Bredel QLINE 20 Operating Manual



bsi
ISO 9001 Quality Management Systems CERTIFIED
ISO 14001 Environmental Management CERTIFIED
ISO 45001 Occupational Health and Safety Management CERTIFIED

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How to access an available translation

The following documents are available on the website. Enter www.wmfts.com/product-documents into your web browser or scan the QR code found on the pump nameplate:

- 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 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 pump QLINE 20.

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 pump
- Part number of the tube element
- 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 tube element, the gearbox, and the electric motor.

See also

Refer to "Description" on page 10

1.5 Environment and disposal of waste

Note: Always observe the local rules and regulations with respect to processing (non reusable) parts of the 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 pump, the surrounding area or the environment



Information on environmentally-friendly disposal or recycling of materials.

2.2 Intended use

The 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 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 pumphead material, pump element material, fluid connections and lubricant can lead to serious damage and safety hazards. Always contact your Bredel representative first.

For specific combinations of the pump element and process connector and in combination with certain chemicals, the peristaltic pumps are configured and delivered in compliance with NSF International certification NSF/ANSI/CAN 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 peristaltic pumps supplied with such a pump, which can also be found on the website, or contact your Bredel representative for advice.

2.3 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 pump(s) 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 pump.



WARNING

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

2.4 Qualification of the user

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

2.5 Regulations and instructions

- Ensure this manual can be easily accessed for safe operation and maintenance.
- Everyone who works with the 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.

3 Warranty conditions

The manufacturer offers a two-year warranty on all parts of the pump. This means that all parts will be repaired or replaced free of charge, with the exception of consumables such as pump elements, 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.

The manufacturer offers a two-year warranty on all parts of the pump. This means that all parts will be repaired or replaced free of charge, with the exception of consumables such as pump elements, 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 **10**

4.2 Construction of the pump **14**

4.3 Operation of the pump **15**

4.4 Pump installation positions **16**

4.5 Pump element **16**

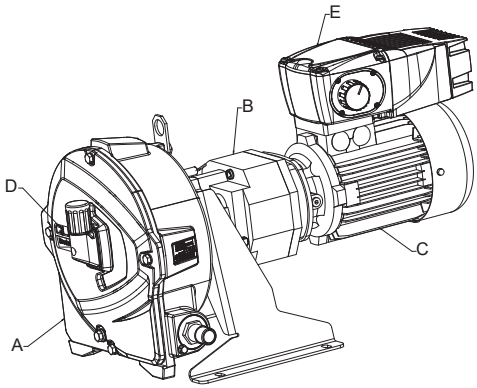
4.6 Gearbox **17**

4.7 Electric motor **17**

4.8 Available options **18**

4.1 Identification of the product

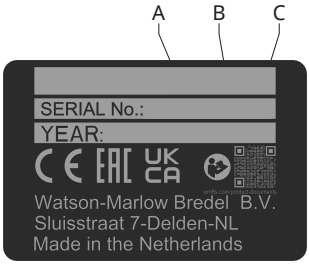
The pump can be identified by identification plates or stickers on:



A	Pumphead	D	Product name
B	Gearbox	E	Frequency controller (option)
C	Electric motor		

Identification of the pump

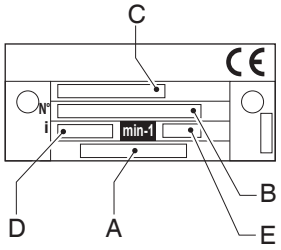
The identification plate on the pumphead contains the following data:



A	Pump type, pump size	B	Serial number
C	Year of manufacture		

Identification of the gearbox

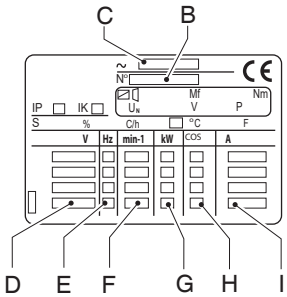
The identification plate on the gearbox contains the following data:



A	Part number	D	Reduction ratio
B	Serial number	E	Number of revolutions per minute
C	Type number		

Identification of the electric motor

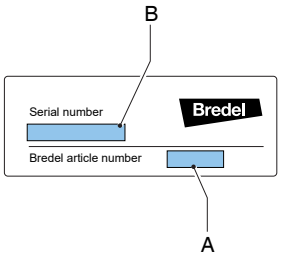
The identification plate on the electric motor contains the following data:



B	Serial number	F	Speed
C	Part number	G	Power
D	Mains	H	Power factor
E	Frequency	I	Current

Identification of the frequency controller

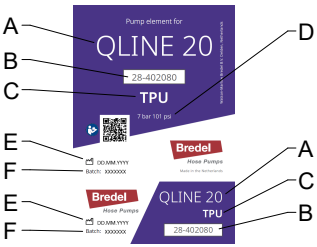
The identification of the Bredel Variable Frequency Drive (VFD) can be found inside the VFD. Remove the cover by loosening the two screws. The identification sticker contains the following data:



A	Part number	B	Manufacturer’s serial number

Identification of the pump element

The label attached to the box of the pump element contains the following data:



A Pump type

B Part number

C Pump element material

D Maximum permissible working pressure

E Manufacturing date

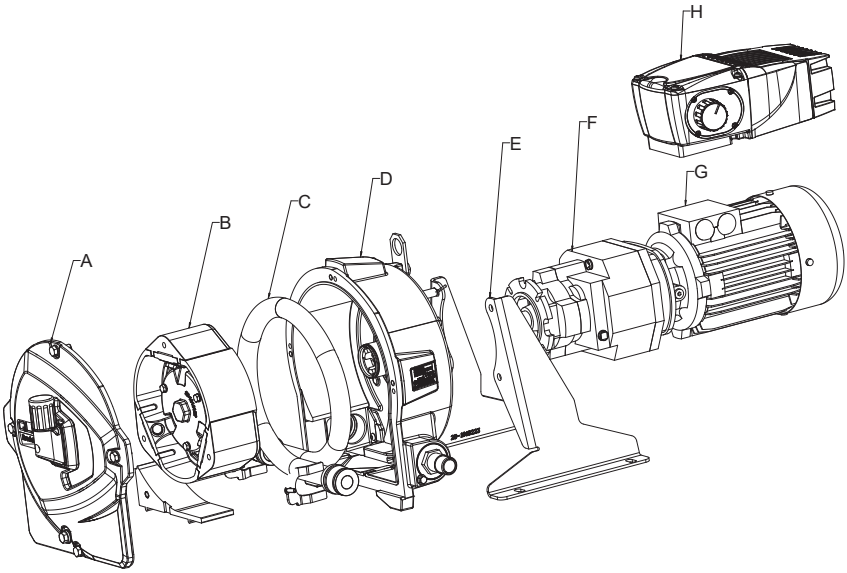
F Batch number

The material of the pump element can be identified by the engraved part number.

See also

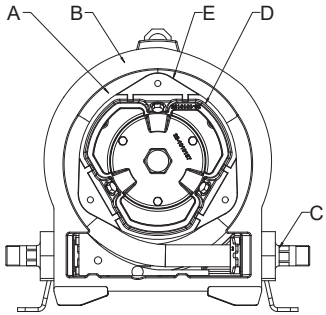
Refer to "General" on page 16

4.2 Construction of the pump



A	Cover	E	Support
B	Rotor	F	Gearbox
C	Pump element	G	Electric motor
D	Pump housing	H	Frequency controller

4.3 Operation of the pump



The heart of the pumphead consists of a specially constructed pump element (A) inside of the pump housing (B). The process fluid is transferred by a rotor (D) with three pressing shoes (E).

The pumphead (A) is connected to the suction and discharge lines by means of a suitable connection (flange, threaded or plain insert) (C).

In this example, it rotates clockwise.

Phase	Description	Pump layout
1	The pressing shoe enters the inlet zone and gently compresses the pump element to full occlusion. This gives a smooth inlet flow.	
2	The pressing shoe enters the compression zone. As the rotor rotates, the fluid moves towards the discharge port.	
3	The pump element returns to its original shape (restitution) behind the pressing shoe and draws new fluid into the pump. As one pressing shoe leaves the compression zone, the next pressing shoe enters it and prevents fluid from flowing back. This method of moving fluid is known as the positive displacement principle.	
4	The pressing shoe enters the outlet zone and gradually releases the compression on the pump element. The pump element fully returns to its original shape and gives a smooth outlet flow.	

4.4 Pump installation positions

The pump must be installed in a horizontal position. The pump can operate in either direction.

4.5 Pump element

General

The QLINE 20 pump can operate with pump elements made from different materials. Select a pump element material that is suitable for the process fluid and the operating conditions. Consider the operating pressure, temperature, chemical compatibility, and abrasive properties of the process fluid.

Each type of pump element type has a unique identification.

Tube material	Identification
TPU	28-402080
Santoprene	28-402090

Note: Contact your Bredel representative for advice about the pump element selection

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 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 69 for the required quantity.

Refer to "Pump element failure" on page 29 for the consequences of a hose failure.

Refer to "Operation" on page 26 for the consequences of a hose failure.

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

4.6 Gearbox

The pump types described in this manual use helical gearbox units. Other gearbox types are available as option.

The gearboxes are fitted with a flange connection.

The standard fasteners are studs and nuts.

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 "Gearbox" on page 72

4.7 Electric motor

The standard electric motor is a completely enclosed three-phase asynchronous motor.

The motor connection must meet the local applicable regulations.

Refer to the documentation supplied with the electric motor for installation and maintenance information.

In case of doubt, consult your Bredel representative.

See also

Refer to "Preparations" on page 24

4.8 Available options

The following options are available for the pump:

- High (lubricant) level float switch
- Revolution counter
- Two types of pump element
- Frequency controller[1]
- Surface finishes in various colours and quality grades are available
- Trolley option

1. Refer to the supplier's documentation and Refer to "Bredel Variable Frequency Drive (VFD) (optional)" on page 73

5 Installation

5.1 Unpacking and inspection

Unpacking

1. Unpack all parts carefully.
2. Retaining packaging until inspection is complete.

Inspection

1. Check all components present
2. Inspect components for damage in transit
3. Report missing components or damage to your local Bredel representative immediately

Packaging disposal

Dispose of packaging materials:

1. Safely
2. Responsibly
3. Recycle outer carton (corrugated cardboard)
4. Compliant to all relevant regulations

5.2 Installation conditions

Ambient conditions

Make sure that the pump is in an area where the ambient temperature during operation is not lower than -20 °C and not higher than +40 °C.

