

# SEG AUTO<sub>ADAPT</sub>

0.9 - 4.0 kW

50 Hz

Installation and operating instructions



Installation and operating instructions



SEG AUTO<sub>ADAPT</sub>

<http://net.grundfos.com/qr/i/97525813>

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GRUNDFOS 

# English (GB) Installation and operating instructions

## Original installation and operating instructions

These installation and operating instructions describe Grundfos SEG AUTO<sub>ADAPT</sub> pumps.

Sections 1-5 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 6-11 give important information about the product, as well as information on service, fault finding and disposal of the product.

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Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.



This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

## 1. General information

### 1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

#### **DANGER**



Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

#### **WARNING**



Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

#### **CAUTION**



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

#### **SIGNAL WORD**



##### **Description of hazard**

Consequence of ignoring the warning.  
- Action to avoid the hazard.

### 1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

### 1.3 Target groups

These installation and operating instructions are intended for professional installers.

## 2. Receiving the product

The pump may be transported and stored in a vertical or horizontal position. Make sure that the pump cannot roll or fall over.

Check that the protective cap for the level sensor has not been damaged during transportation. See pos. 7 in fig. 10. If the protective cap is defective, contact your nearest Grundfos company.

### 2.1 Transporting the product

All lifting equipment must be rated for the purpose and checked for damage before any attempts to lift the pump. The lifting equipment rating must under no circumstances be exceeded. The pump weight is stated on the pump nameplate.

#### **WARNING**

##### **Crushing hazard**

Death or serious personal injury

- Do not stack pump packages or pallets on top of each other when lifting or moving them.
- Always lift the pump by its lifting bracket or by means of a forklift truck if the pump is fixed on a pallet. Never lift the pump by means of the power cable, hose or pipe.



#### **CAUTION**

##### **Sharp element**

Minor or moderate personal injury

- Make sure not to cut your hands on the sharp edges when opening the pump package.



The polyurethane-embedded plug prevents water from penetrating into the motor via the power cable.



We recommend that you keep the cable end protectors in storage for later use.

### 3. Installing the product



Pump installation in pits must be carried out by specially trained persons. Work in or near pits must be carried out according to local regulations.



Persons must not enter the installation area when the atmosphere is explosive.

#### DANGER

##### Electric shock



Death or serious personal injury  
- It must be possible to lock the main switch in position 0. Type and requirements as specified in EN 60204-1, 5.3.2.

#### DANGER

##### Electric shock



Death or serious personal injury  
- Make sure there are at least 3 m free cable above the maximum liquid level.

For safety reasons, all work in pits must be supervised by a person outside the pit.



We recommend that you make all maintenance and service work when the pump is placed outside the pit.

#### DANGER

##### Crushing hazard



Death or serious personal injury  
- Make sure that the lifting bracket is tightened before attempting to lift the pump. Tighten if necessary.

Carelessness during lifting or transportation may cause injury to persons or damage to the pump.

### 3.1 Mechanical installation



Make sure the pit bottom is even before installing the product.

#### DANGER

##### Electric shock



Death or serious personal injury  
- Before beginning the installation, switch off the power supply and lock the main switch in position 0.  
- Switch off any external voltage connected to the product before working on it.

#### CAUTION

##### Hot surface



Death or serious personal injury  
- Make sure that the pump has cooled down before touching it.

#### DANGER

##### Electric shock



Death or serious personal injury  
- Before installing the pump and starting it up for the first time, check the power cable for visible defects to avoid short circuits.

#### CAUTION

##### Biological hazard



Minor or moderate personal injury  
- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.  
Pits for submersible sewage and wastewater pumps may contain sewage or wastewater with toxic and/or disease-causing substances.  
- Wear appropriate personal protective equipment and clothing.  
- Observe the local hygiene regulations in force.

Fit the extra nameplate supplied with the pump at the installation site or keep it in the cover of this booklet.

Observe all safety regulations at the installation site, for instance the use of blowers for fresh-air supply to the pit.

Check the oil level in the oil chamber before installing the pump. See section [8.4 Oil check and oil change](#).

The pumps are suitable for different installation types which are described in sections [3.1.2 Installation on auto coupling](#) and [3.1.3 Free-standing submerged installation](#).

High-flow pumps have a cast DN 50 outlet flange. All other pumps have a cast DN 40 outlet flange.



The pumps are designed for intermittent operation. When completely submerged, the pumps can also operate continuously.



Always use Grundfos accessories to avoid malfunctions due to incorrect installation.



Only use the lifting bracket for lifting the pump. Do not use it to hold the pump when in operation.

### CAUTION

#### Crushing of hands

Minor or moderate personal injury

- Do not put your hands or any tool into the pump inlet or outlet port after the pump has been connected to the power supply, unless the pump has been switched off by removing the fuses or switching off the main switch.
- Make sure that the power supply cannot be accidentally switched on.



Make sure that the liquid entering the pit through the inlet does not cause water to be splashed on the sensors of the pump.

### CAUTION

#### Sharp element

Minor or moderate personal injury

- Do not touch the sharp edges of the impeller, grinder head, and grinder ring without wearing gloves.



### CAUTION

#### Biological hazard

Minor or moderate personal injury

- Make sure to seal the pump outlet properly when fitting the outlet pipe, otherwise water might spray out of the sealing.



### 3.1.1 Lifting the product

#### WARNING

##### Crushing of hands

Death or serious personal injury

- When lifting the pump, make sure your hand is not caught between the lifting bracket and the hook.



#### WARNING

##### Crushing hazard

Death or serious personal injury

- Make sure that the hook is fixed properly to the lifting bracket.
- Always lift the pump by its lifting bracket or by means of a forklift truck if the pump is fixed on a pallet.
- Never lift the pump by means of the power cable, hose or pipe.
- Make sure that the lifting bracket is tightened before attempting to lift the pump. Tighten if necessary.



Carelessness during lifting or transportation may cause injury to persons or damage to the pump.

When lifting the pump, use the right lifting point to keep the pump balanced. Place the lifting chain hook in point A for auto-coupling installations and in point B for other installations. See [fig. 1](#).

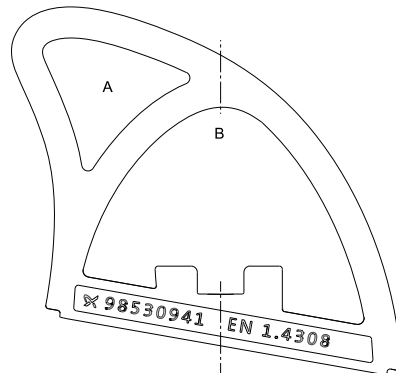


Fig. 1 Lifting points

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### 3.1.2 Installation on auto coupling

Pumps for permanent installation can be mounted on a stationary auto-coupling guide rail system or a hook-up auto-coupling system.

Both auto-coupling systems facilitate maintenance and service as the pump can easily be lifted out of the pit.



Before beginning installation procedures, make sure that the atmosphere in the pit is not potentially explosive.

We recommend that you use loose flanges to ease the installation and to avoid pipe tension at flanges and bolts.



Make sure that the pipes are installed without the use of undue force. No loads from the weight of the pipes must be carried by the pump.



Do not use elastic elements or bellows in the pipes. Never use these elements as a means to align the pipes.

#### Auto-coupling guide rail system

See fig. 1 in [Appendix](#).

Proceed as follows:

1. Drill mounting holes for the guide rail bracket on the inside of the pit, and fasten the guide rail bracket provisionally with two anchor bolts.
2. Place the auto-coupling base unit on the bottom of the pit. Use a plumb line to establish the correct positioning. Fasten the auto coupling with anchor bolts. If the bottom of the pit is uneven, the auto-coupling base unit must be supported so that it is level when being fastened.
3. Assemble the outlet line in accordance with the generally accepted procedures and without exposing the line to distortion or tension.
4. Insert the guide rails in the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket at the top of the pit.
5. Unscrew the provisionally fastened guide rail bracket, fit it on top of the guide rails, and finally fasten it firmly to the pit wall.



The guide rails must not have any axial play as this would cause noise during pump operation.

6. Clean out debris from the pit before lowering the pump into the pit.
7. Fit the guide claw to the pump outlet. Grease the gasket of the guide claw before lowering the pump into the pit.
8. Slide the guide claw between the guide rails and lower the pump into the pit by means of a chain secured to the lifting bracket of the pump. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.



When the pump has reached the auto-coupling base unit, shake the pump by means of the chain to make sure that it is placed in the correct position.

9. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
10. Adjust the length of the power cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cable is not sharply bent or pinched.
11. Connect the power cable and the control cable, if any.



The free end of the cable must not be submerged as water may penetrate through the cable into the motor.

## Hookup auto-coupling system

See fig. 2 in [Appendix](#).

Proceed as follows:

1. Fit a crossbar in the pit.
2. Fit the stationary part of the auto coupling on top of the crossbar.
3. Fit the adapted piece of pipe for the movable part of the hookup auto coupling to the pump outlet.
4. Fasten a shackle and a chain to the movable part of the hookup auto coupling.
5. Clean out debris from the pit before lowering the pump.
6. Lower the pump into the pit by means of the chain secured to the lifting bracket of the pump. When the movable part of the auto coupling reaches the stationary part, the two will automatically connect tightly.



When the pump has reached the auto-coupling base unit, shake the pump by means of the chain to make sure that it is placed in the correct position.

7. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
8. Adjust the length of the power cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook at the top of the pit. Make sure that the cable is not sharply bent or pinched.
9. Connect the power cable and the control cable, if any.



The free end of the cable must not be submerged as water may penetrate through the cable into the motor.

### 3.1.3 Free-standing submerged installation

Pumps for free-standing submerged installation can stand freely on the bottom of the pit or similar location. See fig. 3 in [Appendix](#).

The pump must be mounted on separate feet (accessory).

In order to facilitate service on the pump, fit a flexible union or coupling to the outlet line for easy separation.

If a hose is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the outlet port.

If a rigid pipe is used, fit the union or coupling, non-return valve and isolating valve in the order mentioned, when viewed from the pump.

If the pump is installed in muddy conditions or on uneven ground, we recommend that you support the pump on bricks or a similar support.

Proceed as follows:

1. Fit a 90 ° elbow to the pump outlet port and connect the outlet pipe or hose.
2. Lower the pump into the liquid by means of a chain secured to the lifting bracket of the pump. We recommend that you place the pump on a plane, solid foundation. Make sure that the pump is hanging from the chain and not the power cable.
3. Hang up the end of the chain on a suitable hook at the top of the pit and in such a way that the chain cannot come into contact with the pump housing.
4. Adjust the length of the power cable by coiling it up on a relief fitting to ensure that the cable is not damaged during operation. Fasten the relief fitting to a suitable hook. Make sure that the cable is not sharply bent or pinched.
5. Connect the power cable and the control cable, if any.



The free end of the cable must not be submerged as water may penetrate through the cable into the motor.



If several pumps are installed in the same pit, the pumps must be installed at the same level in order to allow optimum pump alternation.

## 3.2 Electrical connection



Do not run the pump via a frequency converter.

Carry out the electrical connection according to local regulations.

### DANGER

#### Electric shock

Death or serious personal injury



- Connect the pump to an external main switch which ensures all-pole disconnection with a contact separation according to EN 60204-1, 5.3.2.
- It must be possible to lock the main switch in position 0. Type and requirements as specified in EN 60204-1, 5.3.2.

The pump incorporates a motor-protective circuit breaker and all control logic.



Make sure there are at least 3 m free cable above the maximum liquid level.

The classification of the installation site must be approved according to local rules in each individual case.

The CIU unit, if used, must not be installed in potentially explosive environments.

On explosion-proof pumps, make sure that an external earth conductor is connected to the external earth terminal of the pump using a conductor with a secure cable clamp. Clean the surface of the external earth connection, and fit the cable clamp.



The cross section of the earth conductor must be at least 4 mm<sup>2</sup>, e.g. type H07 V2-K (PVT 90 °) yellow and green.

Make sure that the earth connection is protected from corrosion.

### DANGER

#### Electric shock

Death or serious personal injury



- If the power cable is damaged, it must be replaced by the manufacturer, his service agent or a similarly qualified person.



Set the motor-protective circuit breaker to the maximum current of the pump. The maximum current is stated on the pump nameplate.



Make sure that the pump is connected in accordance with the instructions given in this booklet.

The supply voltage and frequency are marked on the pump nameplate. For voltage tolerance, see section [10. Technical data](#). Make sure that the motor is suitable for the power supply available at the installation site.

All pumps are supplied with 10 m power cable and a free cable end.

### DANGER

#### Electric shock

Death or serious personal injury



- Before installing the pump and starting it up for the first time, check the power cable for visible defects to avoid short circuits.



A possible replacement of the power cable must be carried out by Grundfos or a service workshop authorised by Grundfos.



### 3.2.1 Wiring diagrams

#### Single-phase pumps

The pump has a patented start function which eliminates the need for a start capacitor. The run capacitor is incorporated in the pump.

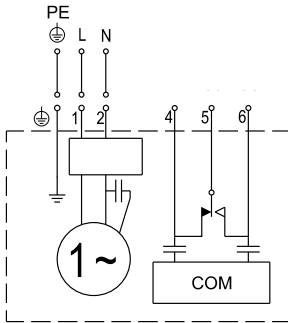


Fig. 2 Wiring diagram for single-phase pumps

#### Three-phase pumps

The pump motor is designed so that the phase sequence in the terminal box is clockwise. This can be determined with a phase sequence detector. The pump does not start unless the phase sequence is correct.

