Pioneering for You

Wilo-Crono... IL/DL/BL
Wilo-Vero... IPL-N/DPL-N, IPS

de Zusatzanleitung ATEX
en Supplementary instructions ATEX
fr Notice complémentaire ATEX
nl Extra handleiding ATEX

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1 General

About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

The installation and operating instructions (or the supplementary installation and operating instructions) are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

The installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

EC declaration of conformity:

A copy of the EC declaration of conformity is a component of these installation and operating instructions.

If a technical modification is made on the designs named there without our agreement or the declarations made in the installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These supplementary installation and operating instructions contain basic instructions concerning utilisation in potentially explosive areas that are to be observed during installation, operation, monitoring and maintenance. For this reason, these supplementary installation and operating instructions must, without fail, be read by the service technician and the responsible specialist/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point “safety” that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

In addition to the present supplementary installation and operating instructions, the following other installation and operating instructions also apply; it is imperative that they be complied with in order to avoid dangers:

- Installation and operating instructions for the pump series
- Installation and operating instructions for the motor

The present installation and operating instructions do not take into account any local regulations for the compliance with which the operator is responsible – also with respect to any installation personnel called in.

In the event that additional information or instructions are required, as well as in case of damage, please contact the International Service Department at WILO SE.

2.1 Indication of instructions in the operating instructions

Symbols

General danger symbol

Danger due to electrical voltage

Special safety information in regard to explosion protection

NOTE

Signal words

DANGER!
Acutely dangerous situation.
Non-observance results in death or the most serious of injuries.

WARNING!
The user can suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this note is disregarded.

CAUTION!
There is a risk of damaging the product/unit. 'Caution' concerns possible damage to the product that could occur if this note is disregarded.

NOTE:
Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as:

- Direction of rotation arrow
- Identification for fluid connections
- Rating plate
- Warning sticker

must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages. Non-observance of the safety instructions can result in the loss of any claims to damages.

In detail, non-observance can, for example, result in the following risks:

- Danger to persons from electrical, mechanical and bacteriological influences
- Damage to the environment due to leakage of hazardous materials
- Property damage
- Failure of important product/unit functions
- Failure of required maintenance and repair procedures.

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.

If the product is utilised in potentially explosive areas, the sections of these supplementary installation and operating instructions marked with the ⟨Ex⟩ symbol are to be observed in particular.

2.5 Safety instructions for the operator

Wilo devices are not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the devices.

- If hot or cold components on the product/the unit lead to hazards, local measures must be taken to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed whilst the product is in operation.
- Leakages (e.g. from the shaft seals) of hazardous fluids (which are explosive, toxic or hot) must be led away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions.

Work to the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the Installation and operating instructions for shutting down the product/unit be complied with.

Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operational reliability of the supplied product is only guaranteed when used properly in accordance with the section in the installation and operating instructions titled “Intended use”. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

2.9 Residual hazards

The following residual hazards could be caused by the pumps:

The pumps and equipment parts, such as the installation flange and the sealing (mechanical seal, flat gasket including the pipework), can be subject to pressure or high temperatures resulting from the fluids and gases.

Even when all necessary precautionary safety measures have been implemented, there still exists a residual danger caused by leakiness or mechanical damage on the pump body. Gases, vapours or fluids could escape unnoticed at seals or screwed connections.

An uncontrolled chemical reaction could take place in the product area when the pump is at a standstill caused by motor or coupling failure.

An electrostatic charging of the circulating fluid and thus the danger of ignition is possible as a result of the operation of the pump, as is the case with all closed circuit circulation processes involving flammable liquids.

- **Implement corresponding precautionary measures, see chapter 6.4 “Earthing” on page 26 and chapter 8.3 “Coupling protection” on page 31.**

3 Transport and interim storage

The instructions listed in the installation and operating instructions of the respective pump series are to be complied with.

4 Intended use

Purpose

In potentially explosive areas of Categories 2 and 3, Atmosphere G, which are covered by EU Directive 94/9/EC, no pumps may be utilised except those whose designs have been approved for the specific utilisation purpose intended.