Installation site

Installation specifications	
Do not exceed ambient operating air temperature range (°C)	-20 °C to +40 °C
Maximum floor slope (mm per metre)	15

Note: Pump is suitable for indoor use. In case of outdoor use contact your Bredel representative for advice.

Installation site requirements:

- Flat
- Horizontal
- Rigid surface
- Rated to support full weight of complete assembly and pumped product
- Allow a free flow of air around the pump, gearbox and electric motor to dissipate heat
- Ensure sufficient access for all maintenance
- Free from excessive vibration

Pipework

- The recommended minimum bore size of the suction and discharge lines is 20 mm. Contact your Bredel representative if you require a line resistance calculation for your application.
- Avoid sharp bends in the flow lines. Make the bend radius as large as possible. Use Y-connections instead of T-connections.
- Keep the suction and discharge 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 pump element.
- Prevent the valves in the suction and discharge lines from being shut while the pump is running.

See also

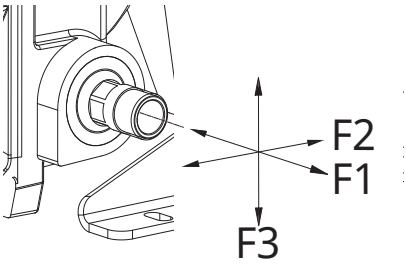
Refer to "Pumphead performance" on page 66



CAUTION

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

- Contact your Bredel representative for advice on process piping layout, taking into account fluid density and pump speed, especially when 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 pump element life.
- To simplify maintenance, Bredel recommends installing an isolation valve and a pipe drain in the suction and discharge pipework. This allows fluid isolation and drainage from the pump during maintenance.
- 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 connection	
Force	**QLINE 20**
F1	300
F2	150
F3	150

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.

In case of doubt, consult your Bredel representative.

Frequency controller

WARNING

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

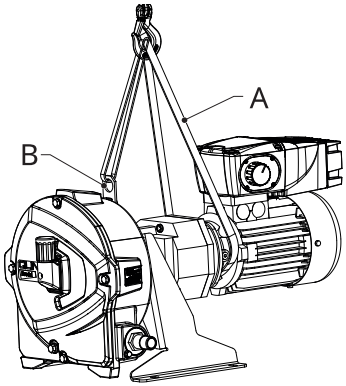
If the pump is fitted with a frequency controller, consider the following points:

- 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^2. The shielding must be connected to earth at one end. In case of doubt, contact your Bredel representative for advice.

5.3 Lifting and moving the pump

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

Lift the pumphead or the complete pump (pumphead, gearbox, and electric motor) using the lifting eye (B) and suitably rated straps or slings (A).

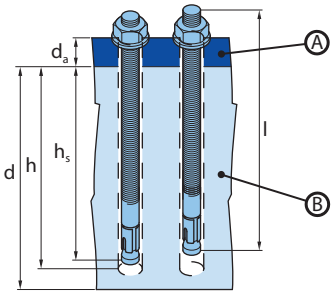


5.4 Placing the pump

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 (M_D).

Item	Unit	Specification
Flange thickness (d_a)	mm	4
Flange hole diameter	mm	12 x 16
Bredel part no.	-	28-F550016
Bolt thread	-	M10
Anchor bolt length (l)	mm	85
Minimum foundation height (d)	mm	200
Drill diameter	mm	10
Minimum drill depth (h)	mm	70
Mounting depth (h_s)	mm	60
Torque setting (M_D)	Nm	30

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 visible in the lower left corner of the inspection. If the lubricant level is below the lower left corner of the inspection window, add Bredel Genuine Hose Lubricant through the breather plug.

See also

Refer to "Frequency controller" on page 22

Refer to "Changing lubricant" on page 34

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. Check the capacity of the pump. If the capacity differs from your specification, follow the instructions in Troubleshooting or contact your Bredel representative for advice.
6. If a frequency controller is present, check the capacity range. In case of any deviations consult the supplier's documentation.
7. Check the pump in accordance with points 2 to 4 of the maintenance table.

See also

Refer to "Maintenance and periodic inspections" on page 31

Refer to "Troubleshooting" on page 62

7 Operation

7.1 Temperature

The pump will heat up during normal operation. 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

Drive power and gear reduction ratio determine the operating limits of the pump.

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.

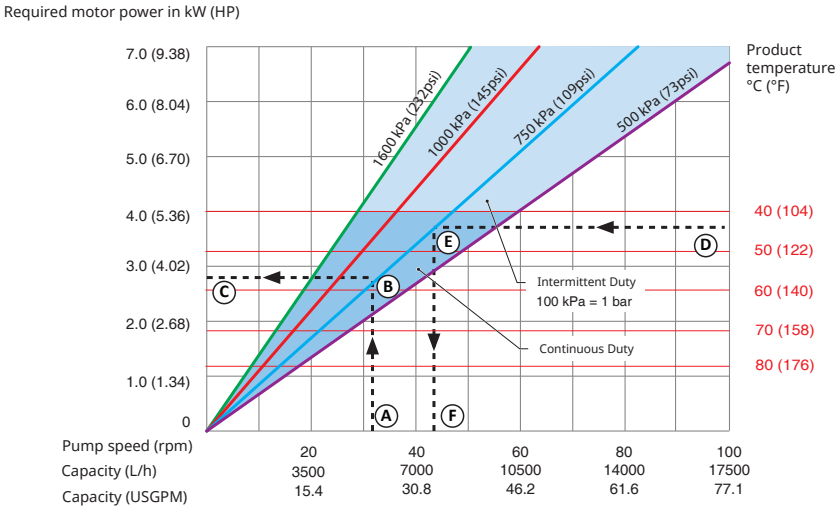
7.3 Performance graphs

The triangular area is the allowed performance area.The required duty points have to fall within this area. For discharge pressures lower than 0 kPa use the 0 kPa line.

Product temperature lines determine the limit for continuous operation. The graphs apply for a maximum ambient temperature of 40 °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



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).

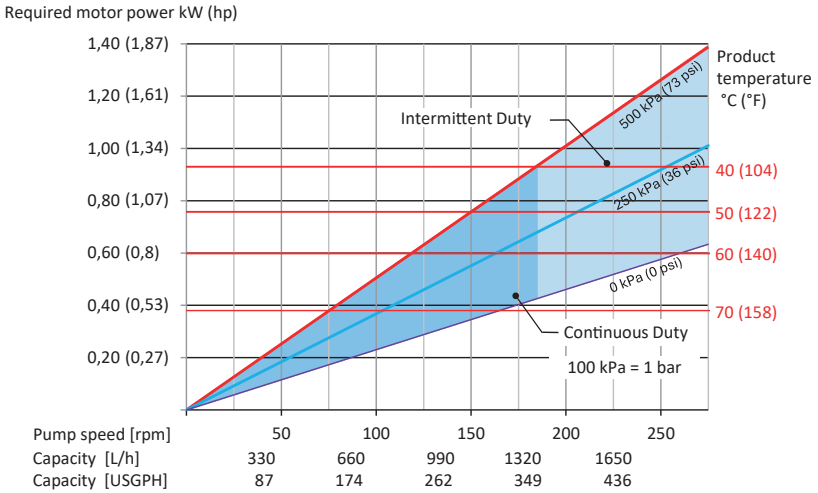
To determine the maximum allowed pump speed:

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).

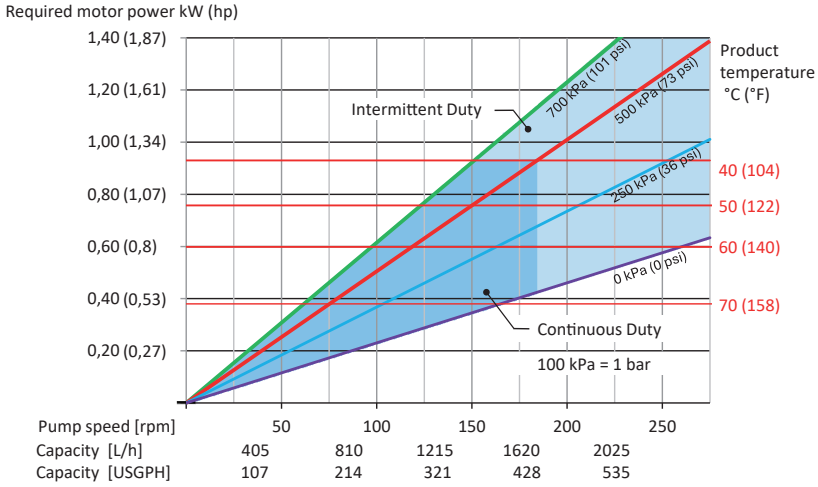
Note: Pump stroke volume is based on pump elements and flooded suction. Actual stroke volume may vary.

Performance graph QLINE 20

QLINE 20 — SANTOPRENE



QLINE 20 — TPU



7.4 Dry running

Dry running occurs when the pump is running and no fluid flows through the pump. Bredel pumps allow dry running for limited periods.

Dry running imposes an additional thermal load on the pump element.

To minimise the extra wear, limit dry running periods to less than one minute at a time.

7.5 Pump element failure

Cause of the failure

The pump element is subjected to repeated compression cycles during operation. These repeated stress cycles cause the pump element to deteriorate and eventually fail. Excessive pressure can cause immediate rupture.

Result of the failure

A failed pump element allows direct contact between the pumped fluid, the pump lubricant, the internal components, and the dynamic seal.

Consequences of the failure

Process fluid can enter and contaminate the pump housing and lubricant. Thoroughly clean the pump interior before installing a new pump element.

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. For example, sodium hypochlorite (NaClO), this can lead to exothermal reaction.

In case of doubt contact your Bredel representative.

See also

Refer to "Lubricant table pump" on page 69



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..

Replace the pump element at regular intervals to prevent rupture and unplanned downtime. The maintenance interval depends on the operating conditions and the process fluid. In case of doubt, consult your Bredel representative.

Large spill of product

Stop the pump immediately to minimise product spillage..

It is strongly recommended to install a high level float switch.

See also

Refer to "Fitting options" on page 58

Install a check valve to prevent reverse flow when all following conditions occur simultaneously

- Pump element failure
- Process pressure exceeds ambient pressure when the pump stops

7.6 Fluid leakage

The pumphead contains lubricant. The front cover and the dynamic seal retain the lubricant during operation. The gearbox contains gearbox lubricant.

