parts .....	65
8.9 Adjust the compression force (shimming) .....	75
8.10 Fitting options .....	78
<b>9 Storage .....</b>	<b>85</b>
9.1 Hose pump .....	85
9.2 Hose .....	85
9.3 Lubricant .....	85
<b>10 Troubleshooting .....</b>	<b>86</b>
<b>11 Specifications .....</b>	<b>92</b>
11.1 Pumphead .....	92
11.2 Lubricant for gearbox .....	100
11.3 Electric motor .....	100
11.4 Parts List .....	101
<b>12 Appendix: Vacuum option .....</b>	<b>124</b>
12.1 Description .....	124
12.2 Commissioning .....	124
12.3 Maintenance .....	125

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12.4 Parts lists .....	127
<b>13 Safety form .....</b>	<b>132</b>

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## QR code



English	To get the translation of the manual in your language, scan the QR code.
Nederlands	Scan de QR code om de vertaling van de handleiding in uw taal te krijgen.
Deutsch	Um die Übersetzung des Handbuchs in Ihrer Sprache zu erhalten, scannen Sie den QR-Code.
Português	Para obter a tradução do manual no seu idioma, faça a leitura do código QR.
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Norsk	Før å lese håndboken oversatt til ditt eget språk, scan QRkoden.
Svenska	För att få en översättning av handboken på ditt språk, skanna QR-koden.
中国	要获取本手册以您的语言呈现的译本，使用光盘或扫描QR代码。

## How to access an available translation

The following documents are available on the website:

- User manual in multiple languages
- Quick reference instructions for the replacement of the pump hose

**Note:** The replacement instructions are only for users that are familiar with the replacement procedures in the user manual.



## System requirements

Source	Hardware	Software
Website	PC or tablet	Internet browser PDF reader
QR code	Smartphone or tablet with camera	Internet browser PDF reader App that can scan QR codes

## How to use the website

1. Go to the website [www.wmfts.com](http://www.wmfts.com) and select the 'Literature' tab.
2. Select Brand 'Bredel' and Document Type 'Manual' and then the required language.
3. Open or save the user manual.

The PDF reader program shows the selected user manual.

## How to use the QR code

1. Scan the QR code with your smartphone or tablet - The app forwards you to the webpage that contains the required language.
2. Open or save the user manual - The PDF reader program shows the selected user manual.

# 1 General

## 1.1 How to use this manual

This manual is intended as a reference book by means of which qualified users are able to install, commission and maintain the hose pumps Bredel 40, Bredel 50, Bredel 65, Bredel 80, and Bredel 100.

## 1.2 Original instructions

The original instructions for this manual have been written in English. Other language versions of this manual are a translation of the original instructions.

## 1.3 Other supplied documentation

Documentation of components such as the gearbox, the motor, and the frequency controller is not included in this manual. However, if additional documentation is supplied, you must follow the instructions in this additional documentation.

## 1.4 Service and support

Some specific adjustments, installation and maintenance or repair jobs fall beyond the scope of this manual. In case of doubt, consult your Bredel representative.

Make sure that you have the following data at hand:

- Serial number of the hose pump
- Part number of the pump hose
- Part number of the gearbox
- Part number of the electric motor
- Part number of the frequency controller

You will find these data on the identification plates or stickers on the pumphead, the pump hose, the gearbox, and the electric motor.

### See also

Refer to "Description" on page 18

## 1.5 Environment and disposal of waste

**Note:** Always observe the local rules and regulations with respect to processing (non reusable) parts of the hose pump.



### **WARNING**

**Risk of poisoning and environmental damage. Pump parts can get contaminated by pumped liquids to such an extent that cleaning becomes insufficient. Dispose of contaminated parts according to local regulations.**

When you discard items, obey these instructions:

- Use suitable personal protective equipment.
- Obey the safety instructions of the working environment.
- Obey the safety, health, and waste sorting instructions of the product.
- Drain, collect, and dispose of the lubricant in accordance with local rules and regulations.
- Collect and dispose of any leaking pumped liquid or oil in accordance with local rules and regulations.
- Neutralize residues of pumped liquid in the pump.
- Dispose of the parts in accordance with local rules and regulations.

Enquire within your local government about the possibilities for reuse or environment-friendly processing of packaging materials, (contaminated) lubricant, and oil.

## 2 Safety

### 2.1 Symbols

In this manual the following symbols are used:



#### WARNING

Procedures which, if not carried out with the necessary care, may result in serious bodily harm.



#### CAUTION

Procedures which, if not carried out with the necessary care, may result in serious damage to the hose pump, the surrounding area or the environment



Information on environmentally-friendly disposal or recycling of materials.



Procedures, remarks, suggestions or advice which refer to use in potentially explosive atmospheres in accordance with the ATEX Directive 2014/34/EU.

### 2.2 Intended use

The hose pump is exclusively designed for pumping suitable products. Every other or further use is not in conformance with the intended use. This is the use for which the technical product is intended in accordance with the specifications of the manufacturer, inclusive of his indications in the sales brochure. In case of doubt it is the use, which appears to be its intended use judging from the construction, execution and function of the product, and its description in the user's documentation.

Only use the pump in conformance with the intended use described above. The manufacturer cannot be held responsible for damage or harm resulting from use that is not in conformance with the intended use. If you want to change the application of your hose pump, contact your Bredel representative first.



#### WARNING

The pump is configured for use with specific fluids for which the chemical compatibility of the pump materials has been approved. Before using it in any application it is required to check the compatibility of the pump materials. Incompatible pumpehead material, hose liner, hose connections and lubricant can lead to serious damage and safety hazards. Always contact your Bredel representative first.

### 2.3 Use in potentially explosive atmospheres

The pumphead and drive mentioned in this manual may be configured to be suitable for use in a potentially explosive atmosphere. Such a pump meets the requirements as stated in the European Directive 2014/34/EU (ATEX Directive). These pumps have a maximum safety level of: Group II Appliances, category 2 G ck T4. The actual safety level (ATEX code) depends on the options that are installed on the pump.



Use in potentially explosive atmospheres requires special configuration of the pump.

If the pump is to be used in potentially explosive atmospheres, contact your Bredel representative.

#### See also

Dedicated ATEX manual, part number 28-29210322.

### 2.4 NSF/ANSI 61 certification

For specific combinations of the hose and insert and in combination with certain chemicals, the hose pumps are configured and delivered in compliance with NSF International certification NSF/ANSI Standard 61: Drinking Water System Components – Health Effects and will bear the NSF mark shown below. A list of certified products and relevant chemicals can be found at <http://www.nsf.org/certified-products-systems>. For further details refer to the Bredel User Guide NSF 61 certified hose pumps supplied with such a pump, which can also be found on the website, or contact your Bredel representative for advice.



Certified to  
NSF/ANSI 61

### 2.5 Responsibility

The manufacturer does not accept any responsibility for damage or harm caused by not observing the safety regulations and instructions in this manual and other supplied documentation, or by negligence during installation, use, maintenance and repair of the hose pumps mentioned on the front cover. Depending on the specific working conditions or accessories used, additional safety instructions can be required.

Immediately contact your Bredel representative for advice if you notice a potential danger while using your hose pump.



#### WARNING

**The user of the hose pump is fully responsible for observing local safety regulations and directives. Observe these safety regulations and directives when using the hose pump.**

## **2.6 Qualification of the user**

The installation, use and maintenance of the hose pump should only be performed by well-trained and qualified users. Temporary staff and persons in training may use the hose pump only under the supervision and responsibility of trained and qualified users.

## **2.7 Regulations and instructions**

- Everyone who works with the hose pump must be aware of the contents of this manual and observe the instructions with great care.
- Never change the order of the actions to be carried out.
- Always store the manual near the hose pump.



### **3 Warranty conditions**

The manufacturer offers a two-year warranty on all parts of the hose pump. This means that all parts will be repaired or replaced free of charge, with the exception of consumables such as pump hoses, ball bearings, wear rings, seals and compression rings, or parts which have been used wrongly or have been misused, whether or not they have been intentionally damaged. If genuine Watson-Marlow Bredel B.V. (hereafter called Bredel) parts are not used, any warranty claim is void.

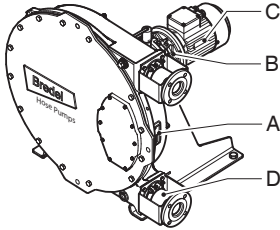
Damaged parts which are covered by the applicable warranty conditions can be returned to the manufacturer. The parts must be accompanied by a fully filled in and signed safety form as present in the back of this manual. The safety form must be applied to the outside of the shipping carton. Parts which have been contaminated or which have been corroded by chemicals or other substances which can pose a health risk must be cleaned before they are returned to the manufacturer. Furthermore, it should be indicated on the safety form which specific cleaning procedure has been followed, and that the equipment has been decontaminated. The safety form is required even if the parts have not been used.

Warranties purporting to be on behalf of Bredel made by any person, including representatives of Bredel, its subsidiaries, or its distributors, which do not accord with the terms of this warranty shall not be binding upon Bredel unless expressly approved in writing by a Director or Manager of Bredel.

## 4 Description

### 4.1 Identification of the product

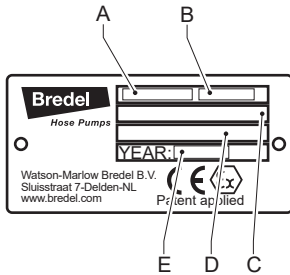
The hose pump can be identified by identification plates or stickers on:



- |   |                |   |                               |
|---|----------------|---|-------------------------------|
| A | Pumphead       | D | Pump hose                     |
| B | Gearbox        | E | Frequency controller (option) |
| C | Electric motor |   |                               |

### Identification of the pump

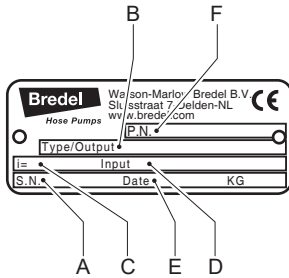
The identification plate on the pumphead contains the following data:



- |   |                          |   |                      |
|---|--------------------------|---|----------------------|
| A | Type number              | B | Serial number        |
| C | ATEX code, if applicable | D | ATEX document number |
| E | Year of manufacture      |   |                      |

## Identification of the gearbox

The identification plate on the gearbox contains the following data:

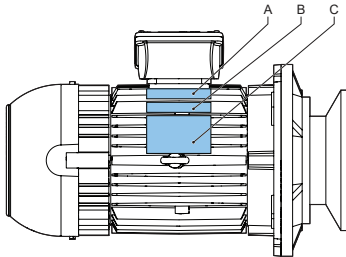


- |                              |  |
|------------------------------|--|
| A Serial number (S.N.)       | D Reduction ratio                                |
| B Type number (Type/ Output) | E Input (adaptation of the motor to the gearbox) |
| C Reduction (i=)             | F Breedel part or order number (PN)              |

## Identification of the electric motor

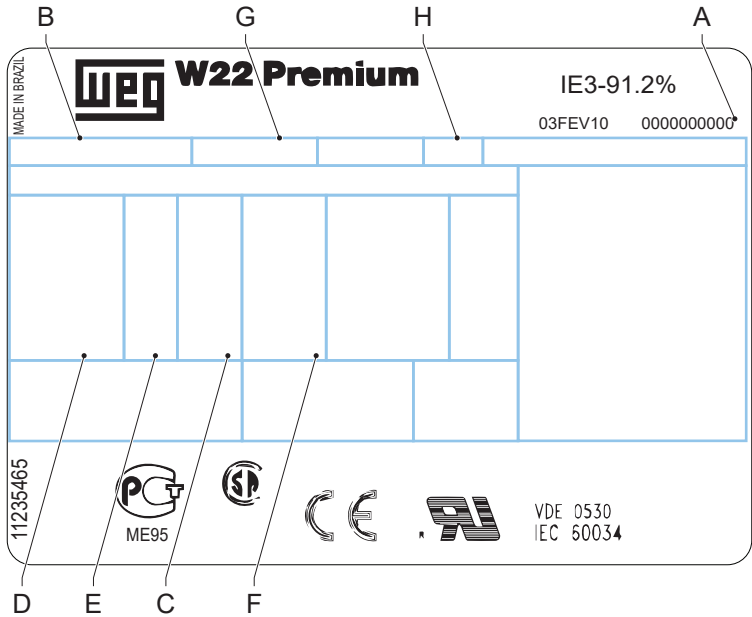
The identification plate on the electric motor contains the following data:

### Overview



- |   |                            |
|---|----------------------------|
| A Breedel part number, starting with "28-..." | C OEM identification plate |
| B OEM other plate                             |                            |

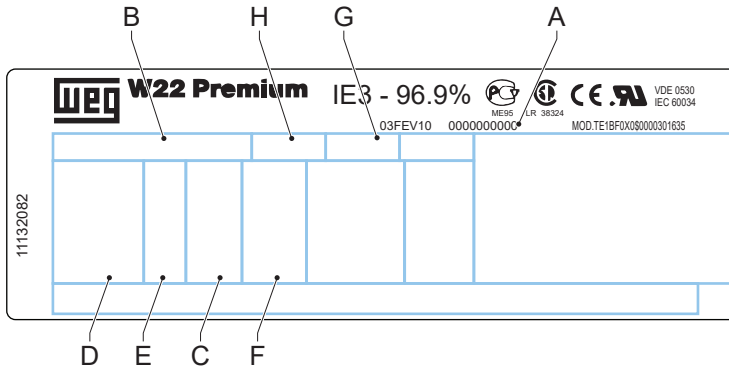
**OEM identification plate for electric motors up to 7.5 kW (IEC frame size 132)**



- A Serial number
- B Type number
- C Power
- D Voltage

- E Frequency
- F Speed
- G Insulation class
- H Protection class

## OEM identification plate for electric motors from 11 kW and up (IEC frame size 160)

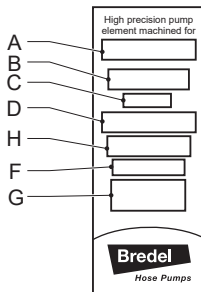


- |   |               |   |                  |
|---|---------------|---|------------------|
| A | Serial number | E | Frequency        |
| B | Type number   | F | Speed            |
| C | Power         | G | Insulation class |
| D | Voltage       | H | Protection class |

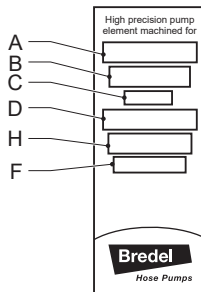
## Identification of the hose

The identification sticker on the pump hose contains the following data:

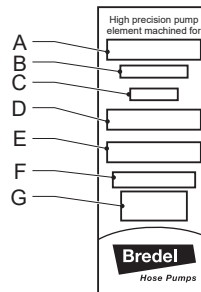
NR Metering hose



NR Transfer hose

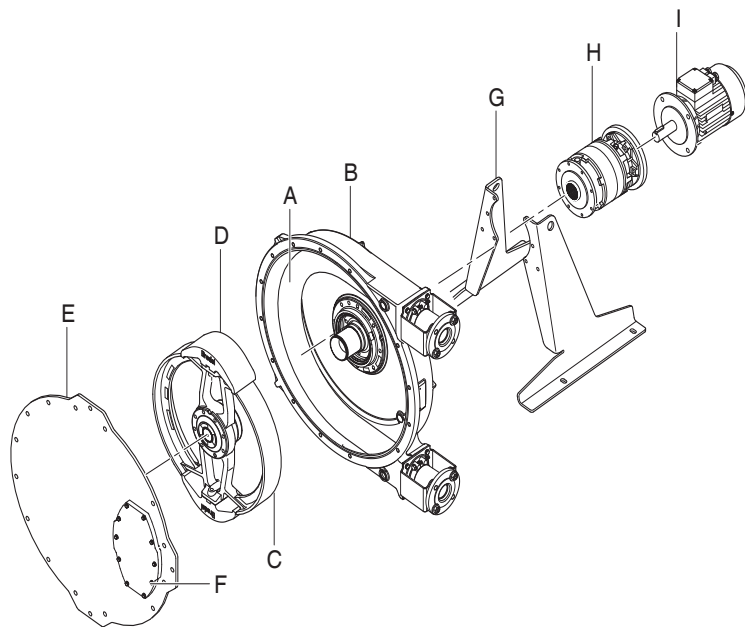


Other hoses



- |   |                                 |   |                                      |
|---|---------------------------------|---|--------------------------------------|
| A | Pump type                       | E | Remarks, if applicable               |
| B | Part number                     | F | Maximum permissible working pressure |
| C | Internal diameter               | G | Production code                      |
| D | Type of material of inner liner | H | Hose type, transfer or metering      |

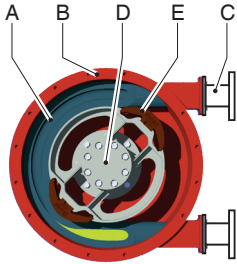
## 4.2 Construction of the pump



- A Hose
- B Pump housing
- C Rotor
- D Pressing shoes
- E Cover

- F Inspection window
- G Supports
- H Gearbox
- I Electric motor

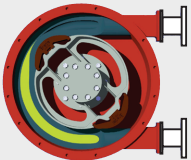
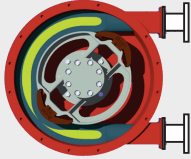
### 4.3 Operation of the pump



The heart of the pumphead consists of a specially constructed hose (A) which lies against the inside of the pump housing (B).

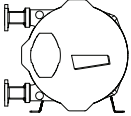
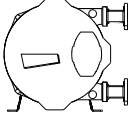
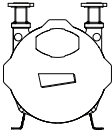
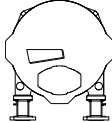
The ends of the hose are connected to the suction and discharge lines by means of a flange construction (C).

A bearing-mounted rotor (D) with two facing pressing shoes (E) is in the centre of the pumphead. In this example, it rotates clockwise.

Phase	Description	Pump layout
1	The lower pressing shoe compresses the hose by the rotational movement of the rotor, forcing the fluid through the hose. As soon as the pressing shoe has passed, the hose recovers to its original shape sucking in new fluid.	
2	When the first pressing shoe leaves the pump hose, the second pressing shoe has already occluded the hose and fluid is prevented from flowing back. This method of liquid displacement is known as the "positive displacement principle".	

## 4.4 Pump installation positions

The pump can be delivered with the following possible pumphead installation positions:

Position	Description	Pump layout
1	Pump ports at left hand side when facing the pump at the cover.	
2	Pump ports at right hand side when facing the pump at the cover.	
3	Pump ports facing upwards.	
4	Pump ports facing downwards.	

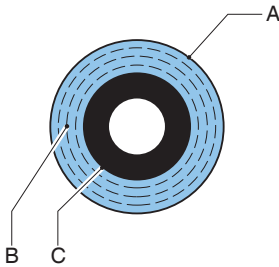
Concerning pumps Bredel 40, Bredel 50, Bredel 65, Bredel 80, and Bredel 100 the inspection window always resides between the inlet and the outlet port. An accurate reading of the lubricant level through the inspection window is only possible at pump positions 1 and 2. An accurate reading of the lubricant level through the inspection window is not possible at pumps in pump positions 3 and 4

At every pump position, operational rotation of the rotor is possible in both directions. In this manual the illustrations are based on pumphead position 2.