The EC-Type Examination Certificates prescribed pursuant to Directive 94/9/EC must be available for the drive motor and the electrical apparatus; in addition, these components must also be correspondingly marked as such. The equipment must be certified for the respective temperature class. The relevant standards according to the motor examination certificate are to be used as the basis for the setting up and operation of the motor.

The glanded pumps of the following series

- Wilo-CronoLine-IL
- Wilo-CronoTwin-DL
- Wilo-CronoBloc-BL
- Wilo-VeroLine-IPL-N
- Wilo-VeroTwin-DPL-N
- Wilo-VeroLine-IPS

are intended for use as circulation pumps in building services.

Fields of application

The above mentioned glanded pumps may only be used for:

- Hot water heating systems
- Cooling and cold water circulation systems
- Process water systems
- Industrial circulation systems
- Heat carrier circuits

Restrictions

Glanded pumps are not approved for generator operation!
Due to the speeds that are possible in this context, there is a danger of overheating and thus exceedance of the permitted temperature range.

- **Both operating conditions and permitted fluids can be found in the following chapter 5.2 “Authorised operating conditions” on page 23 of these installation and operating instructions.**

5 Specifications concerning products and operating conditions

5.1 Identification marking

Explosion-protected glanded pumps are marked as follows for interior pump space and environment.

Example:

- for interior pump space and environment:
  II2 Gcb IIA T3/T4 / II2 Gcb IIC T3/T4
- for the motor:
  CE 123 II2 G Ex e/d/nA/de IIA T3/T4

Explanation of markings based on the following examples:

Flag	Explanation
CE	CE marking
123	Name or symbol of the testing authority
II	Device group
2	Device category
G	Ex-atmospheres due to gases, vapours and mist
Ex	General marking of an explosion-proof motor
C	Design safety (protection due to safe design)
b	Ignition source monitoring with T4
IIC / IIB / IIA	Explosion group, corresponding to the distribution of gases and vapours as a function of the ignition temperature (MESG=gap width limit): MESG <0.5 mm: II C 0.5 mm < MESG <0.9 mm: II B MESG > 0.9 mm: II A
T1-T4	Temperature class with maximum surface temperature: T1 = 450 °C T2 = 300 °C T3 = 200 °C T4 = 135 °C
e/d/nA/de	Motor ignition protection class: e = increased safety d = pressure-resistant enclosure nA = non-sparking equipment de = pressure-resistant enclosure, increased terminal box safety

Tab. 1: Identification marking

Pumps and mechanical seals must be additionally protected against dry running in the T4 temperature range. This can be achieved by monitoring the differential pressure or the rated motor power (see chapter 6.5 “Dry-running protection” on page 26 and chapter 7 “Operating instructions” on page 27).
The pump may not be operated against closed valves, orifice plates, slide valves or other check valves in the media circulation. If these cannot be excluded, then a volume flow monitor must be installed.

5.2 Authorised operating conditions

5.2.1 For the IPL-N/DPL-N series

Fluid	Mechanical seal	Limitation of maximum permissible fluid temperature		
		Number of motor poles	T4 p=10 bar	T3 p=10 bar
Heating water in accordance with VDI 2035	Standard (AQ1EGG)	2	120 °C	120 °C
		4	120 °C	120 °C
Semi-desalinated water with conductivity >80 µs, silicates <10 mg/l, pH value >9	Standard (AQ1EGG)	2	120 °C	120 °C
		4	120 °C	120 °C
Mineral oil	with fluorine-rubber secondary seal, e.g. Viton (AQ1VGG)	2	105 °C	120 °C
		4	115 °C	120 °C
Heating water with conductivity <850 µs, silicates <10 mg/l, solid matter content <10 mg/l	Standard (AQ1EGG)	2	120 °C	120 °C
		4	120 °C	120 °C
Condensate	Standard (AQ1EGG)	2	100 °C	100 °C
		4	100 °C	100 °C
Cooling brine, inorganic; pH value >7.5, inhibited	Standard (AQ1EGG)	2 and 4	30 °C	30 °C
Water with oil contamination	with fluorine-rubber secondary seal, e.g. Viton (AQ1VGG)	2 and 4	90 °C	90 °C
Cooling water with frost protection (pH value: 7.5-10; no galvanised components)	Standard (AQ1EGG)	2 and 4	40 °C	40 °C
Water-glycol mixture (20 %-40 % glycol)	Standard (AQ1EGG)	2 and 4	40 °C	40 °C