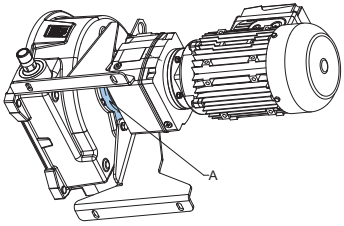
Seal damage can occur due to normal wear in time, but is seriously accelerated if the seal gets in contact with contaminated lubricant. Thorough cleaning of the pump housing after a failure and regular replacement of the lubricant is strongly advised.

Seal damage can occur due to normal wear. Contaminated lubricant increases seal wear.

Thoroughly clean the pump housing after a pump element failure. Replace the lubricant at the recommended intervals.

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 leakage zone (A) is provided in the pumphead for early detection of pump or gearbox seal damage.



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 31

8.2 Maintenance and periodic inspections 31

8.3 Cleaning the pump element 33

8.1 General



WARNING

Disconnect and lock the power supply to the pump drive before any work is carried out.



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.



CAUTION

Only use original Bredel parts when maintaining the 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 inspections required to ensure safe operation and maximise the service life of the pump.

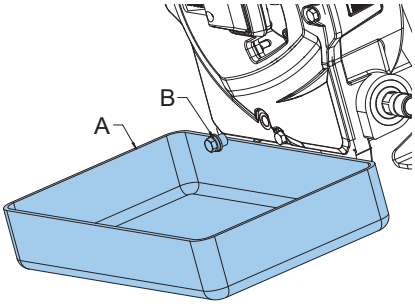
Item	Action	To be carried out	Remark
1.	Check the lubricant level.	Before start-up of the pump and at scheduled intervals during operation.	Refer to "Changing lubricant" on page 34
2.	Regularly check the pumphead for any leakage around the cover, the pump connections, and the rear of the pumphead.	Before start-up of the pump and at scheduled intervals during operation.	Refer to "Troubleshooting" on page 62
3.	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.
4.	Check the pump for deviating temperature or strange noises.	At scheduled intervals during operation.	Refer to "Troubleshooting" on page 62
5.	Check the pressing shoes for excessive wear or damage.	When replacing the pump element.	Refer to "Removing the pump element" on page 37
6.	Internal cleaning of the pump element.	Cleaning of the system or fluid change.	Refer to "Cleaning the pump element" on the next page
7.	Replace the pump element.	Preventive, this means after 75% of the life of the first pump element.	Refer to "Removing the pump element" on page 37
8.	Change the lubricant.	After every second pump element change, after 5000 service hours, after a year or after rupture whichever comes first.	Refer to "Changing lubricant" on page 34
9.	Replace rotor and seal	If necessary	Refer to "Exchanging replacement parts" on page 53

8.3 Cleaning the pump element

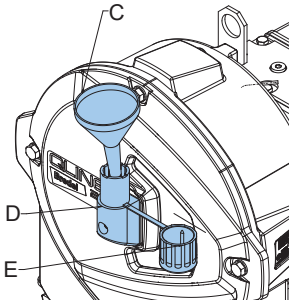
If the fluid is at risk of hardening, clean the pump element immediately after the pumping process. Rinse the pump with clean water to clean the inside of the pump element. If a cleaning agent is added to the water, make sure that the pump element material is resistant to the cleaning agent. Also make sure that the pump element is suitable for the cleaning temperature. Special cleaning sponge balls are available.

In case of doubt, consult your Bredel representative.

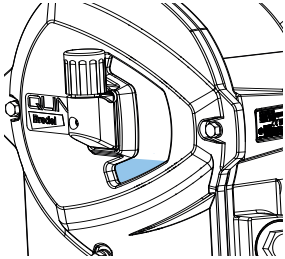
8.4 Changing lubricant



1. Place a shallow tray (A) under the drain plug. The tray must be large enough to contain the lubricant from the pumphead, including any product fluid contamination.
2. Remove the drain plug (B).
3. Allow all lubricant to drain from the pumphead.
4. Position the drain plug and tighten it to the specified torque.



5. Remove the breather cap (B). Place a funnel (C) in the breather (D). Slowly pour the lubricant into the pump housing.



6. Fill the pump housing until the lubricant level is visible in the lower left corner of the inspection window. Refit the breather cap.

See also

For the required quantity of lubricant, Refer to "Lubricant table pump" on page 69

Refer to "Torque figures" on page 71

8.5 Accessing the pumphead internals

Several maintenance, inspection and repair procedures require access to the internal components of the pumphead.

This procedure provides access to the pumphead internals for inspection, cleaning, and replacement of internal components.

Complete this procedure before carrying out any of the following maintenance tasks:

- Cleaning the pumphead
- Replacing the pump element
- Replacing the rotor
- Replacing the bearings
- Replacing the seal rings
- Replacing the pressing shoes
- Replacing the housing insert

Taking the pump out of service

To access the pumphead internals for maintenance, inspection or repair :

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.

Removing the pumphead cover

WARNING

Risk of chemical injury.

Process fluid or contaminated pump lubricant can escape when the pumphead is opened, lubricant is drained, or internal components are removed.

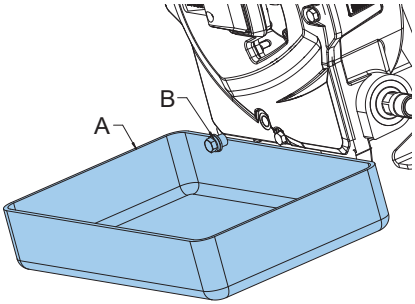
Avoid contact with the process fluid and contaminated lubricant. Wear the required personal protective equipment (PPE).

WARNING

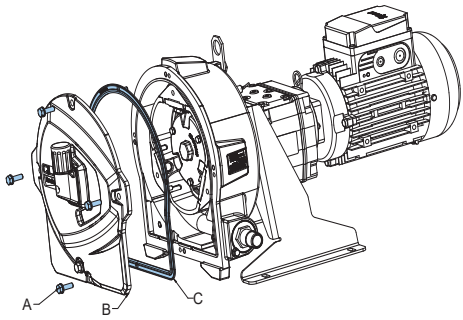
Risk of injury from slipping.

Residual process fluid and pump lubricant can escape when the pumphead is opened or internal components are removed. Spilled fluid can make floors slippery.

Clean any spilled fluid immediately.



3. Place a shallow tray (A) under the drain plug. The tray must be large enough to contain the lubricant from the pumphead, including any product fluid contamination.
4. Remove the drain plug (B).
5. Allow all lubricant to drain from the pumphead.
6. Position the drain plug and tighten it to the specified torque.



7. Remove the cover (B) by loosening the retaining bolts (A).

8. Check the sealing ring (C) for damage. Replace the sealing ring if it is damaged.

The internal components of the pumphead are now accessible. Proceed with the required maintenance, inspection, or repair procedure.

See also

Refer to "Removing the pump element" below

Refer to "Fitting the pump element" on page 46

Refer to "Removing and Replacing the Rotor" on page 53

Refer to "Maintenance and periodic inspections" on page 31

8.6 Removing the pump element

The pump element must be replaced as part of preventive maintenance or when the pump element is damaged or worn.

Before carrying out the procedures in this section:

- Refer to "Accessing the pumphead internals" on page 35

WARNING

Risk of chemical injury.

Process fluid or contaminated pump lubricant can escape when the pumphead is opened, lubricant is drained, or internal components are removed.

Avoid contact with the process fluid and contaminated lubricant. Wear the required personal protective equipment (PPE).

WARNING

Risk of injury from slipping.

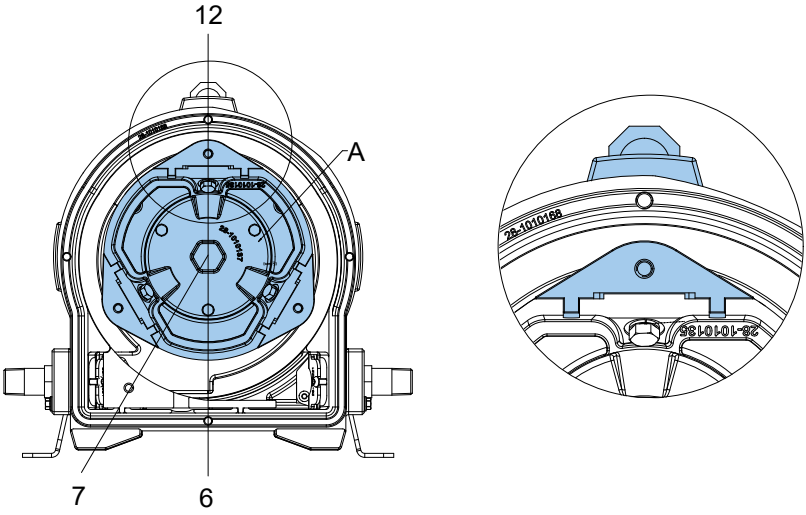
Residual process fluid and pump lubricant can escape when the pumphead is opened or internal components are removed. Spilled fluid can make floors slippery.

Clean any spilled fluid immediately.

To remove the pressing shoes and pump element, the rotor must be rotated to specific positions.

Resistance during rotation is normal. The mechanical components of the drive system and the pressing shoes compressing the pump element cause this resistance.

1. Make sure that all process lines are closed.



2. Use an M32 wrench to rotate the rotor (A) to position 12. The upper pressing shoe is vertically aligned with the top of the pumphead housing.

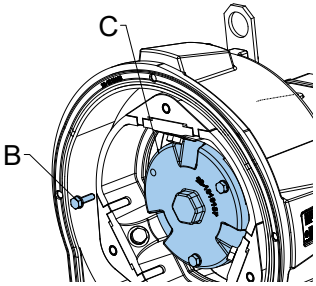
NOTE: If the rotor can be rotated to position 12 using normal force, go to step 4.

NOTE: If excessive force is required to rotate the rotor, do steps 3 and 5 to temporarily decouple the rotor before continuing.

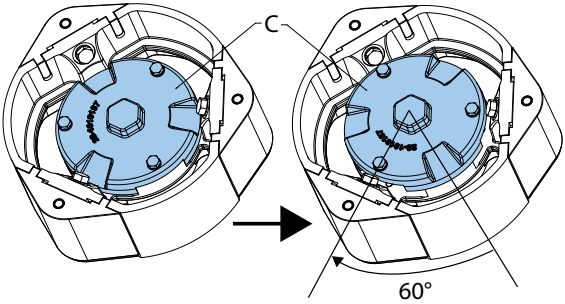
3. It is important to mark the rotor position before removing the rotor.

