Instruction manual
AWP_BTA_01_EN

STROBL PUMPEN

Sewage water pumps Series AWP

- Instruction manual
  valid for the versions
  AWP, AWPT, AWPL, AWP-C and AWP-S
  with size
  25-125, 50-160, 80-200, 80-315 and 100-200

- Sectional- and dimensional drawings

Read carefully before use!
Keep for later use!

STROBL

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Table of contents

1. General

1.1 Principles

This Instruction manual describes the correct and secure usage of the pumps, series or systems that are named on the cover page in accordance with the Machinery Directive 2006/42/EC of the European parliament. It has to be at the place of operation of the described pump/system and for a usage free of disturbances it has to be read and understood before works on the pump/system.

The manufacturer (see backside of the cover of the instruction manual as well as on the Declaration of Conformity) does not hold himself liable for damages on persons, animals or the pump/system itself, that are caused according to non-observance of this instruction manual.

1.2 Target audience

Target audience of this instruction manual is technically trained, qualified personnel as well as the operator of the pump/system. The persons responsible for the factory or system have to check if the instruction manual is complete, to provide the instruction manual to the mentioned persons and to make sure that the instruction manual is understood completely.

1.3 Documents that are valid in addition

The following documents are valid for the pump/system, additionally to this instruction manual:

- EC Declaration of Conformity
- Technical presentations, dimensional drawings and data sheets
- Acknowledgement of the order as well as additional contracts (if the instruction manual is only valid for pumps/systems with on the cover page listed serial number)
- Enclosed documents of integrated third-party products (if included in the shipment)
- Further documents (e.g. for ATEX) (if included in the shipment)

1.4 Identifications of signs/symbols

The following signs and symbols are used in this instruction manual:

x	Requirements
>	Instructions
$>^{1.,2.,...}$	multi step instructions
=>	Results
ⓘ	Informations, details, commendations

The following identifications are used to highlight dangers for persons, the environment or the pump/system itself:

DANGER
A danger with high degree of risk that can cause death or massive injuries.

WARNING
A danger with medium degree of risk that can cause massive injuries.

ATTENTION
A danger with low degree of risk that can cause simple injuries.

DANGER
A danger that is caused by (electric) voltage.

ATTENTION
A situation that can cause the partly or complete destruction of the machine.

1.5 Glossary and list of abbreviations

Pumpe	- Single pump with or without drive
System	- System with integrated pump, drive, valves, etc...
Suction line	- Inlet line for mediums that is connected to the suction nozzle
Pressure line	- Outlet line for medium at the discharge nozzle of the pump
Drive	- Motor connected to the pump (electric, hydraulic, ...)

2. Security

2.1 General safety informations

ⓘ The manufacturer is not liable for damages that are caused by non-observation of the whole documentation.

The instruction manual contains information concerning installation, operation and maintenance of the pump. The instruction manual has to be read completely before these works and has to be observed by the execution of the works. The instruction manual has either to be printed or digitally dressed available at workplace anytime and to be visible for qualified and authorized personnel.

Sings that are additionally fixed at the pump/system have to stay proper visible. Examples are the identification plate, the arrow of direction of rotation or the signs for the connections.

The adherence of additionally location-dependent instructions that are not mentioned in the instruction manual has to be observed by the operator.

2.2 Intended usage

- The pump/system has only to be used in the described/agreed on fields of operation.
- The usage must only be done in technically correct condition.
- No other mediums than the in the instruction manual or the documentation to the order mentioned have to be conveyed.
- The usage without medium is not permitted and can cause the destruction of the pump.
- Information to the minimum and maximum conveyance height as well as amount are to be observed and should not be under-/overrun.
- Usages that are not mentioned in the instruction manual or additional documentation have to be agreed on with the manufacturer.

2.3 Incorrect usage and arbitrary rebuilding

The pump system has never to be operated outside the in the instruction manual or in the additional data sheets mentioned design limits. This explicitly also includes design limits concerning surrounding, e.g. temperature, air humidity, etc.

ATTENTION

A not permitted usage can cause the destruction of the pump/system.

DANGER

The secure usage of the pump/system can only be guaranteed for allowed usages of the original pump/system.

For arbitrary rebuilding or the usage of not of the manufacturer shipped spare parts the manufacturer can not be hold liable.

2.4 Safety orientated working

Additionally to the security information of the instruction manual as well as the information to the allowed usage, the following security informations are valid:

- Rules for accident prevention, security and company instructions
- Explosion prevention and protection
- Security instructions for usage of dangerous substances

2.5 Qualification and training of staff

The personnel for the usage, maintenance, inspection and assembly has to have the right qualification for this work. Areas of responsibility, competences and the surveillance of the personnel have to be stipulated by the operator. If the personnel does not have the necessary knowledge, they have to be trained and qualified. This can be done, if necessary, by the manufacturer/distributer if ordered by the operator. Additionally has the operator to make sure, that the content of the instruction manual is completely understood by the personnel.