Tab. 2: Authorised operating conditions for the IPL-N/DPL-N series

5.2.2 For the IL/DL/BL series

Fluid	Mechanical seal	Limitation of maximum permissible fluid temperature				
		Number of motor poles	T4 p=10 bar	T4 p=16 bar	T3 p=10 bar	T3 p=16 bar
Heating water in accordance with VDI 2035	Standard (AQ1EGG)	2	100 °C	90 °C	140 °C	120 °C
		4	115 °C	110 °C	140 °C	120 °C
Semi-desalinated water with conductivity >80 µs, silicates <10 mg/l, pH value >9	Standard (AQ1EGG)	2	100 °C	90 °C	140 °C	120 °C
		4	115 °C	110 °C	140 °C	120 °C
Mineral oil	with fluorine-rubber secondary seal, e.g. Viton (AQ1VGG)	2	75 °C	50 °C	140 °C	115 °C
		4	95 °C	80 °C	140 °C	120 °C
Heating water with conductivity <850 µs, silicates <10 mg/l, solid matter content <10 mg/l	Standard (AQ1EGG)	2	100 °C	90 °C	120 °C	120 °C
		4	115 °C	110 °C	120 °C	120 °C
Condensate	Standard (AQ1EGG)	2	100 °C	90 °C	100 °C	100 °C
		4	100 °C	100 °C	100 °C	100 °C
Cooling brine, inorganic; pH value >7.5, inhibited	Standard (AQ1EGG)	2 and 4	20 °C	20 °C	20 °C	20 °C
Water with oil contamination	with fluorine-rubber secondary seal, e.g. Viton (AQ1VGG)	2 and 4	90 °C	90 °C	90 °C	90 °C
Cooling water with frost protection (pH value: 7.5–10; no galvanised components)	Standard (AQ1EGG)	2 and 4	40 °C	40 °C	40 °C	40 °C
Water-glycol mixture (20 %–40 % glycol)	Standard (AQ1EGG)	2 and 4	40 °C	40 °C	40 °C	40 °C

Tab. 3: Authorised operating conditions for the IL/DL/BL series

5.2.3 For the IPS series

Fluid	Mechanical seal	Limitation of maximum permissible fluid temperature					
		T4	T4	T3	T3	T3	T3
		$T_{Medium\ max.}$		$T_{Medium\ max.}$ Version PN 6		$T_{Medium\ max.}$ Version PN 6	
		PN 6	PN 10	p=5 bar	p=6 bar	p=8 bar	p=10 bar
Heating water in accordance with VDI 2035	Standard (BVEGG)	108 °C	108 °C	140 °C	120 °C	140 °C	120 °C
Semi-desalinated water with conductivity >80 µs, silicates <10 mg/l, pH value >9	Standard (BVEGG)	108 °C	108 °C	140 °C	120 °C	140 °C	120 °C
Mineral oil	with fluorine-rubber secondary seal, e.g. Viton (BVVGG)	108 °C	95 °C	140 °C	120 °C	140 °C	120 °C
Heating water with conductivity <850 µs, silicates <10 mg/l, solid matter content <10 mg/l	Standard (BVEGG)	108 °C	108 °C	1240 °C	120 °C	120 °C	120 °C
Condensate	Standard (BVEGG)	100 °C	100 °C	100 °C	100 °C	100 °C	100 °C
Cooling brine, inorganic; pH value >7.5, inhibited	Standard (BVEGG)	20 °C	20 °C	20 °C	20 °C	20 °C	20 °C
Water with oil contamination	with fluorine-rubber secondary seal, e.g. Viton (BVVGG)	90 °C	90 °C	90 °C	90 °C	90 °C	90 °C
Cooling water with frost protection (pH value: 7.5–10; no galvanised components)	Standard (BVEGG)	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Water-glycol mixture (20 %–40 % glycol)	Standard (BVEGG)	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C

Tab. 4: Authorised operating conditions for the IPS series

The use of solvents is not permissible, since these may corrode the elastomers in the seals. In turn, this can lead to uncontrolled leakage!