## 4.5 Hose

### General



A Extruded or wrapped outer layer made of natural rubber    C Extruded or wrapped inner liner  
B Nylon reinforcement layers

The hose liner material should be chemically resistant to the process fluid being pumped. For each pump model various hose types are available. Choose the most appropriate for your application.

The material of the inner liner of the hose determines the hose type. Each hose type is marked by a unique colour code.

Hose type	Material	Colour code
NR Metering and NR Transfer	Natural rubber	None
		Purple
		Purple/Green
NBR	Nitrile rubber	Yellow
NBR for food*	Nitrile rubber	Yellow
F-NBR for food (white inner liner)*	Nitrile rubber	Yellow
EPDM	EPDM	Red
CSM	CSM	Blue

#### \*See also

Dedicated manuals:

NBR hoses for food contact, part number 28-29211330

F-NBR hoses for food contact, part number 28-29211322

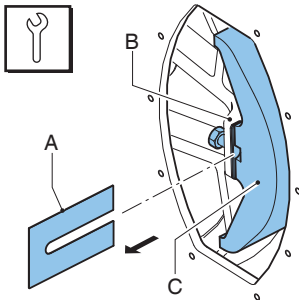
**Note:** Contact your Bredel representative for advice about the chemical and temperature resistance of the hoses.

The Bredel hoses are carefully manufactured and quality checked to achieve minimum tolerances in wall thickness.

It is very important to guarantee the correct compression of the hose, because:

- When the compression is too high, it creates an excessive load on the pump and hose, which may reduce the life of the hose and bearings.
- When the compression is too low, it cuts capacity and causes backflow. Backflow reduces the life of the hose.

### Hose compression force adjustment



In order to achieve optimal life of the hose, the compression force of the pump hose can be adjusted by placing a number of shims under the pressing shoes. The shims (A) are fitted between the rotor (B) and the pressing shoe (C). The number of shims will vary for each counterpressure situation.

#### See also

Refer to "Adjust the compression force (shimming)" on page 75 for how to select and install the shims.

### Lubrication and cooling

The pumphead is filled with Bredel Genuine Hose Lubricant. This lubricant lubricates the pressing shoes and dissipates the generated heat via the pump and the cover.

The lubricant is food grade. The user is responsible to ensure the chemical compatibility of the lubricant with the fluid to be pumped.

#### See also

Refer to "Lubricant table pump" on page 94 for the required quantity and NSF registration.

Refer to "Hose failure" on page 45 for the consequences of a hose failure.

**Note:** Consult your Bredel representative for advice on lubrication when operating the hose pump below 2 rpm.

## 4.6 Gearbox

The hose pump types described in this manual use planetary gearbox units.

The gearbox units are characterized by their compact and modular construction. This modular construction enables a wide range of reductions, torques and connection possibilities for the electric motor.

Refer to the documentation supplied with the gearbox for installation and maintenance information. In case of doubt, consult your Bredel representative.

### See also

Refer to "Changing oil in the gearbox" on page 53

Refer to "Specifications" on page 92

If the pump is to be used in potentially explosive atmospheres: Refer to "Use in potentially explosive atmospheres" on page 15

## 4.7 Electric motor

If the electric motor has been standard supplied by the manufacturer, it is a standardized squirrel-cage motor.

### See also

If the pump is to be used in potentially explosive atmospheres, Refer to "Use in potentially explosive atmospheres" on page 15

Refer to "Specifications" on page 92

## 4.8 Available options

The following options are available for the hose pump:

- High (lubricant) level float switch
- Low (lubricant) level float switch
- Revolution counter
- Cover Lifting Device
- Epoxy pressing shoes
- Stainless steel flanges, flange brackets, hose clamps, support and mounting parts
- Different flange standards (EN,ANSI,JIS)
- Several hose types
- Vacuum assist facility to improve suction
- Heavy duty bearings
- Special configuration for use in potentially explosive atmospheres



The high level float switch is mandatory for use in potentially explosive atmospheres. If the pump is to be used in potentially explosive atmospheres, contact your Bredel representative.

## 5 Installation

### 5.1 Unpacking

Unpack all parts carefully, retaining the packaging until you are sure all components are present and in good order. Check against the components supplied list, below.

#### Packaging disposal

Dispose of packaging materials safely, and in accordance with regulations in your area. The outer carton is made of corrugated cardboard and can be recycled.

### 5.2 Inspection

Check that all components are present. Inspect components for damage in transit. If anything is missing or damaged, contact your distributor immediately.

Report any damage immediately to your Bredel representative.

### 5.3 Installation conditions

#### Ambient conditions

Make sure that the hose pump is in an area where the ambient temperature during operation is not lower than -20 °C and not higher than +45 °C.

The minimum start-up temperature for the gearbox is -10 °C. A heater is required for temperatures below -10 °C.

#### Set-up

It is recommended that the pump is sited on a flat, horizontal, rigid surface, free from excessive vibration, to ensure the correct lubrication of the gearbox and correct pumphead operation. Allow a free flow of air around the pump to ensure that heat can be dissipated. Ensure that the ambient temperature around the pump does not exceed the recommended maximum operating temperature.

The pump materials and protective layers are suitable for indoor set-up and a protected outdoor set-up. Under certain conditions the pump is suitable for limited outdoor setup or a salty or aggressive atmosphere. Contact your Bredel representative for advice.

Ensure sufficient room around the pump to carry out the necessary maintenance.

Make sure that the room is sufficiently ventilated, so that the heat developed by the pump and drive can be discharged. Keep some distance between the ventilation cover of the electric motor and wall to enable the supply of necessary cooling air.

#### Installation specifications

Recommended operating temperature range (°C)	-20 to 45
Maximum floor slope (mm per metre)	50

## Pipework

When determining and connecting suction and discharge lines consider the following points:

- The bore size of the suction and discharge lines must be larger than the bore size of the pump hose. In case of doubt, consult your Bredel representative.
- Avoid sharp bends in the discharge line. Make sure that the radius of the bent discharge line is as large as possible. It is recommended to use Y-connections instead of T-connections.
- Keep the delivery and suction lines as short and direct as possible.
- Select the correct mounting material for flexible hoses and make sure that the installation is suited for the design pressure of the system.
- Do not exceed the maximum working pressure of the hose pump.
- Prevent the valves in the suction and discharge lines from being shut while the pump is running.

### See also

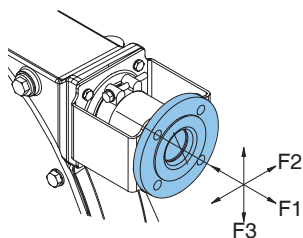
Refer to "Performance" on page 92



### CAUTION

**Consider the maximum permissible working pressure on the discharge side. Exceeding the maximum working pressure may lead to serious damage to the pump.**

- Contact your Bredel representative for advice on mounting pulsation dampening devices. A pulsation dampener and/or inlet pulse accumulator may be necessary if the relative density and pump speed is high and the line lengths are long.
- The self-priming and positive displacement nature of peristaltic pumps means that valves are not required. If for whatever reason valves are fitted into the system, they must have a straight fluid path and cause minimum restriction to flow in the pumping circuit. Note that the presence of check valves directly in the process stream may increase pulsation and negatively impact hose life.
- For the ease of hose changing and some pulsation suppression, it is recommended to use a segment of flexible hose between the pump flange and hard piping of the suction and/or discharge line. A segment of three quarters (3/4) of the pump hose length for the flexible pipe work is recommended. Bredel also recommends installing an isolation valve and pipedrain in the suction and discharge pipework to allow fluid isolation and drainage from the pump during maintenance. Following these recommendations will help to minimize the exposure of process fluid to maintenance personnel.
- Make sure that the maximum forces on the flanges are not exceeded. The permissible loads are given in the following table.



### Maximum permissible loads [N] on the pump flange

Force	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
F1	1000	1400	1400	2000	2000
F2	200	300	300	400	400
F3	500	700	700	1000	1000

### Motor

The motor connection must meet the local applicable regulations. A thermal safety device should reduce the risk of a motor overload. For connecting PTC thermistors (if present) a special thermistor relay must be used. In case of doubt, contact your Bredel representative for advice.

Refer to the documentation supplied with the electric motor for information on how to connect the motor to your power supply.

### Frequency controller



#### WARNING

**A frequency controller that is fitted without manual control can start the pump automatically when power is applied.**

If the hose pump is fitted with a frequency controller, consider the following points:

- Take precautions so the motor does not restart automatically after an unscheduled stop. In the event of a power or mechanical failure, the frequency controller stops the motor. When the cause of the failure is removed, the motor can restart automatically. The automatic restart can be dangerous in certain pump installations.
- All control cables outside the enclosure must be shielded and have a cross sectional area of at least 0.22mm<sup>2</sup>. The shielding must be connected to earth at one end. In case of doubt, contact your Bredel representative for advice.

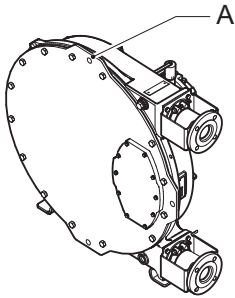
## 5.4 Lifting and moving the pump



Lifting should be performed according to standard Health and Safety guidelines and should be performed by qualified personnel only.



Do not use the holes in the pump supports to lift the hose pump.



For lifting and moving, the pump has a lifting point. This lifting point (A) is located at the upper side of the cover.

The maximum rating of the lifting point depends on the pump model. Make sure that the total of weight to be moved will not exceed this maximum rating.

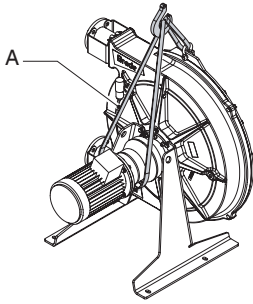
### Maximum rating of the lifting point of the pumphead

Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
200kg	390kg	670kg	1020kg	1580kg

### See also

For the weights, Refer to "Weights" on page 95





The complete hose pump, i.e. pumphead, gearbox and electric motor, must be lifted using the lifting point of the pumphead plus additional support using suitably rated straps or slings (A). Never exceed the maximum rating of the lifting point of the pumphead.

## 5.5 Placing the pump

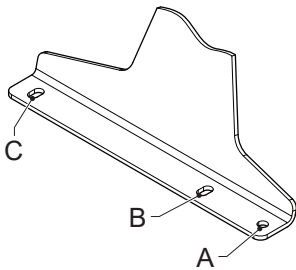


**Do not use holes (B) when the pump is placed on the levelling elements. This can cause the pump to tilt.**



**Do not use the holes in the pump supports to lift the hose pump.**

The pump can be fixed to the floor using anchors. Alternatively the pump can be placed on the floor using levelling elements.



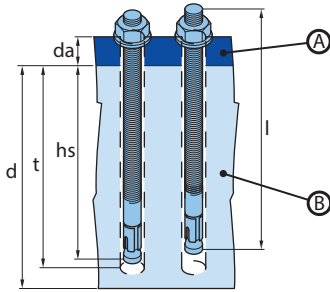
- In case of fixing to the floor use holes (A) or (B) and holes (C) at both sides of the pump.
- In case of levelling elements, use holes (A) and holes (C) at both sides of the pump.

**Note:** If the pump installation position is in position 4, then the use of levelling elements is not possible.

## Using anchor bolts

Position the pump on a horizontal surface. Use suitable anchor bolts to attach the pump to the floor surface.

Follow the next steps to make sure the anchor bolts are used properly. Use the specifications below.



A. Pump support

B. Foundation

1. Drill the holes.
2. Clean the bore holes.
3. Use a hammer to drive the anchor bolt into the bore.
4. Tighten the bolt to the applicable torque setting (MD).

Item	Pump	Specification	Unit
Flange thickness ( $d_a$ )	Bredel 40	6	mm
	Bredel 50	8	
	Bredel 65	10	
	Bredel 80	15	
	Bredel 100	15	
Flange hole diameter	Bredel 40 - Bredel 65	18 x 30	
	Bredel 80 - Bredel 100	22 x 45	
Bredel part no.	Bredel 40 - Bredel 65	28-F550041	-
	Bredel 80 - Bredel 100	28-F550048	
Bolt thread	Bredel 40 - Bredel 65	M16	-
	Bredel 80 - Bredel 100	M20	

Item	Pump	Specification	Unit
Anchor bolt length (l)	Bredel 40 - Bredel 65	145	mm
	Bredel 80 - Bredel 100	145	
Minimum foundation height (d)	Bredel 40 - Bredel 65	250	mm
	Bredel 80 - Bredel 100	250	
Drill diameter	Bredel 40 - Bredel 65	16	mm
	Bredel 80 - Bredel 100	20	
Minimum drill depth (t)	Bredel 40 - Bredel 65	110	mm
	Bredel 80 - Bredel 100	110	
Mounting depth (h <sub>2</sub> )	Bredel 40 - Bredel 65	100	mm
	Bredel 80 - Bredel 100	100	
Torque setting (M <sub>D</sub> )	Bredel 40 - Bredel 65	50	mm
	Bredel 80 - Bredel 100	100	

### Using levelling elements

Use four suitable levelling elements to place the pump on a horizontal surface. Adjust the elements such that the pump does not wobble and the weight of the pump is evenly spread over the elements at left hand and right hand sides.

Pump	Diameter holes (A) [mm]	Size holes (C) [mm]	Element thread diameter	Rated load capacity per element [kg]
Bredel 40	18	30x18	M16	220
Bredel 50	18	30x18	M16	400
Bredel 65	18	30x18	M16	700
Bredel 80	22	45x22	M20	1200
Bredel 100	22	45x22	M20	1700

## Installing the cover lifting device (CLD)

The cover lifting device is available for Bredel 50, Bredel 65, Bredel 80 and Bredel 100 only. It is applicable for pump positions 1 and 2 only.

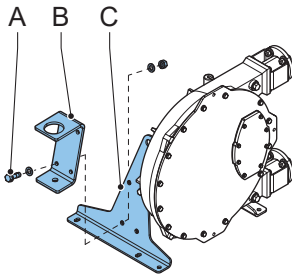
### See also

Refer to "Pump installation positions" on page 24

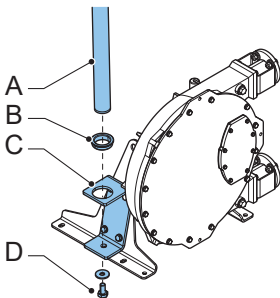


### WARNING

**Do not exceed the maximum allowed lifting weight of 200 kg/440 lbs during the lifting of the cover. This is also indicated on the CLD.**

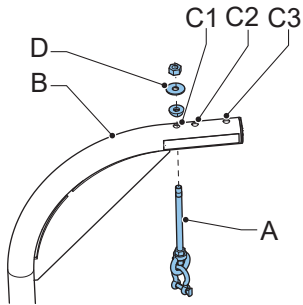


1. Determine the position. For pump position 1, the device must be mounted on the right pump support looking at the pump cover. For pump position 2, the device must be mounted on the left pump support.
2. Fit the bracket (B) with the supplied fasteners (A) to the pump support (C). The torque on the bolts should be as given in the table below.

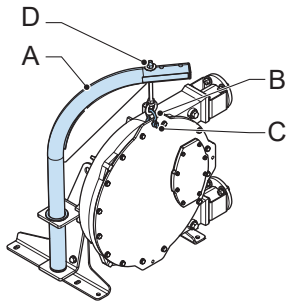


3. Place the plastic bearing (B) on top of the bracket (C).
4. Place the boom (A) into the bracket (C).
5. Fix the boom with washer and bolt (D) and tighten the bolt. The torque on the bolt should be as given in the table below. The boom can rotate around a vertical axis now.

Position	Torque [Nm]
Bracket bolt	210
Boom fixation bolt	50



- Place the threaded rod (A) in the correct hole in the boom (B). For Bredel 50 apply hole C1, for Bredel 65 hole C2 and for Bredel 80 and 100 hole C3.
- Place rings and nut (D) on the rod (A).



- Turn the boom (A) so that the threaded rod with the shackle (B) is above the cover of the pump. Mount the shackle onto the top hole (C) in the pump cover. Tighten nut (D) slightly. When the cover is dismantled the height can be adjusted by turning nut (D).

## 6 Commissioning

### 6.1 Preparations



#### WARNING

A frequency controller that is fitted without manual control can start the pump automatically when power is applied.



#### WARNING

Disconnect and lock the power supply to the pump drive before any work is carried out. In case the motor is fitted with a frequency controller and has a single-phase power supply, wait two minutes to make sure that the capacitors have discharged.

1. Connect the electric motor and, if present, the frequency controller in conformance with the locally applicable rules and regulations. Have the electrical installation work carried out by qualified personnel.
2. Check that the lubricant level is above the minimum level line in the inspection window. If necessary refill with Bredel Genuine Hose Lubricant via the breather plug.
3. Check that the correct number of shims corresponds with your application.

#### See also

Refer to "Frequency controller" on page 31

Refer to "Changing lubricant" on page 52

Refer to "Specifications" on page 92

## 6.2 Commissioning

1. Connect the pipework.



### CAUTION

**Make sure that there are no obstructions such as closed valves.**

2. Connect the pump to the electrical supply.
3. Switch on the electrical supply.
4. Check the rotation of the rotor.
5. If the pump hose is installed with hose clamps, make sure that the hose clamps are fitted properly.
6. Check the capacity of the hose pump. If the capacity differs from your specification, follow the instructions in Troubleshooting or contact your Bredel representative for advice.
7. If a frequency controller is present, check the capacity range. In case of any deviations consult the supplier's documentation.
8. Check the hose pump in accordance with points 2 to 4 of the maintenance table.

### See also

Refer to "Maintenance and periodic inspections" on page 48

Refer to "Tightening the hose clamps" on page 62 for how to tighten the hose clamps

Refer to "Troubleshooting" on page 86

## 7 Operation

### 7.1 Temperature

The pump will heat up during normal operation. Heat is generated as the pump hose is compressed and released. The heat is removed by the lubricant and transported to the pump housing and cover. This will result in a temperature higher than the ambient temperature.



#### WARNING

**Avoid contact with the casing and cover under conditions of high pressure and running speed.**

### 7.2 Power rating

The pump requires a certain amount of power for the specified operating condition(s). The gearbox and motor are sized to deliver that power at the given revolution speeds.

#### See also

Refer to "Performance graphs" below to determine the required power.



#### WARNING

**Overloading the motor can lead to serious motor damage. Do not exceed the maximum power rating of the motor.**



#### WARNING

**Overloading the gearbox leads to increased tooth wear and shortened bearing life. This can lead to serious gearbox damage. Do not exceed the maximum power rating of the gearbox.**

### 7.3 Performance graphs

The pump operating window can be found in the performance graphs in which discharge-pressure curves are displayed in a speed-power diagram.

The pump and hose are designed to handle a discharge pressure up to 1600 kPa. The triangular area between the 500 kPa and the 1600 kPa lines describes the allowed performance area. The required duty points have to fall within this area. For discharge pressures lower than 500 kPa use the 500 kPa line.

