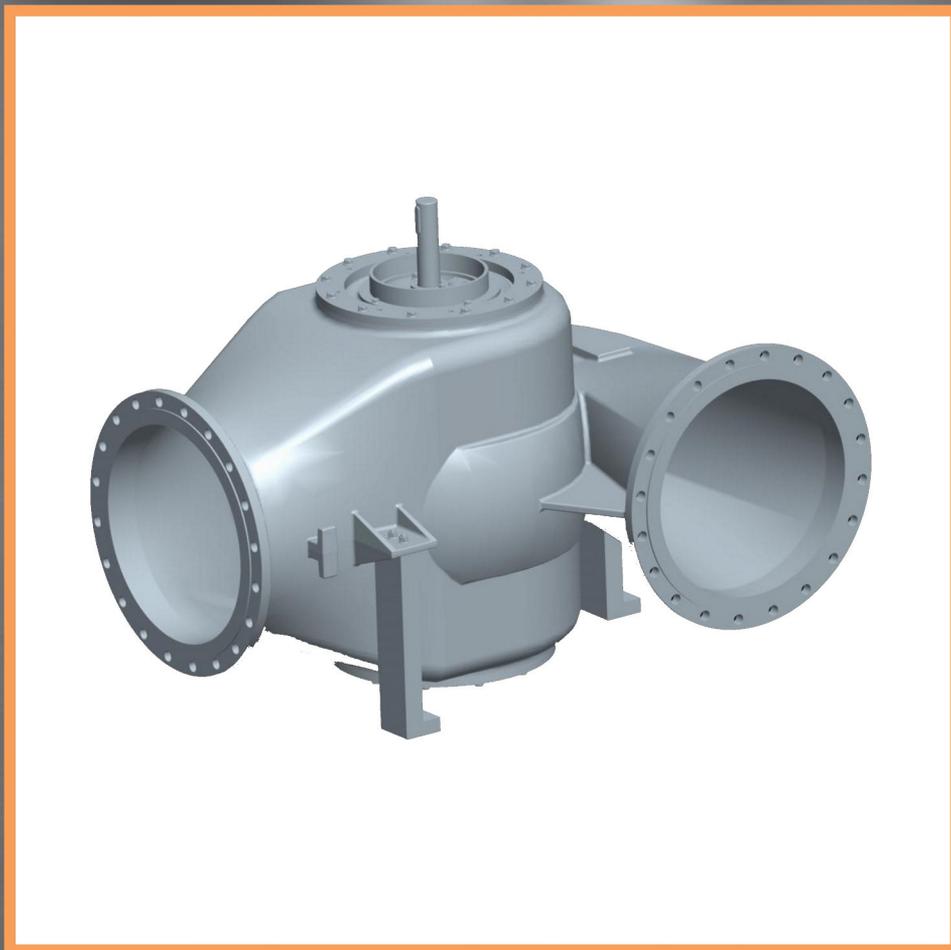




Instruction manual

WSCA Pumps



www.winter-pumpen.de

Instruction Manual

WSCA Pumps

Size: 500 & 600

Impressum

Operating- and Installation Instructions WSCA-Pumps
– Translation of the original Instruction Manual (Übersetzung der Originalbetriebsanleitung) –



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Glossary

- **Pressure pipe**
Pipe, connected to or to be connected to outlet.
- **Hydraulics**
The so-called hydraulics describes the part of a pump, which converts speed power to pressure power.
- **Product**
A product identifies a pump or a pump aggregate, according to scope of supply.
- **Pump**
Pump with free shaft end, without drive assembly and without electric motor, with or without pump coupling.
- **Pump aggregate**
A pump aggregate consists of the pump with relating drive assembly and electric motor.
- **Suction pipe**
The suction pipe is / will be connected to suction flange.

1. General

1.1 General Information

This instruction manual refers to WSCA-Pumps stated on cover sheet for the following sizes: 500 & 600

It describes proper handling and use during life cycle of pump/pump unit. Moreover this instruction manual contains basic safety-related information.

It is absolutely necessary for technical staff to read this manual before starting assembly, before installation and commissioning before any works done at pump/pump unit. The manual must be always available at site.

For more information, please, apply to manufacturer.

For identification, please state number of manual (U99_001), written at the lower edge of manual.

NOTE	
	<ul style="list-style-type: none"> The manufacturer assumes no liability for pumps / aggregates, if instructions of available manual are disobeyed. Assembly works must be done by technical skilled staff only. Warranty for works done at pumps/aggregates is applicable only, if performed by after sales service of the manufacturer. If works/changes at pumps/aggregates are done by unau-thorized staff within period of guaranty, the claim expires. Modification or changes of pump/aggregate are permitted only after collusion with manufacturer. Original spare parts and accessories, authorized by manufacturer, serve as security. If unauthorized parts are used, the liability of manufacturer expires for damages arising thereby.

1.2 Fields of application

1.2.1 Intended use

According to the material selection for the delivery of pure or slightly turbid liquids, hot-water, lyes, acids etc. The pumps are exclusively to be used under the operating conditions stipulated (including selected medium) in the order. All Pumps are tested in our works according to our standart test schedule. For performance data stated in the order of confirmation, tolerances to EN ISO 9906:2013-3 are valid, if nothing different is agreed. The agreed operating conditions are mentioned on order confirmation, delivery note or technical data sheet. In the case of no agreements stipulated in the order concerning the operating conditions, the pump is constructed for application with pure, not aggressive water with a temperature of approximately 20°C.

Area of application:

Shipbuilding industry, Industry, Water supply, Sprinkler, Irrigation and drainage, Drinking water supply
Water treatment, Swimming pool engineering, Plant construction

1.2.2 False application

The manufacturer assumes liability only for the stated and agreed purposes but not for false applications or misappropriation!

1.3 Subjects for this manual

This manual addresses technical skilled staff.

1.4 Documents applicable with this manual

In addition to this manual documents stated in below chart are applicable.

Document	Topics
Datasheet/Technical description, if agreed before	Technical data of pump / pump aggregate
Dimensional drawing	Dimensions of pump / aggregate
Spare Part List	General chart about available spare parts
Order documentation, if agreed before	i.e. offer, order confirmation contract documents
further instruction manuals	z. B. automatic aspirator, motor,...

