

Disc

The disc inserted in the front cover contains the user manual of the models Bredel 40, Bredel 50, Bredel 65, Bredel 80 and Bredel 100. The user manual is available in the following languages:

Česky	Français	Polski	Suomi
Dansk	Italiano	Português	English (US)
Deutsch	Magyar	Română	
English (UK)	Nederlands	Русский	
Español	Norsk	Svenska	

The disc also contains quick-reference instructions for the replacement of the pump hose. This replacement instruction is only for users that are familiar with the replacement procedures in the user manual.

How to use the disc

- 1 Put the disc in the disc drive.
- 2 Close the disc drive.
The disc will start automatically.
- 3 Wait until the various language versions appear on screen.
- 4 Select the required language (click 1x with the left mouse button).
The PDF reader program will automatically start and the required user manual appears on screen.

Shortcuts

In the left margin you will find the various chapters and paragraphs. These can be accessed directly by clicking on the required chapter or paragraph.

In the text you will find hyperlinks to chapters or paragraphs. These hyperlinks are linked with the required chapters or paragraphs. By clicking a shortcut the required chapter or paragraph appears on screen.

System requirements

The program on the disc requires a PC with the following minimum system requirements:

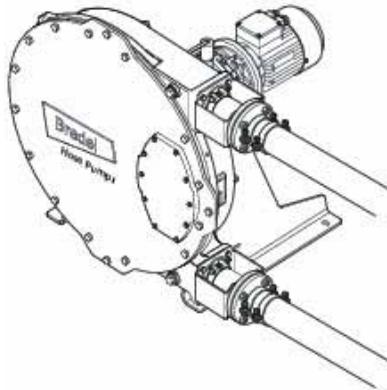
- Disc drive

The following software must be installed on the PC:

- PDF reader program
- An Internet browser

**Hose pump series
Bredel 40, Bredel 50, Bredel 65, Bredel 80 and
Bredel 100**

Manual



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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 mentioned on the front cover.

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 motors and inverters is normally 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

For information with respect to specific adjustments, installation, maintenance or repair jobs which fall beyond the scope of this manual, contact your Bredel representative. Make sure you have the following data at hand:

- Serial number hose pump
- Article number pump hose
- Article number gearbox
- Article number electric motor
- Article number frequency controller

You will find these data on the identification plates or stickers of the pumphead, the pump hose, the gearbox and the electric motor. Refer to § 4.1.1.

1.5 Environment and disposal of waste

**CAUTION**

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

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 damage to the hose pump or 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.
--	---

	Remarks, suggestions and advice.
---	----------------------------------

	WARNING Procedures, remarks, suggestions or advice which refer to use in potentially explosive atmospheres in accordance with the ATEX Directive 94/9/EC.
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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.

The "Intended use" as laid down in EN 292-1 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. Observing the instructions in the user's documentation also belongs to intended use.

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.

2.3 Use in potentially explosive atmospheres

The *pump head* and *gearbox* mentioned in this manual are suitable for use in a potentially explosive atmosphere. Use in Potentially explosive atmospheres requires special configuration of the pump unit (See 4.7). The pumps mentioned meet the requirements as stated in the European Directive 94/9/EC (ATEX Directive).

The pumps belong to:

- Group II Appliances, category 2 G ck T4

2.4 Responsibility

The manufacturer does not accept any responsibility for damage or harm caused by not (strictly) observing the safety regulations and instructions in this manual and the also 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, if you noticed a potential danger while using your hose pump.

**WARNING**

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

2.5 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.

2.6 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, hose clamps, ball bearings, wear rings, and seals, or parts which have been misused or have been intentionally damaged.

If parts are used that are not Watson-Marlow Bredel B.V. (hereafter called Bredel) parts, every warranty becomes 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 it should be indicated that the equipment has been decontaminated. The safety form is required at all items, 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.

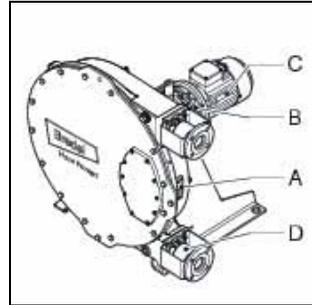
4 DESCRIPTION

4.1 Identification of the product

4.1.1 Identification of the product

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

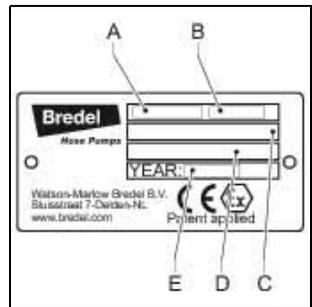
- A:** Pump head
- B:** Gearbox
- C:** Electric motor
- D:** Pump hose



4.1.2 Identification of the pump

The identification plate on the pump head contains the following data:

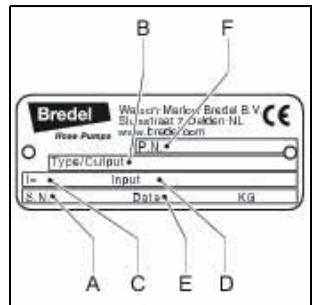
- A:** Type number
- B:** Serial number
- C:** ATEX code
- D:** ATEX document number
- E:** Year of manufacture



4.1.3 Identification of the gearbox

The identification plate on the gearbox contains the following data:

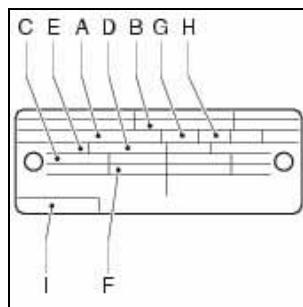
- A:** Serial number (S.N.)
- B:** Type number (Type/Output)
- C:** Reduction (i=)
- D:** Input (adaptation of the motor to the gearbox)
- E:** Date
- F:** Bredel article or order number (PN)



4.1.4 Identification of the electric motor

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

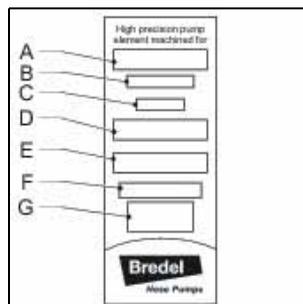
- A:** Serial number
- B:** Type number
- C:** Power
- D:** Voltage
- E:** Frequency
- F:** Speed
- G:** Insulation class
- H:** Protection class
- I:** Bredel article or order number



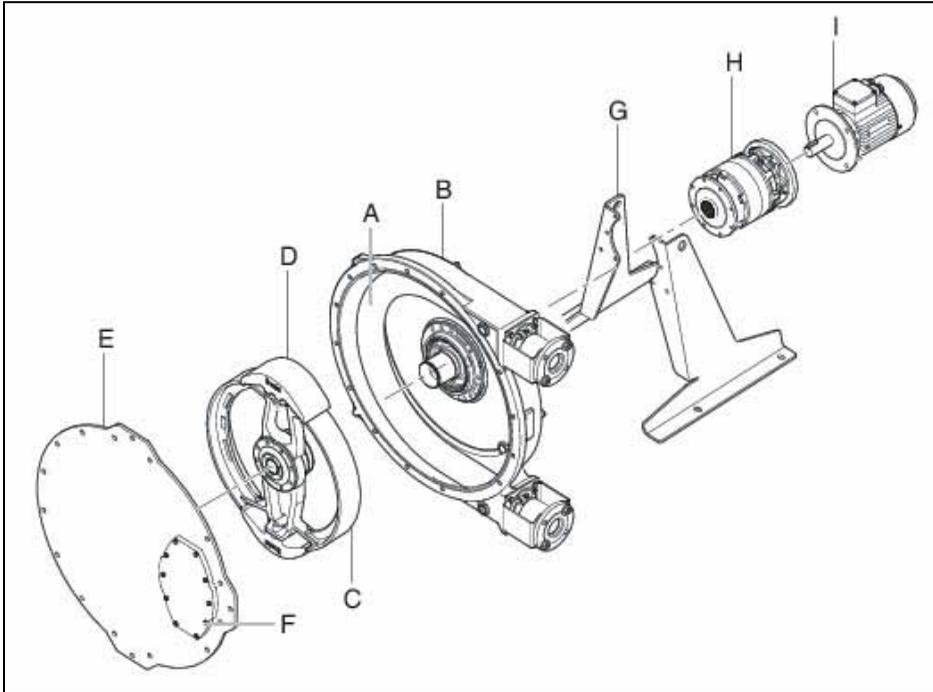
4.1.5 Identification of the pump hose

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

- A:** Pump type
- B:** Reorder number
- C:** Internal diameter
- D:** Type of material of inner liner
- E:** Remarks, if applicable
- F:** Maximum permissible working pressure
- G:** Production code



4.2 Construction of the pump



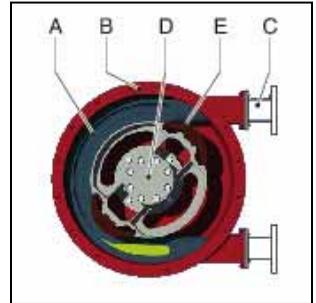
- A: Pump hose
- B: Pump housing
- C: Rotor
- D: Pressing shoes
- E: Cover
- F: Inspection window
- G: Supports
- H: Gearbox
- I: Electric motor

4.3 Operation of the pump

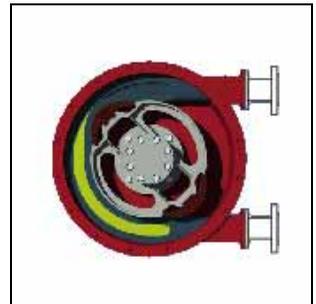
The heart of the pump head consists of a specially constructed pump hose (A) which lies contorted against the inside of the pump housing (B). Both ends of the hose are connected to the suction and discharge lines

by means of a flange construction (C). A bearing-mounted rotor (D) with two facing pressing shoes (E) is in the centre of the pump head.

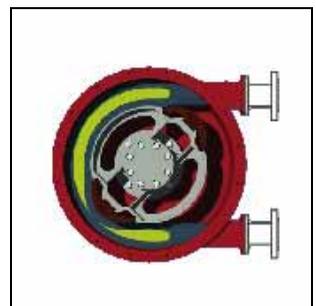
In phase 1 the lower pressing shoe compresses the pump hose by the rotational movement of the rotor, forcing the fluid through the hose. As soon as the pressing shoe has passed, the hose recovers to its original shape due to the mechanical properties of the material.



In phase 2 the product is drawn into the hose by the (continuous) turning motion of the rotor.



In phase 3, the second pressing shoe will subsequently compress the pump hose. Due to the continuous rotating movement of the rotor not only new product is sucked in, but also the already present product is pressed out by the pressing shoe. When the first pressing shoe runs from the pump hose, the second pressing shoe has already closed the pump hose and the product is prevented from flowing back. This method of liquid displacement is also known as the "positive displacement principle".