5.3 Operation with flammable liquids and explosion protection

All relevant regulations are to be complied with for the operation of a pump with flammable liquids. These include, in particular:

- Technical rules for flammable liquids (TRbF)
- Ordinance concerning electrical and non-electrical devices in potentially explosive areas (Directive 94/9/EC)
- Machinery Directive (2006/42/EC)
- Ordinance on Industrial Safety and Health (in accordance with Directive 1999/92/EC)
- Explosion Protection Ordinance (ExVO)
- Hazardous Substances Ordinance (GefStoffV, in accordance with Directive 98/24/EC)

The possibility of an electrostatic charging of the fluid must be taken into account during utilisation of the pump, as is the case with all closed circuit circulation processes involving flammable liquids. Ignition hazards could arise as a result.

WARNING! Danger of personal injury!
Even when all necessary precautionary safety measures have been implemented, there still exists a residual danger caused by leakiness or mechanical damage. Gases, vapours or fluids could escape unnoticed at seals or screwed connections.

- **Keep a safe distance from the pump during commissioning.**
- **Wear protective clothing, protective gloves and protective goggles.**

6 Instructions concerning installation and commissioning

6.1 Coupling/coupling protection

In accordance with the Ordinance on Industrial Safety and Health and the Machinery Directive, the pump may not be operated without coupling protection.

Unintended spark formation could result from contact between the coupling and tools or other metal objects.

6.2 Unobstructed movement of the drive shaft

The unobstructed movement of the drive shaft is to be checked prior to establishing the electrical connection. The coupling protection must be removed for this purpose and the shaft must be rotated manually to the height of the coupling. The movement of the shaft must be unobstructed. No audible grinding sounds are permitted.

The grinding of the impeller could result in a non-permitted temperature increase at the pump housing or to a blocking of the pump.

The coupling protection is to be remounted after the check has been completed.

6.3 Electrical connection

Wilo recommends using a motor protection apparatus as an additional protective device; this must be according to EN 60079 Part 14. Electrical installation in accordance with EN 60079 Part 14 is necessary in potentially explosive areas.

6.4 Earthing

In order to prevent dangers caused by static charging, the unit must be earthed at the earthing connection provided for this purpose.

6.5 Dry-running protection

In order to avoid non-permitted temperatures arising from dry running of the mechanical seal, we recommend the installation of a device for monitoring pressure difference or motor power which will switch off the pump in the event of a sudden drop in pressure or motor power.

Pumps and mechanical seals must be additionally protected against dry running in the T4 temperature range. This can be accomplished by monitoring the differential pressure or the rated motor power (see chapter 7.2.3 “Operating mode of the pump” on page 28).

6.6 Test run with the product

Test runs without fluid (dry run) are not permitted, because this will lead not only to pre-existing damage to the mechanical seal but also to temperatures in the area of the mechanical seal in excess of 140 °C!

The instructions contained in chapter 7.2.1 “Filling/venting the pump” on page 27 are to be observed without fail!

The instructions contained in the installation and operating instructions for the pump series concerning commissioning, particularly with regard to venting the pump, are to be observed without fail!

A test run is to be carried out outside of the Ex-atmosphere as a part of the commissioning process. The following points are to be noted in particular during this test run:

- Quiet, vibration-free running of the pump
- Current consumption of the motor. Compare the values with the specifications contained in the installation and operating instructions of the motor
- Noise and temperature developments for the drive unit
- Leakage at the flange connections
- Leakage at the gasket
- Monitoring of the direction of rotation (note direction of rotation arrow on the fan cover)

In order to avoid possible temperature increases in the event of contact between rotating and stationary parts, the monitoring of the direction of rotation may not under any circumstances be carried out by briefly switching on the unfilled pump.