Table 1: General Chart of documents valid in addition

1.5 Symbolic

Symbol	Bedeutung
	Requirement Marks a requirement for the explained action
	Call to Action Generally and with safety notes
	Cross References
	Please, note: Marks important (general) indications and recommendations for proper and safe handling with goods supplied
1. 2. 3.	Step-by-step structuring of the course of an action

Table 2: Symbolic

1.6 Supplementary information

1.6.1 Manufacturer's-, agents'-, after-sales service and customer service addresses

See Impressum

	NOTE
	In case of spare part orders or customer service requests, please always indicate pump type and serial number.  see 4.2 Information to the Product

1.6.2 Accessories (order-related)

Frequency regulation, pressure tanks, control systems, drive assemblies, automatic aspirator, other accessories

2. **Safety**

2.1 **General Information**

Before starting works at the product, this manual must be coned by the responsible personnel / operator prior to assembly and commissioning. It is always to be kept available at the installation site.

The safety-related instructions and all provisions must be followed,

2.2 **Marking of safety- & warning notices in this manual**

Non-compliances of safety instructions given in this manual will affect safety of persons. These are identified by the following symbols:

Symbolic chart	Meaning / Explanation
	DANGER This symbol / word marks a hazard with a high risk grade. If this danger is not avoided, severe injuries or death can be the consequence.
	WARNING This symbol / word marks a hazard with a medium high risk grade. If this danger is not avoided, severe injuries or death can be the consequence.
	ATTENTION! This symbol / word marks a hazard, which can be a safety risk for persons and machines, if disregarded.
	General danger spot In combination with a signal word, this symbol marks a general danger spot. If it is disregarded, severe injuries can be the consequence.
	Hazardous Voltage In combination with a signal word, this symbol marks a general danger spot, caused by voltage. Additional information for protection against electric shock is available there.

Table 3: Symbolic chart; Meaning / Explanation

It is imperative that signs affixed to the machine, (e. g. arrow indicating the direction of rotation, symbols indicating fluid connections, name plate) be observed and kept legible.

2.3 **Intended use of the product**

The intended use is subject to the fields of application, stated in  [1.2.1. Intended use.](#)

2.4 **Illegal operation**

Operating safety of supplied machine is guaranteed only for intended use according to  [1.2. Fields of application](#) in operation manual. The limit values stated on name plate, datasheet or order documentation must not be exceeded by no means.

2.5 **Qualification and training of operating staff**

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant management. If the personnel does not have the necessary knowledge, it must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant management. Moreover, the plant management is to make sure that the contents of the operating manual are fully understood by the personnel. Personnel without professional competence or technical training are not at liberty to do works at the product!

2.6 **Compliance with regulations pertaining to safety at work**

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant management are to be observed.

2.7 **Information to adopting protective measures**

For the phase of life of the pump / pump aggregate the following protective measures must be adopted:

- Equipment of staff with personal protective equipment.
- Instruction of staff, based on safety regulations in this operation manual

2.8 Safety instructions relevant to operation

- If hot or cold machine components involve hazards, they must be guarded against an accidental contact at side.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- A touch guard, dismantled i.e. for maintenance works, must be assembled before restarting of machine.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk that may occur to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be precluded (see, for example, the VDE Specifications and the by-laws of the local power supply utilities).

2.9 Safety notes for assembly-, service- and maintenance works

The operator has to ensure, that all assembly-, service- and maintenance works are done by authorized and technical staff, which is thoroughly acquainted by reading up on instruction manual. Works at the machine must be principally done only when power is down. The procedure for switching-off the machine as described in operation manual must be strictly observed.  [6.5 Shut down](#)
Pumps or –aggregates, which pump liquids, which are hazardous to health, must be decontaminated. Immediately after finishing the works all safety- and protective devices must be reinstalled and/or activated. Operation without these devices is not allowed. Before recommissioning consider the instructions stated under  [6.3.1. commissioning](#)

2.10 Residual Risk

Despite of enormous protective measures against hazards it cannot be ruled out. The quality structure of the product reduces residual risks to the minimum. These are evitable in strict accordance of the applicable safety measures and by professional working.

	 DANGER
	Remaining Residual Risks <ul style="list-style-type: none">• Electric shock hazard during connection of power supply.• Electric shock hazard during interruption of power supply.• Hazard by leakage of medium  Works at / with power lines must be done only, if the lines are out of service and secured against unforeseeable restart. Check leakproofness before commissioning / decommissioning

2.11 Consequences and hazards at disregarding this operation manual

Disregarding of safety instructions can cause hazards for persons as well as for environment and machine.

For example:

- Failure of import functions of machine
- Failure of stipulated methods of service and maintenance
- Hazards for persons caused by electrical, mechanical and chemical impacts
- Hazards for environment by leaking dangerous medium

	NOTE
	 Disregarding of safety instructions and provisions can result in loss of any claim damages and warranty.

3. Transport, preservation, intermediate storage, reshipment and disposal

3.1 Safety instructions for transport and intermediate storage

Regarding transport, the rules and regulations common in the transportation business, respectively the regulations for handling of fork carriers, cranes etc. are to be observed

3.2 Transport / Unpacking

3.2.1 Transport

Our products are packed up for transport as stated in order confirmation according to the standard of the manufacturer. During transport, the pump must not be exposed to any strong vibrations, otherwise the lifetime of ball bearings and other sensitive parts may be reduced

Pay attention to transport securing according to instructions!

	 DANGER
	Danger of life by falling-off parts Pumps must be transported and lifted according to the valid instructions and regulations  Mind lifting instructions in  9.4 Transport, Intermediate storage and assembly / installation

3.2.2 Unpacking

Already during unpacking of supplied product make sure that serial number stated on order confirmation is the same as stated on delivery note and name plate of. The shipment must be checked for completeness. The goods should be preferably unpacked on site, sothat unintended and unforeseeable contamination is avoided. Also make sure, that the product is not damaged during unpacking and that no parts of packing material remain at the product. Packaging waste must be disposed in a way that no hazards arise for personal (i.e. stumbling or any other hazards) and environment

	NOTE
	✓ Pay attention to 9.4 Transport, Intermediate storage and assembly / installation

3.3 Preservation

3.3.1 Durability

In regular case, the preservation is for a period of time of approximately 3 months.
We normally use preservation which is physiologically safe. For any additional information, please, apply to manufacturer.