If the dry-running sensors are covered by liquid, and the pump does not start, the cause may be wrong phase sequence. Interchange L1 and L2.

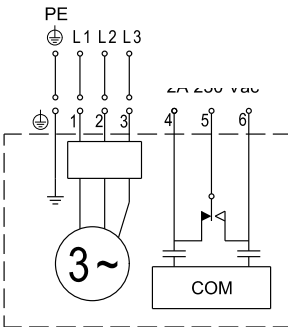


Fig. 3 Wiring diagram for three-phase pumps

### 3.2.2 Grundfos CIU

CIU stands for "Communication Interface Unit" and the CIU is used as a communication interface between an SEG AUTO<sub>ADAPT</sub> pump and a main data communication network.

The CIU is optional. See separate installation and operating instructions supplied with the unit.

### 3.2.3 Alarm relay or communication connection

The pump incorporates an alarm relay output. NC and NO are available and can be used as required, for example for acoustic or visual alarms. Maximum load of relay is 230 VAC 2 A.

Alternatively, the wires 4 and 6 can be used for external communication via a CIU.



If a CIU is connected, do not use a relay. CIU incorporates a relay which takes over the alarm function.

See example of wiring diagram in the documentation supplied with CIU.

### 3.2.4 Supply requirement

The maximum permissible system impedance  $Z_{max}$  must be 0.24 Ohm at 50 Hz at the interface point of the user's supply or the current capacity, which is 100 A per phase, supplied from a distribution network.

If not, a minor voltage drop may occur, which may result in a brief flashing of an electric light.

Consult the supply authority, if necessary, to ensure that the current capacity at the interface point is sufficient for the equipment.

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## 4. Starting up the product

### CAUTION

#### Crushing of hands

Minor or moderate personal injury

- Do not put your hands or any tool into the pump inlet or outlet port after the pump has been connected to the power supply, unless the pump has been switched off by removing the fuses or switching off the main switch.
- Make sure that the power supply cannot be accidentally switched on.



Before starting the product:



- Make sure that the fuses have been removed.
- Make sure that all protective equipment has been connected correctly.

### CAUTION

#### Biological hazard

Minor or moderate personal injury

- Make sure to seal the pump outlet properly when fitting the outlet pipe, otherwise water might spray out of the sealing.



### WARNING

#### Crushing of hands

Death or serious personal injury

- When lifting the pump, make sure your hand is not caught between the lifting bracket and the hook.



### DANGER

#### Crushing hazard

Death or serious personal injury

- Make sure that the hook is fixed properly to the lifting bracket.
- Always lift the pump by its lifting bracket or by means of a forklift truck if the pump is fixed on a pallet.
- Never lift the pump by means of the power cable, hose or pipe.
- Make sure that the lifting bracket is tightened before attempting to lift the pump. Tighten if necessary.



### DANGER

#### Electric shock

Death or serious personal injury

- Before starting up the product for the first time, check the power cable for visible defects to avoid short circuits.
- If the power cable is damaged, it must be replaced by the manufacturer, his service agent or a similarly qualified person.
- Make sure that the product is earthed properly.
- Switch off the power supply and lock the main switch in position 0.
- Switch off any external voltage connected to the product before working on it.



### CAUTION

#### Biological hazard

Minor or moderate personal injury

- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.
- Pits for submersible sewage and wastewater pumps may contain sewage or wastewater with toxic and/or disease-causing substances.
- Wear appropriate personal protective equipment and clothing.
- Observe the local hygiene regulations in force.



### CAUTION

#### Hot surface

Minor or moderate personal injury

- Do not touch the surface of the pump while the pump is running.



- Do not open the clamp while the pump is running.

## 4.1 Operating modes



Do not start the pump if the atmosphere in the pit is potentially explosive.

The pumps are designed for intermittent operation (S3). When completely submerged, the pumps can also operate continuously (S1).

### S3, intermittent operation

S3 operation is a series of 10-minute duty cycles (TC). Each cycle has a 4-minute period of constant load followed by a 6-minute period of rest. Thermal equilibrium is not reached during the cycle. See fig. 4.

In this operating mode, the pump is partly submerged in the surrounding liquid. The minimum liquid level is at the top of the cable entry.

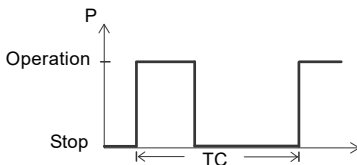


Fig. 4 S3 operation

### S1, continuous operation

In this operating mode, the pump can operate continuously without being stopped for cooling. Being completely submerged, the pump is sufficiently cooled by the surrounding liquid. See fig. 5.

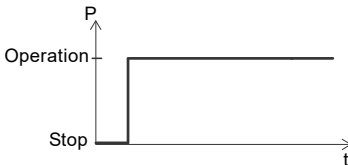


Fig. 5 S1 operation

## 4.2 Preparations for starting up

### 4.2.1 Default settings

The pump is supplied from the factory with the following default settings:

Parameter	0.9 - 4.0 kW	
Start delay (random)	Off	
Start level	25 cm	
High-level alarm	+ 10 cm	
Anti-seizing:	Interval	3 days
	Duration	2 sec.

If you need to change one or more of the above parameters, use the optional CIU together with Grundfos GO.

CIU can be connected temporarily for configuration. If no CIU is available, you can change the parameters using Grundfos PC Tool. For further information, see the installation and operating instructions for CIU.

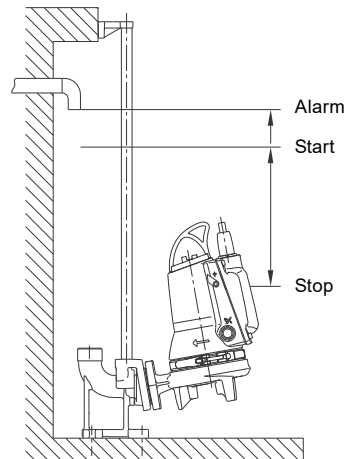


Fig. 6 Start and stop levels

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**4.2.2 Pump alternation**

If up to four pumps are installed in the same pit, the control logic incorporated in the pumps will ensure that the load is distributed evenly among the pumps over time.

Alternation is carried out according to a patented method based on measurement of the liquid level in the pit.



The barometric pressure may affect the alternating sequence.

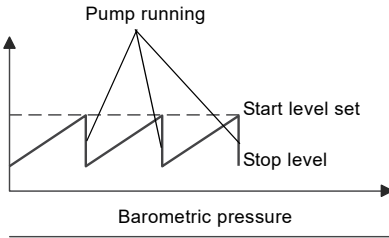
**4.3 Start and stop levels**

**4.3.1 Setting the start level**

The pump start level may be affected by the barometric pressure. In the case of long intervals between start and stop, the start level may differ from the set level. See examples below.

**Example 1: Constant barometric pressure**

The pump will start when the liquid level in the pit has reached the set start level. Then the pump will run until the liquid level reaches the stop level. When it stops, the pump will calibrate itself in relation to the actual barometric pressure. See fig. 7.

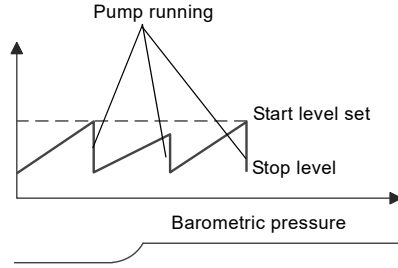


**Fig. 7** Example 1: Constant barometric pressure

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**Example 2: Rising barometric pressure**

If the barometric pressure rises after the pump has stopped, the pump will register this rise as a rise in liquid level. The result may be that the pump starts before the set start level is reached. See fig. 8.

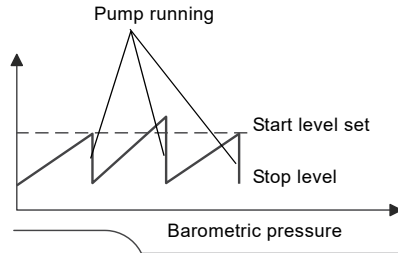


**Fig. 8** Example 2: Rising barometric pressure

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**Example 3: Falling barometric pressure**

If the barometric pressure falls after the pump has stopped, the pump will register this fall as a fall in liquid level. The result may be that the pump starts after the set start level was reached. See fig. 9. Therefore, the distance between the pump stop level and the inlet to the pit must be at least 50 cm. See fig. 6.



**Fig. 9** Example 3: Falling barometric pressure

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The pump incorporates dry-running protection via two dry-running sensors placed on either side of the electronic unit. If the water level falls below a dry-running sensor, the pump will stop immediately, and it cannot restart until the sensors are fully submerged again.



The sensors must be cleaned at regular intervals, depending on the deposits of sludge on the sensors in the pit.

## 4.4 Direction of rotation



The pump may be started for a very short period without being submerged to check the direction of rotation.

All single-phase pumps are factory-wired for the correct direction of rotation.

The electronics incorporated in a three-phase pump ensure that the pump does not start with a wrong phase sequence, and consequently wrong direction of rotation.

If the pump does not run, and the liquid level is above the dry-running sensors, interchange L1 and L2.

An arrow on the stator housing indicates the correct direction of rotation.

## 4.5 Startup



The pump must not run dry.



If the atmosphere in the pit is potentially explosive, use only pumps with Ex approval.



Before startup, check that the system has been filled with liquid and vented. The pump is self-venting.



If the dry-running sensors are not covered by liquid, the pump cannot start.

In case of abnormal noise or vibrations from the pump, other pump failure or power supply failure, stop the pump immediately.



Do not attempt to restart the pump until the cause of the fault has been found and corrected.

Proceed as follows:

1. Remove the fuses and check that the impeller can rotate freely. Turn the grinder head by hand.
2. Check the condition of the oil in the oil chamber. See also section [8.4 Oil check and oil change](#).
3. Check that the level sensor is clean, and that the protective cap is intact.
4. Check that the dry-running sensors are clean.
5. Open the isolating valves, if fitted.  
**Auto coupling:** It is important to grease the gasket of the guide claw before lowering the pump into the pit.
6. Lower the pump into the liquid, and insert the fuses.  
**Auto coupling:** Check that the pump is in the right position on the auto-coupling base unit.
7. Check that the system has been filled with liquid and vented. The pump is self-venting.
8. Switch on the power supply to the pump. When the power is on, the pump will start and pump down to the dry-running level. This process can be used to check that the pump functions correctly.



If the dry-running sensors are not covered by liquid, the pump cannot start. To check that the phase sequence is correct, test run the pump for a few seconds. If the pump does not run, interchange L1 and L2 and repeat the test run.

After one week of operation or after replacement of the shaft seal, check the condition of the oil in the oil chamber. See section [8.4 Oil check and oil change](#).

## 4.6 Resetting the pump

To reset the pump, switch off the power supply for one minute, and switch it on again.

# 5. Handling and storing the product

## 5.1 Handling the product

Before handling the product, see section [3.1.1 Lifting the product](#).

## 5.2 Storing the product

During long periods of storage, protect the pump against moisture, heat and temperatures below -25 °C.

After a long period of storage, inspect the pump before putting it into operation. Make sure that the impeller can rotate freely. Pay special attention to the condition of the shaft seal, cable entry and sensors.

## 6. Product introduction

### 6.1 Product description

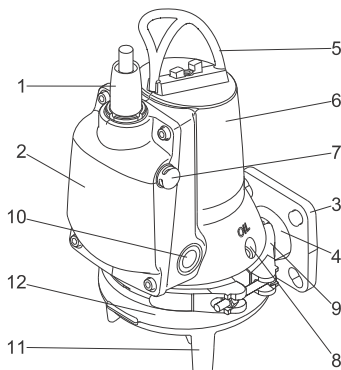


Fig. 10 SEG AUTO<sub>ADAPT</sub>

TM06 5751 0116

Pos.	Description
1	Cable plug
2	Electronic unit
3	Outlet flange DN 40 and DN 50
4	Outlet port
5	Lifting bracket
6	Stator housing
7	Level sensor
8	Oil screw
9	Clamp
10	Dry-running sensors
11	Pump foot
12	Pump housing

### 6.2 Applications

The compact design makes the pumps suitable for both temporary and permanent installation.

The pumps can be installed on an auto-coupling system or stand freely on the bottom of a pit.

SEG AUTO<sub>ADAPT</sub> pumps are portable and designed for pumping domestic and industrial sewage and wastewater and thus ideal for use in sparsely populated areas where gravity sewage systems are not available.

SEG AUTO<sub>ADAPT</sub> pumps are designed with a grinder system which grinds solid particles into small pieces so that they can be led away through outlet pipes of a relatively small diameter.

### 6.3 Pumped liquids

The product is designed for pumping these liquids:

- domestic wastewater with discharge from toilets
- sewage from restaurants, hotels, camping sites, etc.

### 6.4 Potentially explosive environments

Use explosion-proof pumps for applications in potentially explosive environments.



The pumps must under no circumstances pump combustible or flammable liquids.



The classification of the installation site must be approved according to local rules in each individual case.

The letter X in the certificate number indicates that the equipment is subject to special conditions for safe use. The conditions are mentioned in the certificate and in these installation and operating instructions.