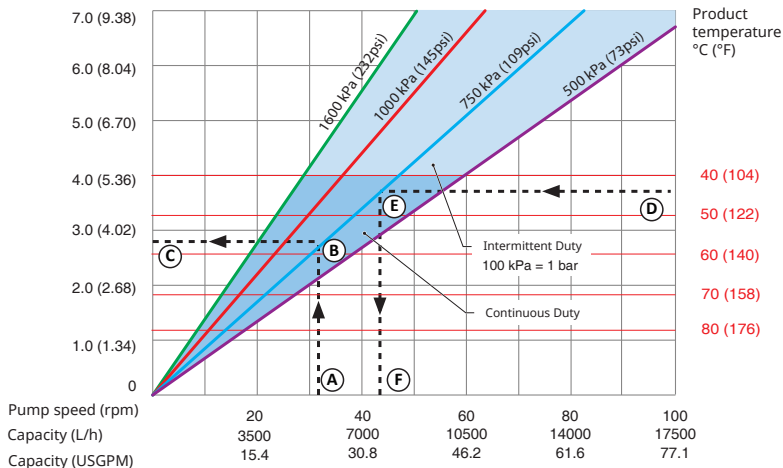
In the direction of higher speeds and powers, pump operation is limited by the heat generated, the product temperature and the ambient temperature. Product temperature lines determine a distinction between areas of continuous operation and intermittent operation in the graphs. The graphs apply for a maximum ambient temperature of 45 °C.

If the duty for an application is specified in the area of intermittent operation, let the pump stand still to cool down for at least one hour after three hours of operation.



## How to use the graphs

Required motor power in kW (HP)



- |   |                             |   |                             |
|---|-----------------------------|---|-----------------------------|
| A | Required flow or pump speed | D | Product temperature         |
| B | Required discharge pressure | E | Required discharge pressure |
| C | Required motor power        | F | Maximum allowed pump speed  |

Refer to the graph to understand how to use the graphs to determine the required motor power or the maximum allowed pump speed.

To determine the required motor power:

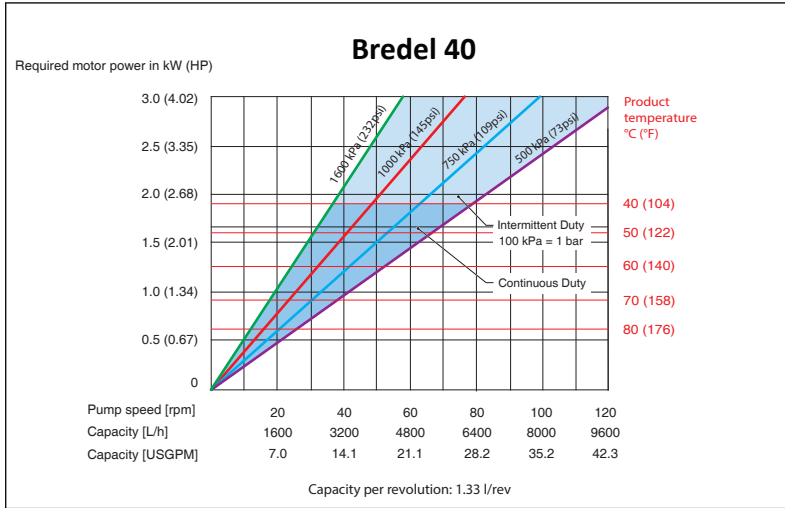
1. Start at the required flow or pump speed (A).
2. Meet the line of the required discharge pressure (B).
3. Read the required motor power (C).

To determine the maximum allowed pump speed:

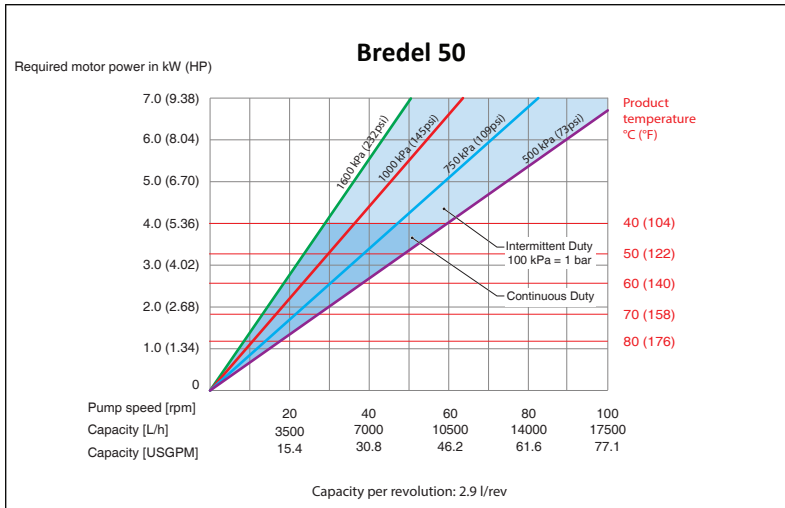
1. Start at the product temperature (D)
2. Meet the line of the required discharge pressure (E).
3. Read the maximum allowed pump speed (F).

**Note:** Pump stroke volume is based on new hoses and flooded suction. Actual stroke volume may vary.

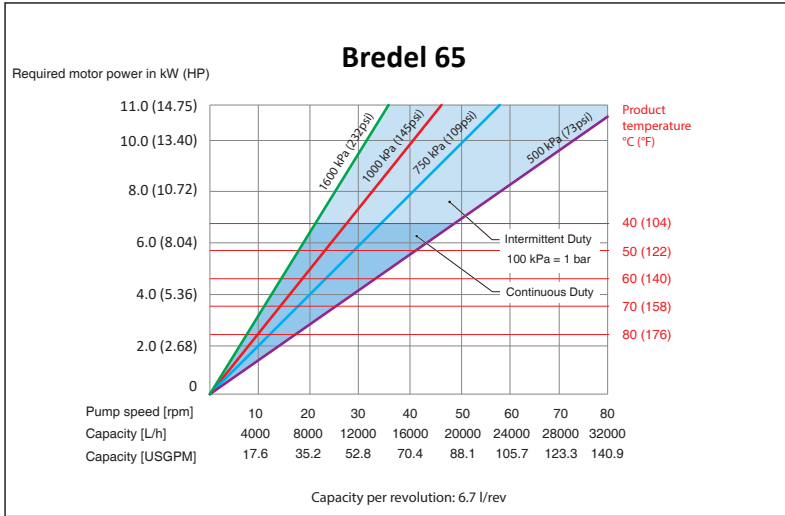
## Performance graph Bredel 40



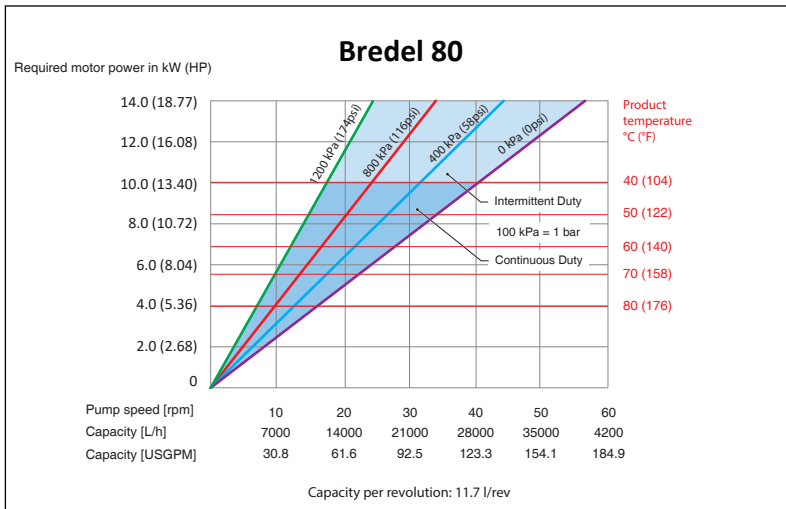
## Performance graph Bredel 50



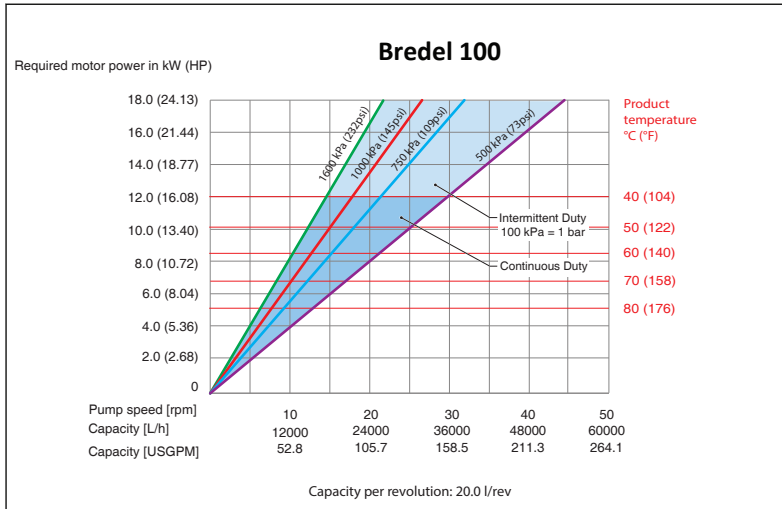
### Performance graph Bredel 65



### Performance graph Bredel 80



## Performance graph Bredel 100



### 7.4 Dry running

Dry running is a running condition of the pump when no fluid is flowing through the hose. Bredel hose pumps allow dry running for limited periods.

Dry running imposes an additional thermal load on the hose, because a part of the internal heat associated with repetitive hose compression is normally removed by the process fluid. So dry running increases the wear on the hose.

The thermal load depends on the running speed of the pump, as well as the rotor type (low pressure or medium pressure).

To minimise the extra wear, it is advisable to minimise dry running periods to less than a minute at a time.

## 7.5 Hose failure

### Cause of a hose failure

The hose in a peristaltic pump has to withstand many load cycles of compression. The repetitive stress cycles will cause the hose to deteriorate and eventually fail.

### Result of a hose failure

A hose failure will result in direct contact between the pumped fluid and the pump lubricant, the internal parts, and the dynamic seal.

### Consequences of a hose failure

In general, this will not cause a hazardous situation because the Bredel Genuine Hose Lubricant is harmless (approved by the United States Food and Drug Administration). However, there is an exception in case of pumping a strong oxidiser or a strong acid.

#### See also

Refer to "Lubricant table pump" on page 94 for the required quantity and NSF registration.

## Hazardous situations



### WARNING

**Avoid direct contact between a strong oxidiser or a strong acid and Bredel Genuine Hose Lubricant. This can cause unwanted chemical reactions. Use an alternative lubricant to avoid hazardous situations. In case of doubt, consult your Bredel representative..**

### Additional downtime

Hose failure will result in additional downtime, because you must clean the pump before a new hose installation.

**Note:** Regularly replace the hose to avoid hose failure and additional downtime. Hose life depends on the operating condition, process fluid and hose material. The end-user should be aware of this and establish the frequency of preventive hose replacement. In case of doubt, consult your Bredel representative.

### Large spill of product

In case the pressure in the process line (reservoir) is above the pressure in the pump housing (ambient pressure), the process fluid can enter the pump housing. If there is no check valve in the process line fluid can flow from the reservoir into the pump housing and escape through the breather onto the floor. This could lead to a large spill of product outside the pump. Reversed flow protection is advised. This is not part of the scope of delivery.

A high-level float switch can be applied to detect fluid escaping through the breather.

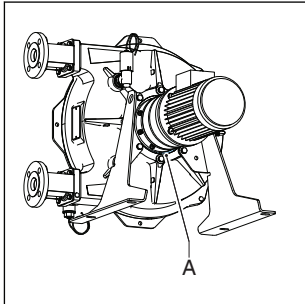
### See also

Refer to "Fitting options" on page 78

## 7.6 Fluid leakage

The pump uses a lubricated rotor to compress the hose. This means the pumphead must be filled with sufficient lubricant during operation. This lubricant is contained in the pump housing by the front cover and by a dynamic seal on the back. The gearbox is filled with gearbox lubricant.

Seal damage can occur due to normal wear in time, but is seriously accelerated if the seal gets in contact with contaminated lubricant. Thorough cleaning of the pump housing after a hose failure and regular replacement of the lubricant is strongly advised.



**Note:** Regularly check the pumphead for any leakage around the cover, the hose connections, and the rear of the pumphead.

The pumphead and gearbox are directly coupled to each other. A special feature is included in the pumphead to allow early detection of seal damage of the pump or gearbox.

This feature is called the leakage zone (A). Drops of lubricant visible at the back of the pump indicate likely seal failure. To avoid consequential damage, the pump must be stopped and lubricant levels of the pumphead and gearbox must be checked. The damaged seal should be replaced.



### **WARNING**

**Risk of injury from falling! Process fluid mixed with pump lubricant that is leaking from the pump can make floors slippery.**

## 8 Maintenance

### 8.1 General



#### WARNING

Disconnect and lock the power supply to the pump drive before any work is carried out. In case the motor is fitted with a frequency controller and has a single-phase power supply, wait two minutes to make sure that the capacitors have discharged.



#### WARNING

Do not remove the pump cover if the power cable is connected to the motor. Do not connect the power cable to the motor if the pump cover is removed.



#### WARNING

If the cover is removed when the pump hose is still in the pumphead, the compression forces on the pump hose may cause deformation of the pump housing. The hose needs to be safely removed before the cover can be replaced. Normally, the compression forces are partially compensated by the cover.



#### CAUTION

Only use original Bredel parts when maintaining the hose pump. Bredel cannot guarantee correct operation and any consequential damage that occurs from the use of non-original Bredel components.



#### CAUTION

Check that all components are present. Inspect components for damage in transit. If anything is missing or damaged, contact your distributor immediately.

**Note:** Do not install damaged parts. If in doubt, contact your Bredel representative for advice.

### 8.2 Maintenance and periodic inspections

The following maintenance schedule shows the maintenance and periodic inspection that need to be carried out on the hose pump to guarantee optimal safety, operation and life of the pump.



**Note:** It is also necessary to carry out periodic inspection of the gearbox and the electric motor. Consult their separate manuals to guarantee an optimal safety, operation and life of the gearbox and the electric motor.

Item	Action	To be carried out	Remark
1.	Check the lubricant level.	Before start-up of the pump and at scheduled intervals during operation.	2. Check that the lubricant level is above the minimum level line in the inspection window. If necessary refill with Bredel Genuine Hose Lubricant via the breather plug.  Refer to "Changing lubricant" on page 52
3.	Regularly check the pumphead for any leakage around the cover, the hose connections, and the rear of the pumphead.	Before start-up of the pump and at scheduled intervals during operation.	Refer to "Troubleshooting" on page 86
4.	Check the gearbox for any leakage.	Before start-up of the pump and at scheduled intervals during operation.	In case of doubt, consult your Bredel representative.
5.	Check the pump for deviating temperature or strange noises.	At scheduled intervals during operation.	Refer to "Troubleshooting" on page 86
6.	Check the pressing shoes for excessive wear or damage.	When replacing the hose.	Refer to "Changing the hose" on page 54
7.	Internal cleaning of the hose.	Cleaning of the system or fluid change.	Refer to "Cleaning the hose" on page 51
8.	Replace the hose.	Preventive, this means after 75% of the hose life of the first hose.	Refer to "Changing the hose" on page 54

Item	Action	To be carried out	Remark
9.	Change the lubricant.	After every second hose change, after 5000 service hours, after a year or after hose rupture whichever comes first.	Refer to "Changing lubricant" on page 52
10.	Change the oil in the gearbox.	Refer to "Lubricant for gearbox" on page 100	Refer to "Changing oil in the gearbox" on page 53
11.	Replace the pump seal.	If necessary.	Refer to "Exchanging replacement parts" on page 65
12.	Replace the wear ring.	If necessary.	Refer to "Exchanging replacement parts" on page 65
13.	Replace the pressing shoes.	Wear on the running surface.	Refer to "Exchanging replacement parts" on page 65
14.	Replace the bearings.	If necessary.	Refer to "Exchanging replacement parts" on page 65
15.	Maintenance and periodic inspection of the gearbox and motor.	Before start-up of the pump and at scheduled intervals during operation.	Refer to the manuals of the gearbox and the motor.

### 8.3 Additional maintenance in potentially explosive environments

The following maintenance scheme shows the additional maintenance and periodic inspections that need to be carried out on the hose pump to guarantee an optimal safety, operation and life of the pump in a potentially explosive environment. Refer to the separate ATEX manual, part number 28-29210322.

Action	To be carried out	Remark
Replace the bearings.	According to ATEX regulations after 20,000 hrs. service or when damage is suspected.	Refer to "Exchanging replacement parts" on page 65
Clean the hose pump.	In potentially explosive (dust) atmospheres, the dust must be removed regularly.	

## 8.4 Cleaning the hose

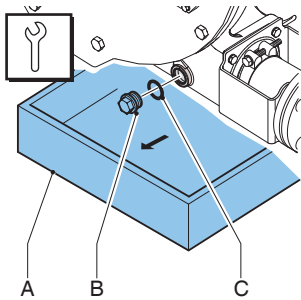
With a lot of product fluids it is necessary to have the hose cleaned immediately after the pumping process to avoid hardening of the fluid inside. The inside of the hose can be easily cleaned by rinsing the pump with clean water. If a cleaning agent is added to the water, check if the hose liner material is resistant to it. Also check if the hose can resist the cleaning temperature. Special cleaning sponge balls are also available. Refer to the documentation of the cleaning products and the hose for more information.

A proper result of a cleaning process in this way is not guaranteed by Bredel, while it strongly depends on the type of pumped fluid and the cleaning fluid applied.

For food applications, cleaning procedures are more strict. Refer to the documentation supplied with the food hose.

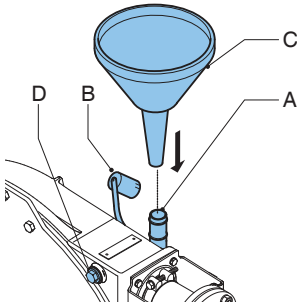
In case of doubt, consult your Bredel representative.

## 8.5 Changing lubricant

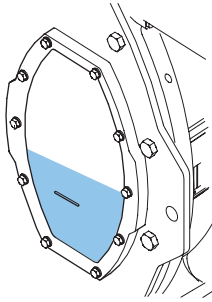


Note: The drain plug is in the bottom of the pumphead.

1. Place a tray (A) under the drain plug. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pumphead. Remove the drain plug (B). Collect the lubricant from the pump housing in the tray.
2. Check the sealing ring (C) is not damaged and replace it if necessary.
3. Position the drain plug and tighten it to the specified torque.



4. The pump housing can be filled with lubricant via the breather (A) on the rear of the pump housing. For this purpose remove the breather cap (B) and position a funnel (C) in the breather. In order to facilitate the filling with lubricant the plug (D) on the front of the pump housing can be removed. Pour the lubricant into the pump housing through the funnel.



- Keep on pouring until the lubricant level has risen above the level line in the inspection window. Place back the breather cap.

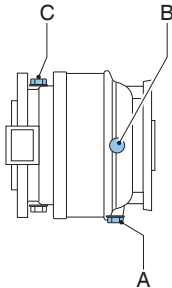
### See also

For the required quantity of lubricant, Refer to "Lubricant table pump" on page 94

Refer to "Torque figures" on page 95

## 8.6 Changing oil in the gearbox

- Isolate the pump from the electrical supply.