3.3.2 Continued preservation

For a longer period of intermediate storage the preservation has to be checked and, if necessary, supplemented by commercial products, which do not affect the used materials. Especially the parts, which are in contact with other parts, must be protected against corrosion sothat it do not stick together. For more information, please, contact the manufacturer.

3.3.3 Removal of preservation

Normally the perservation is washed-off during trial service of the pump/ plant. A removal is not necessary.

3.4 Intermediate storage

Intermediate storage in an environment with high humidity and altering temperatures must be avoided.
Deviations must be cleared up with manufacturer. Condensation water may attack metal parts in contact (e.g. bearings) and impact quality of lubricating greases. In case of delivery with internal combustion engine, make sure, that cooling systems and motor are protected from frost damage.

	NOTE
	The warranty claim expires, if storage instructions are disregarded!

3.5 Return consignment

Return drained pump, only!

If hazardous liquids were pumped, decontamination of pump is necessary before returning it.
For return consignment only use preservation and transport packing prescribed by manufacturer.

	⚠ DANGER
	Hazards by liquids which are dangerous to health and environment Pay attention to safety instructions in this manual as well as instructions of operator and locally applicable regulations. To be in suitable, personal protective gear is obligatory. If liquids are pumped, which are hazardous for persons and environment, precautions have to be taken, which ensure safe collecting of leakage and its proper disposal.

	NOTE
	Disregarding of instructions for return consignment can result in loss of any claim damages and warranty.

3.6 Disposal

The operator is responsible for proper disposal of the product.

For proper disposal, the following procedure is helpful:

- Drain medium and, if necessary, collect for separate disposal. Decontaminate product, if necessary.
- Disassemble pump/aggregate
- If liquids are pumped, which are hazardous for health and environment, clean contaminated parts of pump/aggregate
- Separate different materials
- Proper disposal of different components according to local applicable regulations.

	⚠ DANGER
	Hazards by liquids which are dangerous for health- and environment The safety instructions in this manual, of operator and local applicable regulation must be observed. To be in suitable, personal protective gear is obligatory. If liquids are pumped, which are hazardous for persons and environment, precautions have to be taken, which ensure safe collecting of leakage and its proper disposal.

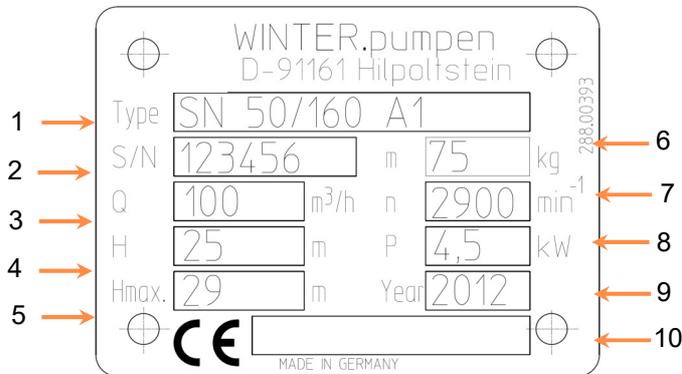
4. Specification of a product

4.1 General description

The Norm-Pumps are a single stage, normal priming centrifugal pump with power assignment and main measurements to EN733. The Norm-Pumps are multiple usable and allows/enables to a reliable and cost-efficient pumping of a lot of different liquids.

4.2 Information to the Product

The technical specifications and characteristics of the product can be taken from the name plate of pump:



ILL 1: Example of a name plate

Nr.	specification
1	Pump type and Execution
2	Serial number (six digits)
3	Quantity operation point
4	Discharge head operation point
5	Maximum discharge height
6	Weight
7	Speed
8	Power
9	Build Year
10	Additional Indications

Chart 4: Description of name plate

The performance specifications of the product can be also learned from the datasheet and the contract documents, if agreed before. The performance data of motor are stamped on its name plate.

4.3 Construction of the pump

4.3.1 Construction

4.3.1.1 Volute casing

WSCA pumps have a single flow, single-stage volute casing with double suction impeller

4.3.1.2 Impeller

According to the pump, with radial-flow impeller or semiaxial impeller.

4.3.1.3 shaft / bearing

construction

Standard:

- vertical shaft
- WSCA 600: grease lubricated bearings
- WSCA 500: lifetime lubricated bearings

4.3.1.4 shaft seals

Standard:

- WSCA 600: Water and grease lubricated and cooled gland packing
- WSCA 500: shaft sealed by lip seals

The kind of installed shaft sealing is stated in the order confirmation, the delivery notes and in the technical datasheet (if available) in the appendix of this instruction.

4.3.1.5 Driving

The pumps are driven by electric motor, hydraulic motor or internal combustion engine. The combustion engine needs fresh air.

	⚠ DANGER
	<p>Hazards for health based on serious burns and exhaust</p> <p>There are high temperatures on the combustion engine. Pay attention to safety instructions in this manual as well as instructions of operator and locally applicable regulations. To be in suitable, personal protective gear is obligatory. The exhaust of the combustion engines must led off. Pay attention to the instructions for operating of the motor.</p>

4.3.1.6 Base frame

According to customer request, the aggregate is mounted on base frame.

4.4 Details on installation site

4.4.1 Space requirement for operation and maintenance

The pump aggregate must be installed in a way that enables to exchange components or the complete unit. If the aggregate is heavy, facilities adapted to the weight are to be provided in order to safe hang-in support of lifting devices and other auxiliaries. Provide appropriate corridors for the transport.

4.4.2 Admissible environmental conditions

Pay attention to dry, frost-proof, vibration free installation of the pumps and pump aggregates. Ambient temperatures below 5°C and higher than 40°C must be avoided. Variations are available on inquiry.

4.4.3 Underground, fundament, wall

Basements must be designed so, that pump respectively the complete pump aggregate can be built up in a safe way and without stresses. Pay attention to the fact that no vibrations are passed onto the pump or pump aggregate via fundament.