Special conditions for safe use of explosion-proof pumps:

1. Bolts used for replacement must be class A2-80 or better according to EN/ISO 3506-1.
2. The pump must not run dry.
3. Make sure the permanently attached cable is suitably mechanically protected and terminated in a suitable terminal board placed outside the potentially explosive area.
4. The thermal protector in the stator windings has a rated cutout temperature of 150 °C guaranteeing the disconnection of the power supply.
5. The IP68 rating is limited to maximum 10 m submersion depth.
6. The temperature range is limited to -20 to +40 °C for ambient temperature and 0-40 °C for liquids.
7. Contact the manufacturer regarding the "d" protection type for pumps and for information on the dimensions of the flameproof joints.
8. The lock nut of the cable connector must only be replaced with an identical one.





## 6.5 Approvals

All versions have been approved by TÜV Rheinland LGA (notified body under the Construction Products Directive) according to EN 12050-1 as specified on the pump nameplate.

### 6.5.1 Approval standards

The explosion-proof versions have been approved by DEKRA according to the ATEX directive.

The explosion protection classification of the pumps is Europe CE 0344  II 2 G Ex db h ib IIB T4 Gb.

Directive or standard	Code	Description
ATEX	CE 0344	= CE mark of conformity according to the ATEX directive 2014/34/EU. 0344 is the number of the notified body which has certified the quality system for ATEX.
		= Explosion protection mark.
	II	= Equipment group according to the ATEX directive defining the requirements applicable to the equipment in this group.
	2	= Equipment category according to the ATEX directive defining the requirements applicable to the equipment in this category.
	G	= Explosive atmosphere caused by gases, vapours or mists.
Harmonised European standard	Ex	= The equipment conforms to the harmonised European standard.
	h	= Non-electrical equipment for explosive atmosphere.
	db	= Flame-proof enclosure according to EN 60079-1.
	ib	= Intrinsic safety.
	IIB	= Classification of gases, see EN 60079-0. Gas group B includes gas group A.
	T4	= Maximum surface temperature is 135 °C.
	Gb	= Equipment for explosive gas atmospheres with "high" level of protection.

### 6.5.2 Australia

For IEC countries, such as Australia and others, the explosion-proof versions have been approved by DEKRA, certificate no. IECEx DEK 11.0026X.

The explosion protection classification of the pumps is Ex db h ib IIB T4 Gb based on IEC 60079-0:2017 and IEC 60079-1:2014, IEC 60079-11:2011, ISO 80079-36:2016, ISO 80079-37:2016.

Directive or standard	Code	Description
IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-11:2011	Ex	= The equipment conforms to the IECEx.
	db	= Flame-proof enclosure.
	ib	= Intrinsic safety.
	IIB	= Classification of gases. Gas group B includes gas group A.
	T4	= Maximum surface temperature is 135 °C.
	Gb	= Equipment for explosive gas atmospheres with "high" level of protection.

## 6.6 Identification

### 6.6.1 Nameplate

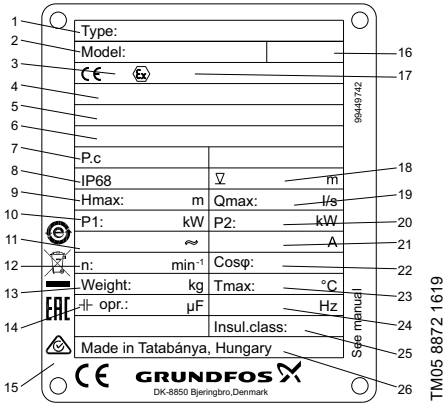


Fig. 11 SEG AUTO<sub>ADAPT</sub> nameplate

Pos.	Description
1	Type designation
2	Product number
3	Approval
4	ATEX certificate number
5	IEC Ex description
6	IEC Ex certificate number
7	Production code, year and week
8	Enclosure class according to IEC 60529
9	Maximum head [m]
10	Rated input power [kW]
11	Rated voltage
12	Speed [rpm]
13	Net weight [kg]
14	Run capacitor [μF]
15	Marks of approval
16	Safety instructions, publication number
17	Ex description
18	Maximum installation depth [m]
19	Maximum flow rate [l/s]
20	Rated power output [kW]
21	Maximum current [A]
22	Cos φ, 1/1 load

Pos.	Description
23	Maximum liquid temperature [°C]
24	Frequency [Hz]
25	Insulation class/temperature rise
26	Production country

### 6.6.2 Type key

Example: SEG.40.11.E.Ex.2.1.5.02

Code	Description	Designation
SE	Grundfos sewage pumps	Type range
G	Grinder system in the pump inlet	Impeller type
40	Nominal diameter of outlet port	Pump outlet [mm]
50	Nominal diameter of the outlet port for high-flow variants	
11	P2 = code number from type designation / 10	Output power [kW]
[ ]	Standard, without equipment	Equipment
E	Electronic version with AUTO <sub>ADAPT</sub> functions	
[ ]	Standard pumps	Pump version
Ex	Explosion-proof pumps	
2	2-pole	Number of poles
1	Single-phase motor	Number of phases
[ ]	Three-phase motor	
5	50 Hz	Frequency [Hz]
02	230 V, DOL	Voltage and starting method
0B	400-415 V, DOL	
0C	230-240 V, DOL	
[ ]	1st generation	Generation <sup>1)</sup>
A	2nd generation	
B	3rd generation	
[ ]	Standard material (EN-GJL-200)	Pump material
Z	Custom-built pump	Customisation

<sup>1)</sup> The pumps in the individual generations differ in design but are similar in terms of power rating.



## 7. Protection and control functions

### 7.1 Built-in protection

The motor incorporates an electronic unit which protects the motor in various situations.

In case of overload, the built-in overload protection stops the pump for 5 minutes. After that period, the pump is ready to restart if the starting conditions are fulfilled.

To reset the pump, switch off the power supply for one minute, and switch it on again.

The motor is protected in the following situations:

- dry running
- voltage surges up to 6000 V  
In areas with high lightning intensity, external lightning protection is required.
- overvoltage
- undervoltage
- overload
- overtemperature

### 7.2 Thermal switches

All pumps have two sets of thermal switches in the stator windings.

When a thermal switch is activated, the pump will stop immediately, and it will not restart until the motor windings have cooled sufficiently.

If the pump does not restart automatically, reset and restart the pump manually. If the pump has to be restarted manually repeatedly, contact Grundfos or a service workshop authorised by Grundfos.

## 8. Servicing and maintaining the product

### 8.1 Safety instruction and requirements

#### DANGER

##### Electric shock

Death or serious personal injury

- Before starting work on the pump, make sure that the fuses have been removed or the main switch has been switched off.
- Make sure that the power supply cannot be accidentally switched on.



#### CAUTION

##### Crushing of hands

Minor or moderate personal injury

- Do not put your hands or any tool into the pump inlet or outlet port after the pump has been connected to the power supply, unless the pump has been switched off by removing the fuses or switching off the main switch.
- Make sure that all the rotating parts have stopped moving.



#### CAUTION

##### Sharp element

Minor or moderate personal injury

- Do not touch the sharp edges of the impeller, grinder head, and grinder ring without wearing gloves.



#### CAUTION

##### Biological hazard

Minor or moderate personal injury

- Make sure to seal the pump outlet properly when fitting the outlet pipe, otherwise water might spray out of the sealing.



#### CAUTION

##### Hot surface

Minor or moderate personal injury

- Do not touch the surface of the pump while the pump is running.



#### WARNING

##### Crushing of hands

Death or serious personal injury

- When lifting the pump, make sure your hand is not caught between the lifting bracket and the hook.



**DANGER****Crushing hazard**

Death or serious personal injury

- Make sure that the hook is fixed properly to the lifting bracket.
- Always lift the pump by its lifting bracket or by means of a forklift truck if the pump is fixed on a pallet.
- Never lift the pump by means of the power cable, hose or pipe.
- Make sure that the lifting bracket is tightened before attempting to lift the pump. Tighten if necessary.

**DANGER****Electric shock**

Death or serious personal injury

- Before installing the pump and starting it up for the first time, check the power cable for visible defects to avoid short circuits.
- If the power cable is damaged, it must be replaced by the manufacturer, his service agent or a similarly qualified person.
- Make sure that the product is earthed properly.
- Switch off the power supply and lock the main switch in position 0.
- Switch off any external voltage connected to the product before working on it.

**CAUTION****Biological hazard**

Minor or moderate personal injury

- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.  
Pits for submersible sewage and wastewater pumps may contain sewage or wastewater with toxic and/or disease-causing substances.
- Wear appropriate personal protective equipment and clothing.
- Observe the local hygiene regulations in force.

**CAUTION****Pressurised system**

Minor or moderate personal injury

- As pressure may have built up in the oil chamber, do not remove the screws until the pressure has been fully relieved.



Except for service on the pump parts, all other service work must be carried out by Grundfos or a service workshop authorised by Grundfos and approved for servicing explosion-proof products.



If the pump is inactive for long periods of time, we recommend that you check the function of the pump.



Service videos can be found in Grundfos Product Center at [www.grundfos.com](http://www.grundfos.com).



A possible replacement of the power cable must be carried out by Grundfos or a service workshop authorised by Grundfos.

**8.2 Contaminated pumps****CAUTION****Biological hazard**

Minor or moderate personal injury

- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.



The product will be classified as contaminated if it has been used for a liquid which is injurious to health or toxic.

If you request Grundfos to service the product, contact Grundfos with details about the pumped liquid before returning the product for service. Otherwise Grundfos can refuse to accept the product for service.

Any application for service must include details about the pumped liquid.

Clean the product in the best possible way before you return it.

Costs of returning the product are to be paid by the customer.

### 8.3 Maintenance schedule

Inspect pumps running normal operation every 3000 operating hours or at least once a year. If the dry-solids content of the pumped liquid is very high or sandy, check the pump at shorter intervals.

Check the following points:

- **Power consumption**  
See section [6.6.1 Nameplate](#).
- **Oil level and oil condition**  
When the pump is new or after replacement of the shaft seal, check the oil level after one week of operation.  
Use Shell Ondina X420 oil or similar type. See section [8.4 Oil check and oil change](#).
- **Sensors**  
For cleaning of sensors, see section [8.5 Cleaning the sensors](#).
- **Cable entry**



Make sure that the cable entry is watertight and that the cable is not sharply bent and/or pinched.

- **Pump parts**  
Check the impeller, the pump housing, etc. for possible wear. Replace defective parts.  
See section [8.10 Service kits](#).
- **Ball bearings**  
Check the shaft for noisy or heavy operation by turning the shaft by hand. Replace defective ball bearings.  
A general overhaul of the pump is usually required in case of defective ball bearings or poor motor function. This work must be carried out by Grundfos or a service workshop authorised by Grundfos.
- **Grinder system and parts**  
In case of frequent choke-ups, check the grinder system for visible wear. When worn, the edges of the grinding parts are round and worn. Compare with a new grinder system.

### 8.4 Oil check and oil change

Every 3000 operating hours or at least once a year, change the oil in the oil chamber as described below. If the shaft seal has been changed, change the oil as well.

The table below states the quantity of oil in the oil chamber:

Pump type	Quantity of oil in the oil chamber [l]
SEG AUTO <sub>ADAPT</sub> up to 1.5 kW	0.17
SEG AUTO <sub>ADAPT</sub> 2.6 to 4.0 kW	0.42

### Draining of oil

#### CAUTION



#### Pressurised system

Minor or moderate personal injury  
- As pressure may have built up in the oil chamber, do not remove the screws until the pressure has been fully relieved.

1. Loosen and remove both oil screws to allow all the oil to drain from the chamber.
2. Check the oil for water and impurities. If the shaft seal has been removed, the oil will give a good indication of the condition of the shaft seal.



Dispose of used oil in accordance with local regulations.

#### Oil filling, pump lying down

See fig. 12.

1. Place the pump in such a position that it is lying on the stator housing and the outlet flange and that the oil screws are pointing upwards.
2. Fill oil into the oil chamber through the upper hole until it starts running out of the lower hole. The oil level is now correct.  
For oil quantity, see section [8.4 Oil check and oil change](#).
3. Fit both oil screws using the gaskets included in the O-ring service kit. See section [8.10 Service kits](#).

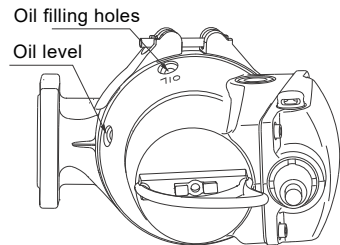


Fig. 12 Oil filling holes

#### Oil filling, pump in upright position

1. Place the pump on a plane, horizontal surface.
2. Fill oil into the oil chamber through one of the holes until it starts running out of the other hole.  
For oil quantity, see section [8.4 Oil check and oil change](#).
3. Fit both oil screws using the gaskets included in the O-ring service kit. See section [8.10 Service kits](#).

## 8.5 Cleaning the sensors

The cleaning intervals below are stated as guidelines and must be adapted to the pit.

### Cleaning intervals for non-explosion-proof pumps

The following table lists the recommended cleaning intervals for sensors in non-explosion-proof pumps. These cleaning intervals are for guidance. We recommend that you find the right cleaning level based on experience and the composition of the wastewater in the specific application.

Wastewater containing grease	Wastewater containing dry solid matter or fibres	Wastewater without grease, dry solid matter or fibres
3 months	6 months	12 months

### Cleaning intervals for explosion-proof pumps



Cleaning intervals of the sensors in explosion-proof pumps are mandatory in order to ensure that the pump is working correctly.

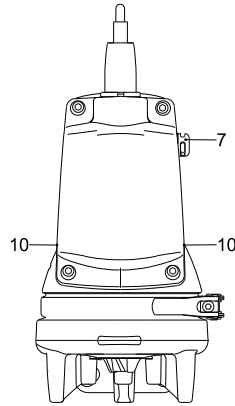
After cleaning, both dry-running sensors must be checked individually for proper functioning.