2.6 Consequences and risks of non-observations of the instruction manual

The non-observance of safety information can cause dangers for persons as well as the environment, machine and surrounding. The non-observation of the safety information causes loss of all claims of damages.
The non-observation can cause e.g. the following dangers:

- Breakdown of important functions of the machine/system
- Danger for persons by electric, mechanic and chemic influences
- Danger for the environment by leakage of dangerous substances
- Damages on furniture and artificial structure

3. Transport, storage and disposal

3.1 Transport

The pumps are packaged carefully before shipment according to the expected way of shipment. As damages by transport can not be excluded, every consignment has to be checked by arriving. If damages of the transport are spotted, the manufacturer and the forwarder have to be informed immediately.

3.2 Storage

For a longer storage, the pump has to be drained completely and has to be dried to avoid corrosion. Further the pump has to be protected against the infiltration of contaminants. A storage in surroundings with high air humidity or changing temperatures has to be avoided, because it can cause condensation. Condensation causes corrosion inside the motor and can cause damages at the motor winding.
For a storage longer than three months, the mentioned points have to be checked on a regular bases and the motor shafts have to be turned to avoid fixation.
A storage that is not professional also before start up of the pump causes loss of all warranty claims.

3.3 Reshipment

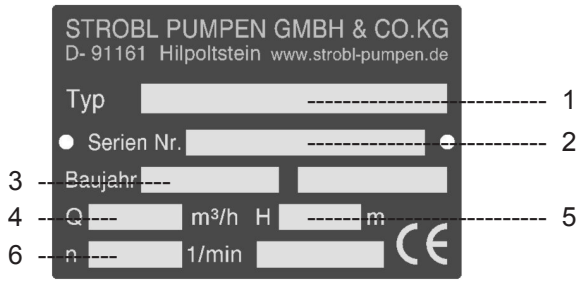
If the pump/system is reshipped to the manufacturer for analysis, repair or maintenance, all steps of chapter 6.3 (removing from operation) have to be done and the pump has to be packaged for the shipment. Ideal is to package the pump the same way it was delivered.
Additionally the enclosed certification of safety has to be filled in and has to be reshipped together with the pump.

3.4 Disposal

For disposal, the pump/system can either be reshipped to the manufacturer (in accordance with chapter 3.3) or it has to be removed from operating correctly and to be purged as well as disassembled after that and to be disposed according to the local prescriptions.

4. Construction and function of the pump or system

4.1 Identification



1 = Type of pump (e.g. AWP 50-160)
2 = Serial number
3 = Year of construction in MM/JJ
4 = Flow rate at the operating point
5 = Delivery head at the operating point
6 = Nominal rotation speed

4.2 General description

Sewage water pumps series AWP are single stage centrifugal pumps for conveying highly polluted raw sewage or similar liquids with a high percentage of solids. The types AWP-C and AWP-S have cutting mechanisms to cut fibres in the media respectively to comminute solids.
The series AWPT has a slightly different design than the AWP type, because it is a pump with a submerged motor.
Pumps series AWPL have a bearing and can therefore be operated with nearly any drive.

4.3 Basic design and mode of action

The pumps have a spiral casing with a suction opening in the front and a casted pressure socket to one side. The impellers can run open against a wear plate or can be channel type impellers, depending on the pump type. Additionally the AWP-S pumps have a special cutting impeller in front of the normal impeller. The impellers can be optimized to a specific working point by variating the impeller diameter, the impeller width, the height or the number of the impeller blades. The shaft seal is a single-acting mechanical seal (tandem-arrangement for the AWPT). Special versions can be executed with special sealing versions like a quench.

ⓘ Mechanical seals can have leakages caused by construction. Drill holes or block outs that make a discharge of this leakage possible, should not be closed in any case.

The pumps series AWP are normaly driven by a close coupled electric motor with special shaft. This is also valid for the submerged version AWPT, but naturally the motor is a submerged one in this case.

If the pump has a bearing with free shaft end (series AWPL) it can be connected to any drive by a flexible coupling. The pumps can also be delivered mounted on a base plate to ensure the correct assembly of the drives.

4.4 Shipment

The shipment is named in the single positions of the order acknowledgement. As a standard we deliver an german instruction manual. Additional copys or different languages can be downloaded from our homepage (only newest versions) or be orderd together with the pump.
Accomplishments that are not stipulated in the acknowledgement or the additional contracts are concerned as not agreed on.

5. Installation, mounting and connection of the pump

5.1 Inspection of the surroundings and conditions of the installation

To guarantee a solid installation, the pump is to be placed on a suitable, firm underground. If the floor is not plane equalizing pieces, adjustable machine feet or resemble things are to be used. If a pump is build into a system or into tight room corners it has to be made sure that enough aeration to the motor is possible. Too low aeration of the motor can cause overheating of the motor.