 [5.4. Pipe works](#)

4.4.4 Auxiliary connections

Order related, see order confirmation and delivery note

- WSCA 600
 - Grease connection for gland packing
 - Grease connection for slide bearing

4.5 Emission values

The noise expectancy values during operation of the Norm-Pumps are, according to size, operation point and motor, of a sound pressure level between 65dB und 100 dB.

	 WARNING
	Hazards by noise emissions  Use noise protection (personal protective gear)

4.6 Measurements and weights

The measurements of the supplied product are stated in dimensional drawing, enclosed to this manual. The weight, applicable for the supplied pump/unit is stamped on name plate.

5. Installation- and assembly instruction

5.1 Safety Instructions

	NOTE
	The installation of machines and parts of machines must be done by technical skilled and qualified staff, which obeys the safety instructions, valid and stated in this operation manual. Consider  9.3 Tightening torques

5.2 Check before assembly and installation

Before starting with assembly works, immediately after receipt of goods, check serial number and pump type of name plate with the information in order confirmation and delivery note. Moreover a sight check in regard to transport damages must be done. The manufacturer must be notified immediately about transport damages, to assess whether the product is fully operational or not.

	CAUTION
	 Make sure, that no packing material is in voids of the pump/aggregate.

 [3.2.2 Unpacking](#)

5.3 Installation- and assembly instruction

	NOTE
	The installation of machines and parts of machines must be done by technical skilled and qualified staff, which obeys the safety instructions, valid and stated in this operation manual.
	WARNING
	Hazards for persons and property by installation of machines on unfixed or not load-bearing fundamentals.  Installation of product only on horizontal and plane surfaces Consider weight data at product

1. Installation of the machine at adjustment elements/fundament and align by means of a water level at shaft and outlet. Allowable tolerance: 2 mm/m
2. Use underlayment-sheets for a possibly necessary height adjustment. These must be put under between the support surfaces of the product and the fundament near of the fastening screws. All used sheets must lay plane! If adjustment elements are used, the alignment must be made by means of screwed feet.
3. Screw in fastening screws and fasten it.  [9.3 Tightening torques](#)

5.3.1 Alignment of coupling

	WARNING
	Hazard by touching/catching at sudden start-up of shaft Put aggregate out of service! Secure against unintended restart! Indications to power supply under  5.7. Connection of energy supply

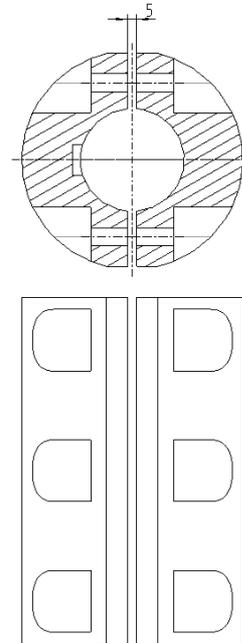
Couplings not supplied by the manufacturer are to be installed and aligned according to the instructions of the respective manufacturer. Couplings supplied with the pump must be aligned as follows:

The distance between both coupling parts need to be measured on all four (4) corners of the coupling.
All four measurement points need to have the same distance +/- 0.15 mm.
It need to be assured, that the connected shafts are in line to each other.

The alignment need to be checked during installation and also after installation when rotated by 180 degree.

CAUTION

A check is necessary at several spots of the coupling circumference.



III.: 2: Alignment coupling

5.4 Pipe works

5.4.1 General

CAUTION

The pipe work must be absorbed directly in front of the pump, must be assembled stress less to the pump and possible charges on connections must be absorbed by suitable measures (e. g. with compensators,...) Pay attention to heavy forces, which may arise at thermal expansion and at filling up big tubes. Pipeworks must be designed as short and straight as possible in order to avoid friction losses. Make sure, that contamination of pump is avoided. Pipes must be laid in a way that air cushions during filling-up are avoided. Make sure that no flange gaskets project in pipes which reduce the cross section of pipes.

The pipework must be built in a way that enables dismantling of pump without draining of vessel or pipes.

To get correct data at site, the pressure measurements shall be acc. to velocity mentioned in point

 [5.4.2 Dimensioning of piping](#). Elbows, valves, taper pieces etc. could affect the pressure measurement points.

Therefore these parts should not be close at the pressure measurement points. Test on circulation pumps are carried out according to DIN EN ISO 9906:2023-3. The arrangement for the flow measure system should be according to the instructions of the supplier. Consider  [9.3 Tightening torques](#)

5.4.2 Dimensioning of piping

In order to minimize losses due to friction in pipes, the flow velocity in the suction, respectively feed pipe must not exceed 1.5 m/s and 2.5 m/s in pressure lines.

- Suction pipe

It need to be assured that the pump will be operated always with inlet-pressure on the suction side.

The inlet pressure in addition to the maximum differential pressure of the pump shall not exceed the maximum allowable pressure of the pump.

- Minimum liquid level

The construction of the conduits and the liquid supplies are to be designed in accordance with the rules of the conduit manufacturers in such a way that the pump can not suck in any air.

A dry-run may cause considerable damage to the pump and the seal.

- **Pressure pipe**
The pressure pipe must be fitted with a gate valve and a non-return- valve. The gate valve renders possible to set a special flow rate while water hammers in pipes at the occasion of switching off the pump are avoided by means of the nonreturn valve. Moreover the non-return-valve is a safety device which allows dismantling the aggregate without draining the pressure line.
- **Data of measurement points**
Tests on centrifugal pumps are carried out according to DIN EN ISO 9906:2013-3. The velocity in the measurement pipes should not be above the data mentioned at the beginning. Taper pieces must be used for higher velocities. Elbows, valves, taper pieces etc. should be mounted behind the pressure measurement points. Therefore these parts should not be too close at the pressure measurement points.

	NOTE
	 To receive reliable measurement data at the plant, a pressure measurement should be made, considering the afore mentioned flow velocities and the construction according to DIN EN ISO 9906:2013-3.

The arrangement for the flow measure system has to be according to the instructions of the supplier.