If the dry-running sensors are not functioning properly, there is a risk of dry-running of the hydraulic part of the pump, which can provoke ignition.

The following table lists the required cleaning intervals for sensors in explosion-proof pumps.

Wastewater containing grease	Wastewater containing dry solid matter or fibres	Wastewater without grease, dry solid matter or fibres
3 months	6 months	6 months



**Fig. 13** Position of level and dry-running sensors

Proceed as follows:

See fig. 13.

1. Level sensor (7):  
Flush the sensor with clean water.
2. Dry-running sensors (10):  
Flush the dry-running sensors with clean water and clean them using a soft brush.
3. Switch on the power supply to the pump.
4. Check that the pump starts and pumps down to the dry-running level.



To avoid damaging the sensors, do not use other cleaning aids than those mentioned in these instructions.



If the dry-running sensors are not covered by liquid, the pump cannot start.

### Checking the functionality of the dry-running sensors

1. Cover one dry-running sensor with a wet cloth.
2. Let the pump run and pump down to the dry-running level.
  - The pump must stop at the dry-running level.
3. Repeat this check with the other sensor.

## 8.6 Adjusting the impeller clearance

For position numbers in brackets, see figs 4 and 5 in [Appendix](#).

Proceed as follows:

1. Gently tighten the adjusting nut (68) until the impeller (49) cannot rotate any more. Use a spanner size 24.
2. Loosen the adjusting nut by 1/4 turn.

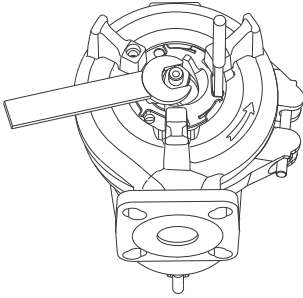


Fig. 14 Adjusting the impeller clearance

## 8.7 Replacing the grinder system

### CAUTION

#### Sharp element



Minor or moderate personal injury  
- Do not touch the sharp edges of the impeller, grinder head, and grinder ring without wearing gloves.



During service the painted surface may be damaged. Remember to restore the painted surface by applying new paint.

For position numbers in brackets, see figs 4 and 5 in [Appendix](#).

Proceed as follows:

## Dismantling

1. Loosen the screw (188a) in one of the pump feet.
2. Loosen the grinder ring (44), and open the bayonet socket by knocking or turning the grinder ring 15 to 20 ° clockwise. See fig. 15.

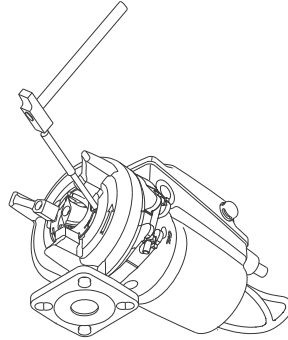


Fig. 15 Removing the grinder ring

3. Gently prise the grinder ring (44) out of the pump housing with a screwdriver.



Make sure that the grinder ring does not get stuck against the grinder head.

4. Insert a punch into the hole in the pump housing to hold the impeller.
5. Remove the screw (188a) in the shaft end and the locking ring (66).
6. Remove the grinder head (45).

## Assembly

1. When fitting the grinder head (45), the projections on the back of the grinder head must engage with the holes in the impeller (49).
2. Tighten the screw (188a) for the grinder head to 20 Nm. Do not forget the lock washer.
3. Fit the grinder ring (44).
4. Turn the grinder ring (44) 15 to 20 ° counter-clockwise until it is tightened.
5. Check that the grinder ring does not touch the grinder head.
6. Tighten the screw (188a) to 16 Nm.



Make sure the impeller can rotate freely and noiselessly.

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## 8.8 Cleaning the pump housing

For position numbers in brackets, see figs 4 and 5 in [Appendix](#).

Proceed as follows:

### Dismantling

1. Stand the pump upright.
2. Loosen and remove the clamp (92) fastening the pump housing to the motor.
3. Lift the motor out of the pump housing (50). As the impeller and grinder head are fastened to the shaft end, the impeller and the grinder head will be removed together with the motor.
4. Clean the pump housing and the impeller.

### Assembly

1. Place the motor with the impeller and the grinder head in the pump housing.
2. Fit and tighten the clamp (92).

See also section [8.9 Checking or replacing the shaft seal](#).

## 8.9 Checking or replacing the shaft seal

To make sure that the shaft seal is intact, check the oil.

If the oil contains more than 20 % water, the shaft seal is defective and must be replaced. If the shaft seal is still used, the motor will be damaged.

If the oil is clean, it can be reused. See also section [8. Servicing and maintaining the product](#).

For position numbers in brackets, see figs 4 and 5 in [Appendix](#).

Proceed as follows:

1. Remove the grinder ring (44).  
See section [8.7 Replacing the grinder system](#).
2. Remove the screw (188a) from the shaft end.
3. Loosen and remove the clamp (92) fastening the pump housing to the motor.
4. Lift the motor out of the pump housing (50). As the impeller and grinder head are fastened to the shaft end, the impeller and the grinder head will be removed together with the motor.
5. Remove the screw (188a) from the shaft end.
6. Remove the grinder head (45).
7. Remove the impeller (49) from the shaft.
8. Drain the oil from the oil chamber. See section [8.4 Oil check and oil change](#). The shaft seal is a complete unit for all pumps.
9. Remove the screws (188a) securing the shaft seal (105).
10. Lift the shaft seal (105) out of the oil chamber using the lever principle, the two dismounting holes in shaft seal retainer (58) and two screwdrivers.
11. Check the condition of the bush (103) where the secondary seal of the shaft seal touches the bush. The bush must be intact. If the bush is worn and must be replaced, the pump must be checked by Grundfos or a service workshop authorised by Grundfos.

If the bush is intact, proceed as follows:

1. Check and clean the oil chamber.
2. Lubricate the faces in contact with the shaft seal with oil.
3. Insert the new shaft seal (105) using the plastic bush included in the kit.
4. Tighten the screws (188a) securing the shaft seal to 16 Nm.
5. Fit the impeller. Make sure that the key (9a) is fitted correctly.
6. Place the motor with impeller and grinder head in the pump housing (50).
7. Fit and tighten the clamp (92).
8. Fill the oil chamber with oil. See section [8.4 Oil check and oil change](#).

For adjustment of the impeller clearance, see section [8.6 Adjusting the impeller clearance](#).

## 8.10 Service kits

The following service kits are available for all pumps.

Service kit	Contents	Pump type	kW	Material	Product number	
Shaft seal kit	Shaft seal complete	SEG.40	All	NBR	96076122	
				FKM	96645275	
		SEG.50	All	NBR	96076123	
				FKM	96645160	
Shaft seal retainer	Shaft seal retainer	SEG.50	All		99346051	
Shaft with rotor	Shaft with rotor complete	SEG.50	2.6		99346054	
			2.6 (Ex)		99346055	
			3.1 - 4.0		99346058	
			3.1 - 4.0 (Ex)		99346091	
			0.9 - 1.5	NBR	96076124 98682327 <sup>1)</sup>	
O-ring kit	O-rings and gaskets for the oil screws	SEG.40/50	0.9 - 1.5	FKM	96646061 98682329 <sup>1)</sup>	
				NBR	96076125	
			2.6 - 4.0	FKM	96646062	
				Standard	96076121	
Grinder system	Grinder head, grinder ring, locking screw, and washer	SEG.40	Heavy duty		96903344	
		SEG.50	High flow		98453210	
Impeller	Impeller complete with adjusting nut, shaft screw and key	SEG.40	0.9		96076115	
			1.2		96076116	
			1.5		96076117	
			2.6		96076118	
			3.1		96076119	
			4.0		96076120	
			SEG.50	2.6		99346032
				3.1		99346046
				4.0		99346048
Oil	1 litre of oil, type Shell Ondina X420. See section <a href="#">8.4 Oil check and oil change</a> for the required quantity of oil in the oil chamber.	All types	All		96586753	
Lifting bracket	Lifting bracket and screw	SEG.40/50	0.9 - 1.5		96984147	
			2.6 - 4.0		96984148	
Power plug	Plug for the power supply and O-rings for the cover	All types	All		96984144	
Protective cap for level sensor	Protective cap and O-rings for the cover and the sensor	All types	All		96898081	
Level sensor	Level sensor, protective cap and O-rings for the cover and the sensor	Standard pumps	All		96898082	
		Ex pumps	All		96984130	

Service kit	Contents	Pump type	kW	Material	Product number
Dry-running sensor	Dry-running sensor and O-rings for the cover and the sensor	Standard pumps	All		96898083
		Ex pumps	All		96984131
Electronic unit, single-phase	Cover with electronics and O-rings for the cover	Single-phase pumps	All		96898085
		Single-phase Ex pumps	All		96984145
Electronic unit, three-phase	Cover with electronics and O-rings for the cover	Three-phase pumps	All		96898086
		Three-phase Ex pumps	All		96984146
Pt1000 sensor	Pt1000 sensor with bracket	All types	All		96984143
Run capacitor	Run capacitor, Pt1000 sensor, bracket and O-rings for the cover	All single-phase pumps	All		96984142

1) For pumps produced in week 19, 2014: P.C. code 1419.



## 9. Fault finding

Before attempting to diagnose any fault, read and observe the safety instructions in section [8.1 Safety instruction and requirements](#).



Observe all regulations applying to pumps installed in potentially explosive environments.

Make sure that no work is carried out in potentially explosive atmosphere.



Before attempting to diagnose any fault:

- Make sure that the fuses have been removed or the main switch has been switched off.
- Make sure that the power supply cannot be accidentally switched on.
- Make sure that all rotating parts have stopped moving.

Fault	Cause	Remedy
1. The pump does not run.	a) The dry-running sensors are not covered by liquid.	After power-on, allow the liquid level to rise until the dry-running sensors are covered with liquid.
	b) Three-phase pumps only: The pump is connected to the power supply with a wrong phase sequence.	Interchange L1 and L2.
	c) The fuses in the electrical installation are blown.	Replace the blown fuses. If the new fuses blow too, check the electrical installation and the power cable.
	d) Power supply failure, short circuit or earth leakage in the power cable or the motor windings.	Have the power cable and the motor checked and repaired by a qualified electrician.
	e) Fault in the motor electronics.	Have the motor checked and repaired by a Grundfos service engineer.
	f) Deposits on the level or the dry-running sensors.	Clean the sensor(s).
2. The pump starts, but stops after a short while.	a) The impeller is blocked by impurities. Increased current consumption in all three phases.	Clean the impeller.
	b) Increased current consumption due to a large voltage drop.	Check that the supply voltage is within the range. If not, reestablish correct voltage supply.
	c) The liquid temperature is too high.	Reduce the liquid temperature.
	d) The liquid viscosity is too high.	Dilute the liquid.
3. The pump runs at below-standard performance and power consumption.	a) The outlet pipe is partly blocked by impurities.	Clean the outlet pipe.
	b) The valves in the outlet pipe are partly closed or blocked.	Check and clean or replace the valves, if necessary.
4. The pump runs, but delivers no liquid.	a) The outlet valve is closed or blocked.	Check the outlet valve and open and/or clean it, if necessary.
	b) The non-return valve is blocked.	Clean the non-return valve.
	c) There is air in the pump.	Vent the pump.
5. The pump is blocked.	a) The grinder system is worn.	Replace the grinder system.

### 9.1 Megging



Do not meg AUTO<sub>ADAPT</sub> pumps as this may damage the built-in electronics.

## 10. Technical data

### 10.1 Operating conditions

#### 10.1.1 Operating mode

The pumps are designed for intermittent operation (S3). When completely submerged, the pumps can also operate continuously (S1).

#### 10.1.2 Installation depth

Maximum 10 m below liquid level.

#### 10.1.3 Operating pressure

Maximum 6 bar.

#### 10.1.4 Number of starts per hour

Maximum 30.

#### 10.1.5 pH value

Pumps in permanent installations can be used for pumping liquids with a pH value between 4 and 10.

#### 10.1.6 Liquid temperature

0-40 °C.

For short periods (maximum 10 minutes), a temperature of up to 60 °C is permissible. This applies for standard versions only.



Explosion-proof pumps must never pump liquids at a temperature higher than 40 °C.

#### 10.1.7 Density of pumped liquid

When pumping liquids with a density and/or a kinematic viscosity higher than that of water, use motors with correspondingly higher outputs.

#### 10.1.8 Sound pressure level

The sound pressure level of the pumps is lower than the limiting values stated in the EC Council Directive 2006/42/EC relating to machinery.

### 10.2 Electrical data

#### 10.2.1 Power supply

- 1 x 230 V - 10 %/+ 6 %, 50 Hz
- 3 x 400-415 V - 10 %/+ 10 %, 50 Hz
- 3 x 230-240 V - 10 %/+ 10 %, 50 Hz

#### 10.2.2 Enclosure class

IP68, according to IEC 60529.

#### 10.2.3 Insulation class

F (155 °C).

### 10.2.4 Pump curves

Pump curves are available via [www.grundfos.com](http://www.grundfos.com).

The curves are to be considered as a guide. They must not be used as guarantee curves.

Test curves for the supplied pump are available on request.

### 10.3 Dimensions and weights

#### 10.3.1 Dimensions

See figs 1 to 3 in [Appendix](#).