- Place a tray under the gearbox.
- Remove the plug (A) and drain the gearbox.

**Note:** The plug (A) is magnetically loaded. In this way metal particles in the oil are pulled to the plug.

- Clean the plug and remove any metal particles if necessary. Check that the sealing ring is not damaged and replace it if necessary.
- Place the plug back in the gearbox and tighten it firmly.
- Remove the level plug (B) and breather (C). Position a funnel in the hole of breather (C) and fill the gearbox with oil until the oil just comes out of the level plug hole (B). Place level plug (B) and breather (C) back and tighten them firmly.

## See also

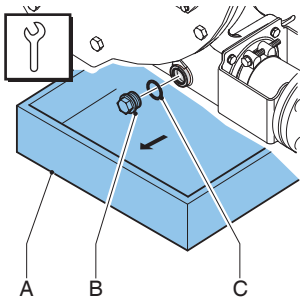
Refer to "Lubricant table pump" on page 94

7. Connect the pump to the electrical supply.
8. Switch on the electrical supply.

## 8.7 Changing the hose

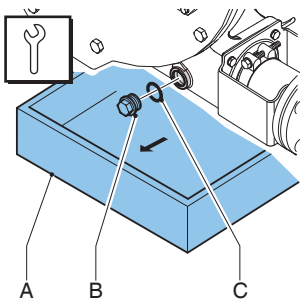
### Removing the hose

1. Isolate the pump from the electrical supply.
2. Close any shut-off valves in the suction and discharge line to minimise the loss of process fluid.

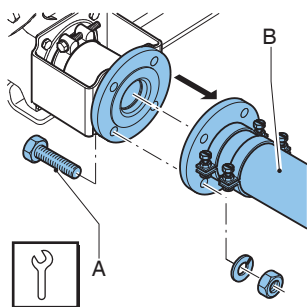


Note: The drain plug is in the bottom of the pumphead.

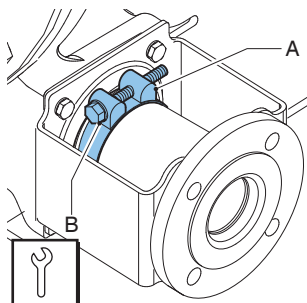
3. Place a tray (A) under the drain plug. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pumphead. Remove the drain plug (B). Collect the lubricant from the pump housing in the tray.
4. Check the sealing ring (C) is not damaged and replace it if necessary.



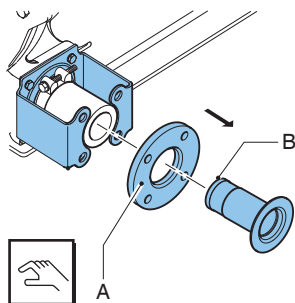
5. Check that the breather vent mounted on the rear is not obscured.
6. Position the drain plug and tighten it to the specified torque.



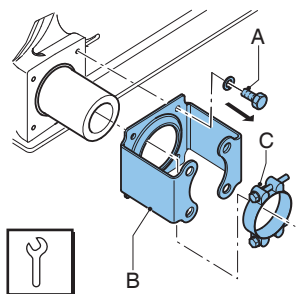
7. Loosen the retaining bolts (A) of both the suction and discharge line (B). Disconnect the suction and discharge lines.



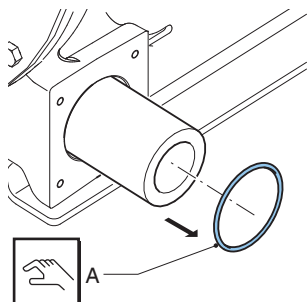
8. Loosen the hose clamp (A) of both the inlet and outlet ports by loosening the retaining bolt (B).



9. Pull the insert (B) from the hose and remove the flanges (A). Carry out this procedure both for the inlet and outlet ports.

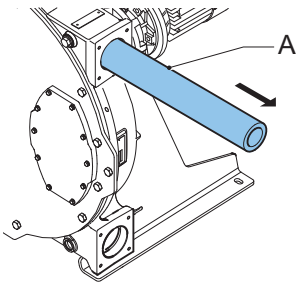


10. Loosen the retaining bolts (A) of the flange bracket (B) and remove the bolts. Slide the flange bracket and the hose clamp (C) off the hose. Carry out this procedure both for the inlet and outlet ports.



11. Slide off the sealing ring (A). Check that the sealing ring is not deformed or damaged and replace it if necessary. Carry out this procedure both for the inlet and outlet ports.
12. Connect the pump to the electrical supply.
13. Switch on the electrical supply.





14. Power out the hose (A) from the pump chamber by jogging the drive motor.

#### **WARNING**



**During jogging the drive:**

- Do not stand in front of the pump ports.
- Do not try to guide the hose by hand.

#### **See also**

Refer to "Torque figures" on page 95

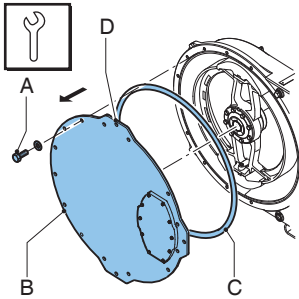
#### **Cleaning the pumphead**

1. Isolate the pump from the electrical supply.



#### **CAUTION**

**Never dismount the cover, when the pump hose is in the pumphead. The compression forces on the pump hose are partially compensated by the cover. By removing the cover, the pump housing may become deformed.**



2. Remove the cover (B) by loosening the retaining bolts (A).
3. Use lifting hole (D) to move the cover by means of a hoist or the cover lifting device (option).
4. Check the sealing ring (C) is not damaged and replace it if necessary.
5. Rinse the pumphead with clean water and remove all residues. Make sure that no rinsing water remains in the pumphead.
6. Check the pressing shoes for wear or damage and replace them if necessary.

#### See also

Refer to "Maintenance and periodic inspections" on page 48

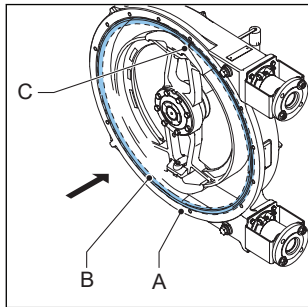
Refer to "Torque figures" on page 95

#### CAUTION



**When the pressing shoes are worn the compression force of the hose decreases. If the compression force is too low, this results in a loss of capacity by the backflow of the liquid to be pumped.**

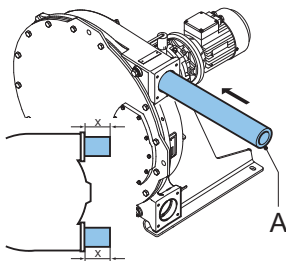
**Backflow results in a reduction of the life of the hose.**



7. Place the seal ring (B) in the groove of the pump housing (A) as such that the seam (C) in the seal is at the top side of the pump.
8. Refit the cover. Make sure that the bolts are refitted and that they are tightened in the correct order, diagonally opposite each other.
9. Connect the pump to the electrical supply.
10. Switch on the electrical supply.

### Fitting the hose

1. Clean the (new) hose on the outside and fully lubricate the outside with Bredel Genuine Hose Lubricant.



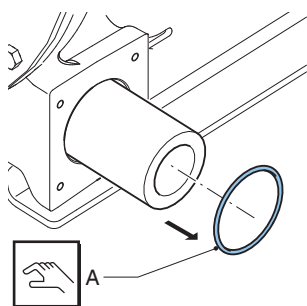
2. Fit the hose (A) via one of the ports.
3. Run the motor so that the rotor pulls the hose into the pump housing. Stop the motor when the hose sticks out equally from both sides of the pump housing.

### WARNING

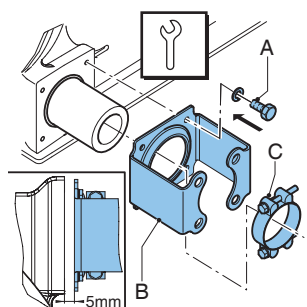


#### During jogging the drive:

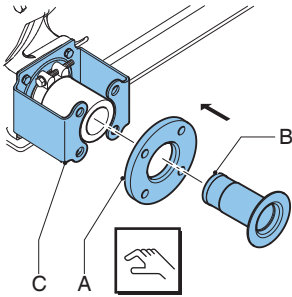
- Do not stand in front of the pump ports.
- Do not try to guide the hose by hand.



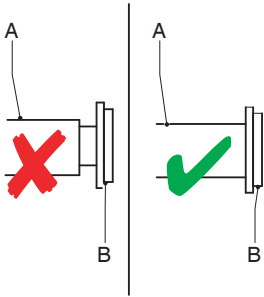
4. First fit the inlet port. Check the sealing ring (A) is not damaged and replace it if necessary. Fit the sealing ring.



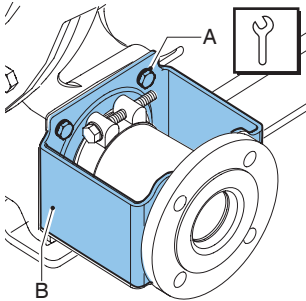
5. Check that the hose clamps (C) are not damaged and replace them if necessary.
6. Slide the flange bracket (B) and the hose clamp (C) over the hose together. Align the holes in the flange bracket with the ones at the front of the port. Position the retaining bolts (A) and tighten them until they are approx. 5 mm from the port, so that the gap between the flange bracket and the port remains.



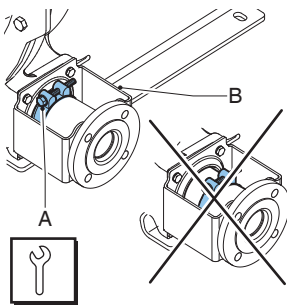
- Slide insert (B) in flange (A) and press the insert in the hose. If necessary lubricate the insert with Bredel Genuine Hose Lubricant in order to simplify mounting. Make sure that the holes in flange (A) are aligned with the holes in flange bracket (C). Check that the insert is in the correct place. If the insert is not positioned correctly, the product to be pumped or the lubricant may leak.



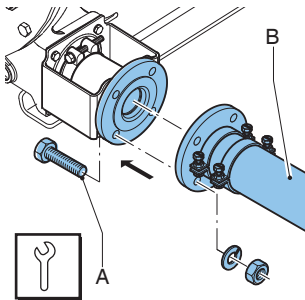
- Turn the rotor in such a way that the hose (A) is pressed firmly against the flange surface (B).



- Fully tighten the retaining bolts (A) of the flange bracket (B). Make sure that the bolts are tightened to the specified torque.



10. Position the hose clamp (A) against the O-ring chamber of the flange bracket (B) and fasten the retaining bolt.
11. Now fit the other port. For this port proceed in the same way as described above for the inlet port.
12. Fill the pump housing with Bredel Genuine Hose Lubricant.



13. Connect the suction and discharge lines (B).
14. Position the retaining bolts (A) and tighten them to the specified torque.

### See also

Refer to "Torque figures" on page 95

Refer to "Changing the hose" on page 54

Refer to "Changing lubricant" on page 52

## Tightening the hose clamps

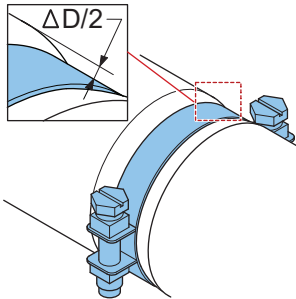
### How to tighten hose clamps in combination with steel inserts

As a first step, apply the initial setup torque value as advised in the table below. In some cases, an adjustment to the specified torque values is required. This can be due to excessive friction between the thread of the tightening bolt and the clamp. The actual clamping force needed can deviate from the clamping force derived from the specified torque values. To minimize this risk, it is advised to grease the clamping bolts.

If the specified torque values lead to a leaking hose connection, it is advised to carefully increase the bolt torque until a sealed situation is obtained. Here the absolute torque value is of less importance. The maximum allowable amount of clamping is indicated in the table below as a minimum allowable outer diameter of the clamp (OD). A suitable indication is the difference between hose outer diameter and clamp outer diameter  $\Delta D$ .

Description	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Initial setup torque, steel inserts [Nm]	25	40	40	40	40
Initial setup distance $\Delta D/2$ * [mm]	0	0	0	0	0
Minimum allowable clamp outer diameter (OD) [mm]	64	77	95	116	138
Approximate maximum distance $\Delta D/2$ * [mm]	1.5	2	2.5	3	3.5

\*  $\Delta D$  = difference of hose outer diameter and clamp outer diameter



### How to tighten hose clamps in combination with plastic inserts

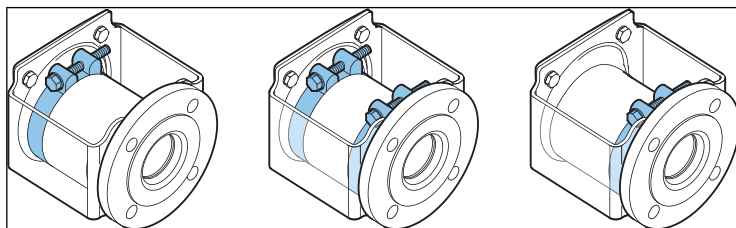
Bredel pumps are supplied with one clamp per hose end as standard. The clamp is positioned close to the pump side to assure a sanitary connection between hose and insert. In case of plastic inserts, the amount of clamping must be limited to avoid deformation of the plastic insert which would lead to leakage instead.

As a first step apply the initial setup torque value as advised in the table below. Then carefully increase the torque and keeping the  $\Delta D/2$  within the range specified. For operating pressures above 8 bar it is strongly recommended to place a second clamp close to the flange. This clamp can be tightened to seal up to 16 bar.

Description	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Initial setup torque (plastic inserts)[Nm]	12	20	20	20	20
Initial setup distance $\Delta D/2$ * [mm]	0	0	0	0	0
Approximate maximum distance $\Delta D/2$ * at 0–8 bar (clamp near pump housing) [mm]	0.5	0.5	0.5	0.5	0.5
Approximate maximum distance $\Delta D/2$ * at 8–16 bar (clamp near flange) [mm]	1	1	1.5	2	2

\*  $\Delta D$  = difference of hose outer diameter and clamp outer diameter

Alternatively in case a sanitary connection is not required the single clamp can be repositioned close to the flange and tightened to seal up to 16 bar.



Left: Standard arrangement with one hose clamp near the pump housing. For low pressure demand.

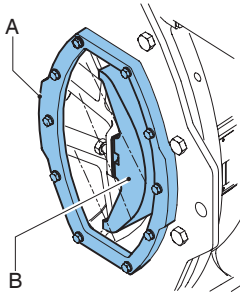
Centre: Alternative arrangement with two hose clamps. For high pressure and sanitary demand.

Right: Alternative arrangement with one hose clamp near the flange. Only for high pressure demand.

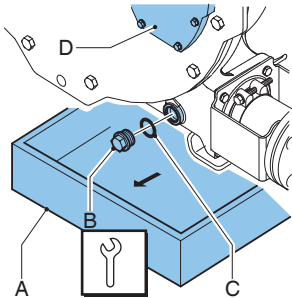


## 8.8 Exchanging replacement parts

### Replacing the pressing shoes

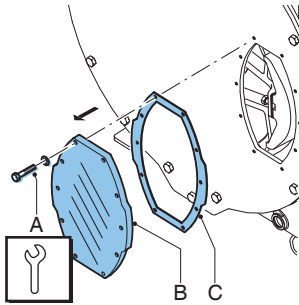


1. Jog the motor until the pressing shoe (B) is positioned in view of the inspection window (A).
2. Isolate the pump from the electrical supply.

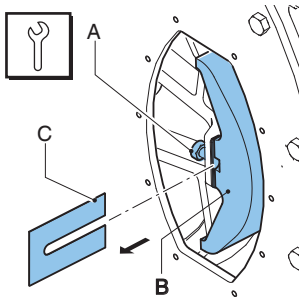


Note: The drain plug is in the bottom of the pumphead.

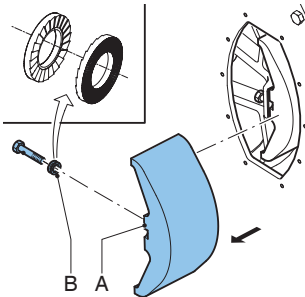
3. Place a tray (A) under the drain plug. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pumphead. Remove the drain plug (B). Collect the lubricant from the pump housing in the tray.
4. Drain as much Bredel Genuine Hose Lubricant until the level has lowered just below the inspection window (D).
5. Check the sealing ring (C) is not damaged and replace it if necessary.
6. Position the drain plug and tighten it to the specified torque.



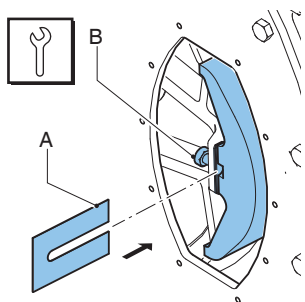
7. Loosen the retaining bolts (A) of the inspection window (B) and remove the bolts. Remove the inspection window. Care must be taken not to damage the gasket (C).



8. Loosen the retaining bolt(s) (A) of pressing shoe (B) a few turns. Remove the shims (C) if present. Loosen the retaining bolt(s) (A) of pressing shoe (B) completely and remove the pressing shoe.



9. Position the (new) pressing shoe (A), check that the NordLock®-rings (B) have been positioned correctly and tighten the retaining bolt(s) a few turns.



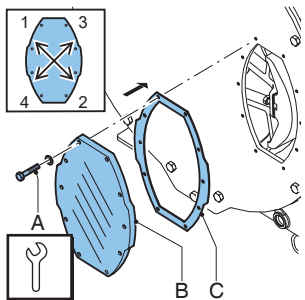
10. Fit the shims (A) . Tighten the retaining bolt(s) (B) with the specified torque.

### See also

In order to determine the correct number of shims for your specific application Refer to "Shims specifications" on page 96.

Refer to "Torque figures" on page 95

11. Connect the pump to the electrical supply.
12. Switch on the electrical supply.
13. Jog the motor until the second pressing shoe is positioned in view of the inspection window.
14. Isolate the pump from the electrical supply.
15. Repeat the procedure for this second pressing shoe.



16. Check the gasket (C) for damage and replace it if necessary.
17. Refit the inspection window (B). Make sure that all retaining bolts (A) are refitted and that they are tightened in the correct order, diagonally opposite each other. Tighten the bolts with the specified torque.
18. Refill the lubricant.
19. Connect the pump to the electrical supply.
20. Switch on the electrical supply.