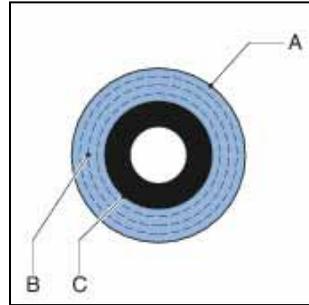
4.4 Pump hose

4.4.1 General

- A:** Outer extruded layer made of natural rubber
B: Four nylon reinforcement layers
C: Inner extruded liner

The pump hose liner material should be chemically resistant with the product to be pumped. Dependent on the specific requirements of your application a corresponding pump hose must be selected. For each pump model various hose types are available.

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



Hose type	Material	Colour code
NR	Natural rubber	Purple
NBR	Nitrile rubber	Yellow
EPDM	EPDM	Red
CSM	CSM	Blue

i	Consult your Bredel representative for more detailed information about the chemical and temperature resistance of pump hoses.
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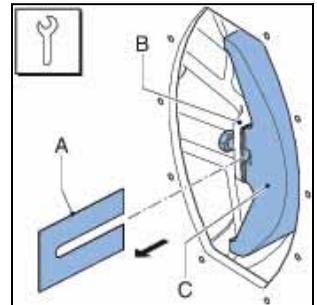
The Bredel pump hoses have been carefully machined, therefore there are minimum tolerances in wall thickness. It is very important to guarantee the correct compression of the pump hose, because:

- When the compression is too high, it creates a too high load of the pump and pump hose, which may result in a reduction of the life of the pump hose and bearings.
- When the compression is too low, this will result in loss of yield and backflow. Backflow results in a reduction of the life of the pump hose.

4.4.2 Hose compression force adjustment (shimming)

In order to achieve optimal life of the pump 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.

The paragraph 7.8 describes how to select and install the shims.



4.4.3 Lubrication and cooling

The pumphead, in which the rotor and pump hose can be found, is filled with Bredel Genuine Hose Lubricant. This lubricant lubricates the movement between the hose and the pressing shoes and dissipates the generated heat via the pump housing and the cover.

The lubricant is food grade. See § 10.1.4 for the required quantity and NSF registration.



Consult your Bredel representative for lubrication recommendations when operating the hose pump below 2 rpm.

4.5 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.

4.6 Electric motor

If the electric motor has been standard supplied by the manufacturer, it is a standardized squirrel-cage motor. Refer to § 10.3 for specifications. If the pump is to be used in potentially explosive atmospheres, contact your Bredel representative.

4.7 Available options

The following options are available for the hose pump:

- High (lubricant) level float switch
- Low (lubricant) level float switch
- Revolution counter
- Adapter for heavy duty drive (Bredel 65 and Bredel 80 only)



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

When unpacking carefully follow the instructions as given on the packaging or on the hose pump.

5.2 Inspection

Check that your delivery is correct and check it for any transport damage. Refer to § 4.1.1. Report any damage immediately to your Bredel representative.

5.3 Installation conditions

5.3.1 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.

5.3.2 Set-up

- 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 set-up or a salty or aggressive atmosphere. Consult your Bredel representative for more information.
- Make sure that the floor surface is horizontal and has a maximum slope of 10 mm per metre.
- Make sure that there is sufficient room around the pump to carry out the necessary maintenance activities.
- 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.

5.3.3 Pipework

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

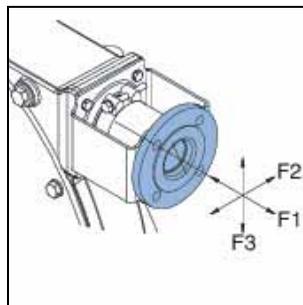
- The bore size of the suction and discharge lines must be larger than the bore size of the pump hose. For more information consult your Bredel representative.
- Limit the presence of sharp bends in the discharge line. Make sure that the radius of the bent discharge line is as large as possible (preferably 5S). It is recommended to use Y-connections instead of T-connections.
- Keep the piping at a minimum equal to or greater than the bore size of the pump. Increase the bore size of the pipe work when the duty fluid has a high velocity or inertia. This will help keep friction and impulse losses to a minimum. Where critical velocities are a concern consult your Bredel representative.
- For the flexible hoses select compatible materials and ensure the installation is suited for the design pressure of the system.
- Keep the delivery and suction lines as short and direct as possible.
- Prevent any possibilities of exceeding the maximum working pressure of the hose pump. Refer to § 10.1.1. If necessary fit a pressure relief valve.

**CAUTION**

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

- 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

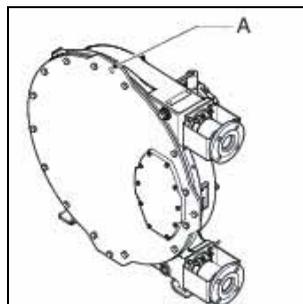


5.4 Lifting and moving the pump

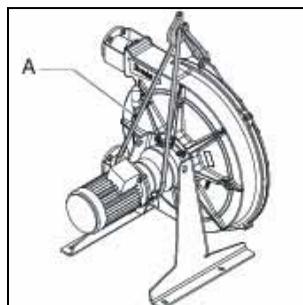
For lifting and moving the pump, it has been fitted with a lifting point. This lifting point (A) is fitted on the upper side of the cover. The maximum rating of the lifting point depends on the pump model. Make sure that the total of weight to be moved will not exceed this maximum rating.

For the weights, refer to § 10.1.5.

Maximum rating of the lifting point of the pump head				
Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
200 kg	390 kg	670 kg	1020 kg	1580 kg



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



WARNING

If the pump is to be lifted ensure that all standard lifting practices are adhered to and carried out by qualified personnel only.

**WARNING**

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

5.5 Placing the pump

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

6 COMMISSIONING

6.1 Preparations

1. Connect the electric motor in conformance with the locally applicable rules and regulations. Ensure that the electrical installation work is carried out by qualified personnel.
2. Check that the lubricant level is above the minimum level line in the inspection window. If necessary add Bredel Genuine Hose Lubricant via the breather/vent plug. See also § 7.4.
3. Check the rotation direction of the rotor.
4. Check that the correct number of shims corresponds with your application. Refer to § 10.1.7.
For adjusting the compression force of the hose, refer to § 7.8.

6.2 Commissioning

1. Connect the pipework. Make sure that there are no obstructions such as closed valves.
2. Switch on the hose pump.
3. Check the rotation of the pump rotor.
4. Check the capacity of the hose pump. If the capacity differs from your specification, follow the instructions in chapter 9 or consult your Bredel representative.
5. Check the hose pump in accordance with points 1 to 4 of the maintenance table from § 7.2.

7 MAINTENANCE

7.1 General

**WARNING**

Only use original Bredel parts when maintaining the hose pump. Bredel cannot guarantee a correct functioning and any consequential damage that occurs from the use of non-original Bredel components. See also chapters [2](#) and [3](#).

**WARNING**

If the cover is removed when the pump hose is still in the pump head, 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.

7.2 Maintenance and periodic inspections

The following maintenance scheme shows the 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.

Point	Action	To be carried out	Remark
1	Check the lubricant level.	Before startup of the pump and on a scheduled interval during operation.	Make sure that the lubricant level is above the minimum level line in the inspection window. If necessary refill the lubricant. See also § 7.4.
2	Check the pump head for any leakage of lubricant around the cover, the flanges and the rear of the pump head.	Before startup of the pump and on a scheduled interval during operation.	See § 9.
3	Check the gearbox on any leakage.	Before startup of the pump and on a scheduled interval during operation.	In case of leakage consult your Bredel representative.
4	Check pump for deviating temperature or strange noises.	On a scheduled interval during operation.	See § 9.
5	Check pressing shoes for excessive damage.	When replacing the pump hose.	See § 7.6.
6	Internal cleaning of the pump hose.	Cleaning of the system or product change.	See § 7.3.
7	Replacing pump hose.	Preventive, this means after 75% of the hose life of the first hose.	See § 7.6.
8	Changing lubricant.	After every 2 nd hose change or after 5,000 service hours, whichever comes first or after hose rupture.	See § 7.4
9	Changing oil in gearbox.	After the first 100 service hours and subsequently annually or every 2500 service hours.	See § 7.5.
10	Replacing pump seal.	If necessary.	See § 7.7.2.

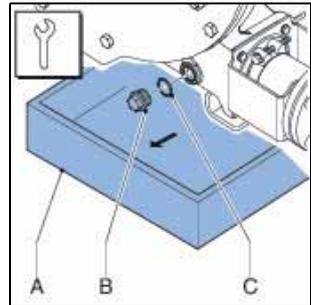
Point	Action	To be carried out	Remark
11	Replacing wear ring.	If necessary.	See § 7.7.2.
12	Replacing pressing shoes.	Wear on the running surface.	See § 7.7.1.
13	Replacing bearings.	If necessary.	See § 7.7.3.
		In potentially explosive atmospheres preventive after 20,000 hrs. service or when damage is suspected.	See § 7.7.1. Exclusively applicable in potentially explosive atmospheres (Group II Appliances, category 2 G c k T4).

7.3 Cleaning the pump hose

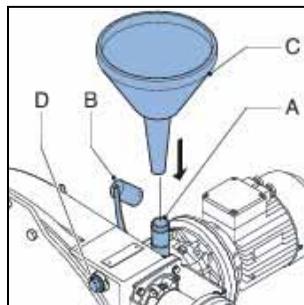
The inside of the pump hose can be easily cleaned by rinsing the pump with clean water. If a cleaning fluid is added to the water, check if the hose liner material is resistant to it. Also check if the pump hose can resist the cleaning temperature. Special cleaning balls are also available. Contact your Bredel representative for more details.

7.4 Changing lubricant

- Place a tray (A) under the drain plug in the bottom of the pump. Remove the drain plug (B). Drain the lubricant from the pump housing into the tray. Check that the sealing ring (C) is not damaged and replace it if necessary. Position the drain plug and tighten it firmly.



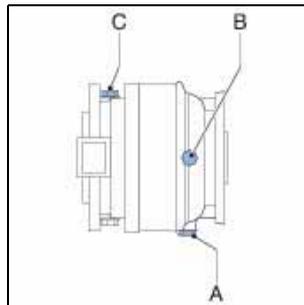
- The pump housing can be filled with lubricant via the breather/vent (A) on the rear of the pump housing. For this purpose remove the breather cap (B) and position a funnel (C) in the breather. In order to facilitate the filling with lubricant the plug (D) on the front of the pump housing can be removed. Pour the lubricant in the pump housing via the funnel. Continue until the lubricant level has reached above the minimum level line.



For the required quantity of lubricant, refer to § 10.1.4.

7.5 Changing oil in gearbox

- Isolate the pump from the electrical supply.
- Position a tray under the gearbox. Remove plug (A) and drain the gearbox.
- 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 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 plug (B) and the plug (C) back and tighten them firmly.