5.4.3 Pressure tests

	NOTE
	 Before mounting the piping to the pump, reservoirs, pipeline and connections must be cleaned thoroughly, scoured out and, if medium makes it necessary, blown through.

The conduits must be leak tested without the pump. Otherwise the pump may be damaged. The mounted pump is normally tested statically under the 1.5-fold of the maximum pressure of the delivered pump.

5.5 **Installation- and assembly instructions for emission-decrease**

Pay attention to screw connections during installation- and assembly works.  [9.3 Tightening torques](#)

	WARNING
	Hazards by vibrations and noise emissions  Check that all screws/connections are tightened! Make sure, that tightening torques of screws are according to valid instructions!

Disregarding of these instructions can result in extended vibrations and extended noise pollution with consequent physical and emotional damages.

5.6 **Protection**

5.6.1 Mechanical

Normally, the safety devices at the product must not be removed.

Dismantle pump only, if power supply is down, to do maintenance works.

	WARNING
	Hazard by touching/catching at sudden start-up of shaft  Put aggregate out of service! Secure against unintended restart! Indications to power supply under  5.7. Connection to power supply

After these works and before starting machine reinstall all safety devices.

Used safety devices: (execution-specific)

- Touch guard at bearing pump side
- Touch guard at bearing drive side
- Coupling guard between bearing and motor

5.6.2 Electrical

If the pump aggregate works outdoors (hazard by lightning) or in case of hazards by electricity charge during operation, an additional earth lug can be installed upon request of customer.
Please, contact manufacturer.

5.7 connection to power supply

	CAUTION
	Connection of machine to electrical grid must be done by technical qualified staff, under consideration of the valid DIN- / VDE- rules and, if necessary, of national valid rules as well as of safety-norms of the European Community.



Consider [2. Safety!](#)

- Consider operation instruction for motor
- Consider stated sense of rotation
- Consider star-delta switch-over (activate time relays)
- Before checking sense of rotation, it is absolutely necessary to fill the pump and the pipeline up with medium, or, if medium is hazardous for environment and/or health, fill up with water.
-  Minding [5.8. Check after installation!](#)

5.8 Check after installation

It is necessary to check the sense of rotation of the pump after installation and connection to power supply.

	NOTE
	Consider that, before checking sense of rotation, pump and pipeline must be filled up with medium, or, if medium is hazardous for environment and/or health, filled up with water. Dry running of pump can destroy important parts of pump.

Viewing from motor to pump, the rotation is clockwise. If special pumps are involved or gears are used, it can be necessary to operate the pump with anti-clockwise rotation.

Pay attention to arrow at volute casing and, if available, instructions in order confirmation and delivery note, when checking direction of rotation.

	WARNING
	Hazards by rotating parts  Never hold hands or objects in the pump! Clean pump, reservoirs, pipeline and connections from dirt and foreign objects.

Observe  [8: Interruptions](#), if sense of rotation is wrong!

6. Starting-up and shut-down

6.1 Details for initial starting

The corresponding operation manuals of other necessary parts of plant and all safety notes must be considered.

6.2 Preparing for operation

6.2.1 Bearing applications

- Regarding lifetime lubricated bearing applications, a continued lubrication is not necessary.
- When using bearing appliances with a regreasing device, ensure that the bearings are always sufficiently lubricated before commissioning and before a re-start of the machine. Make sure, that the bearings are not „over-greased“!

6.2.2 Filling / Venting

CAUTION

Pump and conduits are to be filled-up with the pumping medium and are to be vented at the highest point. Check that there is no pressure in pump before venting of pump, to avoid injuries.



WARNING

Mind protection for persons and environment, when using liquids, which are hazardous for environment and health. Reinstall safety devices.

6.2.3 Shaft seal



WARNING

Mind protection for persons and environment, when using liquids, which are hazardous for environment and health. Reinstall safety devices.

- Lip seals
For execution with lip seals, no special works are necessary.
- Gland packing
Before starting up, loosen the gland in order to cause an increased leakage when the pump is set into operation. The leakage is necessary for the lubrication of the gland in the run-in phase of the pump. A too strong tightening of the gland packing causes higher wear on the shaft protecting sleeve and possibly the damage of the gland packing caused due to overheat. After a running-in phase of about 2-3 working hours, the gland packing can be tightened carefully.
A permanent insignificant leakage is necessary for the lubrication of the gland packing.
If leakage arises, the gland packing can be tightened only during operating by means of the nuts at the gland.
In order to avoid tilting of the gland, it is necessary to tighten also the nuts.

6.2.4 Electric connections



WARNING

Hazards by electric shock
Electric connections are described under
 [5.7. Connection to power supply](#)

6.2.5 Monitoring- and control devices

6.2.5.1 Conducting functional check

The functioning of emergency switches and other switching elements of controller must be checked regularly by the operator.

6.2.5.2 Programming

Control equipment and monitors must be programmed by operator as agreed upon with manufacturer.

6.2.5.3 Supplementary facilities (cooling, circulation, heating etc.)

CAUTION

Make sure that, if pump is equipped with cooled mechanical seal or gland packing, cooling of seal starts in cold condition of pump and stops only, when pump is cold again after switching off. Quenches are to be checked in regular periods and are to be refilled in the case of losses of liquid or rather be renewed in the case of an enrichment with the pumping medium.

6.2.5.4 Motor protection (setting)

Set over-current relay, monitoring devices for ptc thermistors to the admissible values. The operating manual of the motor manufacturer is to be observed.

6.2.5.5 Emergency shut down

Properly functioning of devices for emergency shutdowns must be checked periodically.
Consider VdE- or other valid national/international norms.

6.2.6 Protection-devices of persons

6.2.6.1 Mechanical (e.g. protection against accidental contact with coupling, shaft)

Touch guards, which protect from rotating parts, must be installed before starting the machine.
Protecting devices against cold or hot parts, or used as splashguard against chemical, aggressive, health-hazardous, cold or hot liquids, must be installed before starting the machine. Commissioning/starting of machine without available safety

devices is not permissible! Protecting devices must not be dismantled during operation. If a dismantling of protecting devices is necessary, pay attention, that they are reinstalled before next start of machine...