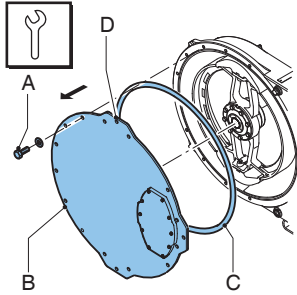
## See also

Refer to "Torque figures" on page 95

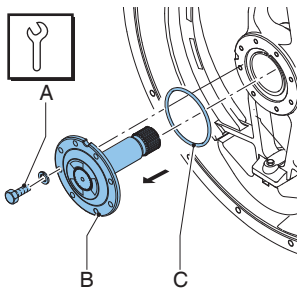
Refer to "Changing lubricant" on page 52

### Replacing seal and wear ring

1. Remove the pump hose.
2. Isolate the pump from the electrical supply.



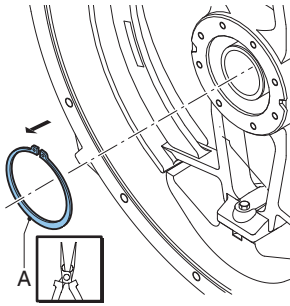
3. Use lifting hole (D) to move the cover by means of a hoist or the cover lifting device (option).
4. Remove the cover (B) by loosening the retaining bolts (A).
5. Check the sealing ring (C) is not damaged and replace it if necessary.



6. Remove the retaining bolts (A) of the drive shaft (B) and remove the drive shaft.

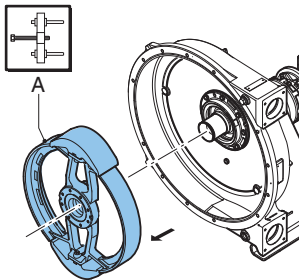
Note: If the drive shaft cannot be removed manually, use a screwdriver in the slots in the rotor provided for this purpose.

7. Check the sealing ring (C) is not damaged and replace it if necessary.



8. Dismount the retaining circlip (A) with the correct tool.

**Note:** The rotor retaining circlip (A) locks the rotor on the hub.

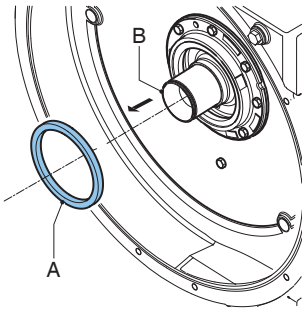


9. Fit the necessary lifting means before dismounting the rotor. Extract the rotor (A) from the hub. A suitable puller or similar extraction tool will be required during this stage of the disassembly.

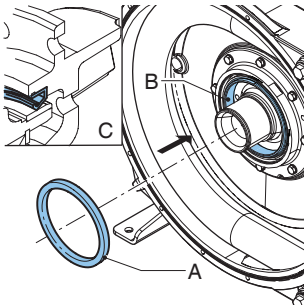


**When removing the rotor a belt or similar lifting aid must carry the weight of the rotor. For the specific weight of the rotor:**

**Refer to "Weights" on page 95**

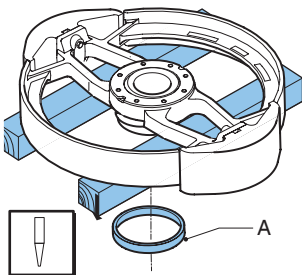


10. Remove the seal (A) from the hub (B). Clean and degrease the bore.

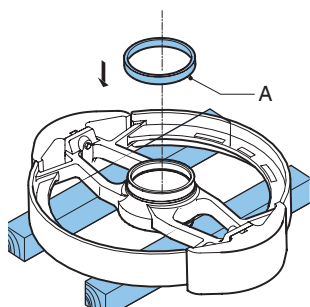


11. Fit a new seal (A) using a wooden block and hammer. Carefully hit the seal crosswise and with equal strength in the bore until it touches the hub. The seal must be fitted in the correct orientation (C). Make sure that the open side points to the pump cover.

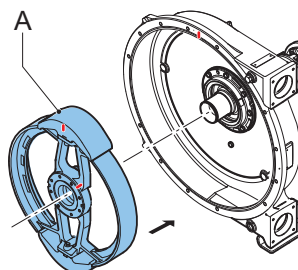
**Note:** If needed for ease of mounting, slightly oil the cavity area (B).



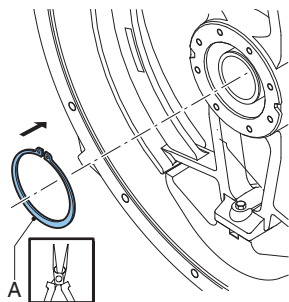
12. Support the rotor with wooden blocks at 90° to the spokes, with the wear ring (A) facing down. Position a suitable punch against the rear of the glued wear ring. Prevent damage to the wear ring seat or other parts.



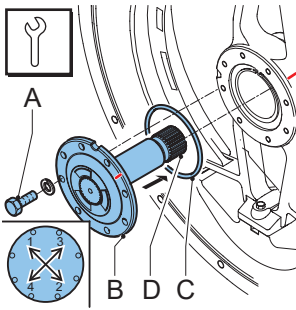
13. Turn the rotor over. Make sure that the seats of the new wear ring (A) and rotor are clean, dry and free of grease. Apply Loctite® type 641 or 603 both on the rotor and the wear ring. Position the new wear ring with the tapered edge facing up. Use a plastic hammer to fit the ring on the rotor until it touches the rotor completely.



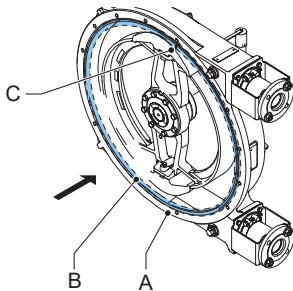
14. Check that the hub is clean and free of grease.
15. Fit the rotor (A). The bearings have been placed on the hub with a slight interference fit. Use a pressing tool to press the rotor on the hub.



16. Check rotor retaining circlip (A) for any signs of damage and replace if necessary. Mount the retaining circlip (A). Use the correct tools for this purpose.



17. Heavily grease the spline (D) of the drive shaft (B) with a graphite-loaded grease.
18. Ensure the mating faces of the drive shaft and rotor are clean, dry and free from lubricant.
19. Check that the sealing ring (C) is not damaged and replace it if necessary.
20. Fit the sealing ring in the groove of the shaft flange.
21. Fit the drive shaft.
22. Turn the rotor until the bolt holes in the drive shaft correspond with the threaded holes in the rotor.
23. Mount the retaining bolts (A) of the drive shaft. Tighten the bolts finger-tight. Tighten them diagonally opposite to each other to the specified torque limits.



24. Place the seal ring (B) in the groove of the pump housing (A) as such that the seam (C) in the seal is at the top side of the pump.
25. Refit the cover. Make sure that the bolts are refitted and that they are tightened in the correct order, diagonally opposite each other.
26. Connect the pump to the electrical supply.
27. Switch on the electrical supply.
28. Fit the (new) pump hose.

#### See also

Refer to "Fitting the hose" on page 59

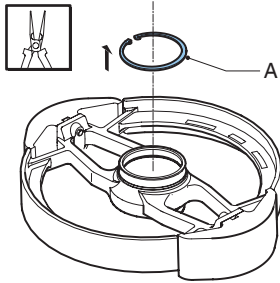


## Replacing bearings

1. Remove the pump hose.
2. Remove the cover.
3. Remove the rotor.

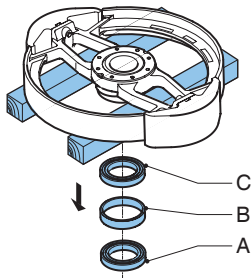
### See also

Refer to "Replacing the pressing shoes" on page 65

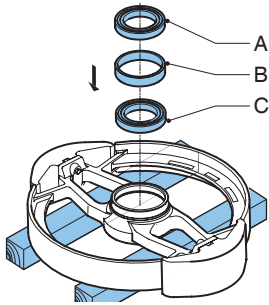


4. Lay the rotor on a flat surface with the wear ring face up.
5. Dismount the retaining circlip (A) with the correct tool.

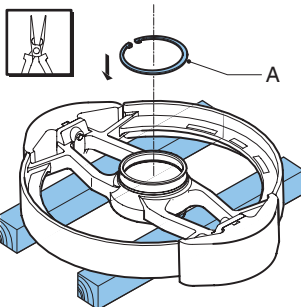
**Note:** The rotor retaining circlip (A) locks the rotor on the hub.



6. Turn the rotor over. Remove the bearing (A), the spacer ring (B) and the bearing (C) with the correct tool. Check the spacer ring (B) for damage and replace it if necessary. Retain the spacer ring (B).



7. Turn the rotor over. Check that the hub is clean and free of grease. Press using the pressing tool the first bearing (C) in its place. Position the spacer ring (B). Subsequently press the second bearing (A) in its place.



8. Check rotor retaining circlip (A) for any signs of damage and replace if necessary. Mount the retaining circlip (A). Use the correct tools for this purpose.
9. Fit the rotor, the cover and pump hose

#### See also

Refer to "Changing the hose" on page 54

## 8.9 Adjust the compression force (shimming)

Fitting and removing shims is a simple action which can be carried out via the inspection window on the front of the pump housing. The pump hose or the pump cover does not need to be removed.

In order to determine the correct number of shims for your specific application Refer to "Shims specifications" on page 96.



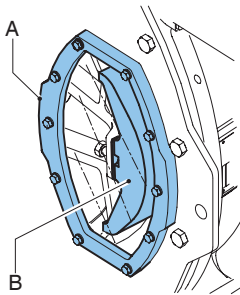
### CAUTION

**Too many shims, this means a too high compression force on the pump hose, create a too high load on the pumphead and pump hose, which results in a reduction of the life of the pump hose and bearings.**

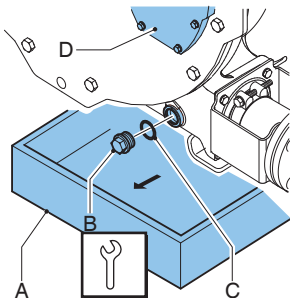


### CAUTION

**Too few shims, this means a too low compression force on the pump hose, create a loss of yield and slip or backflow. Backflow results in a reduction of the life of the pump hose.**

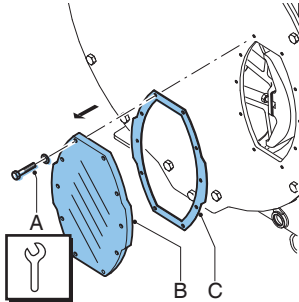


1. Jog the motor until the pressing shoe (B) is positioned in view of the inspection window (A).
2. Isolate the pump from the electrical supply.

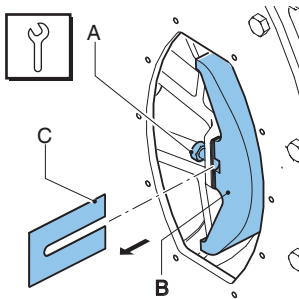


Note: The drain plug is in the bottom of the pumphead.

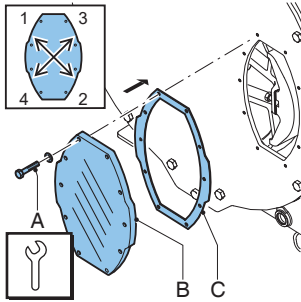
3. Place a tray (A) under the drain plug. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pumphead. Remove the drain plug (E). Collect the lubricant from the pump housing in the tray.
4. Drain as much Bredel Genuine Hose Lubricant until the level has lowered just below the inspection window (D).
5. Check the sealing ring (C) is not damaged and replace it if necessary.
6. Position the drain plug and tighten it to the specified torque.



7. Loosen the retaining bolts (A) of the inspection window (B) and remove the bolts. Remove the inspection window. Care must be taken not to damage the gasket (C).



8. Loosen the retaining bolt(s) (A) of the pressing shoe (B) a few turns. Fit the shims (C) or remove them, until the correct number of shims is present. Tighten the retaining bolt of the pressing shoe to the specified torque.



9. Check the gasket (C) for damage and replace it if necessary.
10. Refit the inspection window (B). Make sure that all retaining bolts (A) are refitted and that they are tightened in the correct order, diagonally opposite each other. Tighten the bolts with the specified torque.
11. Connect the pump to the electrical supply.
12. Switch on the electrical supply.
13. Jog the motor until the second pressing shoe is positioned in view of the inspection window.
14. Isolate the pump from the electrical supply.
15. Repeat the procedure for this second pressing shoe.
16. Refill the lubricant.

#### See also

Refer to "Changing lubricant" on page 52

Refer to "Torque figures" on page 95

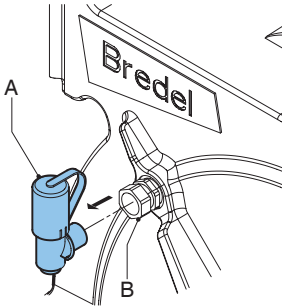
Refer to "Shims specifications" on page 96

## 8.10 Fitting options

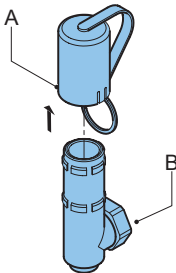
### Fitting a high level float switch



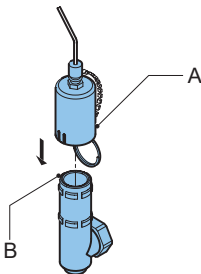
For explosive environments, contact your Bredel representative.



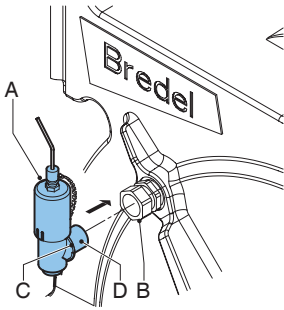
1. Dismount the standard breather (A) rear of the pump, by dismounting it from the crimp connector (B).



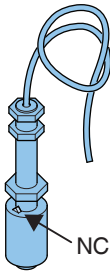
2. Slide the standard breather cap (A) from the breather (B).



3. Replace the standard breather cap with the breather cap with a high-level float switch (A) and slide it over the breather (B).



4. Place the ring (C) at the chain's end around tube (D). Mount the breather (A) to the crimp connector (B) on the rear of the pump. Tighten the nut of the crimp connector gently.



5. Connect the high-level float switch to the auxiliary power circuit via the 2 metre long PVC cable ( $2 \times 0.34 \text{ mm}^2$ ). Bear in mind that the electrical contact of the float switch is normally closed (NC). The knob is upwards for normally closed operation. When the lubricant level is (too) high the contact will open.



### Specifications\*

Voltage	Max. 230 V AC/DC
Current	Max. 2 A
Power	Max. 40 VA

\*For use in non-explosive atmospheres.

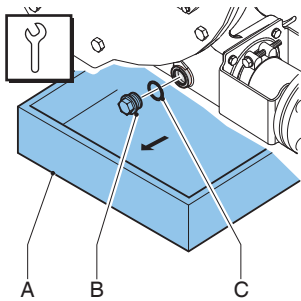
**Note:** Where the float switch is constructed to stop the equipment, operating has to be arranged so that the stop function locks out, preventing the equipment from being restarted without resetting. Check if the float switch is mounted with the NC sign at the top.

### Fitting a low-level float switch



For explosive environments, contact your Bredel representative.

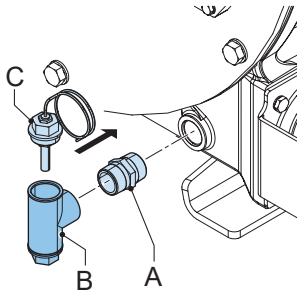




**Note: If the pump is filled with lubricant this must be removed first:**

Note: The drain plug is in the bottom of the pumphead.

1. Place a tray (A) under the drain plug. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pumphead. Remove the drain plug (B). Collect the lubricant from the pump housing in the tray.
2. Check the sealing ring (C) is not damaged and replace it if necessary.



3. Fit the connector (A) to the pump housing. Fit the low level float switch (B) to the connector (A). Apply Loctite® 561, 572, 577, or an equivalent product on the thread.
4. Connect the low-level float switch to the electrical supply. Bear in mind that the electrical contact of the float switch is normally closed (NC). When the lubricant level is (too) low the contact will open.
5. Refill the lubricant.
6. Breathe the float switch by carefully opening the plug (C) until lubricant escapes. Subsequently close the plug again.

**See also**

Refer to "Fitting a high level float switch" on page 1

## Specifications\*

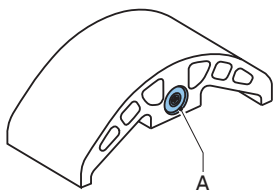
Voltage	Max. 230 V AC/DC
Current	Max. 2 A
Power	Max. 40 VA

\*For use in non-explosive atmospheres.

**Note:** Where the float switch is constructed to stop the equipment, operating has to be arranged so that the stop function locks out, preventing the equipment from being restarted without resetting. Check if the float switch is mounted with the NC sign at the top.

### Fitting a revolution counter

1. Remove one of the pressing shoes of the rotor

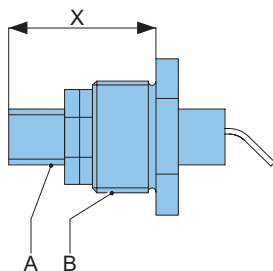


2. Replace pressing shoe by the special pressing shoe with a magnet (A).

### See also

Refer to "Replacing the pressing shoes" on page 65

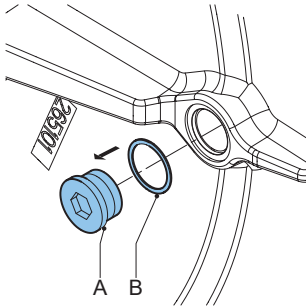
**Note:** Make sure that the pressing shoe is placed in such a way that the magnet (A) is at the backside and facing the pump housing.



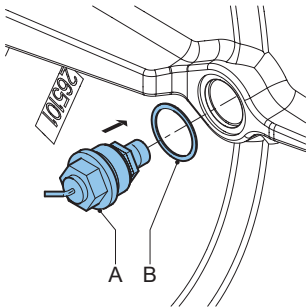
3. Fit the inductive sensor (A) in plug (B) and adjust it to dimension "X" as indicated in the table below. Use sealant Loctite 572 or similar to prevent leakage.

Pump type	Dimension "X"
Bredel 40	32 +0 /-1
Bredel 50	32 +0 /-1
Bredel 65	32 +0 /-1
Bredel 80	45 +0 /-1
Bredel 100	45 +0 /-1

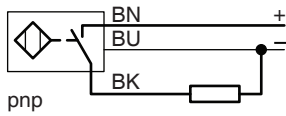
4. Tighten the adjusting nuts.



5. Remove a plug (A) and the sealing ring (B) on the back side of the pump housing.



6. Fit the plug with the inductive sensor (A) together with sealing ring (B) on the pump housing.  
7. Refill the lubricant.



8. Connect the sensor via the 2- meter long PVC cable (3 x 0.34 mm<sup>2</sup>).

### Specifications

Voltage	10-30 VDC
Current	Max. 150 mA



#### WARNING

Contact your Bredel representative for proper connection of the sensor.



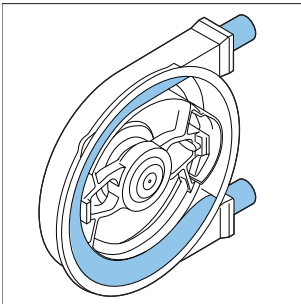
For explosive environments, contact your Bredel representative.

## 9 Storage

### 9.1 Hose pump

- Store the hose pump and pump parts in a dry area. Make sure that the hose pump and pump parts are not exposed to temperatures lower than  $-40\text{ }^{\circ}\text{C}$  or higher than  $+70\text{ }^{\circ}\text{C}$ .
- Cover the openings of the inlet and outlet ports.
- Prevent corrosion of untreated parts. For this purpose use the correct protection or packaging.
- After a long period of standstill or storage, the static load on the pump hose may have caused permanent deformation, which will reduce the life of the pump hose and may cause difficulty in starting.