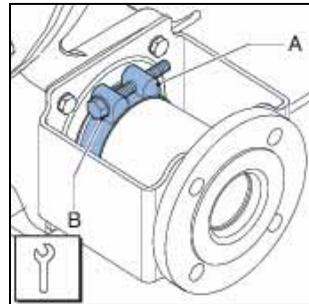
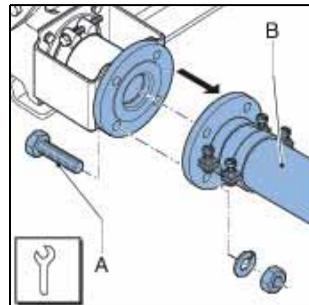
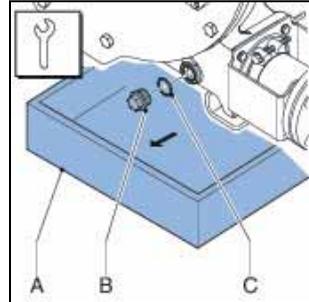
For the required lubricant, refer to § 10.2.

- Switch on the electrical supply to the pump.

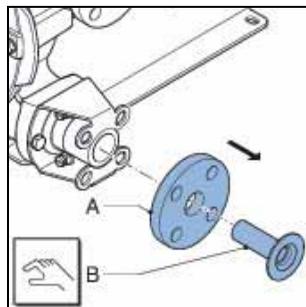
7.6 Replacing pump hose

7.6.1 Removing pump hose

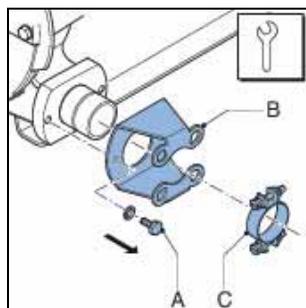
1. Isolate the pump from the electrical supply.
2. Close any shut-off valves in both the suction and discharge line to minimize product loss.
3. Place a tray (A) under the drain plug in the bottom of the pump head. The tray must be large enough to contain the lubricant, possibly contaminated with product fluid, from the pump head. Remove the drain plug (B). Catch the lubricant from the pump housing in the tray. Check that the breather vent mounted on the rear is not obscured. Check that the sealing ring (C) is not damaged and replace it if necessary. Position the drain plug and tighten it firmly.
4. Loosen the retaining bolts (A) of both the suction and discharge line. Disconnect the suction and discharge lines.
5. Loosen hose clamp (A) of both the inlet and outlet ports by loosening retaining bolt (B).



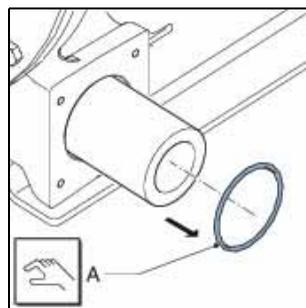
6. Pull the insert (B) from the hose and remove the flanges (A). Carry out this procedure both for the inlet and outlet ports.



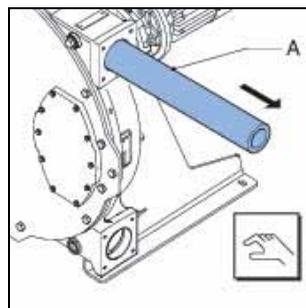
7. Loosen the retaining bolts (A) of the flange bracket (B) and remove the bolts. Slide the flange bracket and the hose clip (C) off the hose. Carry out this procedure both for the inlet and outlet ports.



8. 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.



9. Connect the pump to the electrical supply.



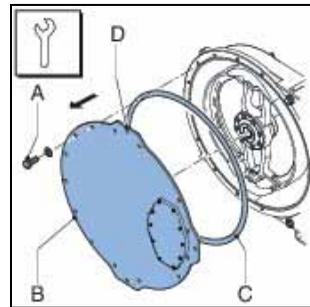
10. Power out the hose (A) from the pump chamber by jogging the drive motor.

	<p>WARNING</p> <p>During jogging the drive:</p> <ul style="list-style-type: none"> - Do not stand in front of the pump ports. - Do not try to guide the hose by hand.
--	--

7.6.2 Cleaning the pump head

1. Isolate the pump from the electrical supply.

	<p>WARNING</p> <p>Never dismount the cover, when the pump hose is in the pump head. The compression forces on the pump hose are partially compensated by the cover. By removing the cover, the pump housing may become deformed.</p>
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2. Use lifting hole (D) to move the cover. Remove the cover (B) by loosening the retaining bolts (A).
3. Check the sealing ring (C) and replace it if necessary.
4. Rinse the pump head with clean water and remove all residues. Make sure that no rinsing water remains in the pump head.

- Check the pressing shoes for wear or damage and replace them if necessary. Refer to § 7.7.1. Also see the maintenance scheme in § 7.2.

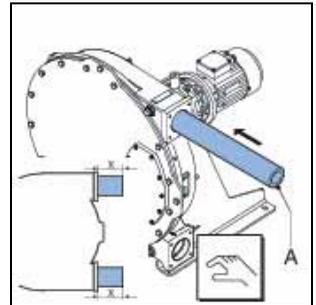
**CAUTION**

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 pump hose.

- Replace the cover and fasten the retaining bolts with the correct torque. Refer to § 10.1.6.
- Switch on the electrical supply to the pump.

7.6.3 Fitting the pump hose

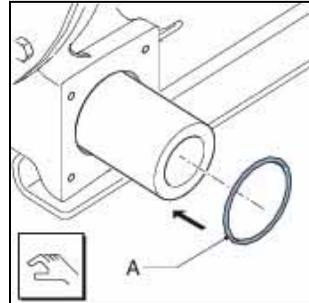
- Clean the (new) pump hose on the outside and fully lubricate it with Bredel Genuine Hose Lubricant.
- Fit the pump hose (A) via one of the ports.
- Let the motor run to draw the hose in the pump housing. The rotor will move the hose. Stop the motor when the hose protrudes out equally from both sides of the pump housing.

**WARNING**

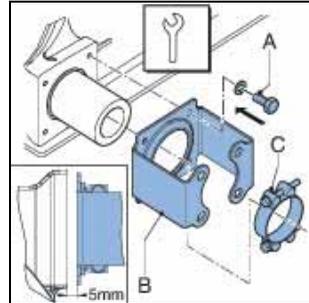
During jogging the drive:

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

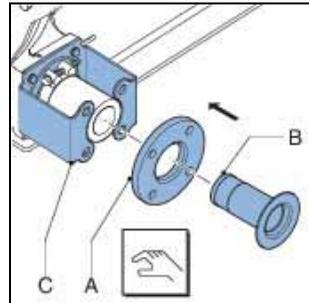
4. First fit the inlet port. Fit the sealing ring. Before mounting, check that the sealing ring (A) is not deformed or damaged and replace it if necessary.



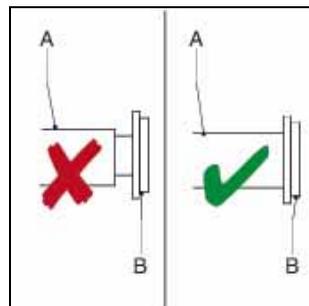
5. Before fitting check that the hose clamp is not damaged and replace it if necessary. Slide the flange bracket (B) and the hose clamp (C) over the hose together. Align the holes in the flange bracket with the ones at the front of the port. Position the four retaining bolts (A) and tighten them until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



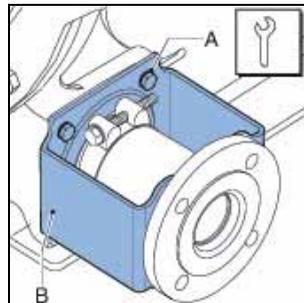
6. Slide insert (B) in the flange (A) and press the insert in the hose. If necessary lubricate the insert with Bredel Genuine Hose Lubricant in order to simplify mounting. Make sure that the holes in flange (A) are aligned with the holes in flange bracket (C). Check that the insert is in the correct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



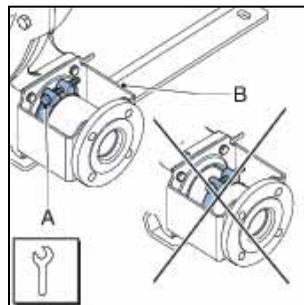
7. Turn the rotor in such a way that the hose (A) is pressed firmly against the flange surface (B).



8. Now fully tighten the retaining bolts (A) of the flange bracket (B). Make sure the bolts are tightened with the correct torque. Refer to § 10.1.6.



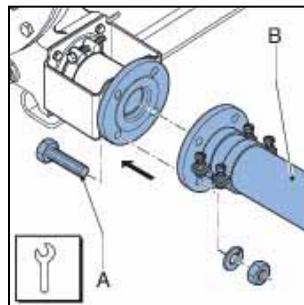
9. Position hose clamp (A) against O-ring chamber of the flange bracket (B) and fasten the retaining bolt. Make sure the bolts are tightened with the correct torque. Refer to § 10.1.6.



10. Now fit the other port. For this port proceed in the same way as described above for the inlet port.

11. Fill the pump housing with Bredel Genuine Hose Lubricant. Refer to § 7.4.

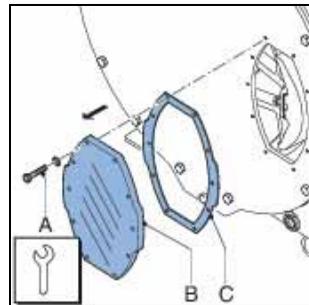
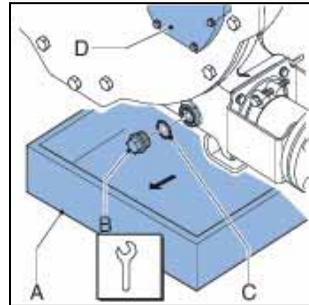
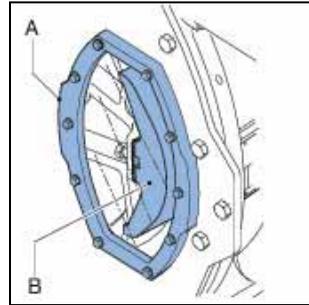
12. Connect the suction and discharge lines (B) and fit the retaining bolts (A). Tighten the retaining bolts with the correct torque. Refer to § 10.1.6.



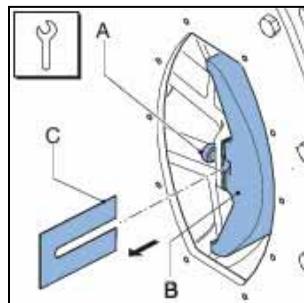
7.7 Exchanging replacement parts

7.7.1 Replacing pressing shoes

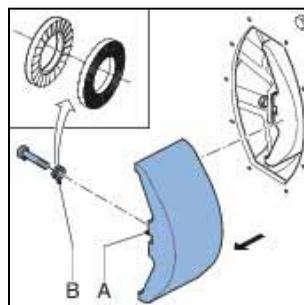
1. Jog the motor until the pressing shoe (B) is positioned in view of the inspection window (A).
2. Isolate the pump from the electrical supply.
3. Place a tray (A) under the drain plug (B) in the bottom of the pumphead. Remove the drain plug. Drain as much Bredel Genuine Hose Lubricant until the level has lowered just below the inspection window (D). Check that the sealing ring (C) is not damaged and replace it if necessary. Position the drain plug and tighten it firmly
4. 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).