6.2.6.2 Acoustic-emission protection

	CAUTION
	In the proximity of the aggregate must be ear protection is generally necessary. For combustion engines use a silencer with high damping to avoid noise pollution beyond site. The instructions of operator regarding health and safety at work as well as to accident control must be obeyed.

6.2.6.3 Power supply

	CAUTION
	Protecting devices at electric components must correspond to DIN- und VDE-regulations. They must be installed before starting the machine and must not be dismantled during operation. Consider  2. Safety

6.3 Starting-up

6.3.1 Commissioning

Before starting with commissioning, the operating manual must be completely studied and understood by the operator in order to avoid any accidents or damage. The commissioning must be done as follows:

- Check all protecting devices
- Check functioning of periphery, for example cooling systems (if existing)
- Consider  [6.2.3 Shaft Seal](#) at execution with gland packing
- Suction- and feed valves must be completely open
- The pressure valve must be slightly open
- Pipe work and pump must be completely filled with medium and completely vented
- After starting the pump, adjust the capacity via the pressure valve. By no means the capacity is to be adjusted by means of the suction valve. When adjusting the capacity, must be observed, that the pump never works in an area, where the motor may be overloaded. Pay attention, that no longer operation of the pump takes place with very low flow (less than 10% of the maximum possible rate of flow).

CAUTION

Ensure that the pump does not operate while the shut-off devices are closed as during this kind of operation high forces are acting onto the impeller and the bearing apparatus. The energy supplied by means of the impeller is transformed into thermal energy and results in boiling of the pumping liquid as via the pumping medium no heat abstraction is performed. Therefrom resulting damage caused by cavitation or by the overload of bearings may occur within very short time. In this case guaranty expires.

6.4 Instructions to operation of machine

6.4.1 Starting frequency

Supplied electric motors are performed for the duty class S 1/permanent operation.

6.4.2 Operation with throttled gate valve (minimum rate of flow)

The minimum flow rate is to be set at approximately 20 % of the maximum possible rate of flow.

6.4.3 Operation with closed gate valve

The operation with closed gate valve is inadmissible - even for a very short time. See  [6.3.1. Commissioning](#)

6.4.4 Stand-by operation

Pumps, which are operated stand-by, must be taken into operation at least once a week. The operating time must allow the evenly warm up of the pump to regular operating temperature.
Observe maintenance intervals.

6.5 Shut-down

6.5.1 Safety instructions

	NOTE
	<p>The VdE rules, the corresponding EU-rules as well as all national valid rules must be observed. Pay attention to  2. Safety.</p>

6.5.2 Switch-off

	⚠ WARNING
	<p>Disconnect aggregate from power supply! Secure against unintentional restarting! If combustion engines are used, stop fuel supply and disconnect batteries, respectively remove spark plugs.</p>

6.5.3 Draining

Drain pump and conduit, under consideration of possible hazards by pumping medium, at the hexagon plug screw in the lowest position. Pay attention to personal- and environment protection!

	⚠ WARNING
	<ul style="list-style-type: none"> - The drainage and the venting are only admitted during the standstill of the pump - The pump must be without pressure

6.5.4 Preservation

see  [3.3.2. Continued preservation](#)

6.5.5 Storage

see  [3.4. Intermediate storage](#)

6.6 Restarting

Restart according to instructions.  [6.3.1. Commissioning](#). Pay attention to the observance of the lubricating periods of pumps and pump aggregates.

7. Maintenance and Servicing

7.1 General instructions / Safety instructions

The safety instructions in this manual and of the operator as well as national norms currently in force are valid for service- and maintenance works.

Consider also operation- and assembly manuals for all assembled parts of plant.

7.2 Manufacturer's recommendation for spare parts according to DIN 24296

The manufacturer recommends to have in stock the spare parts recommended to DIN 24296, as per below chart. The indication of quantity is for continuous operation of 2 years.

No.	Spare Part	Number of pumps ²⁾ (including stand-by-pumps)						
		2	3	4	5	6 / 7	8 / 9	>10
		Quantity of spare parts						
1 ¹⁾	Impeller	1	1	1	2	2	2	20%
2	Wear ring ³⁾	2	2	2	3	3	4	50%
3	Shaft with key & safety elements	1	1	1	2	2	2	20%
4	Radial bearing (Set)	1	1	2	2	2	3	25%
5	Packing ring ³⁾ (Set)	4	4	6	6	6	8	100%
6	Mechanical seal complete / Lip seal ¹⁾ (Set)	1	1	2	2	2	3	25%
7	Gasket for Pump casing (Set)	4	6	8	8	9	12	150%
8	other Gaskets	4	6	8	8	9	10	100%
9	Coupling/Transmission elements	1	1	2	2	3	4	30%

¹⁾ Optional
²⁾ If a spare part can be used for different pumps of the plant, the quantity of this part depends on total quantity of pumps
³⁾ contained in pump order-related, only.

Chart 5: Recommendation to stock of spare parts

7.2.1 Motor with regreasing

The quality and quantity of stuff lubricants for motors with regreasing devices has to be taken from label on motor.

7.2.2 Oil lubrication bearing

At normal operation conditions the oil must be changed after abt. 2000 working hours. For oil change also consider  [6.2.1 bearing applications](#). Before starting up and oil change you have to fill the oil lubricated bearing with oil. The oil level has to be between the minimum and the maximum marks on the oil dipstick.

Lubricant:

Non-alloy mineral oils to DIN 51517 with code letter CL and a viscosity of 20 – 30 mm²/s are normally sufficient. Make sure, that oils with different qualities are not being mixed up.

7.3 **Preventive measures**

(e.g. wearing parts, lubrication, quench-medium...)

Spare parts see in item  [7.2. Manufacturer's recommendation for spare parts according to DIN 24296](#)

Sealing liquid: Liquids, which are used, must satisfy the following requirements:

- solution of the pumping medium without sedimentation or chemical reactions
- poisonlessness and peaceableness to the environment
- inferior viscosity (similar to water)
- no chemical attacks against the used materials...