The motor has to be protected against influences of the environment (except for pumps type AWPT). If necessary a canopy has to be used. The motor can be equipped with a stationary heating installation to avoid the appearance of condensate.

ATTENTION

An incorrect installation can cause destruction of the pump/system or a destruction of parts of the pump.

5.2 Connection of the pipework as well as possible shutoffs

The suction and discharge connections at the casing of the pump are equipped with flanges according to DIN or ANSI. Additional connections for ventilation or cleanout are depending on the order either equipped with threads or flanges.

ATTENTION

All connecting pipes have to be able to be fixed absolutely without tension onto the aggregate to avoid damages.

Pumps type AWPT have not to be connected to an suction line because they are completly submerged.

5.3 Adjustment of the coupling, motor and pump

The sewage water pumps series AWP and AWPT are build with a close coupled motor with special shaft and for that we do not have a coupling that has to be aligned.

For pumps type AWPL the couplings have to be aligned according to the enclosed instruction manual (depending on the type of coupling).

5.4 Security and control mechanisms

If the pump is from type AWPL with bearing housing the safety mechanisms (coupling protection 681.1) have to be mounted on again after alignement of the coupling.

DANGER

It has to be checked that all safety mechanisms are build up correctly, before restart of the pump/system.

5.5 Electric connection

The voltage of the net has to correspond to the voltage and frequency instructions on the identification plate of the motor. The connection of the motor has to be done by a trained and qualified electrically skilled person. The corresponding VDE or national laws have to be observed.
A usage in systems with special security requirements is only allowed if an electronically skilled person mounts necessary security mechanisms for such systems.

DANGER

The operator of the pump/system has to guarantee that only authorized personnel makes the electric connection. The non-observance of some security rules can lead until death of the person that executes the works.

5.6 Testing of the direction of rotation

After the electric connection of the pump/system a test of the direction of rotation of the single pumps has to be made. Therefore the pump is switched on and immediately off. The correct direction of rotation of the pump is defined over an arrow at the motor of the pump.

ATTENTION

A wrong direction of rotation can damage the mechanical seal and some parts of the pump.

6. Operation

6.1 Start up

The pump has to be installed as well as connected hydraulically and electrically, according to the descriptions in chapter 5. Before start up all connection lines have to be checked again on correctness.

DANGER

While controlling of the electric connection the connection line has to be without voltage and has to be protected against starting up electricity. After finishing of the control works all possibly removed security mechanisms have to be mounted again.

The body of the pump, the mechanical seal and the suction line have to be filled with liquid before the first start up of the pump/system.

ATTENTION

A running dry of the pump causes a over average high abrasion or the destruction of the parts of the pumps and seals of the shaft.

Additional to the instruction manual of the pump/system all instruction manuals of elements that are integrated (mechanical seal, coupling, motor,…) have to be read and observed before start up.

6.2 Parameters conditional on operation

The in chapter 9 as well as in the acknowledgement listed design limits, mediums and other basic conditions have to be guaranteed without any breaks.

ATTENTION

Operating the pump outside of these design parameters can destroy the pump or parts of it. The manufacturer is not liable for damages that are caused by non-observation of the design parameters.

6.3 Removing from operation and storage/preservation

After switching off the pump in case of a final or temporary giving up all suction or pressure side valves are to be closed and the rest liquid of the pump has to be discharged through the drain lines or drillings for drainage.

WARNING

As far as this liquid is dangerous for persons, animals or the environment it has to be observed that important security arrangements are made and the liquids are collected correctly.

If the pump is stored for a longer time the pump has to be filled with suitable conservation oil. This step has not to be done for all material versions, but in any case for cast iron. Additonally the pump shaft has to be turned in a regular way (see chapter 7.2) to avoid a seizing of the pump.

6.4 Restart of operation

For restart of operation the same steps are to be done than by start up (chapter 6.1).

7. Maintenance

7.1 Security information

DANGER

For works at the pump/system the electric connection has to be free of voltage and to be safe against restarting. After finishing of the work all possibly removed safety mechanisms have to be mounted again.

WARNING

Assembly and dismantling are only to be done with the correct tools and under observation of all regulations of the prevention of industrial accidents (especially national regulations for lifting of heavy loads). The non-observance of these regulations can cause massive injuries (cuts, contusion, breaks, …).

7.2 Maintenance

Regular visual inspections of the pump have to be done. Here the look has to be especially on possible leakages as well as damages at the casing of the motor or pump. Further the pump has to be checked on free movement, especially after longer periods of shutdowns.

DANGER

Therefore the electric connection has to be free of voltage and to be safe against restarting. After finishing of the work all possibly removed safety mechanisms have to be mounted again.

The shaft/coupling should be able to be turned without a strong resistance. If the pump has a close coupled motor, the free-moving of the shaft can be checked through the fan of the motor. For this the fan cover of the motor has to be removed (see instruction manual of the motor).
If this is not the case the pump could be blocked. In this case a failure analysis like chapter 8 has to be made.