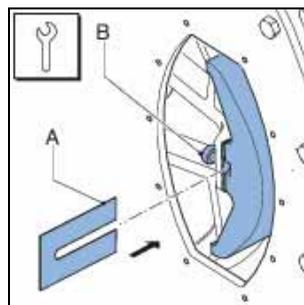
5. Loosen the retaining bolt(s) (A) of pressing shoe (B) a few turns. Remove the shims (C) if present. Loosen the retaining bolt(s) (A) of pressing shoe (B) completely and remove the pressing shoe.



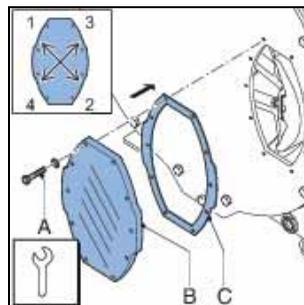
6. Position the (new) pressing shoe (A), check that the NordLock®-rings (B) have been positioned correctly and tighten the retaining bolt(s) a few turns.



7. Fit the removed shims (A) again. Tighten the retaining bolt(s) (B) with the correct torque. Refer to § 10.1.6.



8. Refit the inspection window (B). Check the inspection window gasket (C) for damage and replace if necessary. Make sure that all bolts (A) are refitted and that they are tightened in the correct order, diagonally opposite each other.

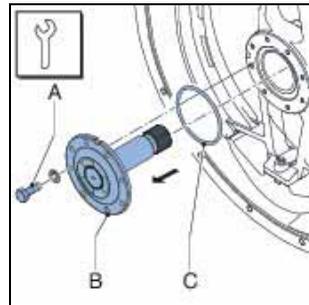
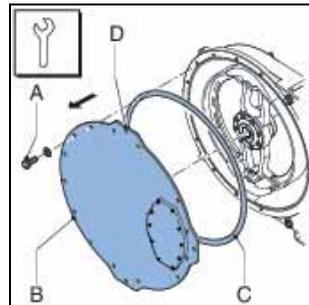


9. Switch on the electrical supply.
10. Jog the motor until the second pressing shoe is positioned in front of the inspection window.

11. Isolate the pump from the electrical supply.
12. Repeat the procedure for removing and fitting this second pressing shoe by repeating steps 4 through 9.
13. Refill the lubricant. Refer to § 7.4.

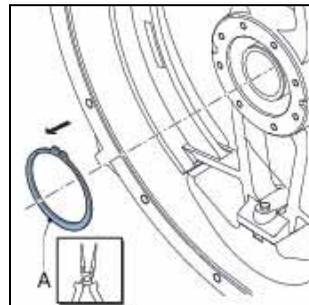
7.7.2 Replacing seal and wear ring

1. Remove the pump hose. Refer to § 7.6.1.
2. Isolate the pump from the electrical supply.
3. Use lifting hole (D) to move the cover. Remove the cover (B) by loosening the retaining bolts (A). Check the sealing ring (C) of the pump cover for damage.
4. Remove the retaining bolts (A) of the drive shaft (B) and remove the drive shaft. Check the sealing ring (C) for damage.



i	If the drive shaft cannot be removed manually, use a screwdriver in the slots in the rotor provided for this purpose.
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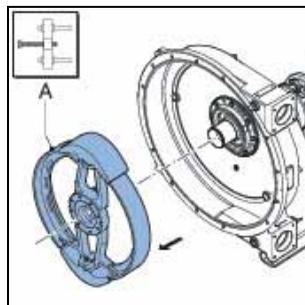
5. Remove the rotor retaining circlip (A), which locks the rotor on the hub. Use the correct tools to do this.



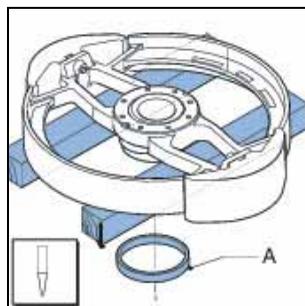
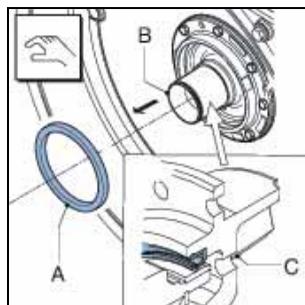
6. Fit the necessary lifting means before dismantling the rotor. Extract the rotor (A) from the hub. A suitable puller or similar extraction tool will be required during this stage of the disassembly.

**WARNING**

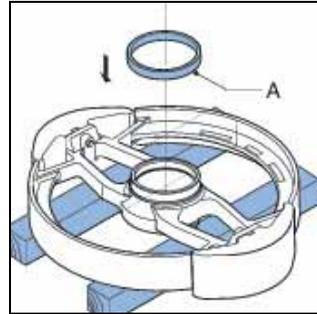
When removing the rotor a belt or similar lifting aid must carry the weight of the rotor. For the specific weight of the rotor, refer to § 10.1.5.



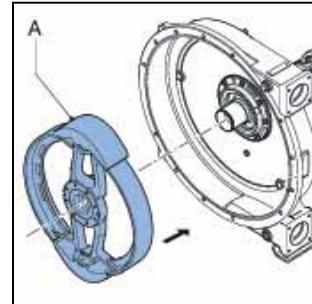
7. Remove the seal (A) from the hub (B). Clean and degrease the bore.
8. Fit a new seal using a wooden block and hammer. Carefully hit the seal crosswise and with equal strength in the bore until it touches the hub. The seal must be fitted in the correct orientation (C). Make sure that the open side points to the pump cover.
9. Support the rotor with wooden blocks at 90° to the spokes, with the 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.



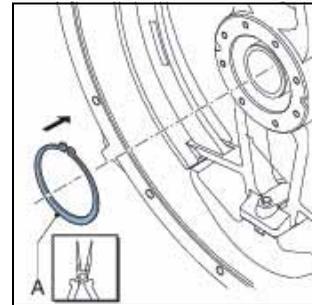
10. Turn the rotor over. Make sure that the seats of the new wear ring (A) and rotor are clean, dry and free of grease. Apply Loctite® type 641 or 603 both on the rotor and the wear ring. Position the new wear ring with the tapered edge facing up. Use a plastic hammer to fit the ring on the rotor until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



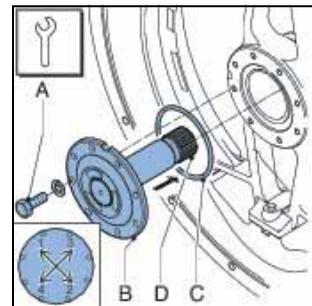
11. Check that the hub is clean and free of grease. Fit rotor (A). The bearings have been placed on the hub with a slight interference fit. Use a pressing tool to press the rotor on the hub.



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



13. Heavily grease the spline (D) of the drive shaft (B) with a graphite-loaded grease. Ensure the mating faces of the drive shaft and rotor are clean, dry and free from lubricant. Check that the sealing ring (C) is not damaged and replace it if necessary. Fit the sealing ring in the groove of the shaft flange. Fit the drive shaft. Turn the

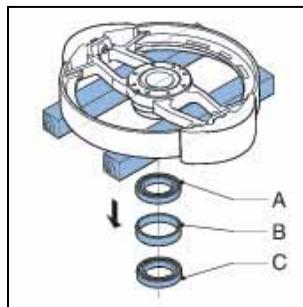
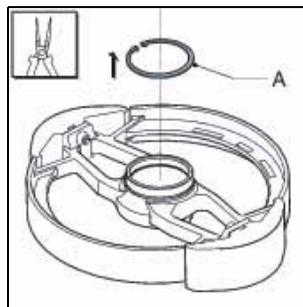


rotor until the bolt holes in the drive shaft correspond with the threaded holes in the rotor. Mount the retaining bolts (A) of the drive shaft. Tighten the bolts finger-tight. Tighten them diagonally opposite to each other to the specified torque limits. Refer to § 10.1.6.

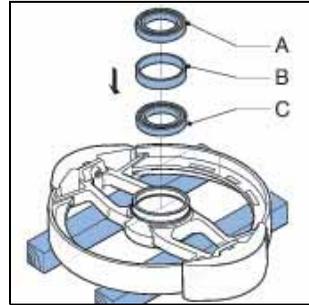
14. Replace the cover and fasten the retaining bolts with the correct torque. Refer to § 10.1.6.
15. Switch on the electrical supply to the pump.
16. Fit the (new) pump hose. Refer to § 7.6.3.

7.7.3 Replacing bearings

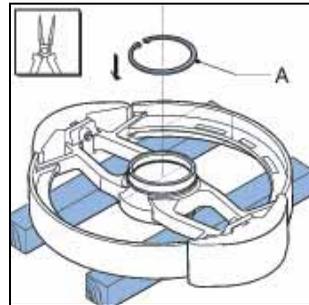
1. Dismount the pump hose, the cover and rotor by following steps 1 through 6 from § 7.7.2.
2. Lay the rotor on a flat surface with the wear ring face up. Remove retaining circlip (A) with the correct tools.
3. Turn the rotor over. Remove using the correct pressing tools, first the first bearing (C), the spacer ring (B) and the second bearing (A) from the rotor. Check the spacer ring for damage. Retain the spacer ring (B).



4. Turn the rotor over. Check that the hub is clean and dry. 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.



5. Refit the retaining circlip (A) in the rotor. Use the correct tools for this purpose.
6. Fit the rotor, the cover and pump hose by following steps 11 through 16 from § 7.7.2.



7.8 Adjusting hose 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 § 10.1.7.



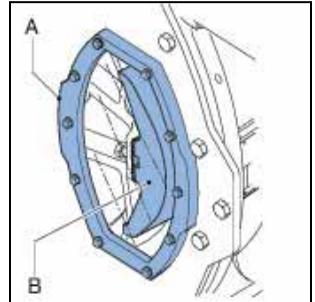
CAUTION

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

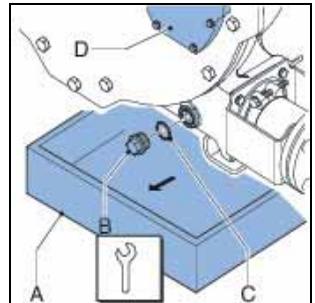
**CAUTION**

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.

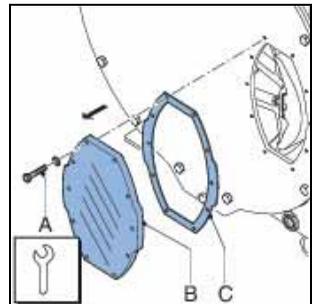
1. Jog the motor until the pressing shoe (B) is positioned in view of the inspection window (A).
2. Isolate the pump from the electrical supply.