CAUTION

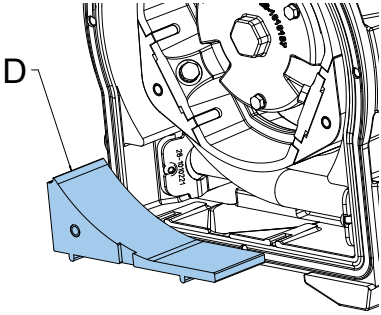
Incorrect rotor alignment during reassembly can damage the rotor or motor. Before you remove the rotor cover, record the rotor position. Mark the rotor position relative to the pumphead or take a photograph of the rotor orientation.



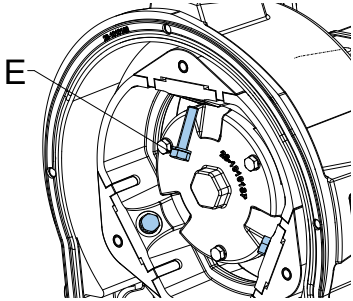
4. Remove the three rotor cover bolts (B). Remove the rotor cover (C).



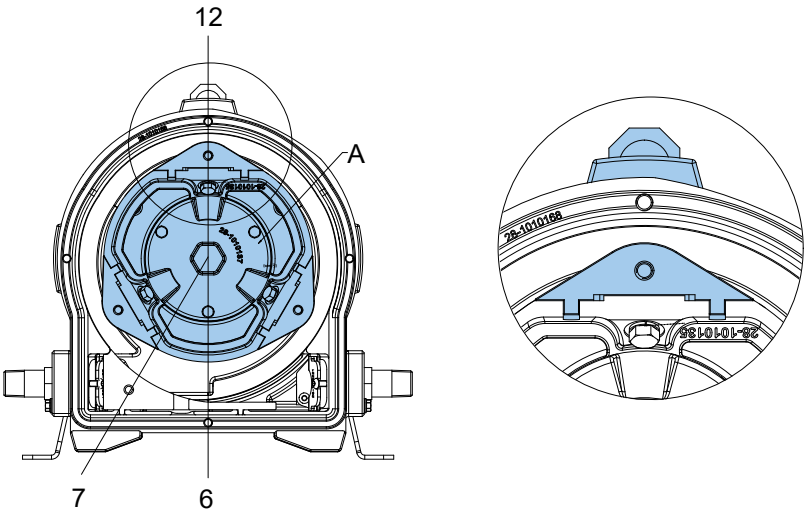
5. Install the rotor cover (C) with a 60° offset from the normal position. Hand-tighten the bolts. The rotor is now temporarily decoupled.



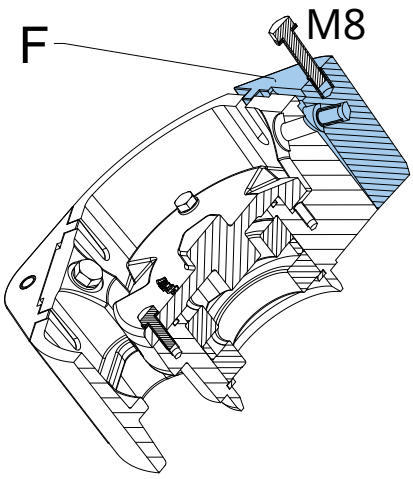
6. Remove the housing insert (D). Pull the housing insert out by hand. If necessary, install an M8 pressing shoe bolt into the housing insert and hand-tighten it. Pull the housing insert out in a straight line.



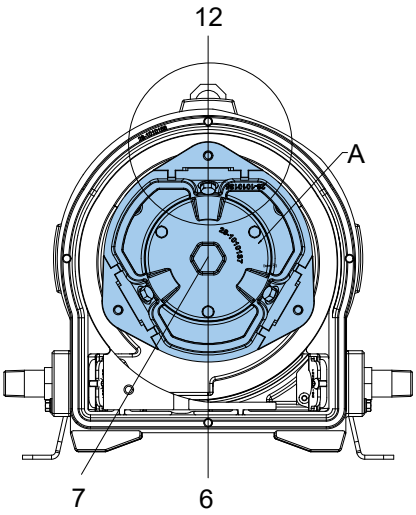
7. Remove all M8 pressing shoe bolts (E).

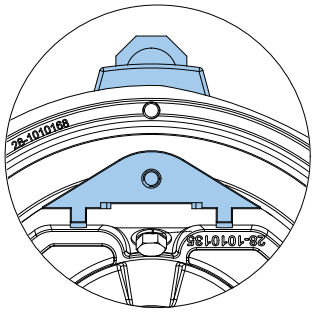


8. Rotate the rotor counter-clockwise to position 7

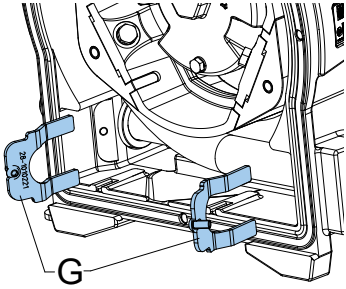


9. Install an M8 pressing shoe bolt into the pressing shoe (F). No wrench is required.
10. Lift and remove the pressing shoe (F).
11. Repeat steps 7 to 9 for all pressing shoes.

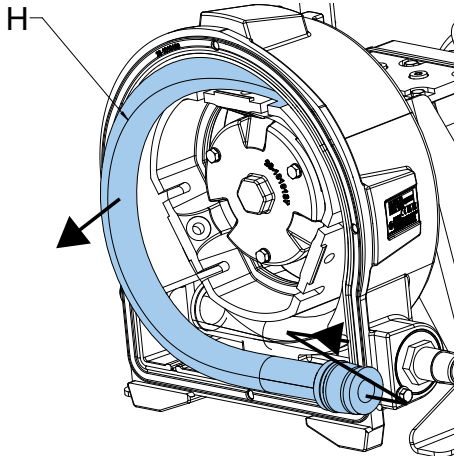




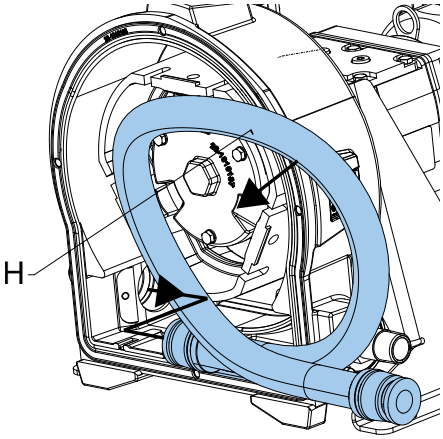
12. Rotate the rotor to position 12.



13. Remove the spring clips (G).



14. Pull the pump element (H) away from the rotor on the left-hand side and at the bottom. Pull the pump element ferrule from the right housing port in a straight line.



15. Pull the pump element (H) away from the rotor on the right-hand side and at the bottom. Remove the pump element through the left housing port in a straight line.

Reassemble and return to service

If no further maintenance, inspection, or repair procedures are required then reassemble the pump and return to service:

Refer to "Fitting the pump element" on page 46

Refer to "Reassembling the Pumphead" on page 56

See also

Refer to "Removing and Replacing the Rotor" on page 53

Refer to "Maintenance and periodic inspections" on page 31

8.7 Cleaning the pumphead

The pumphead internals may require cleaning in the following situations:

- Pump element failure resulting in contamination of the pump lubricant.
- Seal failure resulting in contamination of the pumphead.
- Lubricant replacement when contamination is present.
- Maintenance inspection requiring access to internal components.

Before carrying out the procedures in this section:

Refer to "Accessing the pumphead internals" on page 35

The pump element does not need to be removed if the required cleaning can be completed with the pump element installed.

If removal of the pump element is required:

"Refer to "Removing the pump element" on page 37"

The rotor does not need to be removed if all contamination can be removed with the rotor installed. Remove the rotor only when access is required for thorough cleaning or inspection.

If removal of the rotor is required:

Refer to "Removing and Replacing the Rotor" on page 53

Cleaning procedure

If the pumphead internals are contaminated:

1. Clean the inside of the pumphead with clean water.
2. Clean the pockets in the pump housing.
3. Clean the inside of the pump ports.
4. Remove all residues.
5. Dry all cleaned surfaces.
6. Make sure that no rinsing water remains inside the pumphead before assembly.

Reassemble and return to service

If no further maintenance, inspection, or repair procedures are required then reassemble the pump and return to service:

Refer to "If the pumphead internals are contaminated:" on page 53

Refer to "Fitting the pump element" on the next page

Refer to "Reassembling the Pumphead" on page 56

See also

Refer to "Maintenance and periodic inspections" on page 31

8.8 Fitting the pump element

The pump element must be replaced as part of preventive maintenance or when the pump element is damaged or worn.

Before carrying out the procedures in this section:

- Refer to "Accessing the pumphead internals" on page 35
- Refer to "Removing the pump element" on page 37



WARNING

Risk of chemical injury.

Process fluid or contaminated pump lubricant can escape when the pumphead is opened, lubricant is drained, or internal components are removed.

Avoid contact with the process fluid and contaminated lubricant. Wear the required personal protective equipment (PPE).



WARNING

Risk of injury from slipping.

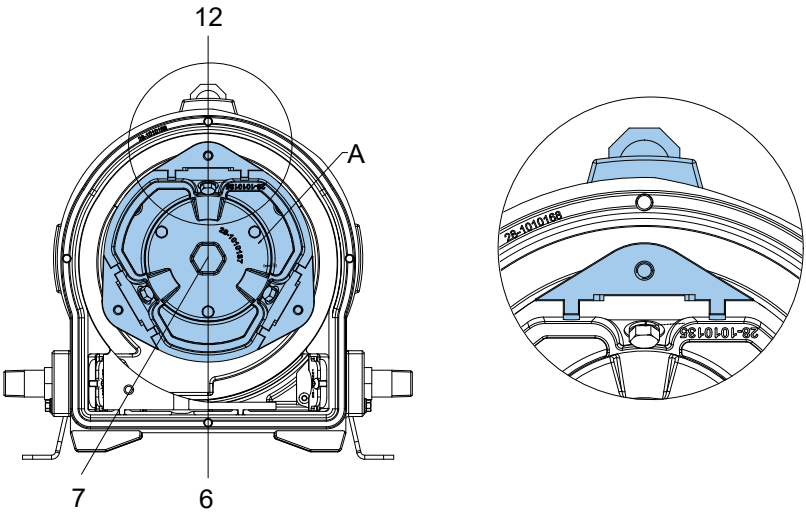
Residual process fluid and pump lubricant can escape when the pumphead is opened or internal components are removed. Spilled fluid can make floors slippery.