7 Operating instructions

7.1 Improper use

Operational reliability is not ensured except in conjunction with intended use as outlined in chapter 4 “Intended use” on page 21 of these Supplementary installation and operating instructions.

The instructions listed in chapter 5 “Specifications concerning products and operating conditions” on page 22 concerning operating conditions are to be complied with.

Any exceeding of the permissible operating conditions, as well as any non-permitted operating mode, can lead to an exceeding of the defined temperatures (see chapter 7.2.3 “Operating mode of the pump” on page 28 and chapter 7.2.7 “Temperature limits” on page 29).

7.2 Explosion protection

If the units are utilised in potentially explosive areas with requirements in accordance with Directive 94/9/EC, then it is imperative for ensuring explosion protection that the measures and instructions contained in the following chapters are observed:

- Chapter 7.2.1 “Filling/venting the pump” on page 27
- Chapter 7.2.7 “Temperature limits” on page 29

7.2.1 Filling/venting the pump

The instructions contained in the installation and operating instructions for the pump series concerning commissioning, particularly with regard to venting the pump, are to be observed without fail!

A hose is to be connected to the ventilation valve for venting, particularly in connection with operations involving fluids that are hazardous to humans or to the environment, in order to ensure that uncontrolled drainage of the fluid into the surrounding environment can be prevented.

WARNING! Risk of injury and damage to property!
Fluids which pose a risk to persons and the environment can cause injuries if touched, and can cause damage to the environment!

- **Fluid escaping in an uncontrolled manner is to be disposed of taking the legal regulations into account.**
- **Wear protective clothing, protective gloves and protective goggles for the ventilation procedure.**

It is assumed for the operation of the pump that the suction and pressure pipe system, and thus the interior of the pump that has contact with the fluid, including the sealing chamber, will be continuously filled with conveyance fluid, in order to ensure that no

explosive atmosphere will be able to be present there.
If the operator is unable to ensure this, then appropriate monitoring measures are to be implemented.

The self-ventilation feature of the sealing chamber could be impaired in the event of incorrect installation, which could then cause gas bubbles to remain in the pump and dry running at the mechanical seal.

The system is to be operated in such a way that no underpressure can occur on the suction side. It is for that reason particularly important to observe the correct configuration and maintenance of filters and diaphragm vessels, in addition to the compliance with and monitoring of system pressure.

If underpressure occurs on the suction side, then this indicates a non-permitted operating mode, which could be connected with air being drawn in through the shaft seal and thus with gas bubbles in the pump. This could lead to dry running of the mechanical seal. Suitable measures are to be implemented as necessary.

Because of reasons of design, however, one cannot always avoid having certain residual volume left over that is not filled with fluid following filling for initial commissioning. This volume will however be immediately filled with conveyance fluid by the onset of the pumping effects of the pump once the motor is switched on.

The careful filling of the sealing chambers and the auxiliary systems of the mechanical seal are to be observed.
The chapters of the installation and operating instructions for the pump series concerning commissioning are to be observed without fail.

7.2.2 Fluid

Only the fluids listed in chapter 5.2 “Authorised operating conditions” on page 23 are permitted to be pumped.

Abrasive constituents are not permitted in the fluid. The ingress of such constituents in the pump can lead to a blockage of the pump. A filter should therefore be installed in the inlet in the event that there is a danger of solid particles entering the pump.

CAUTION! Risk of damage to property!
Danger of damage to the pump due to fluid temperatures which are too low!

- **It is a rule for pumps of the Wilo-VeroLine-IPS series that the minimum temperature of the fluid is not permitted to fall below -10 °C, even with extreme ambient temperatures!**

7.2.3 Operating mode of the pump

It is to be ensured that the pump is always started with a completely opened check valve on the suction side and a slightly opened check valve on the pressure side. The pump can however be started up against a closed non-return valve mounted on the pressure side.