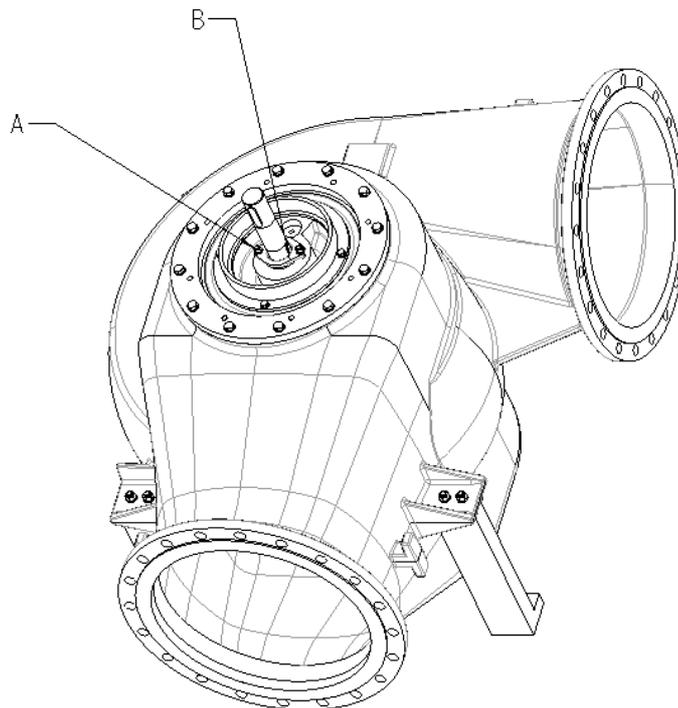
7.4 Change of sealing

	<p>NOTE</p> <p>Assembly works must be done by technical qualified staff. To obtain warranty, works at the product must be done by the service-staff of the manufacturer or by persons, authorized by the manufacturer. Consider 6.5 Shut-down Exemplar procedures are valid for all executions of Normpumps Consider 9.3 Tightening torques</p>
	<p>WARNING</p> <p>Disconnect aggregate from power supply! Secure against unintentional restart! If combustion engines are used, stop fuel supply and disconnect batteries, respectively remove spark plugs.</p>

7.4.1 Change of gland packing

Comply with following procedure:

- Switching-off of pump aggregate according to [6.5.2. switch of](#)
- Loosen nuts (A) and push back gland (B)
- Pull out packing rings
- Clean gland area, shaft und gland
- Check shaft on wear & tear- and shrinkage damages
- ✓ Replace the shaft, if it shows heavy shrinkage damages [7.6 Disassembly and Assembly](#)
- Insert new packing rings with the butt, staggered by 90° each, in the stuffing box area.
- Slightly tighten gland (B) with nuts (A)
- Consider [6.2.3. shaft seal](#)
- Restarting must be done as described in [6. Starting-up and shut-down](#)



III. 3: change gland packing

7.4.2 Change of lip seal

Depending on installation circumstances, pump- and motor size must be decided whether the pump aggregate has to be partly or totally dismantled from basement.

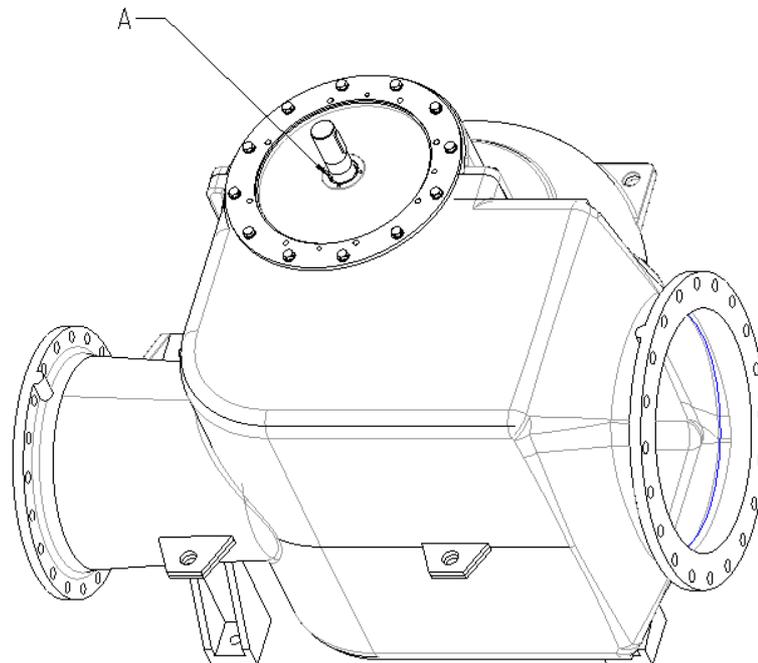


NOTE

On principle, complete mechanical seal has to be changed.
Auxiliaries: 0,5 % soapsuds , soft fuzz-free cloth

Comply with following procedure:

- Switch-off pump aggregate as per  [6.5.2 Switch-off](#)
- Remove coupling located on the pump shaft end
- Remove Key from pump shaft
- Remove old lip seal (A)
- Clean pump shaft and seat of the lipseal
- Grease the lip seal, the shaft and the lip seal seat with soap water
- Slightly put the lip seal on the shaft towards lip seal seat
- Take care that the lip seal will not be damaged by the key nut
- Place the lip seal into the seat
- Put back key in shaft and asselble coupling again.



III. 4: Change of lip seal

Restarting must be done as des described in  [5. Installation- and assembly instruction](#) and  [6.6. Restarting](#).
Pay attention to the corresponding safety instructions!

7.5 Disassembly and Assembly

	<p>NOTE</p> <p>Assembly works must be done by technical qualified staff. To obtain warranty, works at the product must be done by the service-staff of the manufacturer or by persons, authorized by the manufacturer. Procedures are valid for all executions of Normpumps Consider  6.5 shut-down and  9.3 Tightening torques</p>
	<p>WARNING</p> <p>Disconnect aggregate from power supply! Secure against unintentional restart! If combustion engines are used, stop fuel supply and disconnect batteries, respectively remove spark plugs.</p>
	<p>DANGER</p> <p>Danger of Crushing by falling-down parts Lifting of products must be done under consideration of accident prevention regulations and possible other available instructions.</p> <p> Consider lifting instructions in  9.4. Transport, Intermediate storage and assembly / installation</p>

8. Interruptions

Example to use Interruption matrix:

Fault: Pump runs not properly/noisy

From the list of mechanic interruptions take code letter „E“

According to the following chart; Interruption matrix: The following causes are possible: 4; 8; 13; 14; 15; 16; 17; 18
In the following chart; Causes and fault removal: Select the possible causes by means of code letters and consider.