Clean any spilled fluid immediately.

If the pumphead internals are contaminated:

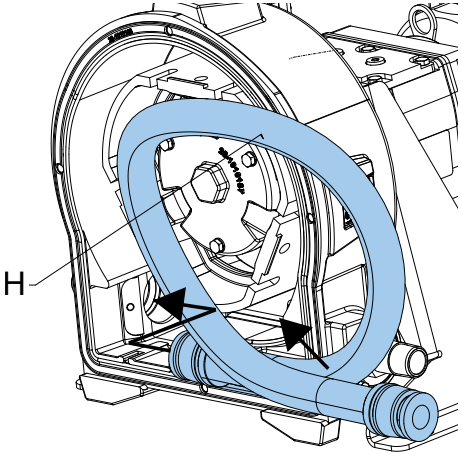
1. Clean the inside of the pumphead with clean water.
2. Clean the pockets in the pump housing.
3. Clean the inside of the pump ports.
4. Remove all residues.
5. Dry all cleaned surfaces.
6. Make sure that no rinsing water remains inside the pumphead before assembly.

Install the Pump Element

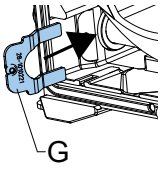


1. Turn the rotor to position 12.

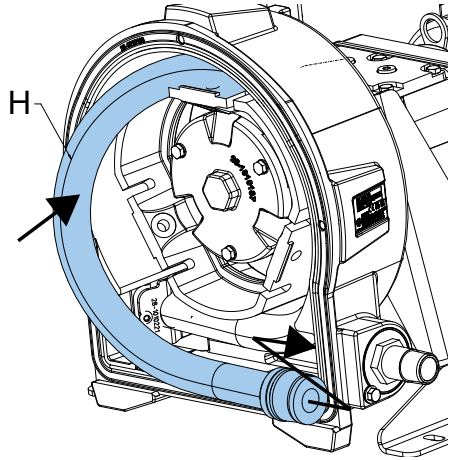
1. Make sure that the exterior of the pump element is clean. Remove all dust, debris, and other contamination.



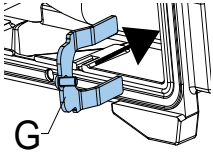
2. Insert one pump element (H) ferrule into the left port.



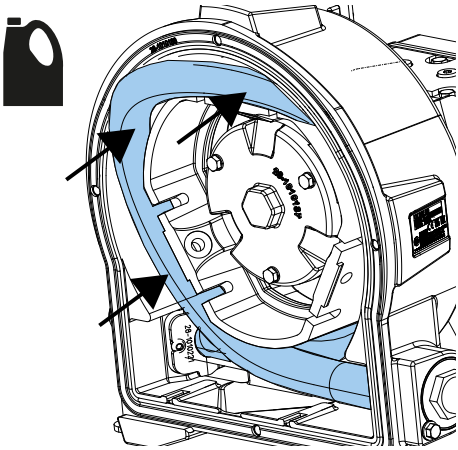
3. Install the clip (G).
4. Press the clip fully into position to seat the bushing in the port.
5. Install the clip bolt. Do not tighten the bolt.
6. Position the pump element (H) around the rotor on the lower right side of the pumphead. Press the pump element in until it is clear of the right port.



7. Bend the hose and insert the other pump element ferrule into the right port.

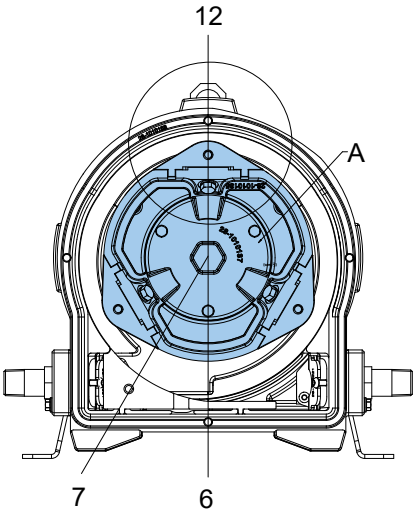


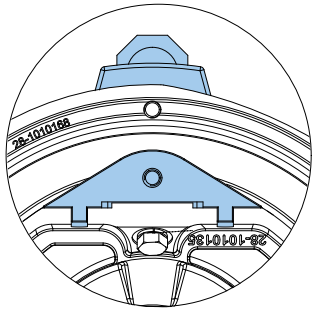
8. Install the clip (G).
9. Press the clip fully into position to seat the bushing in the port.
10. Install the clip bolt. Do not tighten the bolt.



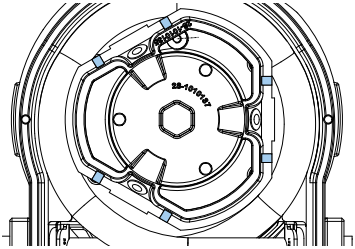
11. Apply lubricant to the pump element.
12. Press the pump element in the centre of the casing track and around the rotor.

Install the Pressing Shoes



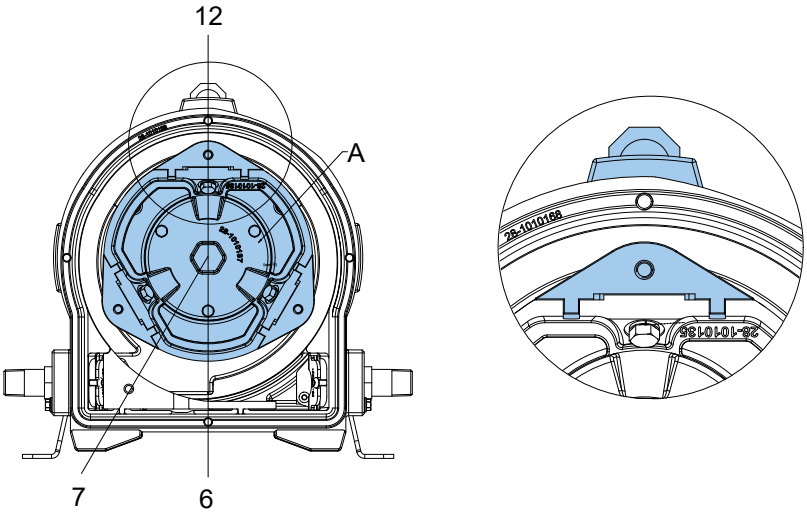


1. Turn the rotor to position 7.
2. Apply lubricant to the pressing shoe surface.

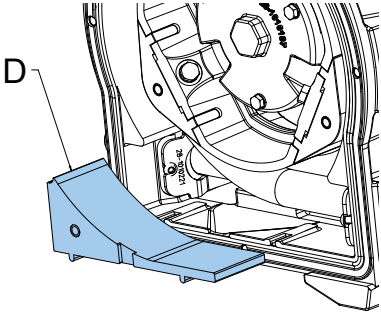


3. Install the pressing shoe. Push the pressing shoe into the slot until it is fully seated.
4. Remove the temporary mounting bolt from the pressing shoe.
5. Install the mounting bolt.
6. Tighten the mounting bolt to 5 Nm maximum.
7. Repeat steps for each remaining pressing shoe.

Install the Housing Insert



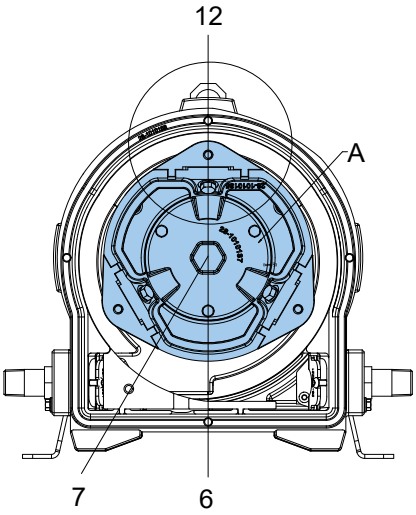
1. Turn the rotor clockwise to position 12.

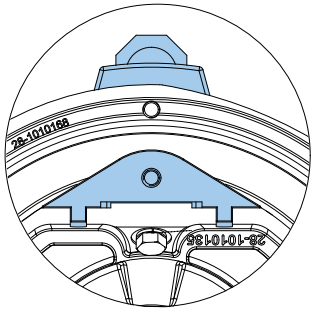


2. Install the housing insert (D).

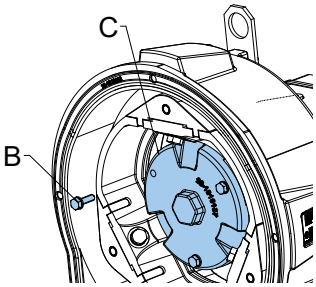
Rotor cover orientation

If you needed to rotate and disengae the rotor cover to remove the pump element you must now re-orient the cover to engage drive.

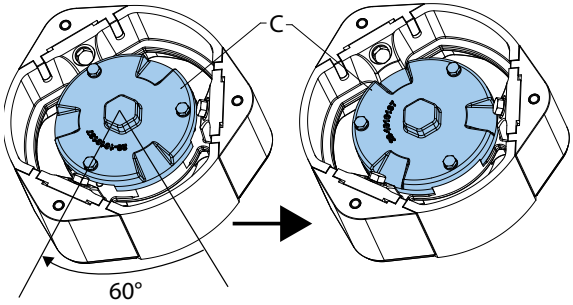




1. Make sure that the rotor is at position 12.



2. Remove the three rotor cover bolts (B). Remove the rotor cover (C).



3. Rotate the rotor cover by 60°.
4. Install the rotor cover.
5. Tighten the rotor cover bolts (B) to 10 Nm.

8.9 Reassemble and return to service

If no further maintenance, inspection, or repair procedures are required then reassemble the pump and return to service:

Refer to "Accessing the pumphead internals" on page 35

See also

Refer to "Removing the pump element" on page 37
Refer to "Cleaning the pumphead" on page 45
Refer to "Removing and Replacing the Rotor" on the next page
Refer to "Maintenance and periodic inspections" on page 31
Refer to "Torque figures" on page 71

8.10 Exchanging replacement parts

Removing and Replacing the Rotor

The rotor may need to be removed for inspection, cleaning, or replacement. Removal of the rotor is not required for routine pump element replacement. Remove the rotor only when additional access to the pumphead is required or when the rotor is damaged or worn.