#### 10.3.2 Weights

Pump type	Weight [kg]
SEG.40.09.2.1.502	40
SEG.40.09.2.50B/C	39
SEG.40.12.2.1.502	40
SEG.40.12.2.50B	40
SEG.40.12.2.50C	39
SEG.40.15.2.1.502	53
SEG.40.15.2.50B	40
SEG.40.15.2.50C	39
SEG.40.26.2.50B/C	62
SEG.40.31.2.50B/C	70
SEG.40.40.2.50B/C	40
SEG.50.26...	64
SEG.50.31...	72
SEG.50.40...	72

## 11. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

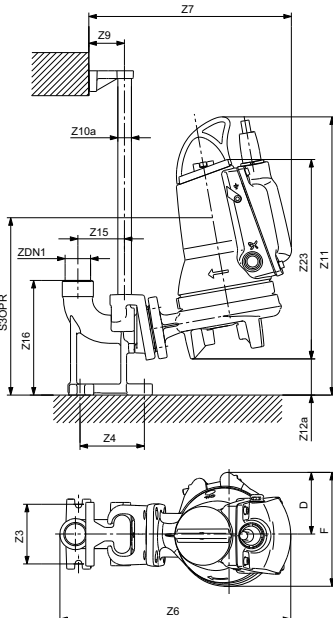


The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

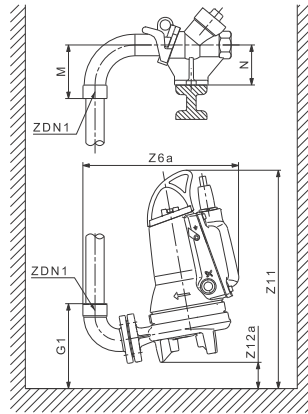
See also end-of-life information at [www.grundfos.com/product-recycling](http://www.grundfos.com/product-recycling).

**Dimensions**

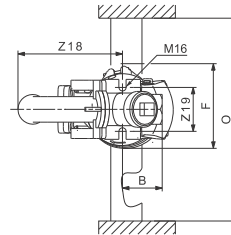
**One-pump installation on auto-coupling and hookup auto-coupling installation**



**Fig. 1** Installation on auto coupling



**Fig. 2** Installation on hookup auto coupling



TM06 5754 0116

TM06 5755 0116

**SEG.40**

Power [kW]	B	D	F	ZDN1	G1	M	N	O	Z3	Z4	Z6	Z6a
0.9 and 1.2	100	99	216	RP 1 1/2	214	134	100		115	118	495	388
1.5 (1-phase)	100	99	216	RP 1 1/2	214	134	100		115	118	495	388
1.5 (3-phase)	100	99	216	RP 1 1/2	214	134	100	Min. 600	115	118	495	388
2.6	100	119	256	RP 1 1/2	215	134	100		115	118	531	423
3.1 and 4.0	100	119	256	RP 1 1/2	215	134	100		115	118	531	423

Power [kW]	Z7	Z9	Z10a	Z11	Z12a	Z15	Z16	Z18	Z19	Z23	S3OPR
0.9 and 1.2	397	70	3/4" - 1"	536	68	90	221	271	120	363	346
1.5 (1-phase)	397	70	3/4" - 1"	551	68	90	221	271	120	363	361
1.5 (3-phase)	397	70	3/4" - 1"	536	68	90	221	271	120	368	346
2.6	433	70	3/4" - 1"	619	80	90	221	271	120	349	371
3.1 and 4.0	433	70	3/4" - 1"	657	80	90	221	271	120	432	371

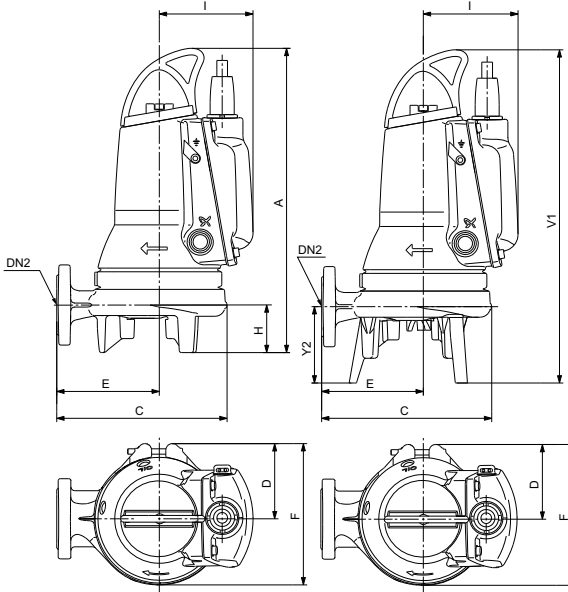
**SEG.50**

Power [kW]	B	D	F	ZDN1	G1	M	N	O	Z3	Z4	Z6	Z6a
2.6	100	119	256	Rp 1 1/2	215	134	100	Min. 600	115	118	531	423
3.1 and 4.0	100	119	256	Rp 1 1/2	214	134	100		115	118	531	423

Power [kW]	Z7	Z9	Z10a	Z11	Z12a	Z15	Z16	Z18	Z19	Z23	Z3OPR
2.6	433	70	3/4" - 1"	634	67	90	221	271	120	435	371
3.1 and 4.0	433	70	3/4" - 1"	672	67	90	221	271	120	475	371

**Free-standing installation**



**Fig. 3** Free-standing Installation

**SEG.40**

Power [kW]	A	C	D	DN2	E	F	H	I	V1	Y2
0.9 and 1.2	456	255	99	DN 40	154	216	71	140	500	116
1.5 (1-phase)	471	255	99	DN 40	154	216	71	140	515	116
1.5 (3-phase)	456	255	99	DN 40	154	216	71	140	500	116
2.6	527	292	119	DN 40	173	256	60	166	582	115
3.1 and 4.0	567	292	119	DN 40	173	256	60	166	622	115

**SEG.50**

Power [kW]	A	C	D	DN2	E	F	H	I	V1	Y2
2.6	575	292	119	50	173	256	60	166	597	115
3.1 and 4.0	615	292	119	50	173	256	60	166	637	115

TM06 5753 0116

Pos.	Description	Описание	Popis	Beschreibung
	GB	BG	CZ	DE
6a	Pin	Щифт	Kolík	Stift
7a	Rivet	Нит	Nýt	Niet
9a	Key	Фиксатор	Pero	Passfeder
16	O-ring	О-пръстени	O-kroužek	O-Ring
26	O-ring	О-пръстени	O-kroužek	O-Ring
37	O-ring	О-пръстени	O-kroužek	O-Ring
37a	O-ring	О-пръстени	O-kroužek	O-Ring
44	Grinder ring	Пръстен	Řezací kolo	Schneidring
45	Grinder head	Режеща глава	Hlava mělničího zařízení	Schneidkopf
48	Stator	Статор	Stator	Stator
48a	Terminal board	Клеморед	Svorkovnice	Klembrett
49	Impeller	Работно колело	Oběžné kolo	Laufrad
50	Pump housing	Помпен корпус	Těleso čerpadla	Pumpengehäuse
55	Stator housing	Корпус на статора	Těleso statoru	Statorgehäuse
58	Shaft seal retainer	Носач на уплътнението при вала	Unašeč ucpávky	Gleitringdichtungsträger
66	Locking ring	Фиксиращ пръстен	Pojistný kroužek	Sicherungsring
68	Adjusting nut	Регулираща гайка	Stavěcí matice	Justiermutter
76	Nameplate	Табела	Typový štítek	Leistungsschild
90a	Electronic unit	Електронен блок	Elektronická jednotka	Elektronikeinheit
90b	O-ring	О-пръстени	O-kroužek	O-Ring
92	Clamp	Скоба	Fixační objímka	Spannband
102	O-ring	О-пръстени	O-kroužek	O-Ring
103	Bush	Втулка	Pouzdro	Buchse
104	Seal ring	Уплътняващ пръстен	Těsnící kroužek	Dichtungsring
105	Shaft seal	Уплътнение при вала	Hřidelová ucpávka	Gleitringdichtung
107	O-rings	О-пръстени	O-kroužky	O-Ringe
108	O-ring	О-пръстени	O-kroužek	O-Ring
112a	Locking ring	Фиксиращ пръстен	Pojistný kroužek	Sicherungsring
153	Bearing	Лагер	Ložisko	Lager
153a	Lock washer	Стопорна шайба	Pojistná podložka	Sicherungsscheibe
153b	Locking ring	Застопоряващ пръстен	Pojistný kroužek	Sicherungsring
154	Bearing	Лагер	Ložisko	Lager
155	Oil chamber	Маслото в камерата	Olejové komoře	Ölsperkkammer
158	Corrugated spring	Гофрирана пружина	Tlačná pružina	Gewellte Feder
159	O-ring	О-пръстени	O-kroužek	O-Ring
161b	Pt1000 sensor with bracket	Pt1000 сензор със скоба	Snímač Pt1000 s držákem	Pt1000-Sensor mit Konsole
161c	Operating capacitor and Pt1000 sensor with bracket <sup>(1)</sup>	Работен кондензатор и Pt1000 сензор със скоба <sup>(1)</sup>	Spouštěcí kondenzátor a snímač Pt1000 s držákem <sup>(1)</sup>	Betriebskondensator und Pt1000-Sensor mit Konsole <sup>(1)</sup>

Pos.	Description	Описание	Popis	Beschreibung
	GB	BG	CZ	DE
172	Rotor/shaft	Ротор/вал	Rotor/hřídel	Rotor/Welle
174	Earth screw <sup>(2)</sup>	Винт за заземяване <sup>(2)</sup>	Zemnicí šroub <sup>(2)</sup>	Erdungsschraube <sup>(2)</sup>
174a	Washer <sup>(2)</sup>	Шайба <sup>(2)</sup>	Podložka <sup>(2)</sup>	Unterlegscheibe <sup>(2)</sup>
176	Inner plug part	Вътрешна част на щепсела	Vnitřní část kabelové průchodky	Kabelanschluß, innerer Teil
181	Outer plug part	Външна част на щепсела	Vnější část kabelové průchodky	Kabelanschluß, äußerer Teil
184	Screw	Винт	Šroub	Schraube
184a	Washer	Шайба	Podložka	Unterlegscheibe
188a	Screw	Винт	Šroub	Schraube
190	Lifting bracket	Ръкохватка	Zvedací rukojeť	Tragbügel
193	Oil screw	Винт при камерата за масло	Olejevá zátka	Ölschraube
193a	Oil	Масло	Olej	Öl
194	Gasket	Гарнитура	Těsnicí kroužek	Dichtung
285	Dry-running sensor <sup>(3)</sup>	Сензор за "суха" работа <sup>(3)</sup>	Snímač provozu nasucho <sup>(3)</sup>	Trockenlaufsensor <sup>(3)</sup>
285a	O-ring	O-пръстен	O-kroužek	O-Ring
285b	Set screw	Фиксиращ винт	Stavěcí šroub	Einstellschraube
287	Level sensor	Сензор за ниво	Hladinový snímač	Niveausensor
287b	O-ring	O-пръстен	O-kroužek	O-Ring
287c	Set screw	Фиксиращ винт	Stavěcí šroub	Einstellschraube
532	Silica gel	Силикагел	Silikonový gel	Kieselgel

<sup>(1)</sup> Single-phase pumps only.  
Само за монофазни помпи.  
Pouze jednofázová čerpadla.  
Nur einphasige Pumpen.

<sup>(2)</sup> Only in Ex pumps.  
Само при взривобезопасни помпи.  
Pouze u čerpadel Ex.  
Nur für explosionsgeschützte Pumpen.

<sup>(3)</sup> Standard pumps have only one dry-running sensor.  
Стандартните помпи имат само един сензор за работа на сухо.  
Běžná čerpadla mají pouze jeden snímač provozu nasucho.  
Standardpumpen verfügen nur über einen Trockenlaufsensor.