8.1 Hydrodynamic faults

- A insufficient discharge flow
- B insufficient discharge height
- C Pump does not suck
- D Interruption of discharge flow just after starting of pump

8.2 Mechanic faults

- E Pump runs not properly/noisy
- F Pump runs very noisy
- G Strong leakage at shaft sealing
- H Leakage at pump
- I Motor is overloaded

8.3 Electric faults

consider VdE rules at electric faults!

Fault-removal according to product specific checklist																					
Fault	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
A	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
B		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
C					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>														
D						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>														
E				<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>								
F			<input checked="" type="checkbox"/>																<input checked="" type="checkbox"/>		
G									<input checked="" type="checkbox"/>												
H										<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
I														<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Chart 6: Interruption matrix

No.	Cause	Fault-removal measurements
1	Too much counter pressure of plant	Adjust to requested duty point
2	Too much discharge flow	Adjust to requested duty point
3	Too much suction height	Reduce suction height
		Increase inlet pressure
		Suction medium is too hot
4	Wrong rotation direction	If driven be E-motor change two phases
5	Pump and circuit is not filled	Vent pump and circuit
6	Airlocks in suction pipe	Change construction of conduit so that no airlocks can arise
7	Leaking suction pipe	Check flange gaskets
		Check, whether foot valve closes
8	Foreign substances in pump or impeller	Remove volute casing, check volute and impeller channels
9	Shaft seal is worn out	Change shaft seal
		Check, whether conveyed medium complies with medium stated in customer order documents.
10	Loose connection screws	Retighten connection screws
11	Defective casing gasket	Change casing gasket
12	Wrong speed of rotation	E-motor with wrong speed; change motor
		Combustion engine
13	Inner parts worn out	Change defective parts
14	Insufficient counter value	Check the whole plant
		Adjust to requested counter pressure
15	Bad/wrong alignment of aggregate or coupling	Check coupling and align new, if necessary
16	Pump is implemented in conduit with stress; resonance oscillations,	Support conduit by suitable measurements
17	Imbalance of impeller	Impeller is worn out, change impeller
		Impeller channels are blocked/dirty; clean impeller
18	Insufficient discharge flow	Consider minimum discharge flow
		Adjust to requested discharge flow
19	Higher density or viscosity than requested in customer order	Use motor with more power. „Necessarily contact manufacturer! “
		Adjust density and viscosity according to customer order requirements
20	Motor runs on two phases	Monitoring of phases check of over current relay
21	Malfunction of switchover form star- to delta connection	Check star-delta connection

Chart 7: Causes and fault removal

9. Corresponding documents

9.1 Specification of pump parts

Please, find the specification of pump parts in order-related technical documentation.

9.2 Drawings

Please, find drawings corresponding to supplied product in order-related technical documentation.

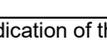
9.3 Tightening Torques

	HINWEIS
Tightening torques shown in the following III. correspond to stated strength classes! For other strength classes contact screw manufacturer for information to tightening torques.	

thread	property class	tightening torques [Nm]
		by total friction factor $\mu=0,08$ (screw MoS ₂ lubricated or cadmium-plated)
M8	8.8	17,9
	10.9	26,2
M10	8.8	36
	10.9	53
M12	8.8	61
	10.9	90
M16	8.8	147
	10.9	216
M20	8.8	297
	10.9	423
M24	8.8	512
	10.9	730

III. 20: Screw tightening torques

9.4 Transport, Intermediate storage and assembly/installation

	CAUTION
The transport as well as assembly and installation must be done in a good and workmanlike manner.	
	NOTE
If lifting eye bolts at motor are available, it must be used for lifting of weight of motor, only. Before lifting retighten it.	
	WARNING
By no means, lifting eye bolts of motor must be used for lifting/installation of the whole pump-motor unit!	
	NOTE
For this application synthetic fiber bands or other suitable facilities must be used at suitable places at product. Suspension of the product must be done only at stable suspension points, like casing, flanges, and frame by means of lifting eye bolts, which are specially welded for this at the base frame!	
	DANGER
<p>Make sure, that the product cannot slip out of lifting facilities during transport! Mortal danger by falling off parts!</p> <ul style="list-style-type: none">  Transport product only in horizontal position!  By no means has use free shaft ended for lifting/transporting!  Consider local accident prevent regulations!  Use only suitable and permitted lifting gears! 	

Please, find weight indication of the product in technical order documentation or at name plate of pump.

EC-Declaration of Conformity

In accordance with the EEC machine directive 2006/42/EC, appendix II A

We hereby certify that the following described machine in it's conception, construction and form put by us into circulation is in accordance with all the relevant essential health and safety requirements of the EC machinery directive 2006/42/EEC as amended and the national laws and regulations adopting this directive. This declaration is no longer valid if the machine is modified without our consent.

Manufacturer and name of the authorised representative of the technical file:

Winter.pumpen GmbH
An der Autobahn L2 D – 91161 Hilpoltstein

Description of the machine:

- Type: Splitcase Pump
- Type series: WSCA

The agreement with further valid guidelines / regulations following for the product is explained:

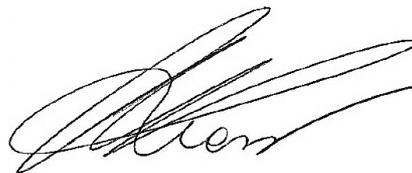
- EMC-Directive (2004/108/EC) (for execution with electric motor)
- LVD-Directive (2006/95/EC) (for execution with electric motor)

Applied harmonized standards:

- EN ISO 12100:2010
- EN 809:1998+A1:2009/AC:2010

Applied other technical standards and specifications:

DIN EN 60034-1 (for execution with electric motor)



Hilpoltstein, 06.10.2016

Oliver Knorr, General manager



Winter.pumpen GmbH

An der Autobahn L 2 · D-91161 Hilpoltstein

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