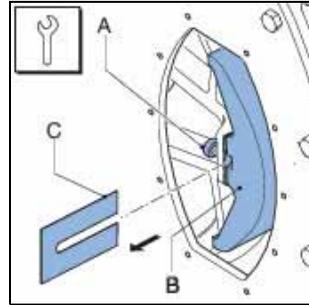
3. Place a tray (A) under the drain plug (B) in the bottom of the pump head. Remove the drain plug. Drain as much Bredel Genuine Hose Lubricant until the level has lowered just below the inspection window (D). Check that the sealing ring (C) is not damaged and replace it if necessary. Position the drain plug and tighten it firmly.



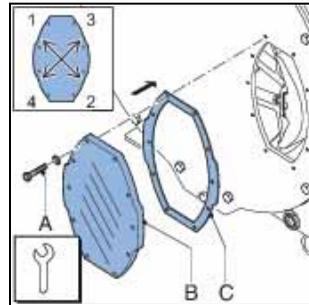
4. Loosen the retaining bolts (A) of the inspection window (B) and remove the bolts. Remove the inspection window. When doing this prevent the gasket (C) from damaging.



5. Loosen the retaining bolt(s) (A) of pressing shoe (B) a few turns. Fit the shims (C) or remove them, until the correct number of shims is present. Refer to § 10.1.7. Tighten the retaining bolt(s) of the pressing shoe with the correct torque. Refer to § 10.1.6.



6. Check the inspection window gasket for damage and replace if necessary. Refit the inspection window (B). Make sure that all bolts (A) are refitted and that they are tightened in the correct order, diagonally opposite each other, to the specified torque limits. Refer to § 10.1.6.



7. Switch on the electrical supply.
8. Jog the motor until the second pressing shoe is positioned in front of the inspection window.
9. Isolate the pump from the electrical supply.
10. Repeat the procedure for this pressing shoe by repeating steps 4, 5, 6 and 7.
11. Refill the lubricant via the breather. Refer to § 7.4.

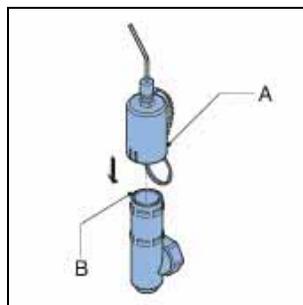
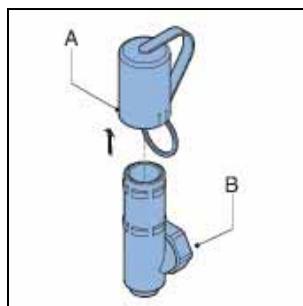
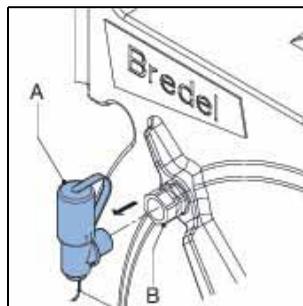
7.9 Fitting options

7.9.1 Fitting a high-level float switch

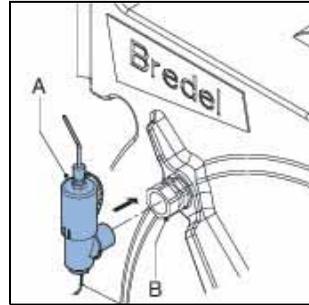


For explosive environments, contact your Bredel representative.

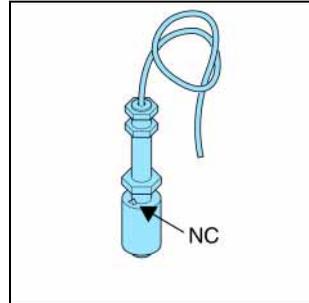
1. Dismount the standard breather (A) on the rear of the pump, by dismounting it from crimp connector (B).
2. Slide the standard breather cap (A) from breather (B).
3. Replace the standard breather cap with the breather cap with high level float switch (A) and slide it over breather (B).



4. Fit the breather (A) on the rear of the pump, by mounting it to crimp connector (B).



5. Connect the high-level float switch to the auxiliary power circuit via the 2-metre long PVC cable (2 x 0.34 mm²). 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

i	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 re-started without re-setting. Check if the float switch is mounted with the NC sign at the top.
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7.9.2 Fitting a low level float switch

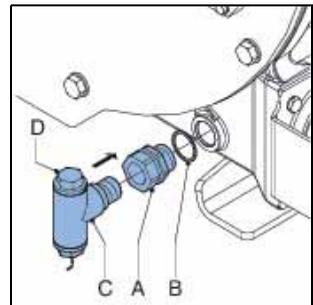
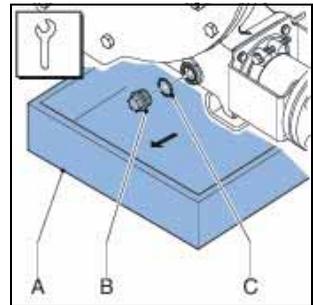


For explosive environments, contact your Bredel representative.



For specifications, refer to § 7.9.1.

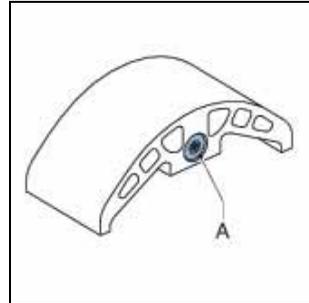
1. If the pump is filled with lubricant this must be removed first. Place a clean tray (A) under the drain plug in the bottom of the pump. Remove the drain plug (B). Drain the lubricant from the pump housing into the tray. Check the sealing ring (C) for damage.
2. Fit the crimp connector (A) together with the sealing ring (B) to the pump housing. Fit the low-level float switch (C) to the crimp connector (A).
3. 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.
4. Refill the pump housing to the proper level with Bredel Genuine Hose Lubricant.
5. Breath the float switch by carefully opening plug (D) until lubricant escapes. Subsequently close the plug again.



7.9.3 Fitting revolution counter

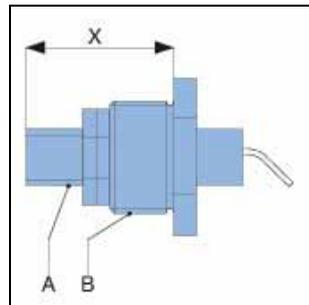
1. Remove one of the pressing shoes of the rotor by following steps 1 through 5 from § 7.7.1.

2. Replace pressing shoe by the special pressing shoe with a magnet (A) by following the steps 6 through 8 from § 7.7.1.

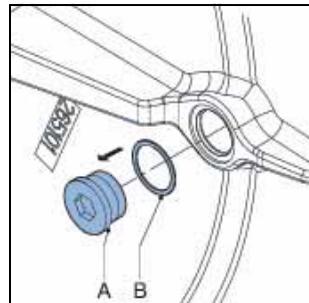


3. Fit the inductive sensor (A) in plug (B) and adjust it to dimension "X" as indicated in the table below.

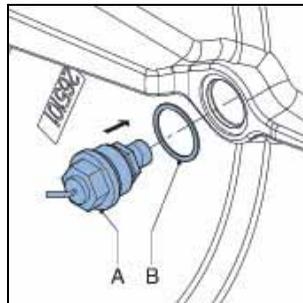
Pump type	Dimension "X"
Bredel 40	32 +0 /-1
Bredel 50	32 +0 /-1
Bredel 65	32 +0 /-1
Bredel 80	45 +0 /-1
Bredel 100	45 +0 /-1



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 pump housing to the proper level with Bredel lubricant.



8. Connect the sensor via the 2-meter long PVC cable (3 x 0.34 mm²).

Specifications

Voltage:	10...30 VDC
Current:	Max. 150 mA

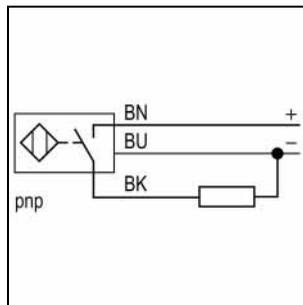


WARNING

Contact your Bredel representative for proper connection of the sensor.



For explosive environments, contact your Bredel representative.



8 STORAGE

8.1 Hose pump

- Store the hose pump or pump parts in a dry area. Make sure that the hose pump or pump parts are not exposed to temperatures lower than -40 °C or higher than +70 °C.
- Cover the openings of the inlet and outlet ports.
- Prevent corrosion of untreated parts. For this purpose use the correct protection or packaging means.
- 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. To prevent this, remove a pressing shoe. Jog the rotor until the second pressing shoe is positioned between the inlet and outlet port. In this way there is no load put on the pump hose.

8.2 Pump hose

- Store the pump hose in a cool and dark room. After two years the hose material will age, which will reduce the life of the hose.

9 TROUBLESHOOTING



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.

If the hose pump does not function (correctly), consult the following checklist to see if you can remedy the error yourself. If this is not the case, contact your Bredel representative.

Problem	Possible cause	Correction
Failure to operate.	No voltage.	Check that the supply power switch is on.
		Check the electrical supply is available at the pump.
	Stalled rotor.	Check if the pump is stalled by incorrect fitting of the hose.
	Lubricant level monitoring system has been activated.	Check that the lubricant level monitoring system has stalled the pump. Check the functioning of the lubricant level monitoring system, or check the lubricant level.

Problem	Possible cause	Correction
High pump temperature.	Non standard hose lubricant used.	Consult the Bredel representative for the correct lubricant.
	Low lubricant level.	Add Bredel Genuine Hose Lubricant. For the required amount of lubricant refer to § 10.1.4.
	Product temperature too high.	Consult the Bredel representative about the maximum temperature range of the product.
	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 § 10.1.7. Remove excess shims.
	High pump speed.	Reduce pump speed to a minimum. Consult with your Bredel pump representative for advice on optimum pump speeds.

Problem	Possible cause	Correction
Low capacity / pressure.	Shut-off valve in the suction line (partly) closed.	Fully open the shut-off valve.
	Under shimming of the pressing shoes.	Consult the diagram in § 10.1.7. Fit the correct number of shims.
	Hose rupture or badly worn hose.	Replace hose. Refer to § 7.6.
	(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.	Tighten connections and hose clamps.
	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.	Consult your Bredel representative for a recommendation.

Problem	Possible cause	Correction
Vibration of the pump and pipe-work.	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. Consult your Bredel representative for a recommendation.
	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.
Short hose life.	Chemical attack of the hose.	Check the compatibility of the hose material with the product to be pumped. Consult your Bredel representative for correct hose selection.
	High pump speed.	Reduce pump speed.
	High discharge pressures.	Maximum working pressure 1600 kPa. 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.	Consult your Bredel representative for correct hose selection.
	High pulsations.	Restructure the discharge and inlet conditions.