Additional to the visual inspection, all signs on the pump/system have to be cleaned regularly and checked on legibility. If signs are lost or damaged they have to be replaced by identical new signs.

If the pump is alright and no parts have to be replaced or changed, it can be restarted according to chapter 6.1.

ⓘ All works described in the following to the changing of parts of the pump should basically only be done by a qualified and trained person.

7.3 Cleanout and cleaning

To clean the pump a cleanout with clear water has to be done. If this is not possible because of procedural reasons, the pump has to be dismantled, to be deconstructed and then the parts have to be cleaned individually.
The necessary discharging while dismantling of the pump can be done over a mounted drainage line or through the discharge screw (903.1) located at the lowest point of the casing. Pumps type AWPT are self draining if they are lifted vertically and do not have any suction lines connected.

WARNING

As far as this liquid is dangerous for persons, animals or the environment it has to be observed that important security arrangements are made and the liquids are collected correctly.

7.4 Dismantling of the pump/system

>¹ The pump has to be set out of service like described in chapter 6.3. For maintenance work the pump has then to be removed out of the system.
>² For pumps type AWPL the coupling guard (681.1) and the drive should be removed from the baseframe before following works on the pump or its parts. If the coupling has a removal device in between it is enough to remove this part.
>³ Now it is possible to open the hexagon nuts (920) and put them aside togehter with the washers (554). The casing (102) can be detached to front now.

WARNING

Single pieces can have a heavy weigth, depending on the pump size. For that suitable lifting equippemnet has to be used during assembly/disassembly.

>Changing the wear plate (135) - only for AWP-C
>>¹ All steps of dismantling the pump like under 7.4 have to be executed.
>>² The next step is to remove the hexagon socket screws (914.1) from the casing.
>>³ Afterwards the wear plate can be removed from the casing easily.
>>⁴ At the end, the new wear plate can be set into the casing and can be fixed with the hexagon socket srews (914.1). The o-rings (412.1) have to be replaced with new ones during re-assembly.

> Changing the impeller (230) - for AWP, AWP-C, AWPL and AWPT
>>¹ All steps for dismantling the pump like mentioned before have to be done.
>>² After loosening the hexagon socket screws (914) and removing the washer from the impeller (550) the impeller can be removed to the front. If the impeller can not be removed by hand, a suitable gear-puller with three-arms has to be used.
>>³ Now it is possible to push the new impeller onto the shaft. During assembly of the impeller, the key (940) has to stay in the proper place of the shaft.
>>⁴ To fix the impeller onto the shaft again the washer (55) has to be put onto the shaft and fixed with the hexagon socket screw. This screw has to be locked with a chemical fluid (e.g. LOCTITE 243).

> Changing the cutting impeller (231) - only for AWP-S

>>[1] All steps from dismantling the pump like in chapter 7.4 >[1] and >[2] have to be done.

>>[2] By loosening the hexagon nuts (920.1) the suction casing can be removed from the casing (161). Afterwards the fixing screw (914) of the cutting impeller and the cutting impeller can be removed.

>>[3] If the impeller has to be changed also, these steps have to been made now.

>>[4] The new cutting impeller can now be moved onto the shaft. During assembly of the impeller, the key (940) has to stay in the proper place of the shaft.

>>[5] If the cutting impeller lies down on the cutting plate (135) the position has to be adjusted. This happens by putting adjusting washers under the cutting impeller until a distance from 0,1-0,2 mm between cutting impeller and cutting plate exists.

>>[6] To fix the new cutting impeller onto the shaft the washer (550) has to be fixed together with the hexagon socket screw. This screw has to be locked with a chemical fluid (e.g. LOCTITE 243).

> Changing the mechanical seal (433)

>>[1] All steps from dismantling 7.4 and the steps >>[1] and >>[2] from changing the impeller Have to be done.

>>[2] The distance ring (504) behind the mechanical seal can now be removed. Afterwards the mechanical seal can be pulled from the shaft.

>>[3] To change the stationary seat , the casing cover (161) has to be removed from the motor or the bearing housing. Therefor the hexagon screws (901) have to be loosed and put aside together with the washers (554.1). The casing cover can now be removed to the front. To remove the stationary seat it can be pushed through the backside of the casing cover.

>>[4] The new stationary seat can be pushed into casing cover and then the casing cover has to be put onto the motor or the bearing housing again. By tigthening the hexagon screws (901) again everything is fixed again.

>>[5] The last step is to put the new mechanical seal onto the shaft and to do all steps from dismantling in reversed order.

> Changing the secondary mechanical seal (433.1) - only for AWPT

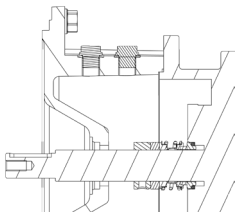
>>[1] All steps from changing the mechanical seal until >>[3] have to be done.

>>[2] The fixing collar (506) can be removed from the shaft after loosening the set screw (904).