Pos.	Beskrivelse	Seletus	Descripción	Kuvaus
	DK	EE	ES	FI
6a	Stift	Tihvt	Pasador	Tappi
7a	Nitte	Neet	Remache	Niitti
9a	Feder	Kiil	Chaveta	Kiila
16	O-ring	O-ring	Junta tórica	O-rengas
26	O-ring	O-ring	Junta tórica	O-rengas
37	O-ring	O-ring	Junta tórica	O-rengas
37a	O-ring	O-ring	Junta tórica	O-rengas
44	Snittering	Purusti plaat	Anillo de corte	Repijärengas
45	Snittehoved	Purusti pea	Cabezal de corte	Repijä
48	Stator	Staator	Estator	Staattori
48a	Kleembræt	Klemmiist	Caja de conexiones	Kytentälevy
49	Løber	Tööratas	Impulsor	Juoksupyörä
50	Pumpehus	Pumbapesa	Cuerpo de bomba	Pumppupesä
55	Statorhus	Staatori korpus	Alojamiento de estator	Staattoripesä
58	Akseltätningsholder	Völlitihendi alusplaat	Soporte de cierre	Akselitiivistekannatin
66	Låsering	Lukustusrõngas	Anillo de cierre	Lukkorengas
68	Justermøtrik	Seademutter	Tuerca de ajuste	Säätömutteri
76	Typeskilt	Andmeplaat	Placa de identificación	Arvokilpi
90a	Elektronikenhed	Elektroonikaplokk	Unidad electrónica	Elektroniikkayksikkö
90b	O-ring	O-ring	Junta tórica	O-rengas
92	Spændebånd	Klamber	Abrazadera	Kiinnityspanta
102	O-ring	O-ring	Junta tórica	O-rengas
103	Bøsning	Puks	Casquillo	Holkki
104	Simmerring	Tihend	Anillo de cierre	Tiivisterengas
105	Akseltätning	Völlitihend	Cierre	Akselitiiviste
107	O-ringe	O-ringid	Juntas tóricas	O-renkaat
108	O-ring	O-ring	Junta tórica	O-rengas
112a	Låsering	Lukustusrõngas	Anillo de cierre	Lukkorengas
153	Leje	Laager	Cojinete	Laakeri
153a	Låseskive	Lukustussei	Arandela de seguridad	Lukkoaluslevy
153b	Låsering	Lukustusrõngas	Anillo de bloqueo	Lukkorengas
154	Leje	Laager	Cojinete	Laakeri
155	Oliekamer	Õlikamber	Cámara de aceite	Öljytila
158	Bølgefeder	Vedruseib	Muelle ondulado	Aaltojousi
159	O-ring	O-ring	Juntas tóricas	O-rengas
161b	Pt1000-sensor med holder	Pt1000 andur koos kinnitusega	Sensor Pt1000 con abrazadera	Pt1000-anturi ja kiinnike
161c	Driftskondensator og Pt1000-sensor med holder <sup>(1)</sup>	Käivituskondensaat or ja Pt1000 andur koos kinnitusega <sup>(1)</sup>	Condensador de funcionamiento y sensor Pt1000 con abrazadera <sup>(1)</sup>	Käyntikondensaat or ja kiinnikkeellä varustettu Pt1000-anturi <sup>(1)</sup>
172	Rotor/aksel	Rootor/võll	Rotor/eje	Rootori/akseli
174	Jordskrue <sup>(2)</sup>	Maanduspolt <sup>(2)</sup>	Tornillo de tierra <sup>(2)</sup>	Maadoitusruuvi <sup>(2)</sup>

Pos.	Beskrivelse	Seletus	Descripción	Kuvas
	DK	EE	ES	FI
174a	Skive <sup>(2)</sup>	Seib <sup>(2)</sup>	Arandela <sup>(2)</sup>	Aluslevy <sup>(2)</sup>
176	Indvendig stikdel	Pistiku sisemine pool	Parte de clavija interior	Sisäpuolinen tulppaosa
181	Udvendig stikdel	Pistiku välimine pool	Parte de clavija exterior	Ulkopuolinen tulppaosa
184	Skruer	Polt	Tornillo	Ruuvi
184a	Skive	Seib	Arandela	Aluslevy
188a	Skruer	Polt	Tornillo	Ruuvi
190	Løftebøjle	Tõsteaas	Asa	Nostosanka
193	Olieskrue	Õlikambri kork	Tornillo de aceite	Õljytulppa
193a	Olie	Õli	Aceite	Õljy
194	Pakning	Tihend	Junta	Tiiviste
285	Tøriløbssensor <sup>(3)</sup>	Kuivikäiguandur <sup>(3)</sup>	Sensor de marcha en seco <sup>(3)</sup>	Kuivakäyntianturi <sup>(3)</sup>
285a	O-ring	O-ring	Junta tórica	O-rengas
285b	Pinolskrue	Seadepolt	Tornillo ajuste	Asetusruuvi
287	Niveausensor	Nivooandur	Sensor de nivel	Pinta-anturi
287b	O-ring	O-ring	Junta tórica	O-rengas
287c	Pinolskrue	Seadepolt	Tornillo ajuste	Asetusruuvi
532	Kisegel	Silikageel	Gel de sílice	Silikageeli

<sup>(1)</sup> Kun 1-fasede pumper.  
Ainult ühefaasilised pumbad.  
Sólo bombas monofásicas.  
Vain 1-vaihepumput.

<sup>(2)</sup> Kun i Ex-pumper.  
Ainult plahvatuskindlate pumpade korral  
Sólo para bombas Ex.  
Vain Ex-pumpuissa.

<sup>(3)</sup> Standardpumper har kun én tøriløbssensor.  
Standard pumpadel on ainult üks kuivikäigukaitse.  
Las bombas estándar sólo cuentan con un sensor de marcha en seco.  
Vakiopumpuissa on vain yksi kuivakäyntianturi.



Pos.	Description	Περιγραφή	Opis	Megnevezés
	FR	GR	HR	HU
6a	Broche	Πείρος	Nožica	Csap
7a	Rivet	Πριτσίνι	Zarezani čavao	Szegecs
9a	Clavette	Κλειδί	Opruga	Rögzítőék
16	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
26	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
37	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
37a	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrűk
44	Anneau broyeur	Δακτύλιος άλεσης	Prsten za rezanje	Őrlőfej
45	Tête de broyeur	Κεφαλή άλεσης	Glava za rezanje	Állórész
48	Stator	Στάτης	Stator	Állórész
48a	Bornier	Κλέμες σύνδεσης	Priključna letvica	Kapcsoló tábla
49	Roue	Περωτή	Rotor	Járókerék
50	Corps de pompe	Περιβλημα αντλίας	Kucište crpke	Szivattyúház
55	Logement de stator	Περιβλημα στάτη	Kucište statora	Állórészház
58	Support de garniture mécanique	Φορέας στυπιοθλίπτη άξονα	Držač brtve	Tengelytömítés-keret
66	Anneau de serrage	Ασφαλιστικός δακτύλιος	Sigurnosni prsten	Rögzítőgyűrű
68	Ecrou de réglage	Ρυθμιστικό περικόχλιο	Matica za justiranje	Beállítóanya
76	Plaque signalétique	Πινακίδα	Natpisna pločica	Adattábla
90a	Unité électronique	Ηλεκτρονική μονάδα	Elektronička jedinica	Elektromos egység
90b	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
92	Collier de serrage	Σφιγκτήρας	Zatezna traka	Bilincs
102	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
103	Douille	Αντιτριβικός δακτύλιος	Brtvenica	Tömítőgyűrű
104	Anneau d'étanchéité	Στεγανοποιητικός δακτύλιος	Brtveni prsten	Tömítőgyűrű
105	Garniture mécanique	Στυπιοθλίπτης άξονα	Brtva vratila	Tengelytömítés
107	Joints toriques	Δακτύλιοι-O	O-prsten	O-gyűrűk
108	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
112a	Anneau de serrage	Ασφαλιστικός δακτύλιος	Sigurnosni prsten	Rögzítőgyűrű
153	Roulement	Έδρανο	Ležaj	Csapágy
153a	Rondelle de blocage	Ροδέλα ασφαλείας	Sigurnosna podloška	Rögzítő alátét
153b	Anneau de serrage	Ασφαλιστικός δακτύλιος	Stezni prsten	Rögzítőgyűrű
154	Roulement	Έδρανο	Ležaj	Csapágy
155	Chambre à huile	Θάλαμος λαδιού	Komora za ulje	Olajkamra
158	Ressort ondulé	Αυλακωτό ελατήριο	Valovita opruga	Hullámrugó
159	Joint torique	Δακτύλιοι-O	O-prsten	O-gyűrű
161b	Capteur Pt1000 avec support	Αισθητήρας Pt1000 με βραχίονα στήριξης	Pt1000 senzor s nosačem	Pt1000 érzékelő kerettel

Pos.	Description	Περιγραφή	Opis	Megnevezés
	FR	GR	HR	HU
161c	Condensateur de fonctionnement et capteur Pt1000 avec support <sup>(1)</sup>	Πυκνωτής λειτουργίας και αισθητήρας Pt1000 με βραχίονα στήριξης <sup>(1)</sup>	Radni kondenzator i Pt1000 senzor s nosačem <sup>(1)</sup>	Üzemi kondenzátor és Pt1000 érzékelő kerettel <sup>(1)</sup>
172	Rotor/arbre	Ρότορας/άξονας	Rotor/vratilo	Forgórész/tengely
174	Vis terre <sup>(2)</sup>	Βίδα γείωσης <sup>(2)</sup>	Vijak za uzemljenje <sup>(2)</sup>	Földelő csavar <sup>(2)</sup>
174a	Rondelle <sup>(2)</sup>	Ροδέλα <sup>(2)</sup>	Podložna pločica <sup>(2)</sup>	Alátét <sup>(2)</sup>
176	Partie intérieure de la fiche	Εσωτερικό τμήμα φικς	Kabel. priključak, nutarnji dio	Belső kábelbevezetés
181	Partie extérieure de la fiche	Εξωτερικό τμήμα φικς	Kabel. priključak, vanjski dio	Külső kábelbevezetés
184	Vis	Βίδα	Vijak	Csavar
184a	Rondelle	Ροδέλα	Podložna pločica	Alátét
188a	Vis	Βίδα	Vijak	Csavar
190	Poignée de levage	Χειρολαβή	Transportni stremen	Emelőfül
193	Bouchon d'huile	Βίδα λαδιού	Vijak za ulje	Olajtöltőnyílás zárócsavarja
193a	Huile	Λάδι	Ulje	Olaj
194	Joint d'étanchéité	Τσιμούχα	Brtva	Tömítés
285	Capteur de marche à sec <sup>(3)</sup>	Αισθητήρας ξηρής λειτουργίας <sup>(3)</sup>	Senzor rada na suho <sup>(3)</sup>	Szárazonfutás szenzor <sup>(3)</sup>
285a	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
285b	Jeu de vis	Βίδα ρύθμισης	Set vijaka	Beállítócsavar
287	Capteur de niveau	Αισθητήρας στάθμης	Senzor razine	Szinttávadó
287b	Joint torique	Δακτύλιος-O	O-prsten	O-gyűrű
287c	Jeu de vis	Βίδα ρύθμισης	Set vijaka	Beállítócsavar
532	Gel de silice	Σίλικα τζελ	Silikonski gel	Szilikagél

<sup>(1)</sup> Pompes monophasées uniquement.  
Μονοφασικές αντλίες μόνο.  
Samo jednofazne crpke.  
Csak egyfázisú szivattyúknál.

<sup>(2)</sup> Uniquement dans les pompes Ex.  
Μόνο σε αντλίες Ex.  
Samo u Ex crpkama.  
Csak robbanásbiztos szivattyúk.

<sup>(3)</sup> Les pompes standard possèdent un seul capteur de marche à sec.  
Οι τυπικές αντλίες διαθέτουν έναν μόνο αισθητήρα ξηρής λειτουργίας.  
Standardne crpke imaju samo jedan senzor rada na suho.  
Az alapkitelű szivattyúk csak egy szárazonfutás érzékelővel vannak ellátva.

Pos.	Descrizione	Aprašymas	Apraksts	Omschrijving
	IT	LT	LV	NL
6a	Perno	Vielokaištis	Tapa	Paspen
7a	Rivetto	Kniedė	Kniede	Klinknagel
9a	Chiavetta	Kaištis	Atslėga	Spie
16	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
26	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
37	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
37a	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
44	Anello trituratore	Smulkintuvo žiedas	Griezējgredzens	Snijring
45	Trituratore	Smulkintuvo galvutė	Griezējgalva	Snijkop
48	Statore	Statorius	Stators	Stator
48a	Morsettiera	Kontakų plokštė	Spaiļu plate	Aansluitblok
49	Girante	Darbaratis	Darbrats	Waaier
50	Corpo pompa	Siurblio korpusas	Sūkņa korpus	Pomphuis
55	Cassa statore	Statoriaus korpusas	Statora korpus	Motorhuis
58	Supporto tenuta meccanica	Veleno sandariklio lizdas	Vārpstas blīvējuma turētājs	Dichtingsplaat
66	Anello di arresto	Fiksavimo žiedas	Sprostgredzens	Borgring
68	Dado di regolazione	Reguliavimo veržlė	Regulēšanas uzgrieznis	Afstelmoer
76	Targhetta di identificazione	Vardinė plokštelė	Pases datu plāksnīte	Typeplaat
90a	Unità elettronica	Elektronikos blokas	Elektroniskā ierīce	Elektronische unit
90b	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
92	Fascetta	Apkaba	Apskava	Span ring
102	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
103	Bussola	Ivorė	Ieliktnis	Bus
104	Anello di tenuta	Sandininimo žiedas	Blīvējošais gredzens	Oliekeerring
105	Tenuta meccanica	Veleno sandariklis	Vārpstas blīvējums	As afdichting
107	O-ring	O žiedai	Apaļa šķērsriezuma blīvgredzeni	O-ringen
108	O-ring	O žiedas	Apaļa šķērsriezuma blīvgredzens	O-ring
112a	Anello di arresto	Fiksavimo žiedas	Sprostgredzens	Borgring
153	Cuscinetto	Guolis	Gultnis	Kogellager
153a	Rondella di sicurezza	Fiksavimo poveržlė	Sprostapaplāksne	Borgring
153b	Anello di arresto	Fiksavimo žiedas	Sprostgredzens	Vergrendelingsring
154	Cuscinetto	Guolis	Gultnis	Kogellager
155	Camera dell'olio	Alyvos kamera	Eļļas kamera	Oliekamer
158	Molla ondulata	Rifiuota spyruoklė	Viļņotā atspere	Drukring