To prevent deformation of the hose, remove a pressing shoe. Jog the rotor until the second pressing shoe is positioned between the inlet and the outlet port. In this way there is no load put on the pump hose.



### 9.2 Hose

- The maximum shelf life for the hose is 2 years. Store the hose in a dark and dry place with temperatures between  $0\text{ }^{\circ}\text{C}$  and  $40\text{ }^{\circ}\text{C}$ . After two years the hose material will age, which will reduce the life of the hose.

### 9.3 Lubricant

- Replace the pump lubricant in case of failure of the pump hose and in any case after one year.
- Use the lubricant before the best-before date marked on the container.
- The lubricant must be stored in closed bottles or cans to avoid absorption of moisture.

## 10 Troubleshooting



### WARNING

**Disconnect and lock out the power supply to the pump drive before any work is carried out. In case the motor is fitted with a frequency controller and has a single-phase power supply, wait two minutes to make sure that the capacitors have discharged.**

If the hose pump does not function (correctly), consult the following check list to see if you can remedy the error yourself. If you cannot, contact your Bredel representative for advice.

Problem	Possible cause	Correction
Failure to operate.	No voltage.	Check if the power supply switch is on.
		Check if the electrical supply is available at the pump.
	Stalled rotor.	Check if the pump is stalled by incorrect fitting of the hose.
		Check any possible blockage inside the hose. Check the frequency controller settings, if applicable.
Lubricant level monitoring system has been activated.	Check if the lubricant level monitoring system has stalled the pump. Check the functioning of the lubricant level monitoring system, and check the lubricant level.	

<b>Problem</b>	<b>Possible cause</b>	<b>Correction</b>
High pump temperature.	Non-standard hose lubricant used.	In case of doubt, consult your Bredel representative.
	Low lubricant level.	Add Bredel Genuine Hose Lubricant. For the required amount of lubricant Refer to "Lubricant table pump" on page 94
	Product temperature too high.	Check the performance graph. Refer to "Performance graphs" on page 40
	Internal friction on the hose caused by blocked or poor suction characteristics.	Check pipework/ valves for blockages. Ensure that the suction pipework is as short as possible and that the diameter is large enough.
	Over-shimming of the pump rotor shoes.	Consult the diagram. Refer to "Shims specifications" on page 96 . Remove excess shims.
	High pump speed.	Reduce pump speed to a minimum. Contact your Bredel representative for advice on optimum pump speeds.

<b>Problem</b>	<b>Possible cause</b>	<b>Correction</b>
Low capacity / pressure.	Shut-off valve in the suction line (partly) closed.	Fully open the shutoff valve.
	Under-shimming of the pressure shoes.	Fit the correct number of shims.
	Hose rupture or badly worn hose.	Replace the hose. Refer to "Changing the hose" on page 54
	(Partial) blockage of the suction line or too little product on the suction side.	Ensure that the suction line is clear of blockages and that sufficient product is available.
	Connections and hose clamps not correctly mounted, which makes the pump suck air.	Check the connections and the hose clamps. Tighten if necessary.
	The filling degree of the pump hose is too low, because the speed is too high in relation to the viscosity of the product to be pumped and the inlet pressure. The suction line can be too long or too narrow or a combination of these factors.	In case of doubt, consult your Bredel representative.
	Severely worn pressing shoes	Check surface condition of the pressing shoes. Replace if necessary.
Vibration of the pump and pipework.	Suction and discharge lines are not secured correctly.	Check and secure pipework.
	High pump speed with long suction and discharge lines or high relative density or a combination of these factors.	Reduce pump speed. Reduce the line lengths on both suction and discharge where possible. In case of doubt, consult your Bredel representative.
	Too narrow diameter of suction and/or discharge line.	Increase the diameter of the suction/ discharge lines.
Broken front cover bolts.	Pump cover (dis)mounted with the hose in the pump.	Never (dis)mount the pump cover when the hose is still in the pump.



<b>Problem</b>	<b>Possible cause</b>	<b>Correction</b>
Short hose life.	Chemical attack of the hose.	Check the compatibility of the hose material with the product to be pumped. In case of doubt, consult your Bredel representative.
	High pump speed.	Reduce pump speed.
	High discharge pressures.	Maximum working pressure depends on the hose type. Check that the discharge line is not blocked, the shut-off valves are fully opened and the pressure relief valve functions properly (if present in the discharge line).
	High product temperature.	In case of doubt, consult your Bredel representative.
	High pulsations.	Restructure the discharge and inlet conditions.
Hose pulled into the pump.	Insufficient or no hose lubricant in the pumphead.	Add extra lubricant. Refer to "Changing lubricant" on page 52.
	Incorrect lubricant: no Bredel Genuine Hose Lubricant in the pumphead.	In case of doubt, consult your Bredel representative.
	Extremely high inlet pressure - larger than 300 kPa.	Reduce the inlet pressure.
	Hose blocked by an incompressible object in the hose. The hose cannot be compressed and will be pulled into the pump housing.	Remove hose, check for blockages and replace if necessary.
	Poor suction conditions, highly viscous flow, or flow with high solid content.	Attach a second hose clamp per hose end. This hose clamp must be tightened to the maximum value. Refer to "Tightening the hose clamps" on page 62.

<b>Problem</b>	<b>Possible cause</b>	<b>Correction</b>
Lubricant leakage at bracket.	Bolts of the bracket are loose.	Tighten to the specified torque settings. Refer to "Torque figures" on page 95
	Bolts of the hose clamps are loose.	Tighten the hose clamps. Refer to "Tightening the hose clamps" on page 62
Leakage from the rear of the pump housing "Buffer zone".	Damaged wear or seal ring.	Replace wear or seal ring.
Motor functions, but rotor does not.	Broken fracture surface on rotor.	Replace the rotor.
Motor functions, but rotor does not.	Broken undercut on the pump shaft.	Follow the installation procedure that is supplied with the replacement shaft.
Leakage of product medium between the hose and the insert.	Steel insert: the hose clamp is not tightened strong enough.	Refer to "Tightening the hose clamps" on page 62 for the procedure and correct torque value.
	Plastic insert: the hose clamp is tightened too much and as a result the insert is deformed.	Loosen the hose clamp and inspect the insert. Replace the insert if necessary. Refer to "Tightening the hose clamps" on page 62

<b>Problem</b>	<b>Possible cause</b>	<b>Correction</b>
Lubricant leakage between the pump housing and the hose.	Steel insert: the hose clamp is tightened too much.	Refer to "Tightening the hose clamps" on page 62
	The O-ring in the bracket is damaged, or not correctly positioned in the bracket.	Inspect the O-ring and replace it if necessary. Lubricate the O-ring before installation with Bredel Genuine Hose Lubricant. Refer to "Fitting the hose" on page 59
	Plastic insert: the hose clamp is tightened too much and as a result the insert is deformed.	Inspect the insert and replace it if necessary. Tighten the hose clamp. Refer to "Tightening the hose clamps" on page 62.
The pump hose does not remain axially positioned in the pump. It is pulled from the insert.	High axial forces on the pump hose can result from poor suction conditions, highly viscous flow, or flow with high solid content.	In such cases, a second hose clamp per hose end is strongly recommended. This hose clamp must be tightened to the maximum value. Refer to "Tightening the hose clamps" on page 62.

# 11 Specifications

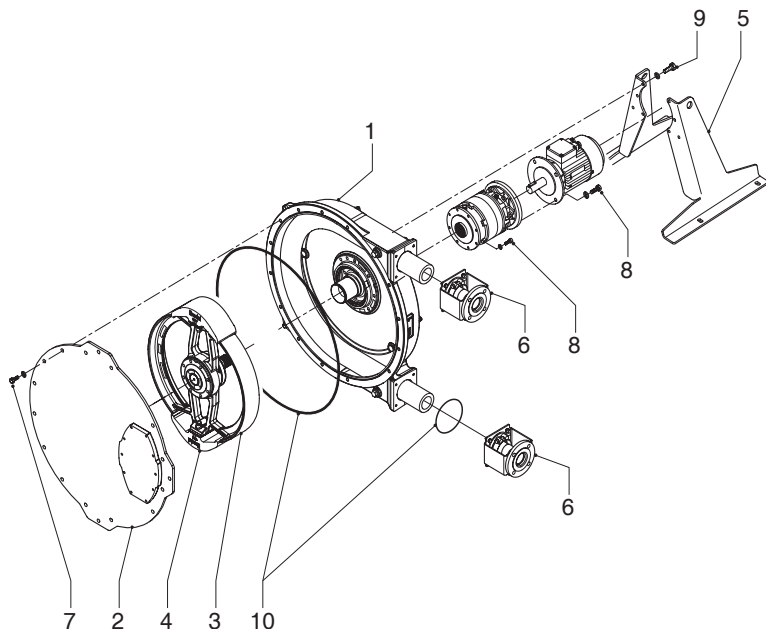
## 11.1 Pumphead

### Performance

Description	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Max. capacity, continuous [m <sup>3</sup> /h]	6.0	10.5	20.0	28.0	36.0
Max. capacity, intermittent [m <sup>3</sup> /h] *	9.6	17.5	32.0	42.0	60.0
Capacity per revolution [l/rev]	1.33	2.9	6.7	11.7	20.0
Max. permissible inlet pressure [kPa]	250	250	200	150	150
Max. permissible working pressure [kPa]			1600		
Permissible ambient temperature [°C]			-20 to +45		
Permissible product temperature [°C]			-10 to +80		
Sound level at 1 m [dB(A)]			70		

\* Intermittent duty: Let the pump stand still to cool down for at least one hour after two hours of operation.

## Materials



Pos	Description	Material
1	Pump housing	Cast-iron
2	Cover	Commercial grade mild steel 37
3	Pump rotor	Cast-iron
4	Pressing shoes	Aluminium (Epoxy is optional)
5	Supports	Mild steel, galvanized*
6	Hose flange brackets	Mild steel, galvanized*
7	Cover fixings	Mild steel, galvanized*
8	Motor fixings	Mild steel, galvanized*
9	Mounting material of supports	Mild steel, galvanized*

Pos	Description	Material
10	Seals and glands	Neoprene or Nitrile

\* Available in Stainless Steel upon request.

### Surface treatment

- After surface preparation, one layer of two-component acrylate is used for surface protection. Standard colour is RAL 3011, other colours are optional. Contact your Bredel representative for advice on surface treatment.
- All galvanised parts have an electrolytic zinc layer of 15 - 20 µm.

### Lubricant table pump

Item	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Lubricant	Bredel*	Bredel*	Bredel*	Bredel*	Bredel*
Required quantity (l)	5	10	20	40	60

Bredel Genuine Hose Lubricant is registered at NSF: NSF Registration No 123204; Category Code H1. Also refer to: [www.nsf.org/certified-products-systems](http://www.nsf.org/certified-products-systems), and search for 'Bredel'.

Components		
Glycerol	(C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> )	50-100% w/w
Glycol	(C <sub>3</sub> H <sub>8</sub> O <sub>2</sub> )	2.5-10% w/w
Water	(H <sub>2</sub> O)	

**Note:** Contact your Bredel representative for advice if you require additional information with respect to the safety data sheet.



#### WARNING

**It is the users responsibility to ensure the chemical compatibility of the fluid to be pumped with the lubricant in the pumphead. Obey the local Health and Safety regulations.**

An alternative lubricant is available based on silicone. Also compatibility with this lubricant must be checked if applied. Refer to the chemical compatibility chart at [www.wmftg.com/chemical](http://www.wmftg.com/chemical) or contact your Bredel representative for advice.

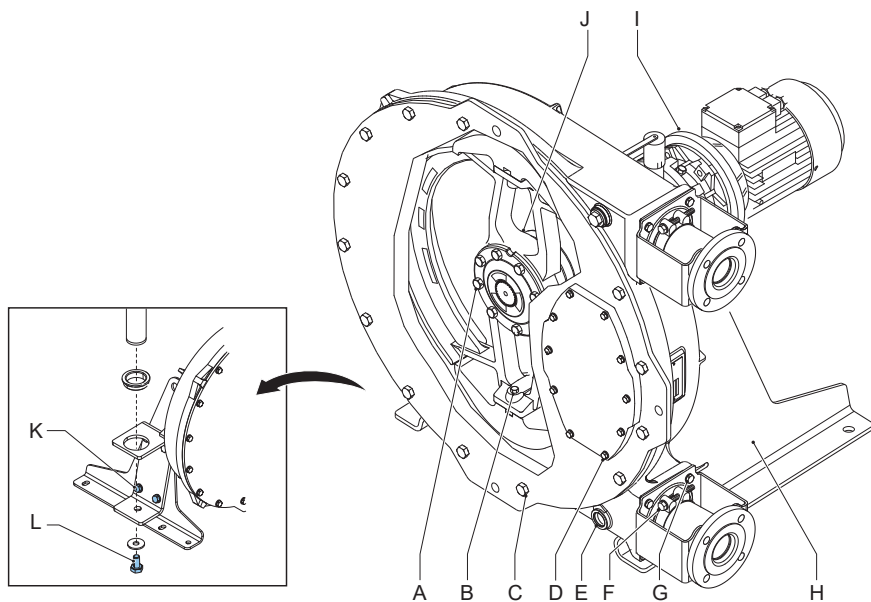
## Weights

Description	Weight [kg]				
	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Hose pump, maximum weight*	180	325	558	930	1300
Pumphead**	121	227	398	672	1032
Rotor	14	24	40	77	118
Pressing shoe	0.8	1.8	4	6.6	12.6
Pump cover	16	30	62.5	106.5	195
Drive shaft	2.5	5.9	7.7	16.6	19.5
Hub	10	16	18	38	53
Hose	3.8	6.4	11.5	21	31

\* Maximum net weight of the hose pump with the heaviest gearbox and electric motor.

\*\* Weight of a completely mounted pumphead (including hose, lubricant and supports).

## Torque figures



Pos	Description	Unit	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
A	Drive shaft bolts	Nm	25	50	85	210	210
B	Pressing shoe bolt(s)	Nm	50	85	85	210	210
C	Cover bolts	Nm	50	85	210	210	400
D	Inspection window bolts	Nm	5	8	8	8	8
E	Drain plug bolts	Nm	40	40	40	80	80
F	Hose clamp*	Nm	25	40	40	40	40
G	Flange bracket bolts	Nm	25	50	50	85	85
H	Support bolts	Nm	50	50	85	210	210
I	Gearbox bolts	Nm	25	85	85	85	135
J	Hub bolts	Nm	50	50	85	210	210
K	Cover lifting device, bracket bolt	Nm	-			210	
L	Cover lifting device, boom fixation bolt	Nm	-			50	

\*Notes:

Due to creeping of the hose material, the hose clamp force initially reduces in time. If leakage starts, re-tighten the hose clamp to the specified torque level. The listed torque values apply to a new and properly greased hose clamp. Also refer to Refer to "Tightening the hose clamps" on page 62 for extra instructions and hose clamp installation.

**Note:** All bolts are class 8.8.

### Shims specifications

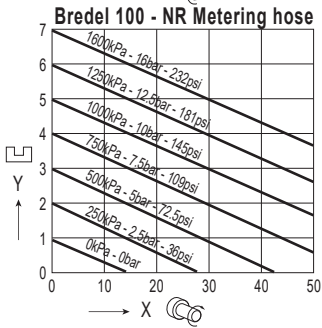
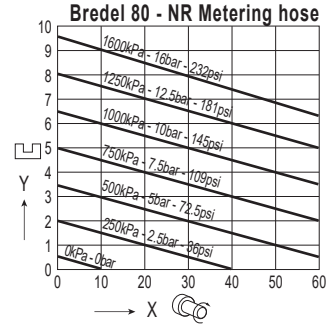
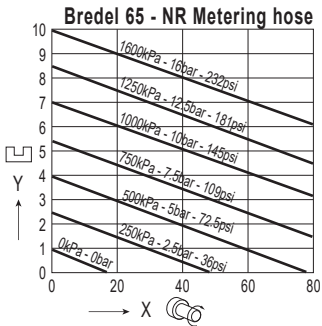
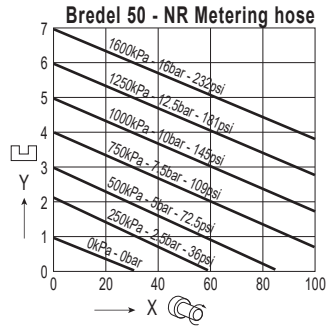
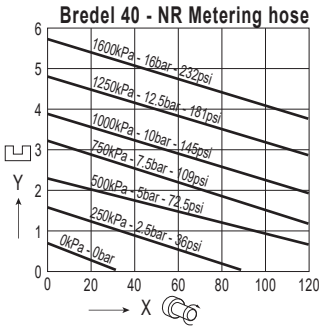
How to use the diagrams:

**Note:** Specifications only valid for genuine Bredel hoses.

1. Find the pump speed in [rpm] on the horizontal axis.
2. Go straight up and meet the proper discharge-pressure line.
3. At that point, go straight to the left and read the number of shims Y on the vertical axis.
4. Always round up the number of shims.

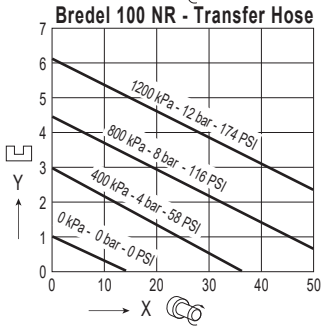
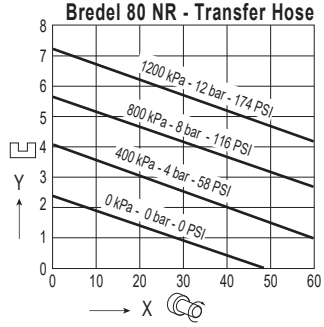
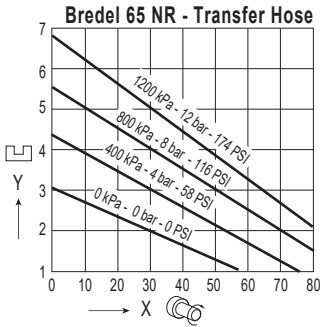
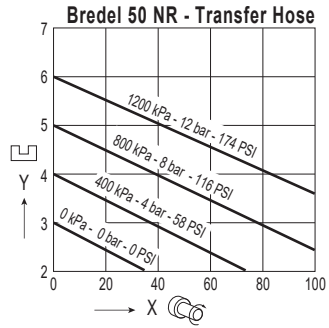
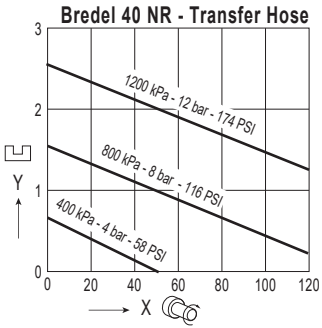


- When the product temperatures are above 60 °C always use one shim less than indicated in the diagrams.
- Each diagram gives the number of shims per pressing shoe.
- Shim both pressing shoes identically.