>>[3] Now it is possible to remove the mechanical seal including the stationary seat.

>>[4] The new stationary seat has to be put into the motor flange and afterwards the mechanical seal has to be put onto the shaft again.

>>[5] While fixening the fixing collar, the following adjusting dimensions have to be observed.



Pump	Mechanical seal	Dimension
AWPT 25-125	Ø20	21,5
AWPT 50-160	Ø25	23,0
AWPT 80-200	Ø30	26,5
AWPT 80-315	Ø38	30,0
AWPT 100-200	Ø30	26,5

>>[6] The final step is to reassemble the pump according to the steps >>[4] and following from the mechanical seal change and to refill the oil chamber of the pump (refill capacitys see chapter 9.3).

> Changing the motor (801) - for AWP and AWPT

>>[1] All steps from dismantling the pump and changing the mechanical seal up to >>[3] have to be carried out.

>>[2] The casing cover can now be placed on a new motor instead of the old one and every step of dismantling the pump has to be done in reversed order.

> Changing the motor (801) - for AWPL

>>[1] If every fixing screw of the motor is loose, the motor itself can be removed from the baseplate and replaced by an new one.

>>[2] The coupling has to be mounted and aligned according to the additional instruction manuals.

7.5 Assembly of the pump/system

For the assembly of the pump all steps of the dismantling have to be done in reverse order. Further the screws and nuts are not unscrewed as by the dismantling but fixed.

At the assembly of the pump all o-rings that were exposed while the dismantling have to be replaced (especially the o-ring of the casing (412) and the oil chamber (412.1) as far as existing).

7.6 Spare parts

ⓘ Original spare parts can be bought at your dealer or manufacturer.

To identify the necessary spare parts clearly the information of the identification plate (type, serial number and year of construction) as well as the position number of the spare part in the sectional drawing are needed.

ATTENTION

If spare parts are used that are no original parts of the manufacturer, a secure operation can no longer be guaranteed. Further cease through the usage of foreign spare parts possibly still existing warranty claims of the dealer or manufacturer.

8. Causes of disturbances and their repair

Failure	Possible reason	Removal
-Motor doesn‘t start	-No power available	-Check connection lines and motor
	-Motor protection is activated	-Reset motor protection
-Pump doesn‘t turn	-Pumpe is blocked	-Remove blockage, control clearances
	-Bearings are destroyed	-Change the bearings
	-Coupling is destroyed	-Change the coupling
-Pump doesn‘t deliver	-Suction or pressure line closed or destroyed	-Check suction and pressure lines
	-Impeller blocked	-Clean impeller
-Pump has a wrong flow	-Impeller partially blocked	-Clean impeller
	-Impeller worn out	-Clean impeller
	-Wrong duty point	-Re-adjust duty point
-Pump is leaking on the shaft	-Mechanical seal untight	-Replace mechanical seal
-Leacking indicator was activated	-Mechanical seal untight	-Replace mechanical seal

For the repair of disturbances the pump has always to be put out of service. If disturbances appear that the operator of the pump/system can not solve himself, the manufacturer has to be contacted immediately.

9. Technical data

9.1 Design limits of operation

Temperature range - operation:	0 °C ... 40 °C
Temperature range - storage:	-15 °C ... 60 °C
Relative humidity - operation:	< 60%

Other operating limits are only possible if agreed by the manufacturer.

9.2 Mediums

Sewage water pumps are suitable for heavy polluted mediums with a high percentage of solids. The maximum solid size must not exceed the free passage through the pump (see cataloque). For aggressive mediums the manufacturer has to check the material version of the pump.

Temperature range - medium: 0 °C ... 60 °C ⓘ Medium must not freeze.

9.3 Liquids for operation

In the pumps series AWP including the types AWP-C, AWP-S and AWPL no liquids for operation are used. For pumps type AWPT the oil chamber in the casing cover has to be filled with environmentally compliant white oil. With delivery the oil chamber is prefilled (3/4 - 4/5 of the total capacity) and has to be controlled regularly afterwards.

9.4 Weight and dimensions

The weigth of the pump and the dimensions are named in the catalogue to the pump series.

9.5 Noise level

The 1m-measurement-noise-pressure-level to DIN EN ISO 3744, in the duty point of the pump is at least less than 80 [dB (A)].

9.6 Voltage, frequency and required power

Voltage and frequence are named on the data sheet of the pump as well as on the order confirmation. Additionally the data on the name plate of the motor has to be verified while electric connecting. The required power can be seen in the pump curve to the order.

9.7 Locking torques

The screws (901) and nuts (920) have, as far as possible, to be tighten down with a torque wrench.

Size	Quality	Locking torque
M 6	A2 / A4	7,5 Nm
M 8	A2 / A4	18 Nm
M 10	A2 / A4	36 Nm
M 12	A2 / A4	62 Nm
M 16	A2 / A4	148 Nm
M 20	A2 / A4	196 Nm

Notes:

EC declaration of conformity

as defined in machinery directive 2006/42/EC

We herewith declare that the following machine corresponds to the basic security and health requirements from EC directive 2006/42/EC in conception, construction and design. If the machine is modified without our approval, this declaration shall no longer be applicable.