Pos.	Descrizione	Aprašymas	Apraksts	Omschrijving
	IT	LT	LV	NL
159	O-ring	O žiedas	Apļa šķērsriezuma blīvgredzens	O-ring
161b	Sensore Pt1000 con staffa	Pt1000 jutiklis su laikikliu	Pt1000 sensors ar kronšteinu	Pt1000 sensor met beugel
161c	Condensatore di marcia e sensore Pt1000 con staffa <sup>(1)</sup>	Darbinis kondensatorius ir Pt1000 jutiklis su laikikliu <sup>(1)</sup>	Darba kondensators un Pt1000 sensors ar kronšteinu <sup>(1)</sup>	Bedrijfscondensator en Pt1000 sensor met beugel <sup>(1)</sup>
172	Gruppo rotore/albero	Rotorius/velenas	Rotors/vārpsta	Rotor/as
174	Vite di messa a terra <sup>(2)</sup>	Ižeminimo varžtas <sup>(2)</sup>	Zemēšanas skrūve <sup>(2)</sup>	Aardschroef <sup>(2)</sup>
174a	Rondella <sup>(2)</sup>	Poveržlė <sup>(2)</sup>	Paplāksne <sup>(2)</sup>	Ring <sup>(2)</sup>
176	Parte interna del connettore	Vidinė kištuko dalis	Spraudņa iekšējā daļa	Kabelconnector inwendig
181	Parte esterna del connettore	Išorinė kištuko dalis	Spraudņa ārējā daļa	Kabelconnector uitwendig
184	Vite	Varžtas	Skrūve	Inbusbout
184a	Rondella	Poveržlė	Paplāksne	Ring
188a	Vite	Varžtas	Skrūve	Inbusbout
190	Maniglia	Kėlimo rankena	Rokturis	Ophangbeugel
193	Tappo dell'olio	Alyvos varžtas	Eļļas aizgrieznis	Inbusbout
193a	Olio	Alyva	Eļļa	Olie
194	Guarnizione	Tarpiklis	Blīvslēgs	Pakkingring
285	Sensore di marcia a secco <sup>(3)</sup>	Sausosios eigos jutiklis <sup>(3)</sup>	Bezšķidrums darbības indikācijas sensors <sup>(3)</sup>	Droogloopsensor <sup>(3)</sup>
285a	O-ring	O žiedas	Apļa šķērsriezuma blīvgredzens	O-ring
285b	Vite di fermo	Regulavimo varžtas	Iestatīšanas skrūve	Stelbout
287	Sensore di livello	Lygio jutiklis	Līmeņa sensors	Niveausensor
287b	O-ring	O žiedas	Apļa šķērsriezuma blīvgredzens	O-ring
287c	Vite di fermo	Regulavimo varžtas	Iestatīšanas skrūve	Stelbout
532	Gel di silice	Silikagelis	Silikagels	Silicagel

<sup>(1)</sup> Solo pompe monofase.  
Tik vienfaziai siurbiai.  
Tikai vienfāzes sūkņiem.  
Alleen eenfasepompen.

<sup>(2)</sup> Solo pompe Ex.  
Tik Ex siurbliuose.  
Tikai Ex sūkņiem.  
Uitsluitend bij Ex-pompen.

<sup>(3)</sup> Pompe standard con un solo sensore di marcia a secco.  
Standartiniuose siurbliuose yra tik vienas sausosios eigos jutiklis.  
Standarta sūkņiem ir tikai viens bezšķidrums darbības sensors.  
Standaard pompen hebben slechts één droogloopsensor.

Pos.	Opis	Descrição	Instalație fixă	Naziv
	PL	PT	RO	RS
6a	Kolek	Pino	Pin	Klin
7a	Nit	Rebite	Nit	Zakovica
9a	Klin	Chaveta	Cheie	Klin
16	Pierścień O-ring	O-ring	Inel tip O	O-prsten
26	Pierścień O-ring	O-ring	Inel tip O	O-prsten
37	Pierścień O-ring	O-ring	Inel tip O	O-prsten
37a	Pierścień O-ring	O-ring	Inel tip O	O-prsten
44	Pierścień tnący	Anilha da trituradora	Inel tocător	Prsten seckalice
45	Głowica tnąca	Cabeça da trituradora	Cap tocător	Glava seckalice
48	Stator	Estator	Stator	Stator
48a	Listwa przyłączeniowa	Caixa terminal	Înveliș stator	Priključna letva
49	Wirnik	Impulsor	Rotor	Propeler
50	Korpus pompy	Voluta da bomba	Carcasă pompa	Kućište pumpe
55	Obudowa statora	Carcaça do estator	Carcasă stator	Stator kućišta
58	Mocowanie uszczelnienia wału	Suporte do empanque	Etanșare	Nosač zaptivanja osovine
66	Pierścień mocujący	Anilha de fixação	Inel închidere	Prsten pričvršćivanja
68	Nakrętka dopasowująca	Porca de ajuste	Cap reglaj	Matica za podešavanje
76	Tabliczka znamionowa	Placa de características	Etichetă	Pločica za obeležavanje
90a	Skrzynka z układami elektronicznymi	Unidade electrónica	Unitate electronică	Električna jedinica
90b	Pierścień O-ring	O-ring	Inel tip O	O-prsten
92	Zacisk	Gancho	Șurub	Obujmica spajanja
102	Pierścień O-ring	O-ring	Inel tip O	O-prsten
103	Tulejka	Anilha	Bucșă	Čaura
104	Pierścień uszczelniający	Anilha de empanque	Inel etanșare	Zaptivni prsten
105	Uszczelnienie wału	Empanque	Etanșare	Zaptivka osovine
107	Pierścień O-ring	O-rings	Inel tip O	O-prsten
108	Pierścień O-ring	O-ring	Inel tip O	O-prsten
112a	Pierścień mocujący	Anilha de fixação	Inel închidere	Prsten pričvršćivanja
153	Łożysko	Rolamento	Rulment	Kuglični ležaj
153a	Podkładka blokująca	Anilha de bloqueio	Șaibă de blocare	Sigurnosna podloška
153b	Pierścień zaciskowy	Anel de fixação	Inel de blocar	Osigurač
154	Łożysko	Rolamento	Rulment	Kuglični ležaj
155	Komorze olejowej	Compartimento do óleo	Camera de ulei	Uljnoj komori
158	Sprężyna falista	Mola	Arc canelat	Sigurnosni prste
159	Pierścień O-ring	O-rings	Inel tip O	O-prsten
161b	Czujnik Pt1000 z uchwytem	Sensor Pt1000 com suporte	Senzor Pt1000 și consolă	Pt1000 senzor a podupiračem

Pos.	Opis	Descrição	Instalație fixă	Naziv
	PL	PT	RO	RS
161c	Kondensator roboczy oraz czujnik Pt1000 z uchwytem <sup>(1)</sup>	Condensador de funcionamento e sensor Pt1000 com suporte <sup>(1)</sup>	Condensator de funcționare și senzor Pt1000 cu consolă <sup>(1)</sup>	Radni kondenzator s Pt1000 senzor sa nosačem <sup>(1)</sup>
172	Rotor/wał	Rotor/veio	Rotor/ax	Rotor/osovina
174	Zacisk uziemiający <sup>(2)</sup>	Parafuso de terra <sup>(2)</sup>	Șurub de legare la pământ <sup>(2)</sup>	Zavrtnanj uzemljenja <sup>(2)</sup>
174a	Podkładka <sup>(2)</sup>	Anilha <sup>(2)</sup>	Spălător <sup>(2)</sup>	Prsten podloške <sup>(2)</sup>
176	Część zewn. wtyczki	Parte interna do bujão	Cablu conector intrare	Unutrašnji deo konektora
181	Część wewn. wtyczki	Parte externa do bujão	Cablu conector ieșire	Spoljni deo konektora
184	Șruba	Parafuso	Filet	Zavrtnanj
184a	Podkładka	Anilha	Spălător	Prsten podloške
188a	Șruba	Parafuso	Filet	Zavrtnanj
190	Uchwył	Suporte de elevação	Mâner	Ručica
193	Șruba olejowa	Parafuso do óleo	Șurub ulei	Zavrtnanj za ulje
193a	Olej	Óleo	Ulei	Ulje
194	Uszczelka	Junta	Spălător	Podloška
285	Czujnik suchobiegu <sup>(3)</sup>	Sensor de funcionamento em seco <sup>(3)</sup>	Senzor pentru mers în gol <sup>(3)</sup>	Senzor rada na suvo <sup>(3)</sup>
285a	Pierścień O-ring	O-ring	Inel tip O	O-prsten
285b	Zestaw śrub	Conjunto de parafusos	Șurub de reglare	Set zavrtnanja
287	Czujnik poziomu	Sensor de nível	Senzor de nivel	Senzor nivoa
287b	Pierścień O-ring	O-ring	Inel tip O	O-prsten
287c	Zestaw śrub	Conjunto de parafusos	Șurub de reglare	Set zavrtnanja
532	Żel krzemionkowy	Gel de sílica	Silicagel	Silikonski gel

<sup>(1)</sup> Tylko pompy jednofazowe.  
Apenas bombas monofásicas.  
Numai pompe monofazate.  
Samo jednofazne pumpe.

<sup>(2)</sup> Dotyczy tylko pomp w wykonaniu Ex.  
Apenas em bombas Ex.  
Numai la pompele Ex.  
Samo kod Ex pumpi.

<sup>(3)</sup> Pompy standardowe posiadają tylko jeden czujnik wykrywający suchobiegu.  
As bombas standard têm apenas um sensor de funcionamento em seco.  
Pompele standard au doar un senzor de mers în gol.  
Standardne pumpe imaju samo jedan senzor rada na suvo.

Pos.	Наименование	Beskrivning	Opis	Popis
	RU	SE	SI	SK
6a	Штифт	Stift	Zatič	Kolík
7a	Заклепка	Nit	Zakovica	Nýt
9a	Шпонка	Kil	Ključ	Pero
16	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
26	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
37	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
37a	Уплотнительное кольцо круглого сечения	O-ringar	O-obroč	O-krúžok
44	Кольцо режущего механизма	Skärring	Drobilni obroč	Rezací kruh
45	Головка режущего механизма	Skärhuvud	Drobilna glava	Rezacia hlava
48	Статор	Stator	Stator	Stator
48a	Выходной щит	Kopplingsplint	Priključna letvica	Svorkovnica
49	Рабочее колесо	Pumphjul	Tekalno kolo	Obežné koleso
50	Корпус насоса	Pumphus	Ohišje črpalke	Teleso čerpadla
55	Корпус статора	Statorhus	Ohišje statorja	Teleso statora
58	Корпус уплотнения вала	Axeltätningshållare	Nosilec tesnila osi	Unášač upchávky
66	Стопорная шайба	Låsring	Zaklepni obroček	Poistný krúžok
68	Регулировочная гайка	Justermutter	Prilagoditvena matica	Nastavovacia matica
76	Фирменная табличка с номинальными техническими данными	Typskylt	Tipska ploščica	Typový štítok
90a	Электронный блок	Elektronikenhet	Elektronska enota	Elektronická jednotka
90b	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
92	Стяжная скоба	Spännband	Sponka	Fixačná objímka
102	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
103	Втулка	Bussning	Podloga ležaja	Púzdro
104	Уплотнительное кольцо	Simmerring	Tesnilni obroč	Tesniaci krúžok
105	Уплотнение вала	Axeltätning	Tesnilo osi	Hriadeľová upchávka
107	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
108	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
112a	Стопорная шайба	Låsring	Zaklepni obroček	Poistný krúžok
153	Подшипник	Lager	Ležaj	Ložisko
153a	Стопорная шайба	Låsbricka	Varovalna podložka	Poistná podložka
153b	Стопорное кольцо	Låsring	Varovalni obroč	Poistný krúžok
154	Подшипник	Lager	Ležaj	Ložisko
155	Масляной камере	Oljekammare	Oljni komori	Olejovej komore

Pos.	Наименование	Beskrivning	Opis	Popis
	RU	SE	SI	SK
158	Упорное нажимное кольцо	Fjäder	Vzmet	Tlačná pružina
159	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	O-krúžok
161b	Датчик Pt1000 с кронштейном	Pt1000-sensor med fäste	Senzor Pt1000 z nosilcem	Snímač Pt1000 s konzolou
161c	Рабочий конденсатор и датчик Pt1000 с кронштейном <sup>(1)</sup>	Driftskondensator, Pt1000-sensor med fäste <sup>(1)</sup>	Kondenzator teka in senzor Pt1000 z nosilcem <sup>(1)</sup>	Prevádzkový kondenzátor a snímač Pt1000 s konzolou <sup>(1)</sup>
172	Ротор/вал	Rotor/axel	Rotor/os	Rotor/hriadel
174	Винт заземления <sup>(2)</sup>	Jordskruv <sup>(2)</sup>	Ozemljitveni vijak <sup>(2)</sup>	Uzemňovacia skrutka <sup>(2)</sup>
174a	Шайба <sup>(2)</sup>	Bricka <sup>(2)</sup>	Tesnilni obroč <sup>(2)</sup>	Podložka <sup>(2)</sup>
176	Внутренние детали электросоединителя	Kontakt, inre del	Notranji vtični del	Vnútrotná časť káblovej priechodky
181	Наружные детали электросоединителя	Kontakt, yttre del	Zunanji vtični del	Vonkajšia časť káblovej priechodky
184	Винт	Skruv	Vijak	Skrutka
184a	Шайба	Bricka	Tesnilni obroč	Podložka
188a	Винт	Skruv	Vijak	Skrutka
190	Ручка	Lyftbygel	Ročaj	Dvíhacia rukoväť
193	Резьбовая пробка	Oljeskruv	Oljni vijak	Olejová zátka
193a	Масло	Olja	Olje	Olej
194	Прокладка	Packning	Tesnilni obroč	Tesniaci krúžok
285	Датчик сухого хода <sup>(3)</sup>	Torrkörningsgivare <sup>(3)</sup>	Senzor zaščite proti suhemu teku <sup>(3)</sup>	O-krúžok <sup>(3)</sup>
285a	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	Poistná matica
285b	Установочный винт	Justerskruv	Nastavitveni vijak	Snímač prevádzky nasucho
287	Датчик контроля уровня	Nivågivare	Senzor nivoja	O-krúžok
287b	Уплотнительное кольцо круглого сечения	O-ring	O-obroč	Regulačná skrutka
287c	Установочный винт	Justerskruv	Nastavitveni vijak	Hladinový snímač
532	Силикагель	Kisegel	Silikonski gel	Ochranné viečko

<sup>(1)</sup> Только для насосов с однофазными электродвигателями.  
Endast 1-faspumpar.  
Samo enofazne črpalke.  
Len jednofázové čerpadlá.