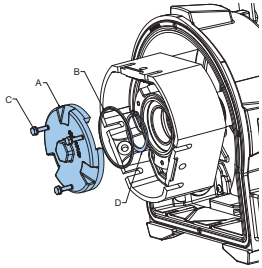
Rotor removal

Before carrying out the procedures in this section:

- Refer to "Accessing the pumphead internals" on page 35
- Refer to "Removing the pump element" on page 37

To remove the rotor:

1. Temporarily mark the position of the rotor relative to the pumphead. **Note:** Install the rotor in the same position during assembly.



2. Remove the 3 bolts (C).
3. Remove the rotor cover (A) and O-ring (B).
4. Remove the retaining ring (D).
5. Slide the rotor and bearing assembly off the shaft.

If the pumphead internals are contaminated:

6. Clean the inside of the pumphead with clean water.
7. Clean the pockets in the pump housing.
8. Clean the inside of the pump ports.
9. Remove all residues.
10. Dry all cleaned surfaces.
11. Make sure that no rinsing water remains inside the pumphead before assembly.

Inspect rotor components

1. Inspect the engagement contour on the rear of the rotor cover for wear or damage.
2. Replace the rotor cover if it is damaged or excessively worn.
3. Inspect the O-ring (B). Replace the O-ring if it is damaged or worn.
4. Inspect the rotor for damage, corrosion, cracks, deformation, or excessive wear.
5. Replace the rotor if damage or excessive wear is found.

Installing the Rotor

1. Slide the rotor and bearing assembly onto the shaft.
2. Install the retaining ring (D).
3. Install the O-ring (B).
4. Install the rotor cover (A).
5. Install the three bolts (C).

Reassemble and return to service

If no further maintenance, inspection, or repair procedures are required then reassemble the pump and return to service:

Refer to "Fitting the pump element" on page 46

Refer to "Reassembling the Pumphead" on page 56

See also

Refer to "Maintenance and periodic inspections" on page 31

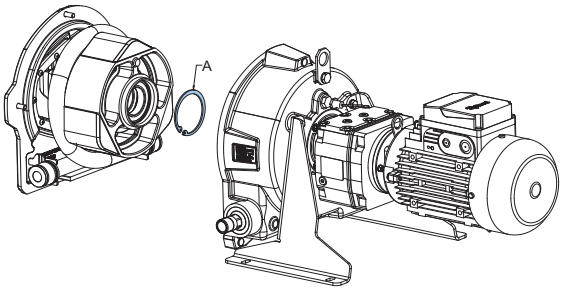
Replacing the bearings and seal ring

The bearings and sealing ring may need to be replaced if they are worn, damaged, or leaking.

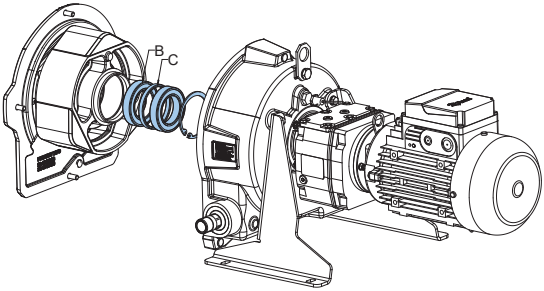
Before carrying out the procedures in this section:

- Refer to "Accessing the pumphead internals" on page 35
- Refer to "Removing the pump element" on page 37
- Refer to "If the pumphead internals are contaminated:" on the previous page

Remove the Bearings and Sealing Ring



1. Remove the circlip (A).



2. Slide the bearings (B) and the spacer ring (C) from the rotor. **Note:** Do not use excessive force when removing the bearings.

Inspect Components

1. Inspect the bearings (B) for wear or damage.
2. Inspect the rotor bearing surfaces for wear or damage.
3. Replace damaged components as necessary.

Install the Bearings and Sealing Ring

1. Apply a thin layer of grease to the bearing surfaces on the rotor.
2. Install the bearings (B) and spacer ring (C) onto the rotor.
3. Install the circlip (A).

Reassemble and return to service

If no further maintenance, inspection, or repair procedures are required then reassemble the pump and return to service:

Refer to "Installing the Rotor" on page 54

Refer to "If the pumphead internals are contaminated:" on page 53

Refer to "Reassembling the Pumphead" below

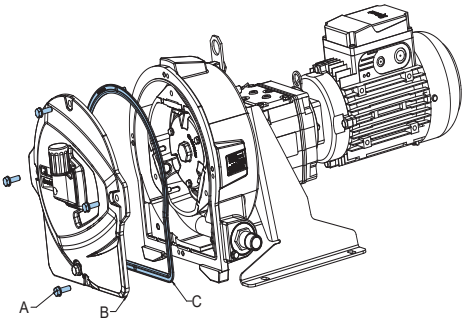
See also

Refer to "Maintenance and periodic inspections" on page 31

8.11 Reassembling the Pumphead

After completing maintenance, inspection, or repair work, reassemble the pumphead and return the pump to service using this procedure

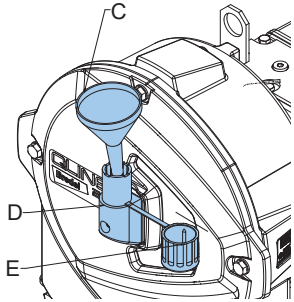
Replacing the pumphead cover



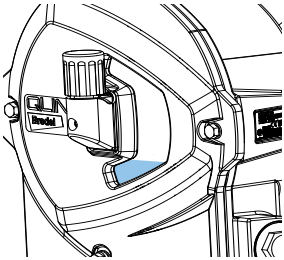
1. Check the sealing ring (C) for damage. Replace the sealing ring if it is damaged.
2. Replace the cover (B). Replace the retaining bolts (A) to the specified torque.

Lubricant

Fill the pump with lubricant before operation. Do not operate the pump without lubricant.



3. Remove the breather cap (B). Place a funnel (C) in the breather (D). Slowly pour the lubricant into the pump housing.



4. Fill the pump housing until the lubricant level is visible in the lower left corner of the inspection window. Refit the breather cap.

See also

For the required quantity of lubricant, Refer to "Lubricant table pump" on page 69

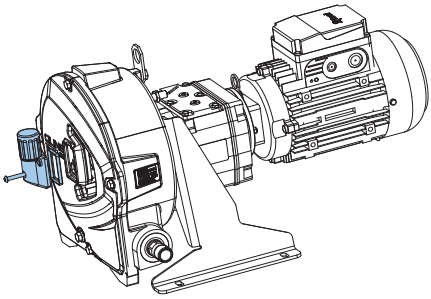
Refer to "Torque figures" on page 71

Return the pump to service

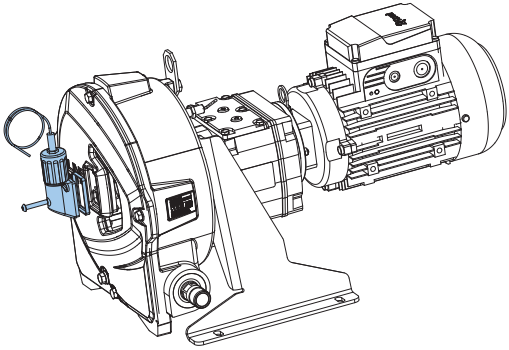
5. Open any shut-off valves in the suction and discharge lines before operating the pump.
6. Connect the pump to the electrical supply.
7. Switch on the electrical supply.

8.12 Fitting options

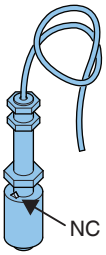
Fitting a high level float switch



1. Dismount the standard breather (D) on the cover of the pumphead.



2. Mount the breather (D) with high-level float switch. Tighten the bolt to the specified torque.



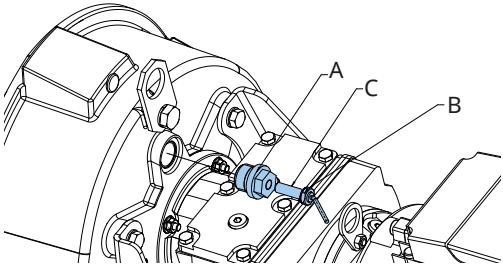
3. Connect the high-level float switch to the auxiliary power circuit via the 1.5 metre long PVC cable (2 x 0.34 mm^2). Bear in mind that the electrical contact of the float switch is normally closed (NC). The knob is upwards for normally closed operation. When the lubricant level is (too) high the contact will open.

See also
Refer to "Torque figures" on page 71

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

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.

Replacing a revolution counter



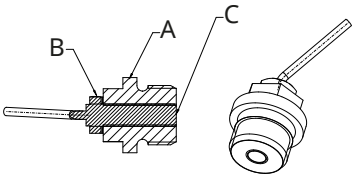
Remove the Sensor

Remove the sensor holder assembly (A) from the pump housing.

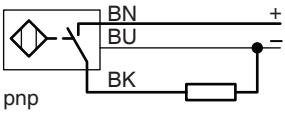
1. Loosen the lock nut (B).
2. Unscrew the revolution counter sensor (C) from the sensor holder (A).

Install the Sensor

3. Install the new revolution counter sensor (C) into the sensor holder (A).



4. Adjust the sensor position until the sensor tip is flush with the end face of the sensor holder (A).
5. Tighten the lock nut (B).
6. Install the sensor holder assembly (C) into the pump housing.



7. Connect the sensor via the 2- meter long PVC cable (3 x 0.34 mm^2).

Specifications*	
Voltage	10-30 VDC
Current	Max. 200 mA

*For use in non-explosive atmospheres

9 Storage

9.1 Pump

- Store the pump and pump parts in a dry area. Make sure that the pump and 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.
- During storage or prolonged standstill, the pump element can become permanently deformed by the pressure of the pressing shoes. Permanent deformation can reduce pump element life and make the pump difficult to start. Remove the pump element if the pump will not be used for more than one month.



WARNING

Do not jog rotors with the electrical drive when the front cover is removed.

9.2 Pump element

- The maximum shelf life of a pump element is 2 years. Store the pump element in a dark, dry location at a temperature between 0 °C and 40 °C. After 2 years, ageing of the pump element material can reduce pump element service life.