Manufacturer:
Strobl Pumpen GmbH & Co.KG
Boschring 3
D-91161 Hilpoltstein

Machine:
Centrifugal pumps series AWP, AWPT, AWPL, AWP-C and AWP-S

Serial number:

We declare also the compliance with the following additional rules/terms applied to the machine:

Harmonized standards applied, in particular:
- DIN EN 809:2011-01
- DIN EN ISO 12100:2011-03
- DIN EN 60034-1:2010

Other technical standards and specifications applied:

Authorized representative for technical documentation:
Christoph Strobl
Strobl Pumpen GmbH & Co.KG
Boschring 3
D-91161 Hilpoltstein

Hilpoltstein, 31.08.2012

Robert Strobl
(Geschäftsführer)

Certification of safety

We declare that the following machine has been completly evacuated and cleaned before the reshipment.

Pump/system: .....

.....

Serial number: .....

Delivery date: .....

Application area: .....

Medium to be pumped: .....

Please tick appropiate:

O explosiv

O corrosive

O toxic

O harmful

O harmful to the environment

O flammable

O harmless

Reason for reshipment: .....

Notes: .....

.....

.....

Special safety arrangements are necessary for further handling:

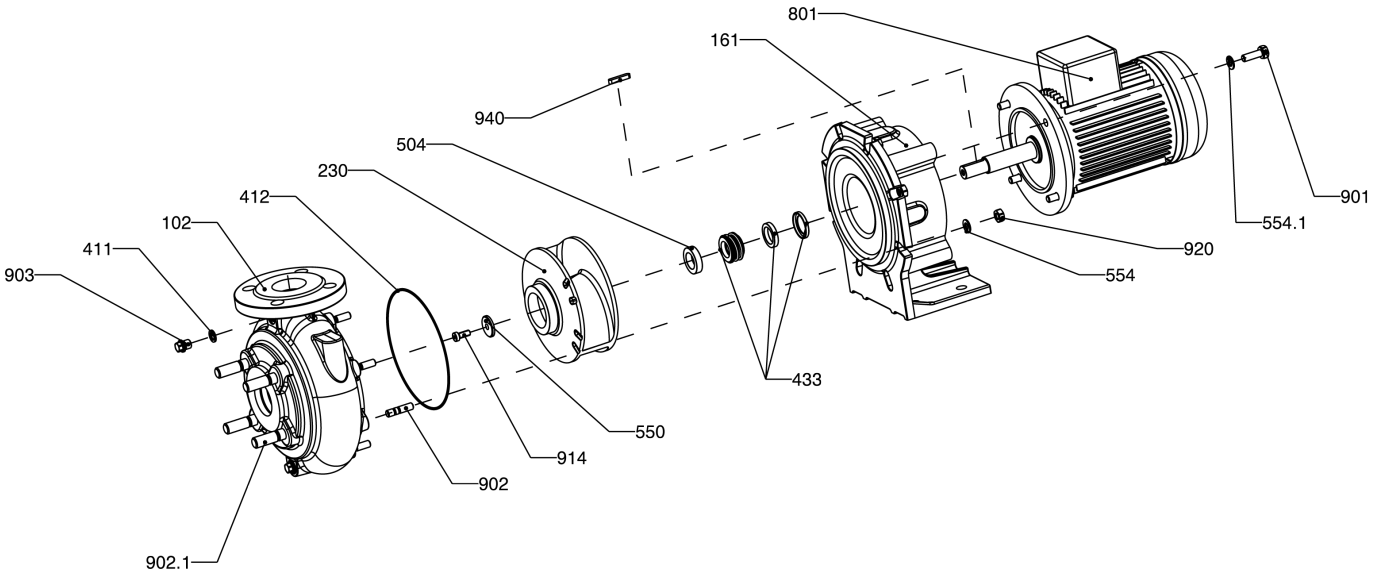
O Yes O No

We declare that these informations are complete and correct.

....

Place, Date Signature complete company name
(Seal)

Sectional drawing AWP - valid for:
AWP 25-125, 50-160, 80-200, 80-315 and 100-200
with impeller types AWP-K1, -K2B, -K3, -F