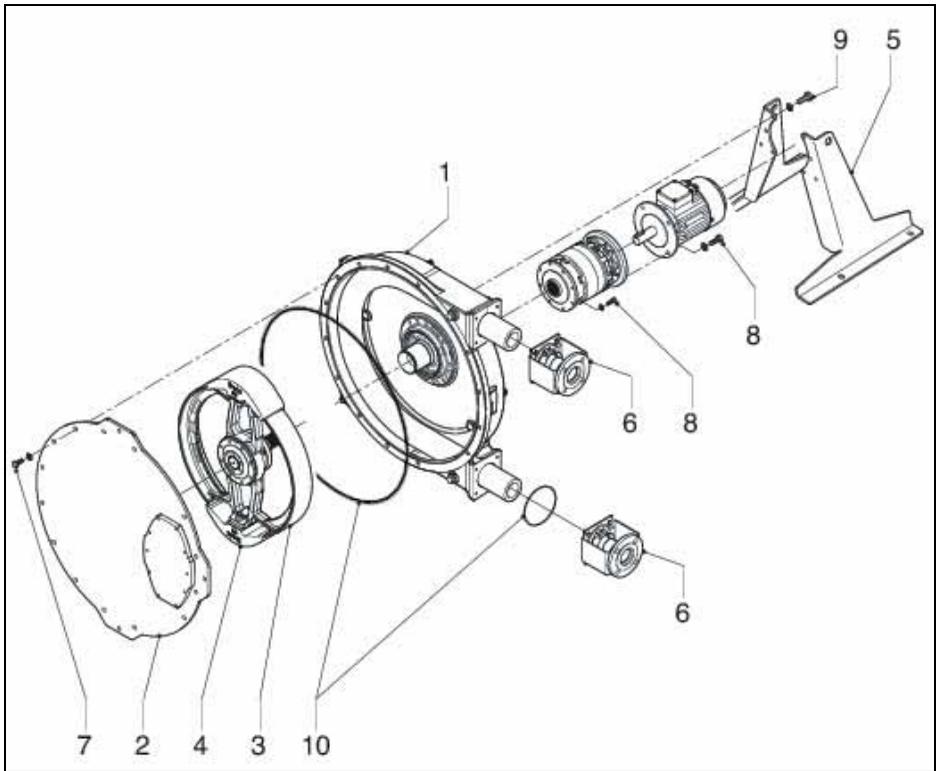
Problem	Possible cause	Correction
Hose pulled into the pump.	Insufficient or no hose lubricant in the pump head.	Add extra lubricant. Refer to § 7.4.
	Incorrect lubricant: no Bredel Genuine Hose Lubricant in the pump head.	Consult the Bredel representative for the correct lubricant.
	Extremely high inlet pressure - larger than 300 kPa.	Reduce the inlet pressure.
Lubricant leakage at flange bracket.	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.
	Bolts of flange bracket loose.	Tighten to the specified torque settings. Refer to § 10.1.6.
	Bolts of hose clamps loose.	Tighten to the specified torque settings. Refer to § 10.1.6.
Leakage from the rear of the pump housing "Buffer zone".	Damaged wear or sealing ring.	Replace wear or sealing ring.
Motor functions, but rotor does not.	Broken undercut on the pump shaft.	Follow installation procedure supplied with replacement shaft.

10 SPECIFICATIONS**10.1 Pump head****10.1.1 Performance**

Description	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Max. capacity, continuous [m ³ /h]	6.0	10.5	20.0	28.0	36.0
Max. capacity, intermittently [m ³ /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 working pressure [kPa]	1600				
Permissible ambient temperature [°C]	-20 to +45				
Permissible product temperature [°C]	-10 to +80				
Sound level on 1 m [dB(A)]	70				

* Intermittent duty: Let the pump stand still to cool down for at least 1 hour after 2 hours of operation.

10.1.2 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 optional)
5	Supports	Mild steel, galvanised
6	Hose flange brackets	Mild steel, galvanised
7	Cover fixings	Mild steel, galvanised
8	Motor fixings	Mild steel, galvanised
9	Mounting material of supports	Mild steel, galvanised
10	Seals and glands	Neoprene or Nitrile

10.1.3 Surface treatment

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

10.1.4 Lubricant table pump

	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Lubricant	Bredel*	Bredel*	Bredel*	Bredel*	Bredel*
Required quantity [litres]	5	10	20	40	60

* Bredel Genuine Hose Lubricant is registered at NSF: NSF Registration No 123204; Category Code H1. See also: www.NSF.org/USDA.

	Should you require additional information with respect to the safety data sheet, consult your Bredel representative.
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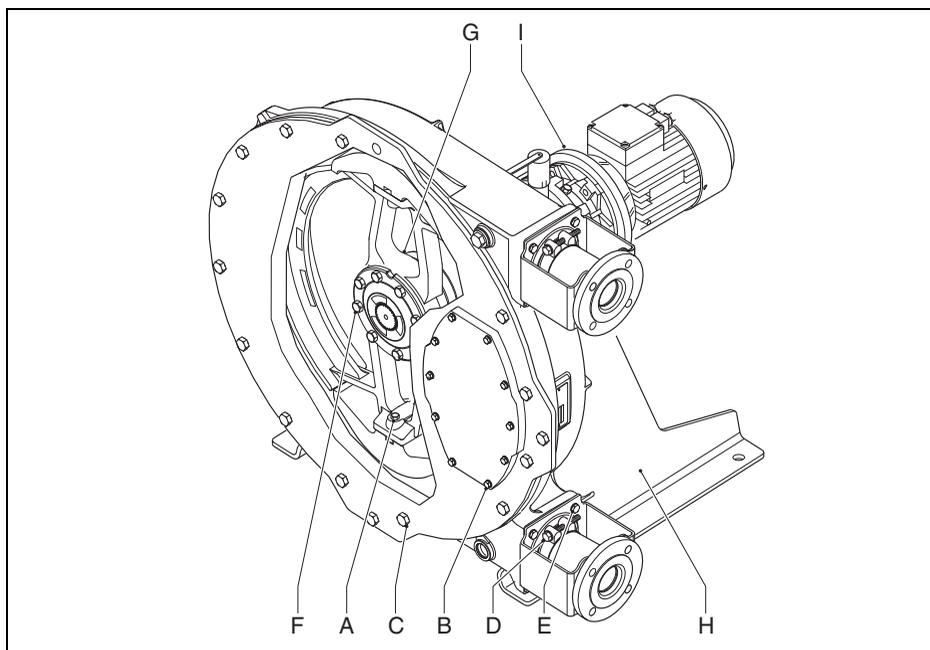
10.1.5 Weights

Description	Weight [kg]				
	Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
Hose pump, maximum weight*	180	325	558	930	1300
Pump head**	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 pump head (inclusive of hose, lubricant and supports).

10.1.6 Torque figures

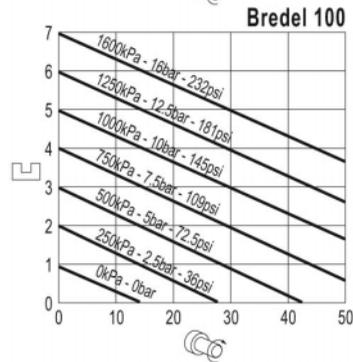
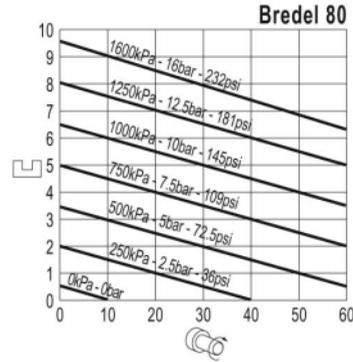
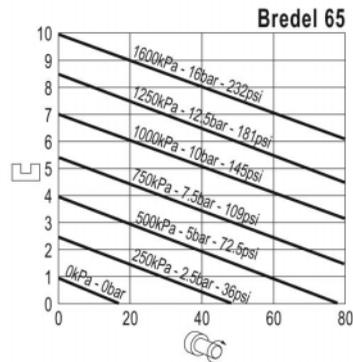
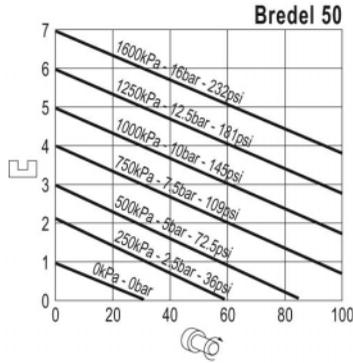
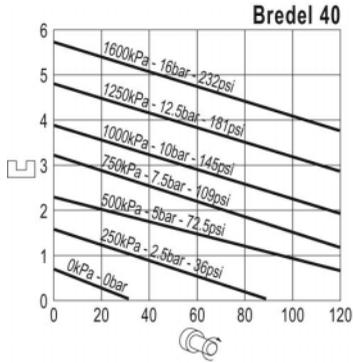


Pos	Description	Torques [Nm]				
		Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
A	Pressing shoe bolt(s)	50	85	85	208	208
B	Inspection window	5	8	8	8	8
C	Cover	50	85	210	210	400
D	Hose clamp*	25	40	40	40	40
E	Flange bracket	25	50	50	85	85
F	Drive shaft	25	50	85	210	210
G	Hub	50	50	85	210	210
H	Supports	50	50	85	210	210
I	Gearbox	25	85	85	85	135

* Due to creeping of the hose material, the hose clamp force reduces in time. If leakage starts, re-tighten the hose clamp to the specified torque level. The listed torque values apply to a new hose clamp.

10.1.7 Shims specifications

- When the product temperatures are above 60 °C always use one shim less than indicated in the diagrams.
- Always round up the number of shims.



10.2 Lubricant table gearbox

Below is an overview of some of the recommended lubricants for the planetary gearbox. In the majority of the cases a mineral oil ISO VG 150 or ISO VG 220 is recommended. In case of very low or ambient temperatures a mineral ISO VG 100 is advised. In case of high ambient temperatures or 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. Contact your Bredel representative for advice.