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 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 pump element. Check any possible blockage inside the pump element. Check the condition on the rear of the rotor cover. 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 if the pump element has ruptured.
		Check the functioning of the lubricant level monitoring system, and check the lubricant level.
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 69
	Product temperature too high.	Check the performance graph. Refer to "How to use the graphs" on page 27
	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.
	High pump speed.	Reduce pump speed to a minimum. Contact your Bredel 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 shutoff valve.
	Pump element rupture or badly worn hose.	Replace the pump element. Refer to "Removing the pump element" on page 37
	(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 not correctly mounted, which makes the pump suck air.	Check the connections. Tighten if necessary.
	The filling degree of the pump element 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.
	Severely worn rotor cover	Inspect the engagement contour on the rear of the rotor cover for wear or damage. Replace if necessary.
Vibration and noise of the pump.	Severely worn bearings.	Replace bearings.

Problem	Possible cause	Correction
Short pump element life.	Chemical attack.	Check the compatibility of the pump element material with the product to be pumped. In case of doubt, consult your Bredel representative.
	High pump speed.	Reduce pump speed.
	High discharge pressures.	Try to minimise pressure loss by reducing flow obstructions. Always stay below the maximum allowable working pressure.
	High product temperature.	In case of doubt, consult your Bredel representative.
Lubricant leakage at pump port	Pump element flange not sealing.	Check pump element for cracks near flange. Check if the spring clip, securing the pump element is in place.
	Port insert not sealing.	Check port insert O-ring, replace if necessary.
Leakage from the rear of the pump housing "Buffer zone".	Damaged seal ring.	Replace seal ring.
Lubricant leakage at cover.	Damaged cover gasket.	Replace gasket.
	Bolts not tightened to the correct torque.	Tighten to the specified torque settings. Refer to "Torque figures" on page 71

11 Specifications

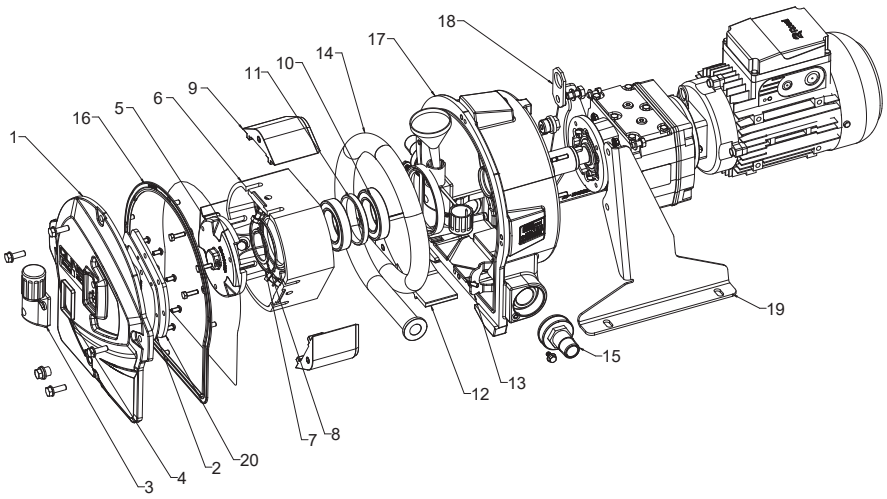
11.1 Pumphead

Pumphead performance

Description	QLINE 20
Max. capacity, continuous [m^3/h]	1.5
Max. capacity, intermittent [m^3/h] *	2.1
Max. permissible inlet pressure [kPa]	200
Max. working pressure [kPa] (TPU)	700
Max. working pressure [kPa] (Santoprene)	500
Permissible ambient temperature min [°C]	0
Permissible ambient temperature max [°C]	45
Permissible product temperature min [°C]	5
Permissible product temperature max [°C]	50
Sound level at 1m [dB(A)]	<70

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

Materials



Pos.	Description	Material
1	Pump Cover	Cast iron - ENGJL250
2	Seal inspection window	NBR
3	Breather	PA6.6
4	Breather seal	NBR
5	Rotor cover	Cast iron - ENGJL250
6	Rotor	Cast iron - ENGJL250
7	O-Ring	NBR
8	Front retaining ring	Steel
9	Pressing shoe	POM-C
10	Bearing	Steel
11	Spacer ring	Steel
12	Housing Insert	PP
13	Spring clip	Duplex Steel
14	Pump element	TPU, Santoprene
15	Process connection	SS316, PVC, PP
16	Cover seal	EPDM
17	Pump housing	Cast iron - ENGJL250
18	Lifting lug	Steel
19	Pump support	Galvanised steel, SS316
20	Inspection window	PMMA

Surface treatment

After surface preparation, two layers of two-component water born paint 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	QLINE 20
Lubricant	Bredel Genuine Hose Lubricant
Required quantity [litres]	1.5

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

Components		
Glycerol	($C_3H_8O_3$)	50-100% w/w
Glycol	($C_3H_8O_2$)	2.5-10% w/w
Water	(H_2O)	

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.

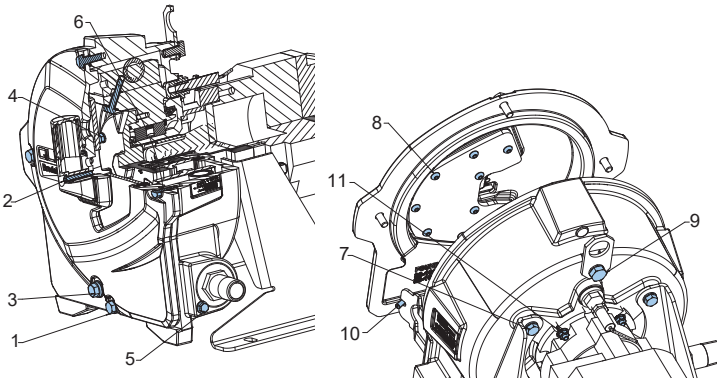
An alternative lubricant is available based on silicone. Also compatibility with this lubricant must be checked if applied. Refer to the chemical compatibility chart at www.wmfts.com/en/support/chemical-compatibility-guide/ or contact your Bredel representative for advice.

Weights

Description	Weight [kg]
	QLINE 20
Pumphead complete*	35
Pump support (4mm) (total weight for 2 supports)	1.88
Rotor	8
Pump element	0.52
Pump cover (complete)	13.60
Gearbox	12
Electric motor	14

*Weight of a completely mounted pumphead with standard flange brackets (including hose, lubricant and standard supports).Weight of a completely mounted pumphead (including pump element, lubricant and standard supports).

Torque figures



Pos.	Description	Torque [Nm]
		QLINE 20
1	Housing cover	25
2	Breather	5
3	Drain plug	10
4	Rotor cover	10
5	Insert lock	10
6	Pressing shoe	5
7	Supports	25
8	Inspection window	2.5
9	Lifting lug	50
10	Spring clip	10
11	Gearbox	10

Note: All bolts are class 8.8.

11.2 Gearbox

Type	Co-axial gearbox with helical gears
Number of stages	Two or three
Mounting position	IM 3001 (IM B5) flanged gearbox with keyed shaft in horizontal position
Motor adapter	Integrated
Optional motor adapter	Adapter in conformance with IEC-B5 or NEMA C.

* Other gearbox types are available as option.

11.3 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

11.4 Electric motor

The standard electric motor is an enclosed three-phase asynchronous motor, suitable for use in combination with a frequency inverter. As a standard, PTC temperature sensors are built-in.

Note: In case of doubt about the local applicable regulations for the drive connection, contact your Bredel representative.

Protection class	IP55/IK08
Insulation class	F
Increase in temperature	Within class B
Voltage/frequency	Refer to identification plate on motor.

11.5 Bredel Variable Frequency Drive (VFD) (optional)

The Bredel Variable Frequency Drive (VFD) has been preprogrammed and only needs to be connected to the mains.

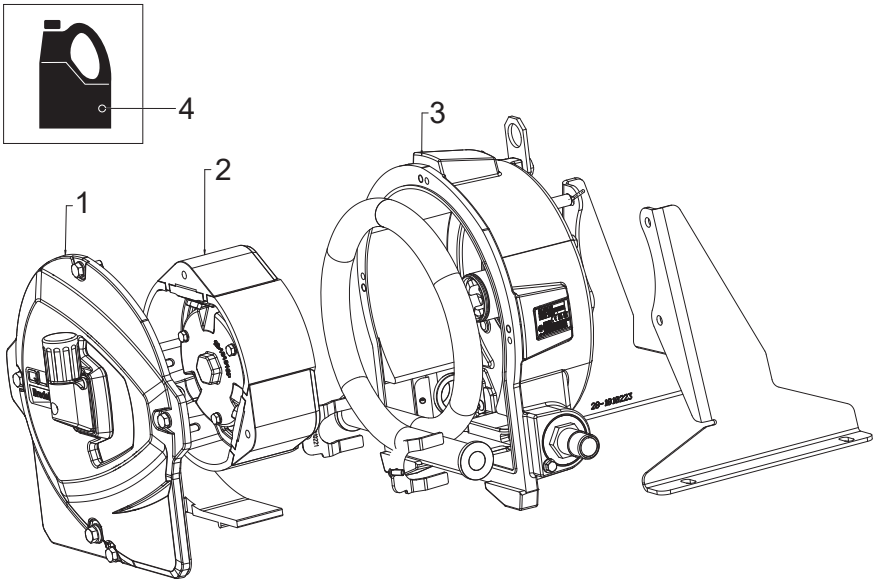
RFI filter	Integrated RFI filter B (industrial applications).
Control	Manual control for setting the speed and the keys for starting forward, stop and starting reverse. More options are available.
Protection class	IP55
Mains power supply	Several types are available; the choice depends on the power and the local electricity grid: • 200-240 V ± 10%; 50/60 Hz ± 5%; 1 ph • 200-240 V ± 10%; 50/60 Hz ± 5%; 3 ph • 400-480 V ± 10%; 50/60 Hz ± 5%; 3 ph