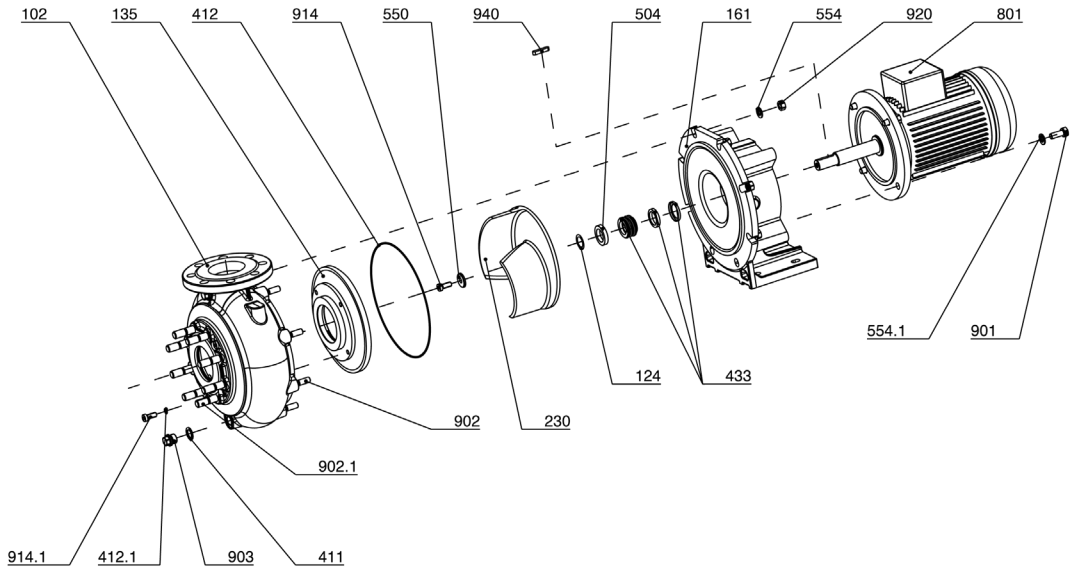


Part-Nr. acc. DIN 24250	Name
102	Casing
161	Casing cover
230	Impeller
411	Gasket
412	O-ring
433	Mechanical seal
504	Distance ring
550	Washer
554	Washer
554.1	Washer
801	Motor
901	Hexagon screw
902	Stud bolt
902.1	Stud bolt
903	Lock screw
914	Hexagon socket screw
920	Hexagon nut
940	Key

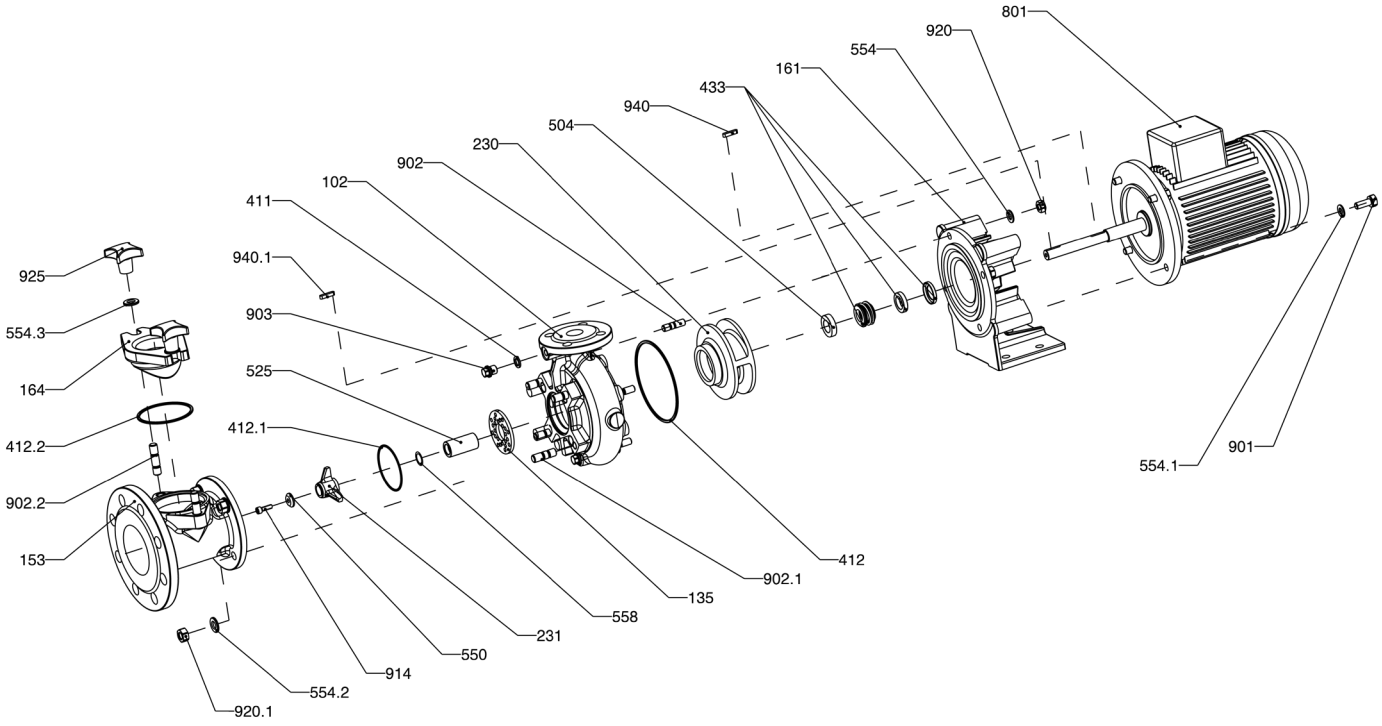
additionally for the AWP-C	
135	Wear plate
412.1	O-ring
914.1	Hexagon socket screw

additionally for the AWP-S	
135	Cutting plate
153	Suction casing
164	Cleaning cover
231	Cutting impeller
412.1	O-ring
412.2	O-ring
525	Distance bushing
554.2	Washer
554.3	Washer
902.2	Stud bolt
920.1	Hexagon nut
925	Star handle