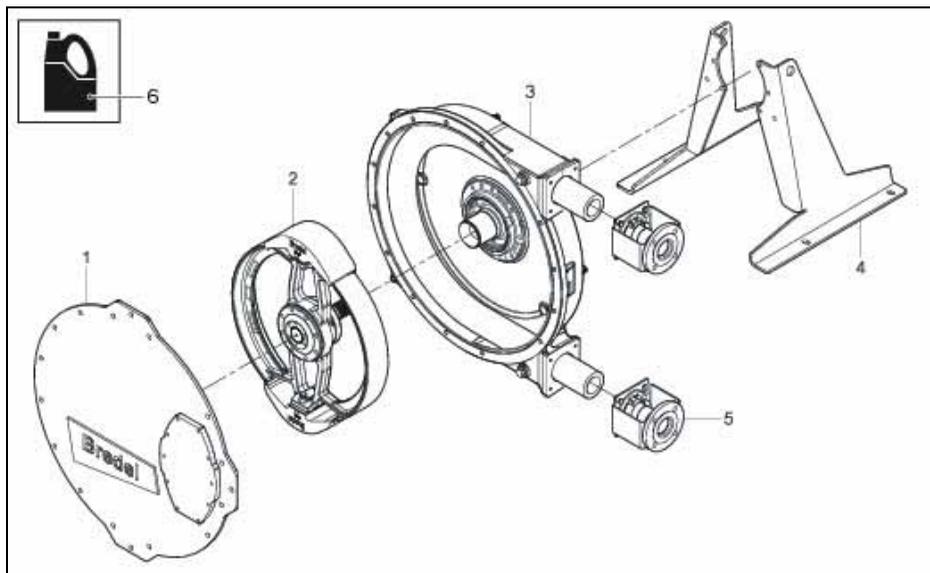
Recommended lubricants for the Bredel planetary gearboxes*				
	-20 °C / +5 °C IV 95 min	+5 °C / +30 °C IV 95 min	+30 °C / +50 C IV 95 min	-30 °C / +65 °C IV 165 min
ISO 3448	VG 100	VG 150	VG 320	VG 150 - 220
AGIP	Blasia 100	Blasia 150	Blasia 320	Blasia SX 220
ARAL	Drgol BG 100	Drgol BG 150	Drgol BG 220	Drgol PAS 220
BP MACH	Energol GR-XP 100	Energol GR-XP 150	Energol GR-XP 320	Energol EXP 220
CASTROL	Alphamax 100	Alphamax 150	Alphamax 320	Alphasyn SN 150
ESSO	Spartan EP 100	Spartan EP 150	Spartan EP 320	Spartan SEP 200
Q8	Goya NT 100	Goya NT 150	Goya NT 320	El Greco 220
I.P.	Mellana 100	Mellana 150	Mellana 320	Telesia Oil 150
MOBIL	Mobilgear XMP 100	Mobilgear XMP 150	Mobilgear XMP 320	Mobilgear SHC XMP 220
SHELL	Omala oil 100	Omala oil 150	Omala oil 320	Omala HD 220
TOTAL	Carter EP 100	Carter EP 150	Carter EP 320	Carter SH 220
KLÜBER	Kluberoil GEM 1-150	Kluberoil GEM 1-150	Kluberoil GEM 1-320	Klubersynth EG 4-220
Texaco	Meropa 100	Meropa 150	Meropa 320	Pinnacle EP 220

* For a complete overview of the recommended lubricants contact your Bredel representative.

10.3 Electric motor

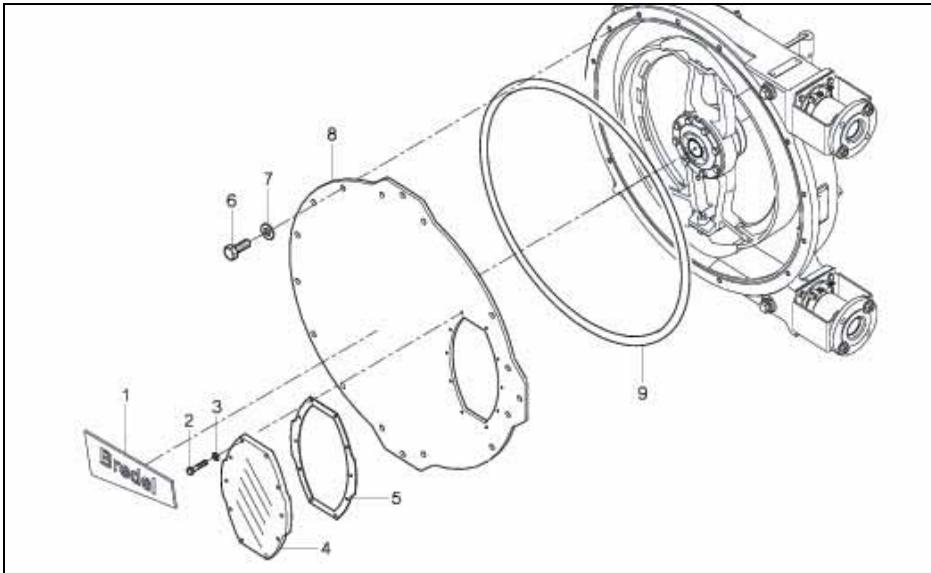
Construction	IM B5 (flange type)
Materials	size IEC-80/90: Housing and connection box: aluminium End shields: cast-iron
	size IEC-100 and larger: Housing, connection box and end shields: cast-iron
Number of poles	4 or 6 poles
Voltage - frequency *	up to 2.2 kW: 230 / 400 V - 3 phases - 50 Hz
	3.0 kW 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

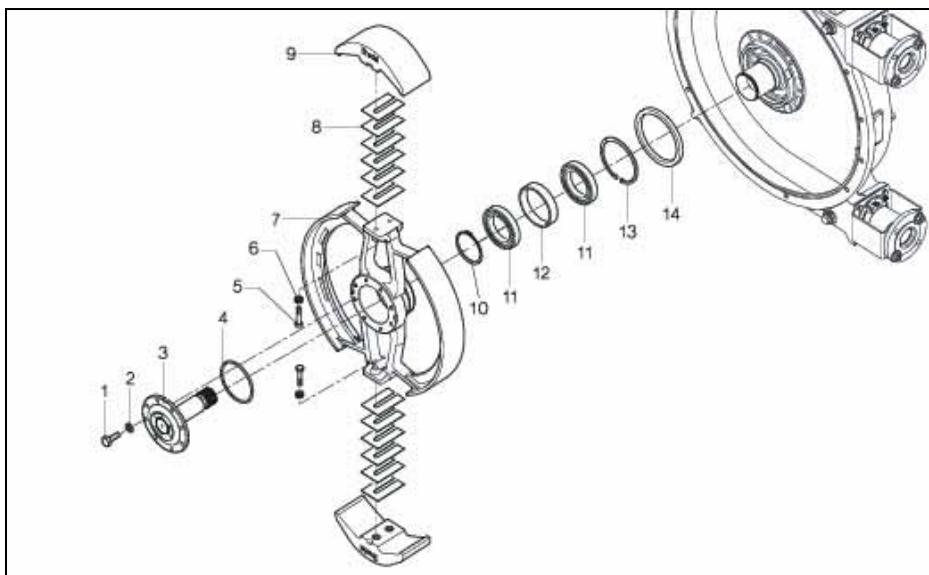
10.4 Parts list
10.4.1 Overview


Pos.	Description
1	Cover assembly. Refer to § 10.4.2.
2	Rotor assembly. Refer to § 10.4.3.
3	Pump housing assembly. Refer to § 10.4.4.
4	Pump support assembly. Refer to § 10.4.5.
5	Flange assembly. Refer to § 10.4.6.
6	Lubricant. Refer to § 10.4.8.

10.4.2 Cover assembly



Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	1	Sticker	240238	250238	265238	280238	200238
2	8	Bolt, hex. head	F111042	F111074	F101038	F101038	F101040
3	8	Washer, plain	F322009	F322012	F322012	F322012	F322012
4	1	Inspection window	240155	250155	265155	280155	200155
5	1	Gasket	240156	250156	265156	280156	200156
6	14	Bolt, hex. head	F111096	F111130	F111182	F111182	F111218
7	14	Washer, plain	F322013	F322015	F322017	F322017	F322019
8	1	Pump cover	240102	250102	265102	280102	200102
9	1	Quad ring	240123	250123	265123	280123	200123

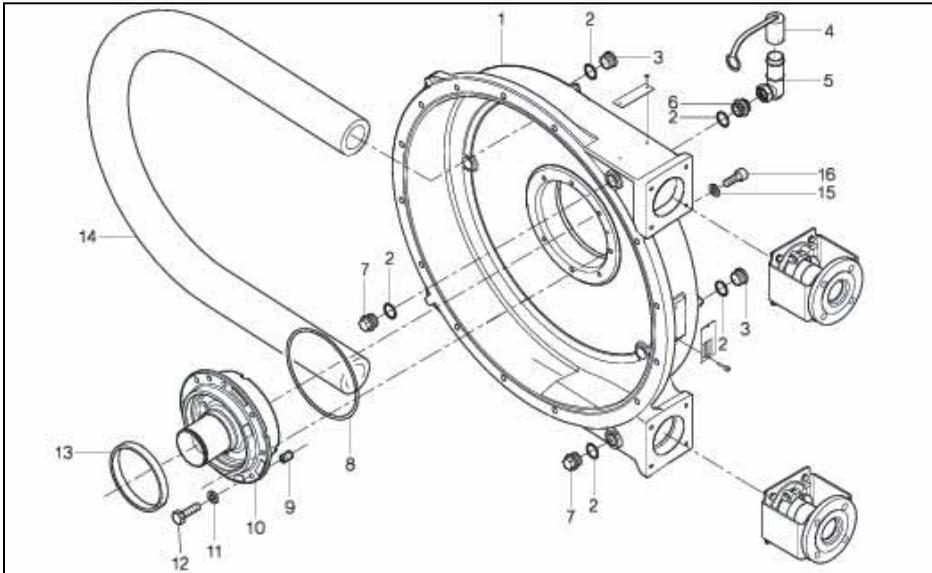
10.4.3 Rotor assembly


Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	8*	Bolt, hex. head	F111073	F111098	F111132	F111184	F111184
2	8*	Washer, spring Lock	F336011	F336012	F336013	F336015	F336015
3	1	Drive shaft**	240104	250104	265104	280104	200104
4	1	O-ring	S122431	S122541	122541	122611	S122611
5	2***	Bolt, hex. head	F101058	F101082	F101085	F101131	F101132
6	2***	NordLock® ring	F349005	F349007	F349007	F349009	F349009
7	1	Rotor	240103	250103	265103	280103	200103
8	12****	Shim	240107	250107	265107	280107	200107
9	2	Pressing shoe: aluminium	240110	250110	265110	280110	200110
	2	Epoxy, with stainless steel insert	240109A	250109A	265109A	280109A	200109A
10	1	Retaining ring	F343056	F343071	F343071	F343075	F343075
11	2	Bearing	B141460	B142060	B142060	B142460	B142460
12	1	Spacer outside	29110201	29150201	29151201	29180201	29181201

Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
13	1	Retaining ring	F344077	F344087	F344087	F344093	F344093
14	1	Wear ring	29140202	29180202	29180202	29240202	29240202

- * Pos. 1 and 2: Bredel 65, Bredel 80, Bredel 100: 12 pieces
- ** Pos. 3: Standard drive shaft. For the drive shaft of the Bredel 65 heavy duty drive (gearboxes G0217... and G0218...) and the Bredel 80 heavy duty drive (gearboxes G0224... and G0225...), consult your Bredel representative.
- *** Pos. 5 and 6: Bredel 65, Bredel 80, Bredel 100: 4 pieces
- **** Pos. 8: Bredel 40: 12 pieces, Bredel 50 and Bredel 100: 14 pieces, Bredel 65 and Bredel 80: 20 pieces