The check valve on the pressure side is not be regulated to the duty point until full speed has not been reached.

The pump may not be operated against closed valves, orifice plates, slide valves or other check valves. If the possibility cannot be excluded, then a volume flow monitoring device must be used to ensure that the required minimum quantity of $Q_{min} = 0.1 \times Q_{max}$ (as a function of the pump curve) of the respective pump type is pumped. The pump must switch off if this minimum amount is not achieved. The monitoring control must at least satisfy the requirements of EN 13463-6 for a minimum functional failure rate of FFR 1.

A pressure relief apparatus should be set up in the pressure pipe.

If this is not complied with, then there is a danger within a very short time of high surface temperatures arising on the pump housing caused by rapid heating of the fluid in the interiors of the pump.

If the check valves are closed on both the suction and pressure sides, then there is an additional danger of overstraining, even to the point of bursting, as a result of the rapid increase in pressure inside the pump that this situation causes!

The specified minimum amounts are in reference to water and water-like liquids. If, however, fluids are present which exhibit physical parameters differing from this, then a check is to be made as to whether the danger of additional heating exists, which would therefore necessitate an increase of the minimum amount.

Pumps for the temperature range T4 may only be operated with a device for monitoring pressure difference or motor power as a safety feature in case of non-permitted temperature increases.

Switch-off criterion for differential pressure is Δp=0.15 bar; Switch-off criteria for the rated motor power P_{2Nom} are

- **$P < 0.2 \times P_{2Nom}$ in cases of 2-pole drives and**
- **$P < 0.4 \times P_{2Nom}$ in cases of 4-pole drives.**

The monitoring control must at least satisfy the requirements of EN 13463-6 for a minimum functional failure rate of FFR 1.

7.2.4 Protective devices

WARNING! Danger of personal injury!
Covers made of plastic are fitted to the lantern as shields against touching.

- **The pump is not permitted to be operated without these covers.**
- **Rotating components of the pump are to be secured in such a way that direct access to rotating components is prevented.**
- **The regulations for protective devices in accordance with DIN EN 12100 are to be complied with.**

7.2.5 Machine noise

WARNING! Danger of personal injury!
Depending on local conditions, a continuous sound pressure level can occur which causes noise-induced hearing loss.

- **In such cases the operating personnel is to be equipped with the required protective equipment or protected by means of safety measures (e.g. by hearing protection, warning signs, etc.).**

The continuous sound pressure level is to be measured at the operating, monitoring and/or maintenance stations.

7.2.6 Structural modifications to the machine

All conversions require written authorisation from Wilo.

CAUTION! Risk of damage to property!
Trouble-free pump operation can only be guaranteed when original spare parts are used. There is no guarantee that third-party parts are designed and manufactured in accordance with appropriate safety and operational requirements.

- **Only use original Wilo spare parts.**
- **Information to be provided when ordering spare parts: All data on the pump and motor rating plate**

7.2.7 Temperature limits

In the normal operating state, the highest temperatures are to be expected on the surface of the pump housing, on the shaft seal and in the vicinity of the bearings.

The surface temperature that occurs on the pump housing corresponds to the temperature of the fluid to be conveyed, unless additional heating is applied. This is based on the assumption that there is open contact between the surface and the atmosphere.

In any event, the operator of the system is responsible for complying with the defined fluid temperature (operating temperature). The maximum permitted temperature of the fluid is dependent on the

respective applicable temperature class and on the increase in heat in the pump.

Specifications concerning the maximum permitted temperature of the fluid as a function of fluid, mechanical seal, motor speed, temperature class conveyed and pressure can be found in chapter 5.2 “Authorised operating conditions” on page 23.

Considerably higher temperatures could occur in the event of incorrect operation and/or malfunctions. The specifications contained in chapter 7 “Operating instructions” on page 27 are to be noted in this regard.

In the case of mechanical seals, the permitted temperature limits could be exceeded because of dry running. Dry running can not only occur with insufficiently filled sealing chambers, but also with excessively high percentages of gas in the fluid. The operation of the pump outside of the permitted operating range can also lead to a dry run.