X = Pump speed

Y = Number of shims per shoe



X = Pump speed

Y = Number of shims per shoe

## 11.2 Lubricant for gearbox

In the majority of the cases a mineral oil ISO VG 150 or ISO VG 220 is recommended. In case of very low ambient temperatures a mineral ISO VG 100 is advised. In case of high ambient temperatures or a relatively wide range of ambient temperatures a synthetic oil is recommended. Also in case of very high loads, resulting in high operating temperatures a synthetic oil is to be preferred.

Use of oil with EP (Extreme Pressure) additives is strongly recommended. Do not mix oils of different types, i.e. mineral, polyglycol and other synthetic lubricant. Refer to the documentation supplied with the gearbox for how to care about lubrication. For the food industry as well as for agricultural areas and nature reserves, special grade lubricants are available.

The table below is an indication for proper viscosity values.

If you have any questions, contact your Bredel representative for advice.

### Recommended lubricant parameters for the Bredel gearboxes

	Mineral Oil		Synthetic oil	
Ambient temperature	-20 to +5 °C	+5 to +30 °C	+30 to +50 °C	-30 to +65 °C
Viscosity acc. to ISO 3448	VG 100	VG 150-220	VG 320	VG 150-220
Oil change interval	5,000 hours		20,000 hours	

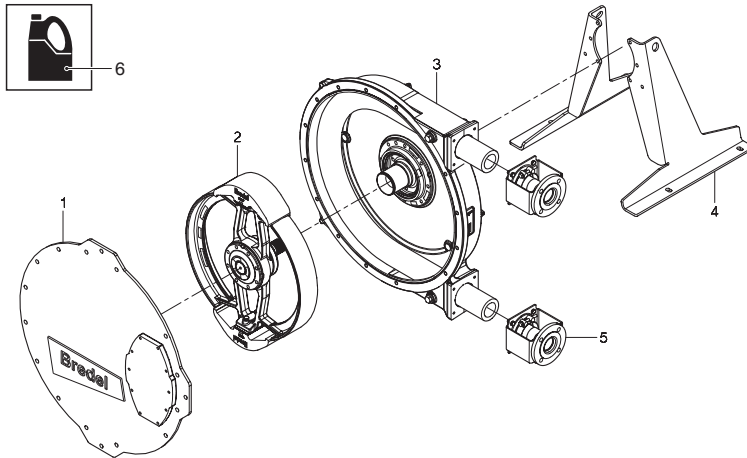
## 11.3 Electric motor

Construction	IM B5 (flange type)
Materials	size IEC-80/90: Housing and connection box: aluminium End shields: cast-iron
	size IEC-100 and larger: Housing, connection box and end shields: cast-iron
Number of poles	4 or 6 poles
Voltage - frequency*	up to 2.2 kW: 230 / 400 V - 3 phases - 50 Hz
	3.0 kW and larger: 400 / 690 V - 3 phases - 50 Hz
Protection class in accordance with IEC 34-5	IP55
Insulation class	F
Temperature class	B

\* Unless specified otherwise.

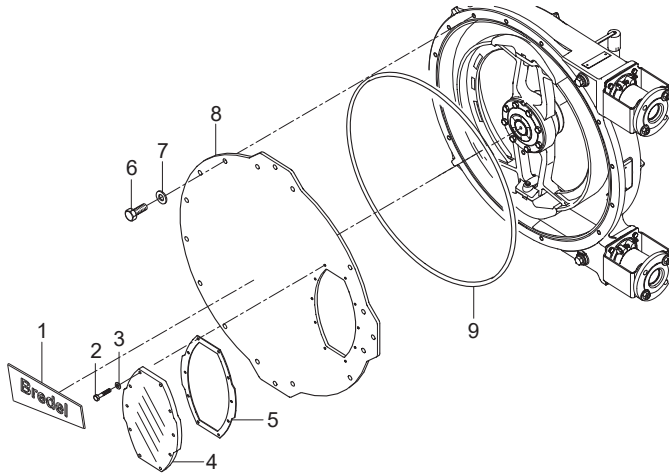
## 11.4 Parts List

### Overview



Pos.	Description
1	Cover assembly. Refer to "Cover assembly." on the next page
2	Rotor assembly. Refer to "Rotor assembly." on page 105
3	Pump housing assembly. Refer to "Pump housing assembly." on page 109
4	Pump support assembly. Refer to "Pump support assembly." on page 115
5	Flange assembly. Refer to "Flange assembly." on page 117
6	Lubricant. Refer to "Lubricant." on page 123

## Cover assembly.



### Bredel 40

Pos.	Qty.	Description	Product code
1	1	Sticker	28-240238
2	8	Bolt, hex. head	28-F111042
3	8	Washer, plain	28-F322009
4	1	Inspection window	28-240155
5	1	Gasket	28-240156
6	14	Bolt, hex. head	28-F111096
7	14	Washer, plain	28-F322013
8	1	Pump cover	28-240102
9	1	Seal ring (quad ring)	28-240123

**Bredel 50**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Sticker	28-250238
2	8	Bolt, hex. head	28-F111074
3	8	Washer, plain	28-F322012
4	1	Inspection window	28-250155
5	1	Gasket	28-250156
6	14	Bolt, hex. head	28-F111130
7	14	Washer, plain	28-F322015
8	1	Pump cover	28-250102
9	1	Seal ring (quad ring)	28-250123

**Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Sticker	28-265238
2	8	Bolt, hex. head	28-F101038
3	8	Washer, plain	28-F322012
4	1	Inspection window	28-265155
5	1	Gasket	28-265156
6	14	Bolt, hex. head	28-F111182
7	14	Washer, plain	28-F322017
8	1	Pump cover	28-265102
9	1	Seal ring (quad ring)	28-265123

**Bredel 80**

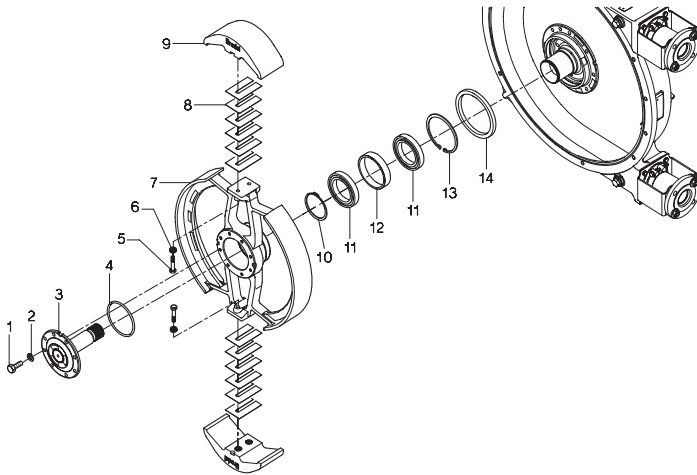
<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Sticker	28-280238
2	8	Bolt, hex. head	28-F101038
3	8	Washer, plain	28-F322012
4	1	Inspection window	28-280155
5	1	Gasket	28-280156
6	14	Bolt, hex. head	28-F111182
7	14	Washer, plain	28-F322017
8	1	Pump cover	28-280102
9	1	Seal ring (quad ring)	28-280123

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Sticker	28-200238
2	8	Bolt, hex. head	28-F101040
3	8	Washer, plain	28-F322012
4	1	Inspection window	28-200155
5	1	Gasket	28-200156
6	14	Bolt, hex. head	28-F111218
7	14	Washer, plain	28-F322019
8	1	Pump cover	28-200102
9	1	Seal ring (quad ring)	28-200123



## Rotor assembly.



### Bredel 40

Pos.	Qty.	Description	Product code
1	8	Bolt, hex. head	28-F111073
2	8	Washer, spring Lock	28-F336011
3	1	Drive shaft	28-240104
4	1	O-ring	28-S122431
5	2	Bolt, hex. head	28-F101059
6	2	Nord-Lock® ring	28-F349005
7	1	Rotor	28-240103
8	12	Shim	28-240107
9	2	Pressing shoe: aluminium	28-240110
	2	Epoxy, with stainless steel insert	28-240109A
10	1	Retaining ring	28-F343056

Pos.	Qty.	Description	Product code
11	2	Bearing	28-B141460
12	1	Spacer outside	28-29110201
13	1	Retaining ring	28-F344077
14	1	Wear ring	28-29140202

#### Bredel 50

Pos.	Qty.	Description	Product code
1	8	Bolt, hex. head	28-F111098
2	8	Washer, spring Lock	28-F336012
3	1	Drive shaft	28-250104
4	1	O-ring	28-S122541
5	2	Bolt, hex. head	28-F101082
6	2	Nord-Lock® ring	28-F349007
7	1	Rotor	28-250103
8	14	Shim	28-250107
9	2	Pressing shoe: aluminium	28-250110
	2	Epoxy, with stainless steel insert	28-250109A
10	1	Retaining ring	28-F343071
11	2	Bearing	28-B142060
12	1	Spacer outside	28-29150201
13	1	Retaining ring	28-F344087
14	1	Wear ring	28-29180202

#### Bredel 65

Pos.	Qty.	Description	Product code
1	12	Bolt, hex. head	28-F111132

Pos.	Qty.	Description	Product code
2	12	Washer, spring Lock	28-F336013
3	1	Drive shaft*	28-265104
4	1	O-ring	28-122541
5	4	Bolt, hex. head	28-F101085
6	4	Nord-Lock® ring	28-F349007
7	1	Rotor	28-265103
8	20	Shim	28-265107
9	2	Pressing shoe: aluminium	28-265110
	2	Epoxy, with stainless steel insert	28-265109A
10	1	Retaining ring	28-F343071
11	2	Bearing	28-B142060
12	1	Spacer outside	28-29151201
13	1	Retaining ring	28-F344087
14	1	Wear ring	28-29180202

\* For the drive shaft of the heavy duty drive (gearboxes 28- G0217... and 28-G0218...), consult your Bredel representative.

#### Bredel 80

Pos.	Qty.	Description	Product code
1	12	Bolt, hex. head	28-F111184
2	12	Washer, spring Lock	28-F336015
3	1	Drive shaft*	28-280104
4	1	O-ring	28-122611
5	4	Bolt, hex. head	28-F101131
6	4	Nord-Lock® ring	28-F349009

Pos.	Qty.	Description	Product code
7	1	Rotor	28-280103
8	20	Shim	28-280107
9	2	Pressing shoe: aluminium	28-280110
	2	Epoxy, with stainless steel insert	28-280109A
10	1	Retaining ring	28-F343075
11	2	Bearing	28-B142460
12	1	Spacer outside	28-29180201
13	1	Retaining ring	28-F344093
14	1	Wear ring	28-29240202

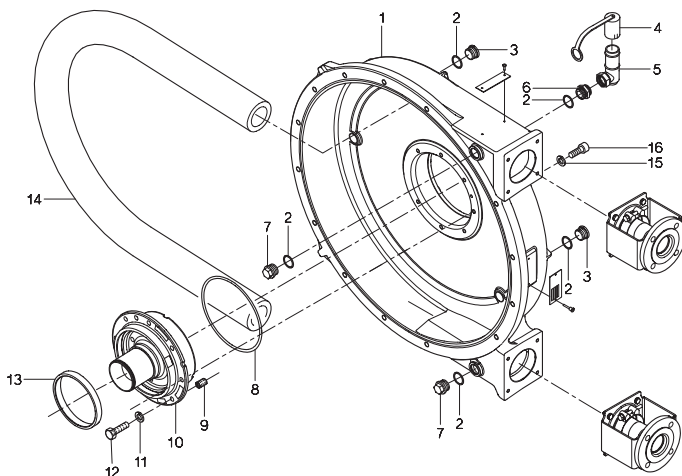
\* For the drive shaft of the heavy duty drive (gearboxes 28- G0224... and 28-G0225...), consult your Bredel representative.

#### Bredel 100

Pos.	Qty.	Description	Product code
1	12	Bolt, hex. head	28-F111184
2	12	Washer, spring Lock	28-F336015
3	1	Drive shaft	28-200104
4	1	O-ring	28-S122611
5	4	Bolt, hex. head	28-F101132
6	4	Nord-Lock® ring	28-F349009
7	1	Rotor	28-200103
8	14	Shim	28-200107
9	2	Pressing shoe: aluminium	28-200110
	2	Epoxy, with stainless steel insert	28-200109A
10	1	Retaining ring	28-F343075

Pos.	Qty.	Description	Product code
11	2	Bearing	28-B142460
12	1	Spacer outside	28-29181201
13	1	Retaining ring	28-F344093
14	1	Wear ring	28-29240202

### Pump housing assembly.



### Bredel 40

Pos.	Qty.	Description	Product code
1	1	Pump housing	28-240101
2	5	Packing ring	28-29040257
3	2	Plug, int. hex. hd	28-F901006
4	1	Breather cap	28-29065223
5	1	Breather	28-29110146

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
6	1	Coupling, straight	28-F602006
7	2	Plug, ext. hex. hd.	28-F911006
8	1	O-ring	28-S122641
9	1	Dowel pin	28-F416082
10	1	Hub	28-240203
11	8	Washer, spring Lock	28-F336012
12	8	Bolt, hex. head	28-F115098
13	1	Seal	28-S212811
14	1	NR Transfer hose	28-1007883
	1	NR Metering hose	28-1000063
	1	NBR	28-040040
	1	Hose NBR Food	28-040061
	1	Hose F-NBR	28-040065
	1	EPDM	28-040075
	1	CSM	28-040070
15	8	Washer	28-F332005
16	8	Bolt, hex. socket cap head	28-F201064

**Bredel 50**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Pump housing	28-250101
2	4	Packing ring	28-29040257
3	2	Plug, int. hex. hd	28-F901006
4	1	Breather cap	28-29065223

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
5	1	Breather	28-29110146
6	1	Coupling, straight	28-F602006
7	2	Plug, ext. hex. hd.	28-F911006
8	1	O-ring	28-S122711
9	1	Dowel pin	28-F416082
10	1	Hub	28-250203
11	8	Washer, spring Lock	28-F336012
12	8	Bolt, hex. head	28-F115098
13	1	Seal	28-S213611
14	1	NR Transfer hose	28-1007884
	1	NR Metering hose	28-1000065
	1	NBR	28-050040
	1	Hose NBR Food	28-050061
	1	Hose F-NBR	28-050065
	1	EPDM	28-050075
	1	CSM	28-050070
15	10	Washer	28-F332007
16	10	Bolt, hex. socket cap head	28-F201106

#### **Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Pump housing	28-265101
2	4	Packing ring	28-29040257
3	2	Plug, int. hex. hd	28-F901006

Pos.	Qty.	Description	Product code
4	1	Breather cap	28-29065223
5	1	Breather	28-29110146
6	1	Coupling, straight	28-F602006
7	2	Plug, ext. hex. hd.	28-F911006
8	1	O-ring	28-S122711
9	1	Dowel pin	28-F416082
10	1	Hub	28-265203
11	8	Washer, spring Lock	28-F336013
12	8	Bolt, hex. head	28-F115132
13	1	Seal	28-S213611
14	1	NR Transfer hose	28-1007885
	1	NR Metering hose	28-1002219
	1	NBR	28-065040
	1	Hose NBR Food	28-065061
	1	Hose F-NBR	28-065065
	1	EPDM	28-065075
	1	CSM	28-065070
15	10	Washer*	28-F332007
16	10	Bolt, hex. socket cap head*	28-F201106

\* For fixation of the heavy duty drive (gearboxes 28-G0217... and 28-G0218...), consult your Breidel representative.

#### Bredel 80

Pos.	Qty.	Description	Product code
1	1	Pump housing	28-280101



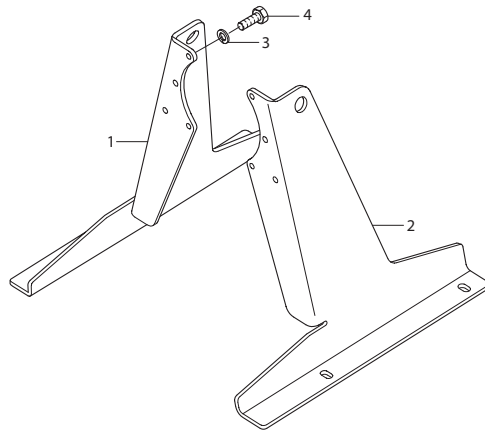
<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
2	4	Packing ring	28-29056244
3	2	Plug, int. hex. hd	28-F901008
4	1	Breather cap	28-29089223
5	1	Breather	28-29125146
6	1	Coupling, straight	28-F602008
7	2	Plug, ext. hex. hd.	28-F911008
8	1	O-ring	28-S122771
9	1	Dowel pin	28-F416121
10	1	Hub	28-280203
11	8	Washer, spring Lock	28-F336015
12	8	Bolt, hex. head	28-F115186
13	1	Seal	28-S214811
14	1	NR Transfer hose	28-1007886
	1	NR Metering hose	28-080020
	1	NBR	28-080040
	1	Hose NBR Food	28-080061
	1	Hose F-NBR	28-080065
	1	EPDM	28-080075
	1	CSM	28-080070
15	10	Washer*	28-F332007
16	10	Bolt, hex. socket cap head*	28-F201106

\* For fixation of the heavy duty drive (gearboxes 28-G0224... and 28-G0225...), consult your Bredel representative.