10.4.4 Pump housing assembly

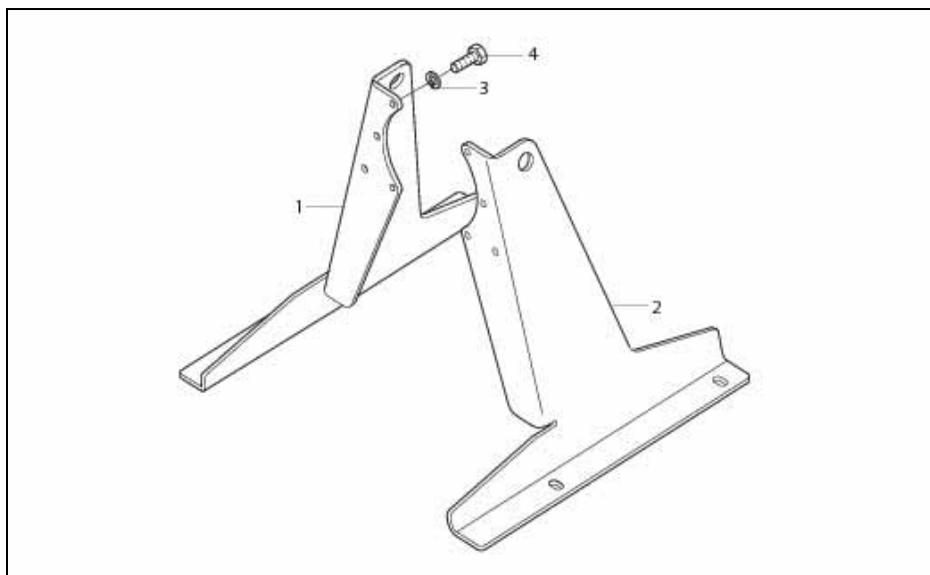


Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	1	Pump housing	240101	250101	265101	280101	200101
2	4	Packing ring	29040257	29040257	29040257	29056244	29056244
3	2	Plug, int. hex. hd	F901006	F901006	F901006	F901008	F901008
4	1	Breather cap	29065223	29065223	29065223	29089223	29089223
5	1	Breather	29110146	29110146	29110146	29125146	29125146

Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
6	1	Coupling, straight	F602006	F602006	F602006	F602008	F602008
7	2	Plug, ext. hex. hd.	F911006	F911006	F911006	F911008	F911008
8	1	O-ring	S122641	S122711	S122711	S122771	S122801
9	1	Dowel pin	F416082	F416082	F416082	F416121	F416121
10	1	Hub	240203	250203	265203	280203	200203
11	8	Washer, spring Lock	F336012	F336012	F336013	F336015	F336015
12	8	Bolt, hex. head	F115098	F115098	F115132	F115186	F115186
13	1	Seal	S212811	S213611	S213611	S214811	S214811
14	1	NR	040020	050020	065020	080020	100020
	1	NBR	040040	050040	065040	080040	100040
	1	EPDM	040075	050075	065075	080075	100075
	1	CSM	040070	050070	065070	080070	100070
15	8	Washer*	F332005	-	-	-	-
	10		-	F332007	F332007	F332007	-
	12		-	-	-	-	F332010
16	8	Bolt, hex. socket cap head*	F201064	-	-	-	-
	10		-	F201106	F201106	F201106	-
	12		-	-	-	-	F201250

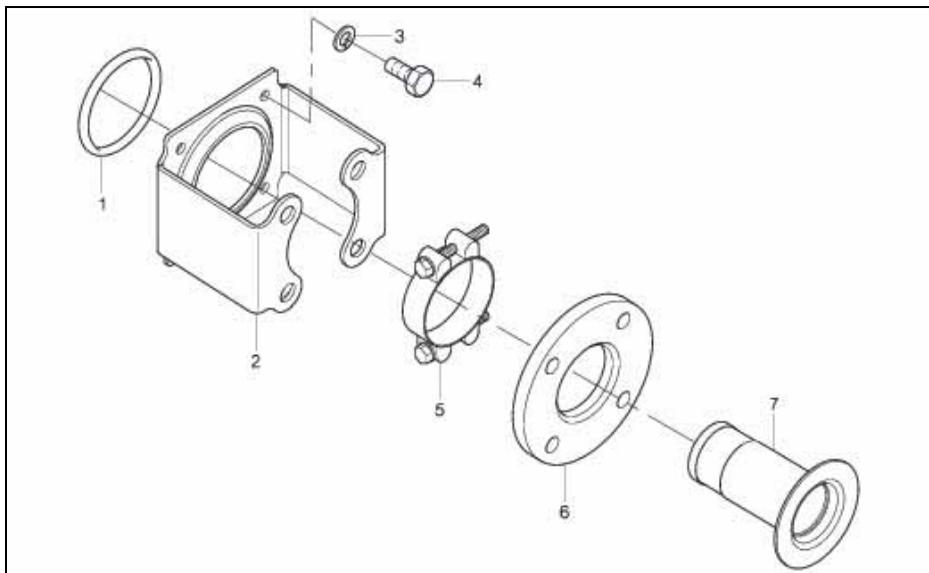
* For fixation of the standard drive. For fixation of the Bredel 65 heavy duty drive (gearboxes G0217... and G0218...) and the Bredel 80 heavy duty drive (gearboxes G0224... and G0225...), consult your Bredel representative.

10.4.5 Support assembly



Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	1	Support, right	240106B	250106B	265106B	280106B	200106B
2	1	Support, left	240106A	250106A	265106A	280106A	200106A
3	8	Washer, spring Lock	F336012	F336012	F336013	F336015	F336015
4	8	Bolt, hex. head	F111096	F111098	F111132	F111186	F111186

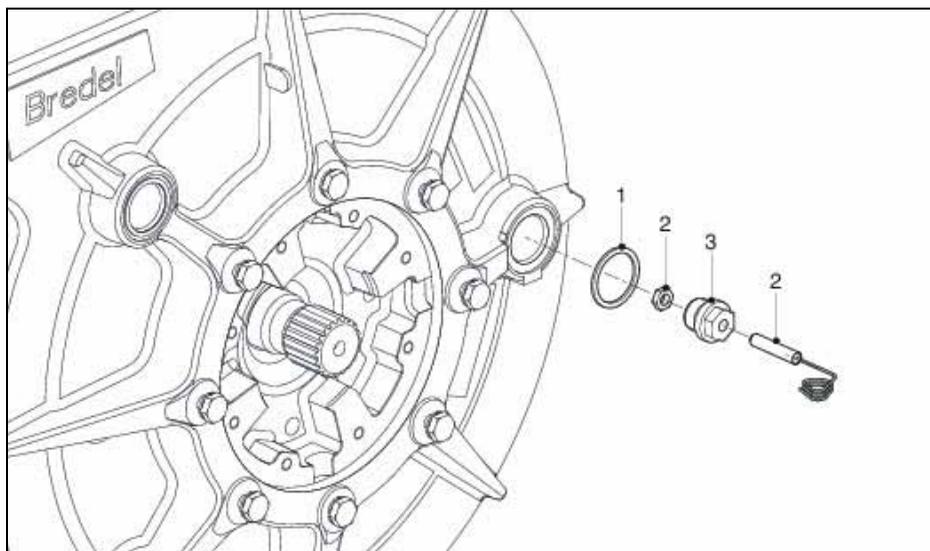
10.4.6 Flange assembly



Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	2	O-ring	S112301	S112371	S112431	S112501	S115571
2	2	Flange bracket, DIN Steel	240197	250197	265197	280197	200197
	2	Flange bracket, DIN SS	240197E	250197E	265197E	280197E	200197E
	2	Flange bracket, ANSI Steel	240197A	250197	265197	280197A	200197
	2	Flange bracket, ANSI SS	240197F	250197E	265197E	280197F	200197E
3	8	Washer, spring lock	F336011	F336012	F336012	F336013	F336013
4	8	Bolt, hex. head	F111071	F111096	F111096	F111128	F111130
5	2	Hose clamp	C101021	C101045	C101048	C101051	C101054
6	2	Flange, DIN Steel	040198	050198	065198	080198	100198
	2	Flange, DIN SS	240199	250199	265199	280199	200199
	2	Flange, ANSI Steel	040198A	050198A	065198A	080198A	100198A
	2	Flange, ANSI SS	240199A	250199A	265199A	280199A	200199A

Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
7	1	Insert, AISI 316	040186	050186	265186	280186	200186
	1	Insert, PP	240189	250189	265189	280189	200189
	1	Insert, PVC	240187	250187	265187	280187	200187
	1	Insert, PVDF	240190	250190	265190	280190	200190

10.4.7 Revolution counter assembly



Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	1	Gasket	29040257	29040257	29040257	29056244	29056244
2	1	Revolution counter	29040462	29040462	29040462	29040462	29040462
3	1	Adapter	29039460	29039460	29039460	29055460	29055460

10.4.8 Lubricants

Pos.	Qty.	Description	Product codes for parts of pump type				
			Bredel 40	Bredel 50	Bredel 65	Bredel 80	Bredel 100
1	1	5 l can Bredel Genuine Hose Lubricant	903143	-	-	-	-
	1	10 l can Bredel Genuine Hose Lubricant	-	904143	-	-	-
	1	20 l can Bredel Genuine Hose Lubricant	-	-	905143	-	-
	2		-	-	-	905143	-
	3		-	-	-	-	905143

EC DECLARATION OF CONFORMITY OF THE MACHINERY

(according to Annex II.1.A. of Directive 2006/42/EC on machinery)

We,
Watson-Marlow Bredel B.V.
Sluisstraat 7
P.O. Box 47
7490 AA Delden
The Netherlands,

herewith declare, on our own responsibility, that the following machinery fulfils all the relevant provisions of Directive 2006/42/EC:

Peristaltic hose pump: **Bredel 40-100** series,

for the transportation of various kinds of fluids.

In addition, the machinery complies with the harmonised standard(s), other standards or technical specifications, applicable requirements of these standards and/or specifications as listed below:

NEN-EN 809
NEN-EN-ISO 12100-2
NEN-EN-IEC 60204-1

The undersigned is responsible for compilation of the technical file and makes this declaration on behalf of the manufacturer.

J. van den Heuvel
Managing Director

The Netherlands, Delden
1 June 2013

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. **RGA/KBR no**.....

1 Company

Address

Postal code.....

Telephone 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

3.4 Cleaning fluid to be used if residue of chemical is found during servicing;
 a)
 b)
 c)
 d)

3 Details of substances pumped

3.1 Chemical Names
 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

3.2 Precautions to be taken in handling these substances:
 a)
 b)
 c)
 d)

Name

Position

Date

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

.....

.....

.....

.....

3.3 Action to be taken in the event of human contact:
 a)
 b)
 c)
 d)

Watson-Marlow Bredel B.V.
P.O. Box 47
NL-7490 AA Delden
The Netherlands
Telephone: +31 (0)74 3770000
Fax: +31 (0)74 3761175

E-mail: bredel@wmpg.com
Internet: <http://www.bredel.com>



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