11.6 Parts list

Ordering parts

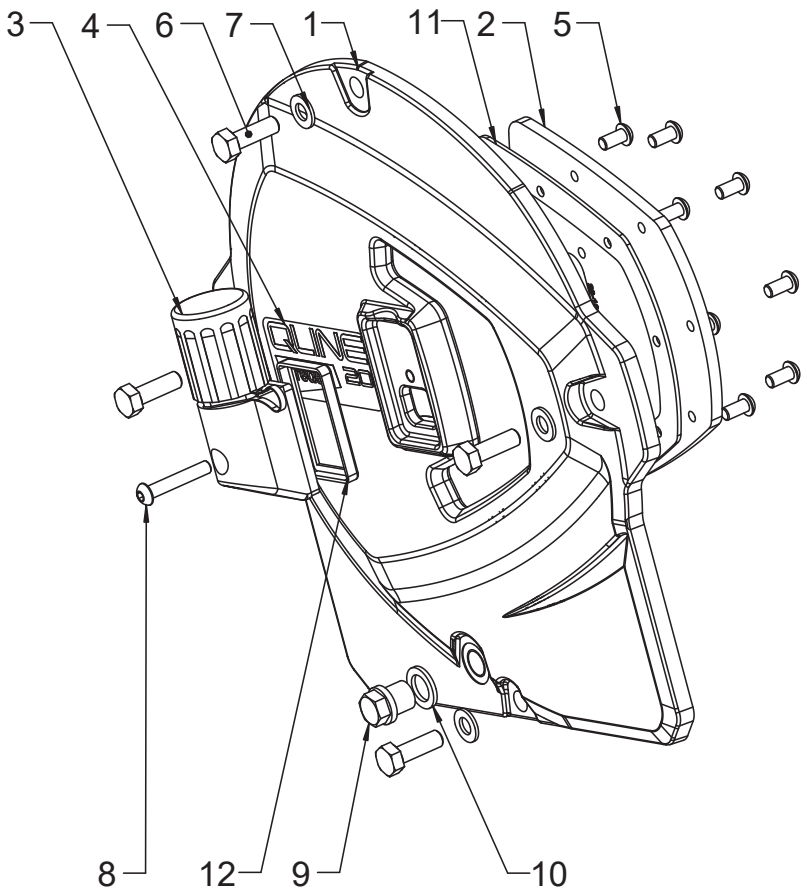
Specify the item number, description and pump type to identify the component you need. Also specify the quantity you need.

Overview



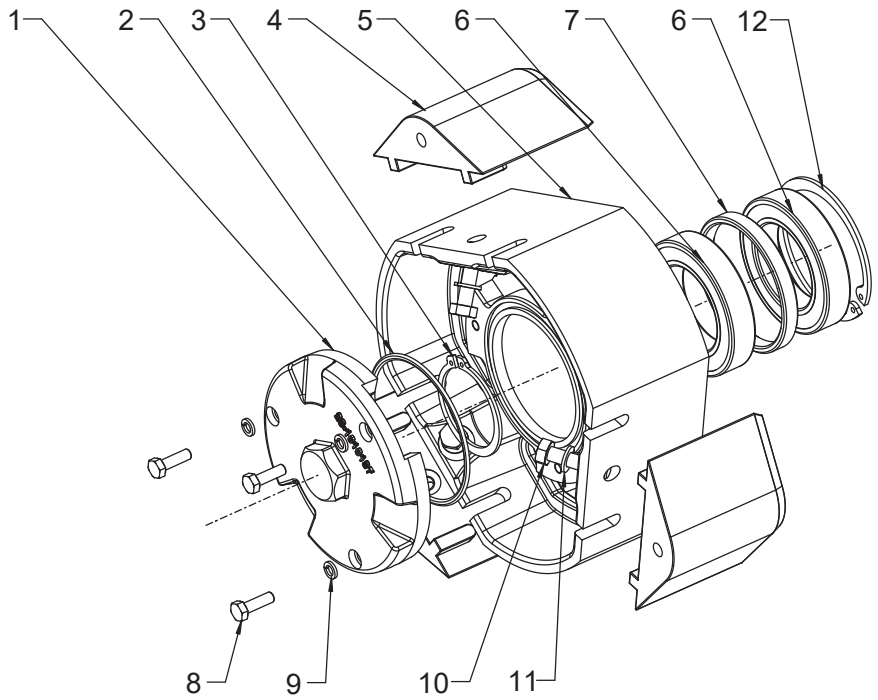
Pos.	Description
1	Refer to "Cover assembly" on the next page.
2	Refer to "Rotor assembly" on page 77
3	Refer to "Pump housing assembly" on page 79
4	Refer to "Lubricant" on page 82

Cover assembly



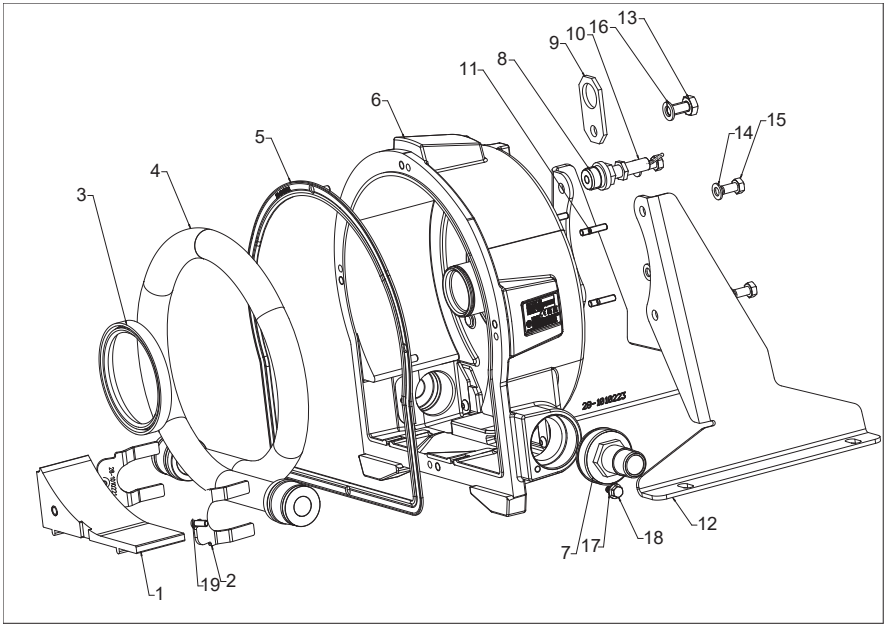
Pos.	Qty.	Description	Product code
1	1	Pump cover	28-1010130
2	1	Inspection cover	28-1010163
3	1	Breather	28-1000051
4	1	Sticker QLINE 20	28-1010188
5	9	Inspection window bolt	28-F552535
6	4	Cover bolt	28-F504055
7	4	Cover bolt washer	28-F523012
8	1	Breather bolt	28-F552541
9	1	Plug	28-F911504
10	1	Plug gasket	28-F342027
11	1	Inspection window gasket	28-1010164
12	1	Breather gasket	28-29056334

Rotor assembly



Pos.	Qty.	Description	Product code
1	1	Rotor cover	28-1010209
2	1	Rotor cover O-ring	28-1010238
3	1	Front circlip	28-F343043
4	3	Pressing shoe	28-1010211
5	1	Rotor	28-1010209
6	2	Rotor bearing	28-B141060
7	1	Spacer ring	28-1010210
8	3	Rotor cover bolt	28-F504038
9	3	Cover washer	28-F332004
10	3	Shoe bolt	28-F504057
11	3	Shoe washer	28-F532009
12	1	Back circlip	28-F347035

Pump housing assembly



Pos.	Qty.	Description	Product code
1	1	Housing insert	28-1000029
2	2	Spring clip	28-1000204
3	1	Rotor seal	28-S211811
4	1	Pump element, TPU	28-402080
		Pump element, Santoprene	28-402090
5	1	Cover seal	28-1010168
6	1	Pump housing	28-1010133
7	2	Process connection, hose tail, SS316	28-1010212
		Process connection, BSPP ¾", SS316	28-1010215
		Process connection, NPT ¾", SS316	28-1010218
		Process connection, hose tail, PVC	28-1010213
		Process connection, BSPP ¾", PVC	28-1010216
		Process connection, NPT ¾", PVC	28-1010219
		Process connection, hose tail, PP	28-1010214
		Process connection, BSPP ¾", PP	28-1010217
		Process connection, NPT ¾", PP	28-1010220
8	1	Plug ½"	28-F911504
9	1	Lifting lug	28-29065361
10	1	Revolution counter	28-1010318
11	4	Studbolt	28-F511001

Pos.	Qty.	Description	Product code
12	1	Pump support right, Galvanised	28-1010222
		Pump support right, SS316	28-1010223
	1	Pump support left, Galvanised	28-1010224
		Pump support left, SS316	28-1010225
13	1	Lifting lug bolt	28-F504074
14	4	Support washer	28-F523012
15	4	Support bolt	28-F504053
16	1	Lifting lug washer, SS316	28-F523013
17	1	Insert lock washer, SS316	28-F527004
18	1	Insert lock bolt, SS316	28-F504038
19	1	Spring clip bolt, SS316	28-F552535

Lubricant

Bredel Genuine Hose Lubricant is available in 0.5, 1, 2, 3, 5, 10 and 20 litre cans. Refer to "Lubricant table pump" on page 69 for specifications of this lubricant.

Pos.	Qty.	Description	Product code
—	1	Genuine Hose Lubricant, Can 3 Ltrs (2 fills)	28-908143
		Silicon Oil, Can 3 Ltrs (2 fills)	28-908144

12 Product conformity

For the purpose of Machinery Regulation (EU) 2023/1230, annex V part B

The pump described in this manual is in conformity with the relevant Union harmonisation legislation:

(EU) 2023/1230 Regulation	*(EU) 2023/1230 of the European Parliament and of the Council of 14 June 2023 on machinery.*
2011/65/EU Directive	*2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) and its amendment Commission Delegated Directive (EU) 2015/863*
(EC) 1907/2006 Regulation	*(EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).*
(EU) 2024/2847 Regulation	*(EU) 2024/2847 concerning cybersecurity requirements for hardware and software products with digital elements.*

The following harmonised standards, or parts thereof, have been applied:

DIN EN ISO 12100:2011-03	*Safety of machinery - General principles for design - Risk assessment and risk reduction*
EN 809:1998+A1:2009	*Pumps and pump units for liquids - General safety requirements*
EN 60204-1:2018+A1:2025	*Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

Detailed information regarding the applicable legislation and the essential health and safety requirements applied and fulfilled is provided in the Declaration of Incorporation supplied separately with the product and/or provided in digital format.

The partly completed machinery must not be put into service until the final machinery into which it is incorporated has been declared in conformity with the applicable requirements.

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.

RGA/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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