<sup>(2)</sup> Только в насосах во взрывозащищённом исполнении  
Endast i Ex-pumpar.  
Samo za črpalke z Ex oznako.  
Iba u čerpadiel Ex.

<sup>(3)</sup> Стандартные насосы оснащены только одним датчиком сухого хода  
Standardpumpar har endast en torrkörningssensor.  
Standardne črpalke imajo samo en senzor suhega teka.  
Štandardne čerpadlá majú iba jeden snímač prevádzky nasucho.



Pos.	Tanım	Beskrivelse	الوصف	Lýsing
	TR	NO	AR	IS
6a	Pim	Nål	مسمار محور	Pinni
7a	Perçin	Nagle	مسمار برشام	Hnoðnagli
9a	Anahtar	Kile	مفتاح	Lykill
16	O-ring	O-ring	حلقة دائرية	O-hringur
26	O-ring	O-ring	حلقة دائرية	O-hringur
37	O-ring	O-ring	حلقة دائرية	O-hringur
37a	O-ring	O-ring	حلقة دائرية	O-hringur
44	Parçalayıcı halka	Kuttering	حلقة مطحنة	Kvarnarhringur
45	Parçalayıcı başlık	Kuttehode	رأس مطحنة	Efsti hluti kvarnar
48	Stator	Stator	العضو الساكن	Sátur
48a	Klemens bağlantısı	Koblingsbrett	لوحة التوصيلات الكهربائية	Tengibretti
49	Çark	Løpehjul	المروحة	Dæluhjól
50	Pompa gövdesi	Pumpehus	جسم المضخة	Dæluhlíf
55	Stator muhafazası	Statorhus	جسم المحرك	Sáturhús
58	Salmastra taşıyıcı	Akseltetningssikring	حامل مانع تسرب عمود الإدارة	Haldari fyrir öxulpétti
66	Kilitleme halkası	Låsering	حلقة زنق	Láshringur
68	Ayar somunu	Justeringsmutter	صمولة ضبط	Stilliró
76	Bilgi etiketi	Typeskilt	لوحة اسم الموديل	Merkiplata
90a	Elektronik ünite	Elektronisk enhet	الوحدة الإلكترونية	Rafmagnseining
90b	O-ring	O-ring	حلقة دائرية	O-hringur
92	Kelepçe	Spennbånd	المشبك	Klemma
102	O-ring	O-ring	حلقة دائرية	O-hringur
103	Burç	Hylse	جاية	Hólkur
104	Sızdırmazlık halkası	Tetningsring	حلقة سد	Péttihringur
105	Salmastra	Akseltetning	مانع تسرب عمود الإدارة	Öxulpétti
107	O-ringler	O-ringer	حلقات مانع تسرب	O-hringir
108	O-ring	O-ring	حلقة دائرية	O-hringur
112a	Kilitleme halkası	Låsering	حلقة زنق	Láshringur
153	Rulman	Lager	كرسي تحميل	Lega
153a	Rondela	Låseskive	حلقة إحكام الربط الخاصة بالفنل	Lásskinna
153b	Kilit halkası	Låsering	حلقة زنق	Láshringur
154	Rulman	Lager	كرسي تحميل	Lega
155	Yağ miktarı	Oljekammer	حجرة الزيت	Ólugeymir
158	Oluklu yay	Korrugert fjær	نابض موج	Rifflaður gormur
159	O-ring	O-ring	حلقة دائرية	O-hringur

Pos.	Tanım	Beskrivelse	الوصف	Lýsing
	TR	NO	AR	IS
161b	Pt1000 sensörü ve elemanı	Pt1000-sensor med brakett	حساس Pt1000 مع كتيفة	Pt1000-skynjari með festingu
161c	Hareket kondansatörü, Pt1000 sensörü ve brakett <sup>(1)</sup>	Driftskondensator og Pt1000-sensor med brakett <sup>(1)</sup>	مكتف تشغيل ومجس Pt1000 مع كتيفة (1)	Vinnsluþéttir og Pt1000-skynjari með festingu <sup>(1)</sup>
172	Rotor/mil	Rotor/aksel	العضو الدوار/عمود الإدارة	Snúður/drifskaft
174	Toprak civatası <sup>(2)</sup>	Jordskrue <sup>(2)</sup>	المسمار الأرضي (2)	Jarðtengi <sup>(2)</sup>
174a	Pul <sup>(2)</sup>	Skive <sup>(2)</sup>	حلقة إحكام الربط (2)	Skinna <sup>(2)</sup>
176	İç fiş kısmı	Innvendig pluggdel	الجزء الداخلي للقباب	Innri hluti tengis
181	Diş fiş kısmı	Utvendig pluggdel	الجزء الخارجي للقباب	Ytri hluti tengis
184	Vida	Skrue	مسمار	Skrúfa
184a	Pul	Brikke	حلقة إحكام الربط	Skinna
188a	Vida	Skrue	مسمار	Skrúfa
190	Kaldırma kolu	Løftebøyle	كتيفة الرفع	Lyftifesting
193	Yağ vidası	Oljeskrue	مسمار الزيت	Olíuskrúfa
193a	Yağ	Olje	الزيت	Olía
194	Conta	Pakning	حشوية	Pakkning
285	Kuru çalıştırma sensörü <sup>(3)</sup>	Tørrkjøringssensor <sup>(3)</sup>	حساس التشغيل الجاف (3)	Vökvaskynjari <sup>(3)</sup>
285a	O-ring	O-ring	حلقة دائرية	O-hringur
285b	Ayar vidası	Settskrue	برغي تثبيت	Stílliskrúfa
287	Seviye sensörü	Nivåsensor	حساس المستوى	Hæðarskyngjari
287b	O-ring	O-ring	حلقة دائرية	O-hringur
287c	Ayar vidası	Settskrue	برغي تثبيت	Stílliskrúfa
532	Silika jel	Silikagel	سيليكا جل	Kísilhlaup

<sup>(1)</sup> Yalnızca tek fazlı pompalar.

Kun enfasepumper.

للمضخات أحادية الطور فقط.

Eingöngu eins fasa dælur.

<sup>(2)</sup> Sadece Ex pompalarda.

Kun í Ex-pumper.

فقط في حالات المضخات المضادة للانفجار.

Eingöngu í Ex-dælum.

<sup>(3)</sup> Standart pompalar sadece bir kuru çalışma sensörüne sahiptir.

Standarpumper har bare én tørrkjøringssensor.

للمضخات القياسية مجس واحد فقط للتشغيل الجاف.

Venjulegar dælur eru aðeins með einn vökvaskynjara.

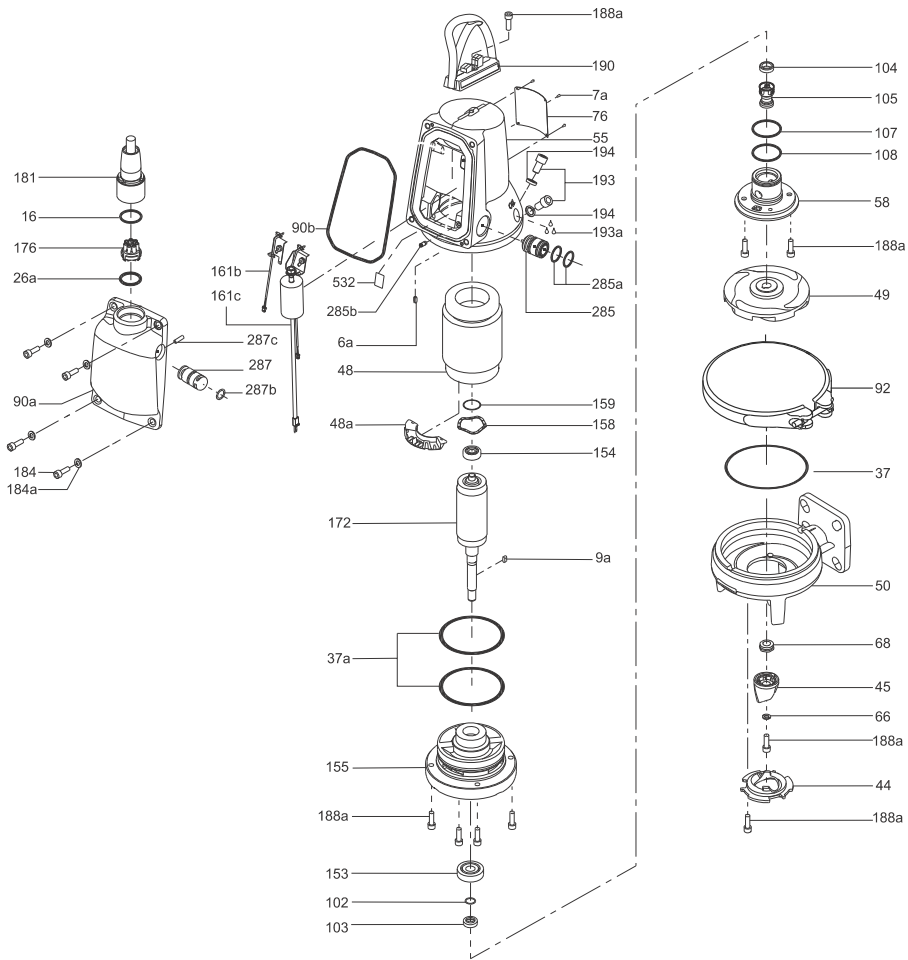
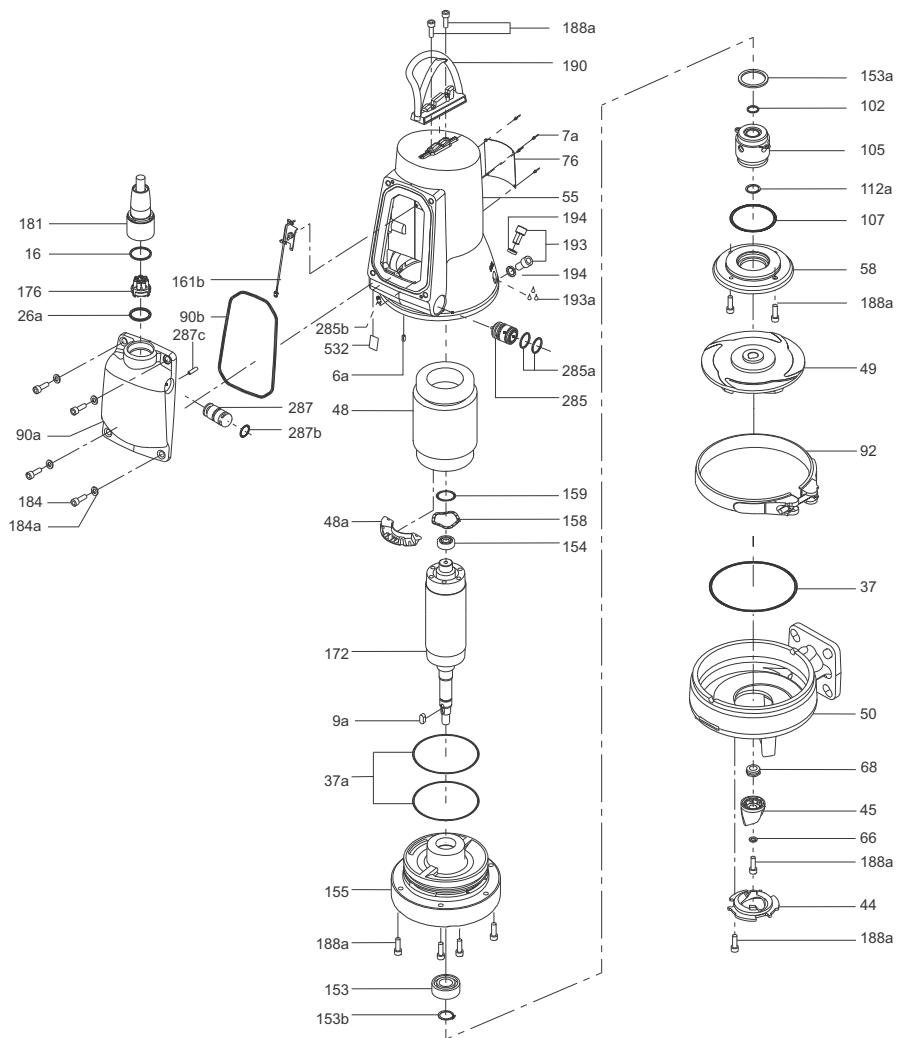


Fig. 4 SEG, 0.9 - 1.5 kW

TM06 5750 5016



TM06 5770 5016

Fig. 5 SEG, 2.6 - 4 kW



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