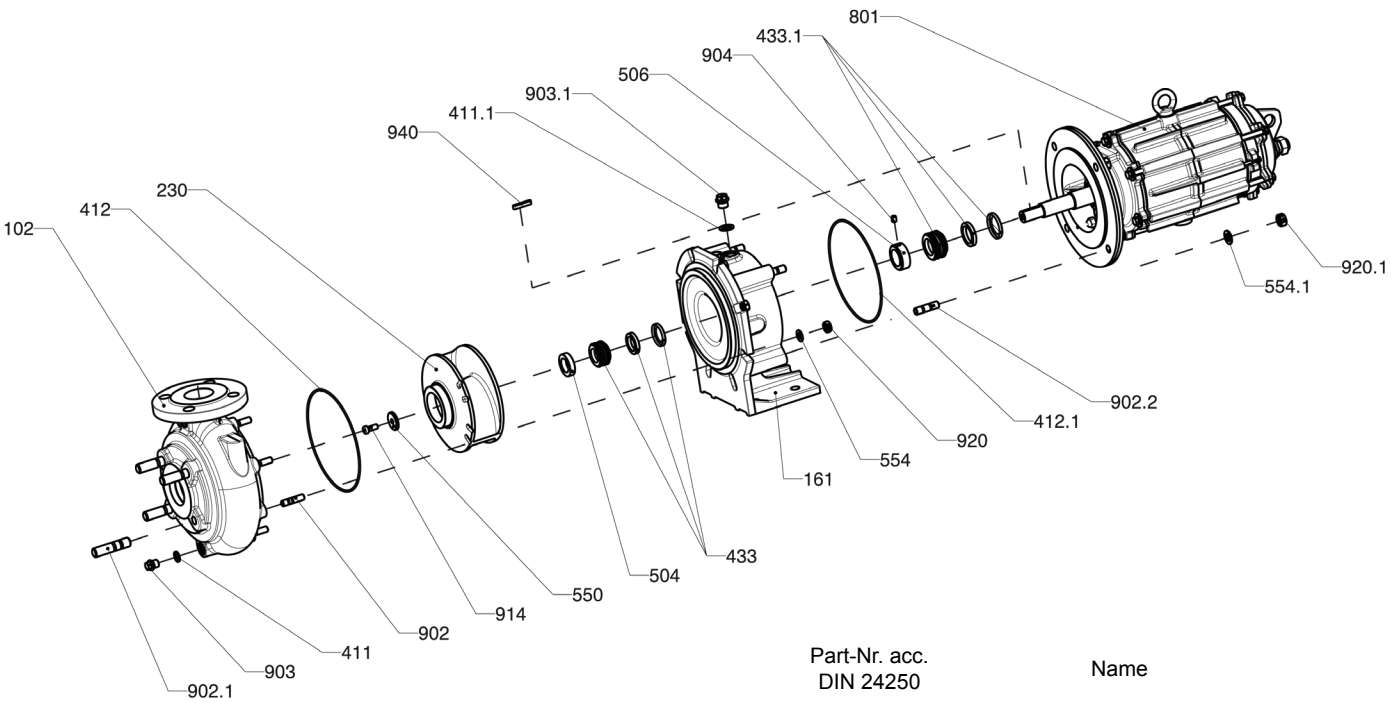
Sectional drawing AWP-C - valid for:
AWP-C 25-125, 50-160, 80-200 and 100-200



Sectional drawing AWP-S - valid for:
AWP-S 25-125 and 50-160



Sectional drawing AWPT - valid for:
AWPT 25-125, 50-160, 80-200, 80-315 and 100-200



Part-Nr. acc. DIN 24250	Name
102	Casing
161	Casing cover
230	Impeller
411	Gasket
411.1	Gasket
412	O-ring
412.1	O-ring
433	Mechanical seal
433.1	Mechanical seal
504	Distance ring
506	Fixing collar
550	Washer
554	Washer
554.1	Washer
801	Submersible motor
902	Stud bolt
902.1	Stud bolt
902.2	Stud bolt
903	Lock screw
903.1	Lock screw
904	Set screw
914	Hexagon socket screw
920	Hexagon nut
920.1	Hexagon nut
940	Key

Notes:

Notes:

Manufacturer:

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