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Pump housing	28-200101
2	4	Packing ring	28-29056244
3	2	Plug, int. hex. hd	28-F901008
4	1	Breather cap	28-29089223
5	1	Breather	28-29125146
6	1	Coupling, straight	28-F602008
7	2	Plug, ext. hex. hd.	28-F911008
8	1	O-ring	28-S122801
9	1	Dowel pin	28-F416121
10	1	Hub	28-200203
11	8	Washer, spring Lock	28-F336015
12	8	Bolt, hex. head	28-F115186
13	1	Seal	28-S214811
14	1	NR Transfer hose	28-1007887
	1	NR Metering hose	28-100020
	1	NBR	28-100040
	1	Hose NBR Food	28-100061
	1	Hose F-NBR	28-100065
	1	EPDM	28-100075
	1	CSM	28-100070
15	12	Washer	28-F332010
16	12	Bolt, hex. socket cap head	28-F201250

**Pump support assembly.**



**Bredel 40**

Pos.	Qty.	Description	Product code
1	1	Support, right	28-240106B
2	1	Support, left	28-240106A
3	8	Washer, spring Lock	28-F336012
4	8	Bolt, hex. head	28-F111096

**Bredel 50**

Pos.	Qty.	Description	Product code
1	1	Support, right	28-250106B
2	1	Support, left	28-250106A
3	8	Washer, spring Lock	28-F336012
4	8	Bolt, hex. head	28-F111098

**Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Support, right	28-265106B
2	1	Support, left	28-265106A
3	8	Washer, spring Lock	28-F336013
4	8	Bolt, hex. head	28-F111132

**Bredel 80**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Support, right	28-280106B
2	1	Support, left	28-280106A
3	8	Washer, spring Lock	28-F336015
4	8	Bolt, hex. head	28-F111186

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Support, right	28-200106B
2	1	Support, left	28-200106A
3	8	Washer, spring Lock	28-F336015
4	8	Bolt, hex. head	28-F111186

## Flange assembly.

### Bredel 40

Pos.	Qty.	Description	Product code
1	2	O-ring	28-S112301
2	2	Flange bracket, EN/JIS Steel	28-240197
	2	Flange bracket, EN/JIS SS	28-240197E
	2	Flange bracket, ANSI Steel	28-240197A
	2	Flange bracket, ANSI SS	28-240197F
	8	Washer, spring Lock	28-F336011
4	8	Bolt, hex. head	28-F111071
5	2	Hose clamp	28-C101021

Pos.	Qty.	Description	Product code
6	2	Flange, EN Steel	28-040198
	2	Flange, EN SS	28-240199
	2	Flange, ANSI Steel	28-040198A
	2	Flange, ANSI SS	28-240199A
7	1	Insert, AISI 316	28-040186
	1	Insert, PP	28-240189
	1	Insert, PVC	28-240187
	1	Insert, PVDF	28-240190

#### Bredel 50

Pos.	Qty.	Description	Product code
1	2	O-ring	28-S112371
2	2	Flange bracket, EN/ANSI/JIS Steel	28-250197
	2	Flange bracket, EN/ANSI/JIS SS	28-250197E
3	8	Washer, spring Lock	28-F336012
4	8	Bolt, hex. head	28-F111096
5	2	Hose clamp	28-C101045
6	2	Flange, EN Steel	28-050198
	2	Flange, EN SS	28-250199
	2	Flange, ANSI Steel	28-050198A
	2	Flange, ANSI SS	28-250199A

Pos.	Qty.	Description	Product code
7	1	Insert, AISI 316	28-050186
	1	Insert, PP	28-240189
	1	Insert, PVC	28-250187
	1	Insert, PVDF	28-250190

#### Bredel 65

Pos.	Qty.	Description	Product code
1	2	O-ring	28-S112431
2	2	Flange bracket, EN/ANSI/JIS Steel	28-265197
	2	Flange bracket, EN/ANSI/JIS SS	28-265197E
	2	Flange bracket, DIN ANSI Steel	28-265197
	2	Flange bracket, DIN ANSI SS	28-265197E
3	8	Washer, spring Lock	28-F336012
4	8	Bolt, hex. head	28-F111096
5	2	Hose clamp	28-C101048
6	2	Flange, EN Steel	28-065198
	2	Flange, EN SS	28-265199
	2	Flange, ANSI Steel	28-065198A
	2	Flange, ANSI SS	28-265199A
7	1	Insert, AISI 316	28-265186
	1	Insert, PP	28-265189
	1	Insert, PVC	28-265187
	1	Insert, PVDF	28-265190

**Bredel 80**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	2	O-ring	28-S112501
2	2	Flange bracket, EN/JIS Steel	28-280197
	2	Flange bracket, EN/JIS SS	28-280197E
	2	Flange bracket, ANSI Steel	28-280197A
	2	Flange bracket, ANSI SS	28-280197F
	8	Washer, spring Lock	28-F336013
4	8	Bolt, hex. head	28-F111128
5	2	Hose clamp	28-C101051
6	2	Flange, DIN Steel	28-080198
	2	Flange, DIN SS	28-280199
	2	Flange, ANSI Steel	28-080198A
	2	Flange, ANSI SS	28-280199A
7	1	Insert, AISI 316	28-280186
	1	Insert, PP	28-280189
	1	Insert, PVC	28-280187
	1	Insert, PVDF	28-280190

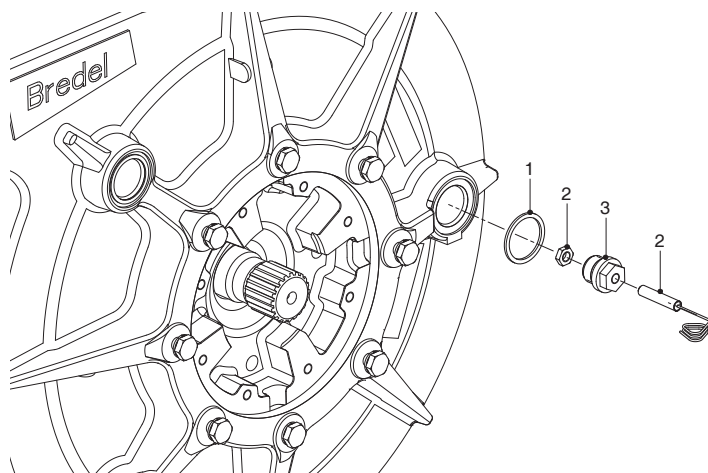
**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	2	O-ring	28-S115571
2	2	Flange bracket, EN/ANSI/JIS Steel	28-200197
	2	Flange bracket, EN/ANSI/JIS SS	28-200197E
3	8	Washer, spring Lock	28-F336013



Pos.	Qty.	Description	Product code
4	8	Bolt, hex. head	28-F111130
5	2	Hose clamp	28-C101054
6	2	Flange, DIN Steel	28-100198
	2	Flange, DIN SS	28-200199
	2	Flange, ANSI Steel	28-100198A
	2	Flange, ANSI SS	28-200199A
7	1	Insert, AISI 316	28-200186
	1	Insert, PP	28-200189
	1	Insert, PVC	28-200187
	1	Insert, PVDF	28-200190

### Revolution counter assembly



**Bredel 40**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Gasket	28-29040257
2	1	Revolution counter	28-29040462
3	1	Adapter	28-29039460

**Bredel 50**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Gasket	28-29040257
2	1	Revolution counter	28-29040462
3	1	Adapter	28-29039460

**Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Gasket	28-29040257
2	1	Revolution counter	28-29040462
3	1	Adapter	28-29039460

**Bredel 80**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Gasket	28-29056244
2	1	Revolution counter	28-29040462
3	1	Adapter	28-29055460

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Gasket	28-29056244
2	1	Revolution counter	28-29040462
3	1	Adapter	28-29055460

**Lubricant.****Bredel 40**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
-	1	5 l can Bredel Genuine Hose Lubricant	28-903143

**Bredel 50**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
-	1	10 l can Bredel Genuine Hose Lubricant	28-904143

**Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
-	1	20 l can Bredel Genuine Hose Lubricant	28-905143

**Bredel 80**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
-	2	20 l can Bredel Genuine Hose Lubricant	28-905143

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
-	3	20 l can Bredel Genuine Hose Lubricant	28-905143

## 12 Appendix: Vacuum option

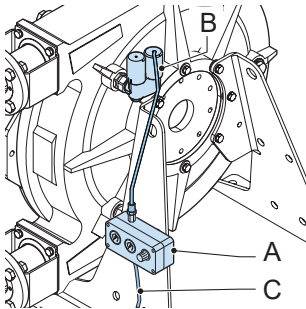
### 12.1 Description

#### Intended use

If the vacuum option is available, sub-atmospheric pressure (or vacuum) can be applied to the pumphead interior. The purpose is to increase the suction conditions of the pump. A sub-atmospheric pressure which stimulates the peristaltic action of the pump element is enabled by a double lipped seal and a de-pressurizing feature. With a pneumatic vacuum unit, a 90% vacuum can be achieved to the pumphead.

#### Pneumatic vacuum unit

This unit withdraws air from the pumphead by means of a pneumatically powered vacuum pump that acts according to the venturi tube principle. The option consists of a unit (A) with the vacuum pump, gauges and a reducer valve, and the special breather (B). These components are connected through a vacuum hose. The unit is connected to the compressed air supply with a hose (C).

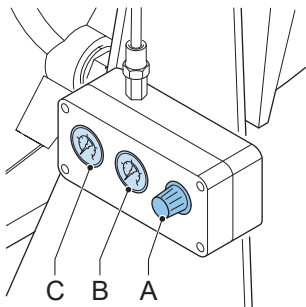


The pressure of the pumphead can be adjusted with the reducer valve.

### 12.2 Commissioning

#### Commissioning a pump that has the pneumatic vacuum unit option

1. Do the general commissioning of the pump.



2. Turn the knob of the reducer valve (A) to close the reducer valve.

3. Switch on the compressed air supply.
4. Turn the knob of the reducer valve until the pressure gauge (C) reads 6 bar (600 kPa).
5. At the vacuum gauge (B), check if the vacuum rises after a few minutes.
6. If the gauge does not give any sign of a vacuum presence:
  - Check all the connections of the vacuum tubing for leakage.
  - Check the breather and the breather cap for leakage.
  - Check the seal for damage.
7. Adjust the knob of the reducer valve to get the preferred vacuum level.

### See also

Refer to "Preparations" on page 38  
 Refer to "Commissioning" on page 39  
 Refer to "Periodic maintenance" below

## 12.3 Maintenance

### Periodic maintenance

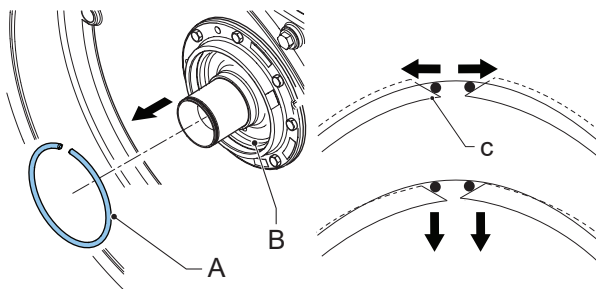
Periodically check the back of the pump for leakage of pump lubricant. Leakage indicates a damaged or worn seal.

### Replace the seal and wear ring (vacuum option)

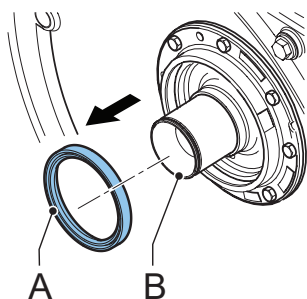
1. Remove the rotor.

### See also

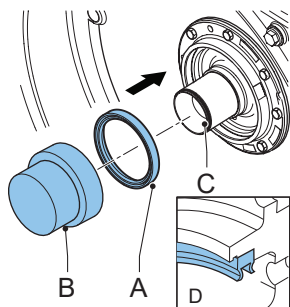
Refer to "Replacing seal and wear ring" on page 68



2. Remove the circlip (A) next to the seal from the hub (B) by pressing the pin shaped tooling on the slanting end (C). The circlip end will rise out of the groove. By moving the tooling along the circumference, the whole circlip can be loosened.



3. Remove the seal (A) from the hub (B).
4. Clean and degrease the bore.

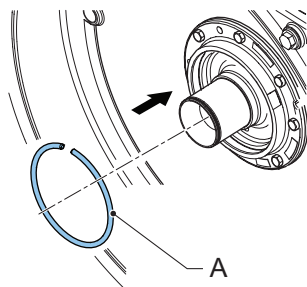


5. Fit a new seal (A) using a wooden block (B) and a hammer or a press. Carefully hit the seal crosswise and with equal strength in the bore until it touches the hub (C). The seal must be fitted in the correct orientation (D).



#### CAUTION

The seal lips have a different hardness. Be sure to mount the seal with the side with the name "BREDEL" pointing toward the pump cover.



6. Mount the retaining circlip (A). Use the correct tools for this purpose.

7. Fill about two-thirds of the space between the seal lips with bearing grease. Use SKF LGMT 2/180 or an equivalent grease.
8. Check the wear ring on the rotor. Replace the wear ring if necessary.
9. Mount the rotor, the pump cover and the pumping element.

### See also

Refer to "Replacing seal and wear ring" on page 68



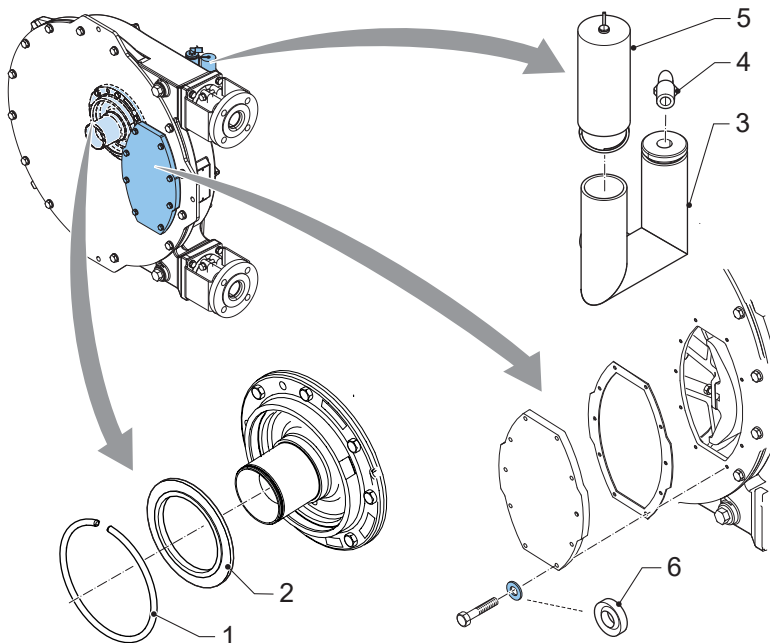
### CAUTION

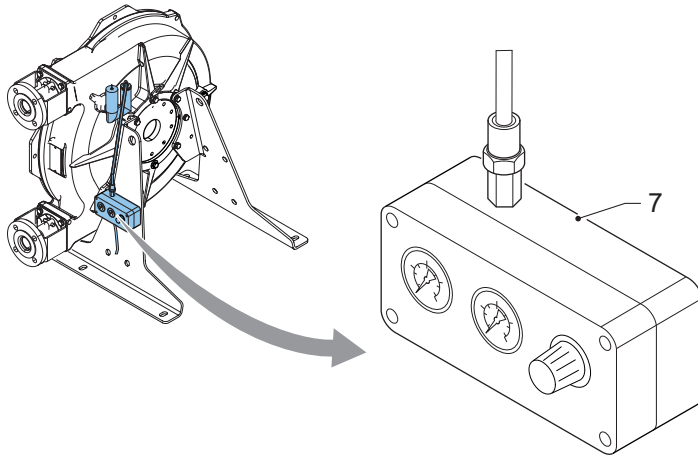
Make sure that the front lip of the seal does not fold back when mounting the rotor onto the hub. Folding back of the seal lip may lead to fatal damage of the seal. If the seal lip is folded back, repair this by carefully turning or moving back the rotor.

## 12.4 Parts lists

Indicated quantities are per pumphead.

(except for pos. 7. Base set: 1 per pump)





### Bredel 40

Pos.	Qty.	Description	Product code
1	1	Retaining ring	28-F346098
2	1	Seal ring	28-S222811
3	1	Breather	28-29133146
4	1	Elbow coupling	28-AL38890813
5	1	Breather cap	28-29088223
	1	Breather cap with high level switch	28-29106610
6	8	Washer (PA6)	28-F724004
7	1	Base set	28-29180292



**Bredel 50**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Retaining ring	28-F346107
2	1	Seal ring	28-S223611
3	1	Breather	28-29133146
4	1	Elbow coupling	28-AL38890813
5	1	Breather cap	28-29088223
	1	Breather cap with high level switch	28-29106610
6	8	Washer (PA6)	28-F724006
7	1	Base set	28-29180292

**Bredel 65**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Retaining ring	28-F346107
2	1	Seal ring	28-S223611
3	1	Breather	28-29133146
4	1	Elbow coupling	28-AL38890813
5	1	Breather cap	28-29088223
	1	Breather cap with high level switch	28-29106610
6	10	Washer (PA6)	28-F724006
7	1	Base set	28-29180292

**Bredel 80**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Retaining ring	28-F346115
2	1	Seal ring	28-S224811
3	1	Breather	28-29210146
4	1	Elbow coupling	28-AL38890813
5	1	Breather cap	28-29089223
	1	Breather cap with high level switch	28-29124610
6	12	Washer (PA6)	28-F724006
7	1	Base set	28-29180292

**Bredel 100**

<b>Pos.</b>	<b>Qty.</b>	<b>Description</b>	<b>Product code</b>
1	1	Retaining ring	28-F346115
2	1	Seal ring	28-S224811
3	1	Breather	28-29210146
4	1	Elbow coupling	28-AL38890813
5	1	Breather cap	28-29089223
	1	Breather cap with high level switch	28-29124610
6	12	Washer (PA6)	28-F724006
7	1	Base set	28-29180292

## Declaration of conformity

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1. Manufacturer:  
Watson-Marlow Bredel B.V.,  
Sluisstraat 7, NL-7491 GA Delden, The Netherlands.
  
2. Object of the Declaration:  
Product: Bredel hose pump series  
Type designation: Bredel 40, Bredel 50, Bredel 65, Bredel 80, Bredel 100
  
3. This declaration of conformity is issued under the sole responsibility of the manufacturer.
  
4. The object of the declaration described above is in conformity with the relevant harmonisation legislation:  
*EU directive: Machinery Directive 2006/42/EC*  
*UKCA directive: Supply of Machinery (Safety) Regulations 2008*
  
5. The Object of this Declaration is in conformity with the applicable requirements of the following harmonised standards and technical specifications:  
*BS EN 809: 1998+A1:2009 Pumps and pump units for liquids - Common safety requirements*  
*BS EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction*  
*BS EN ISO 60240-1: 2018 Safety of machinery - Electrical equipment of machines*

*On behalf of:*  
Watson-Marlow Bredel B.V.  
Delden, 01 January 2023

*J. van den Heuvel, Managing Director, Watson-Marlow Bredel B.V.*  
*Watson-Marlow Fluid Technology Solutions, telephone +31(0) 74 377 0000*  
*A Spirax-Sarco Engineering plc company*

## 13 Safety form

### **Product Use and Decontamination Declaration**

In compliance with the Health and Safety Regulations, the user is required to declare those substances that have been in contact with the item(s) you are returning to Watson-Marlow BredeL B.V. or any of its subsidiaries or distributors. Failure to do so will cause delays in servicing the item or in issuing a response. Therefore, **please complete this form** to make sure we have the information before receipt of the item(s) being returned. A completed copy must be attached to **the outside of the packaging** containing the item(s). You, the user, are responsible for cleaning and decontaminating the item(s) before returning them.

Please complete a separate Decontamination Certificate for each item returned.

**RGK/KBR no.**.....

1 Company .....  
Address .....

Telephone ..... Postal code .....  
Fax number .....

2 Product .....

2.1 Serial Number .....

2.2 Has the Product been used?

YES  NO

If yes, please complete all the following paragraphs.

If no, please complete paragraph 5 only

3 Details of substances pumped

3.1 Chemical Names

a) .....  
b) .....  
c) .....  
d) .....

3.2 Precautions to be taken in handling these substances:

a) .....  
b) .....  
c) .....  
d) .....

3.3 Action to be taken in the event of human contact:

a) .....  
b) .....  
c) .....  
d) .....

3.4 Cleaning fluid to be used if residue of chemical is found during servicing;

a) .....  
b) .....  
c) .....  
d) .....

4 I hereby confirm that the only substances(s) that the equipment specified has pumped or come into contact with are those named, that the information given is correct, and the carrier has been informed if the consignment is of a hazardous nature.

5 Signed .....  
Name .....  
Position .....  
Date .....

**Note:**  
**To assist us in our servicing please describe any fault condition you have witnessed.**

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