Mechanical seals are to be checked regularly for leakage.

8 Maintenance instructions

In addition to a number of other factors, the operational reliability and service life of the pump are also dependent on correct maintenance and repair work.

The maintenance regulations contained in the installation and operating instructions for the pump series, the motor and the mechanical seal are to be observed in addition to the maintenance instructions listed below for these supplementary installation and operating instructions.

The following basic principles are to be observed:

- Perform the prescribed maintenance and inspection tasks on schedule.
- Inform operating personnel before beginning maintenance and repair work.
- Secure all of the system parts and operating fluids upstream and downstream from the machine against unsupervised commissioning.
- Switch the machine voltage-free for all maintenance, inspection and repair work. Secure the main switch against being unexpectedly switched back on.
  - Lock a the main switch and remove the key.
  - Hang up a sign warning against switching on again.
  - Observe safety regulations for the fluid to be pumped.
  - Consult the Safety data sheet and other sources for personal safety measures.
  - Exclude hazards caused by contact or breathing in dangerous liquids, gases, mists, vapours and dusts by implementing appropriate protective measures.
- Fasten and secure larger-sized assemblies carefully to hoisting gear when replacing them.
- Replace deficient machine parts immediately.
- Check screwed connection for firm placement, observe torques.

Check functioning of protective devices after completion of the maintenance tasks.

Wilo recommends that Wilo personnel perform first-time repair work on the pump. Your own maintenance personnel can be trained at the same time this is done. Wilo also recommends the compilation of a maintenance schedule.

Observe chapter 6 “Instructions concerning installation and commissioning” on page 26 for renewed commissioning following completion of maintenance or repair work. All liability and warranties on the part of WILO SE are excluded for damages resulting from the use of non-original spare parts.The following special features are to be observed:

8.1 Motor bearings

The service life of the motor bearings achieved in practice depends strongly on the operating mode and the operating conditions. The statements contained in the installation and operating instructions for the motor concerning maintenance and service life are to be complied with.

The bearings of the motors of this series are designed for 20,000 (2-pole) or 30,000 (4-pole) operating hours. The bearings must be replaced after this number of operating hours has been reached.

Generally speaking, the motor bearings are to be checked daily with respect to conspicuous noises which could indicate early damage to the bearings.The installation and operating instructions of the motor manufacturer are to be observed with respect to required motor components.

8.2 Static gaskets

Essential static gaskets are the gaskets between pump housing and lantern and those between the pump flanges and the pipes. These gaskets are to be inspected daily for possible leakage.

8.3 Coupling protection

Coupling protection and other covers of rapidly rotating parts are to be inspected daily for correct seating, deformations and sufficient clearance from rotating parts.

In order to avoid electrostatic charging of the plastic covers, cleaning is permitted only with a moist cloth.

8.4 Mechanical seal

The function of the mechanical seal is to be ensured by means of daily inspection for possible leakage. The seal is to be replaced without fail after a dry run.

The procedure outlined in the installation and operating instructions for the pump series is to be followed without fail when replacing mechanical seals. The seal between pump housing and lantern is also to be replaced in any case.

In the case of pumps of the Wilo-VeroLine- IPL-N or Wilo-VeroTwin-DPL-N series, an inspection should be made of the bore holes for flushing the mechanical seal to ensure that they are both unobstructed and clean at the time the seal is replaced. These bore holes are located in the lantern (from the ventilation valve to the seat of the counter ring of the mechanical seal) and in the brass spacer between impeller and the rotating part of the mechanical seal.

It is also necessary to check that the pump shaft is unobstructed at the conclusion of the process.

8.5 Unobstructed movement of the drive shaft

The pump is to be checked daily with respect to the unobstructed movement of the drive shaft. Conspicuous noises are to be watched for which might indicate a grinding or blocking of the impeller.

8.6 Wilo-VeroLine-IPS series impellers

Because of the material used, Wilo-VeroLine-IPS series impellers must be replaced after 8 years of operation.

Technical information subject to change without prior notice!

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