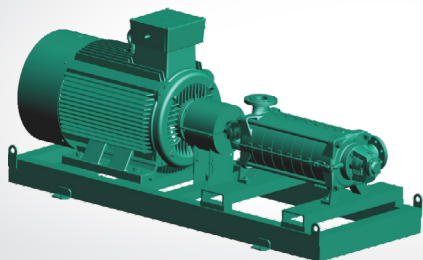


Wilo-Zerox FIRST



en Installation and operating instructions

Fig. 1:

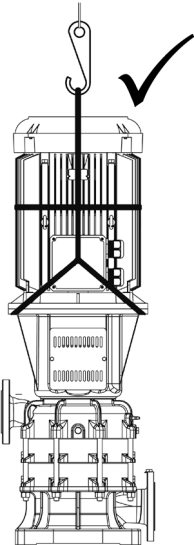
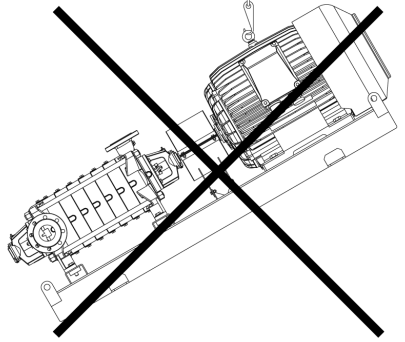
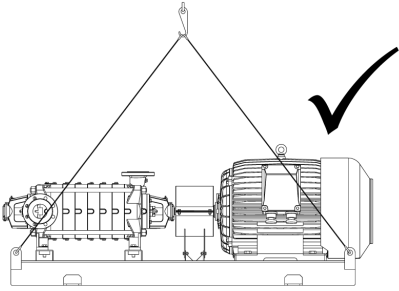
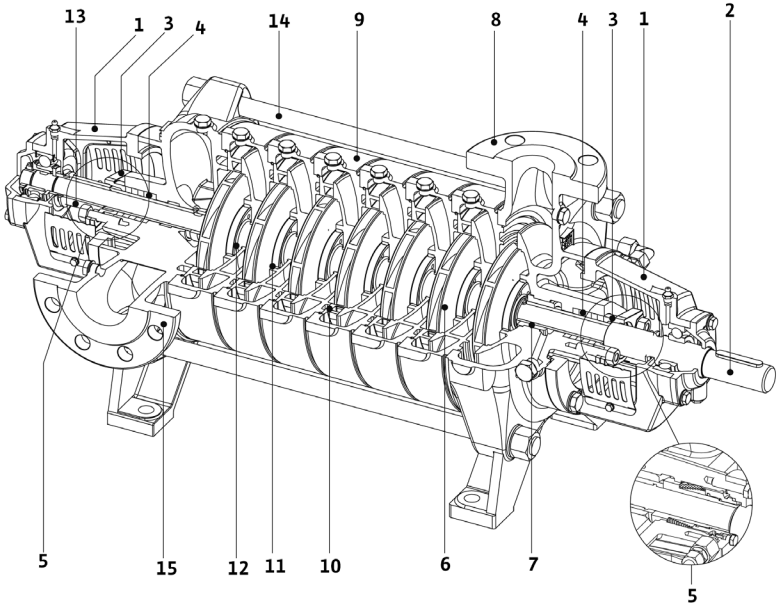


Fig. 2:

Zeox FIRST H



Zeox FIRST V

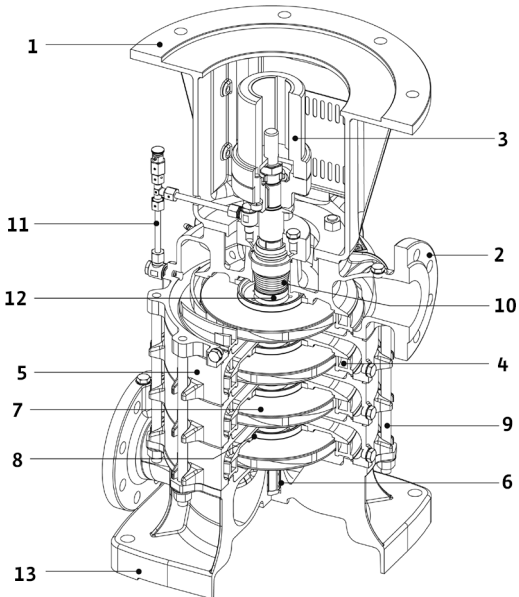


Fig. 3:

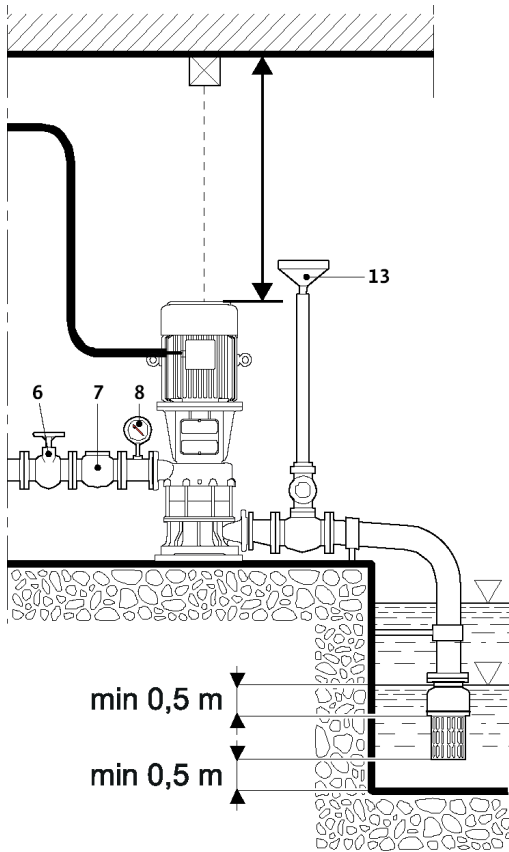
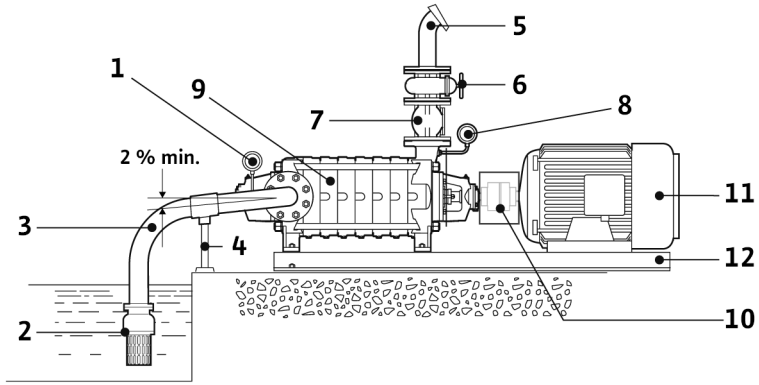


Fig. 4:

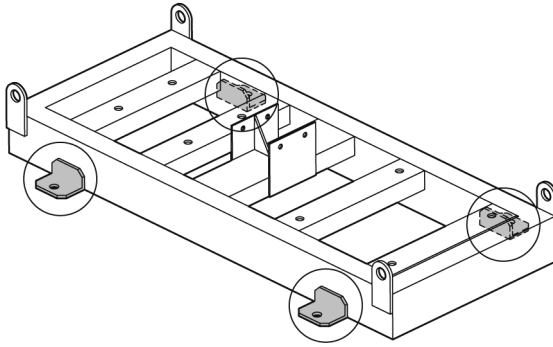


Fig. 5:

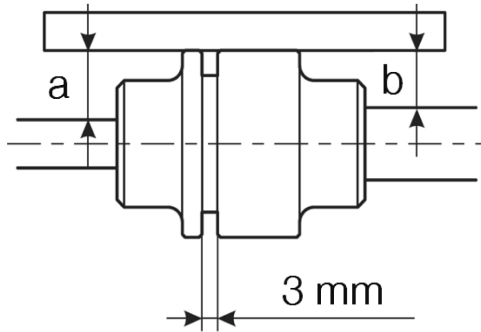
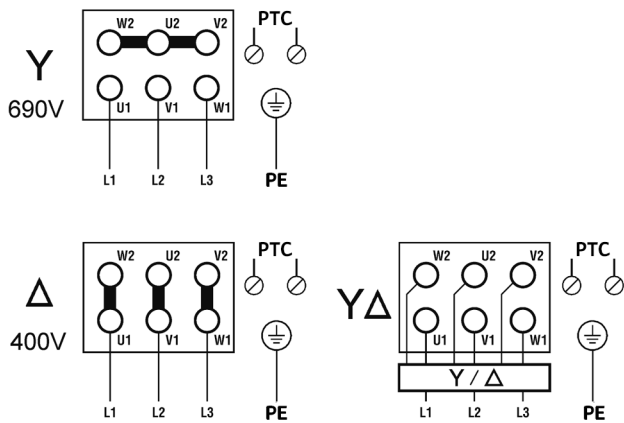


Fig. 6:



1	General	2
2	Safety	2
2.1	Symbols and signal words used in these operating instructions	2
2.2	Personnel qualifications	3
2.3	Danger in the event of non-observance of the safety instructions	3
2.4	Safety consciousness on the job	3
2.5	Safety instructions for the operator	3
2.6	Safety instructions for installation and maintenance work	4
2.7	Unauthorised modification and manufacture of spare parts	4
2.8	Improper use	4
3	Transport and interim storage	4
4	Intended use	5
5	Product information	6
5.1	Type key	6
5.2	Technical data	7
5.3	Scope of delivery	8
5.4	Accessories	8
6	Description	8
6.1	Description of the product	8
6.2	Design of the product	9
7	Installation	9
7.1	Inspections before installation	9
7.2	Installation	10
7.3	Hydraulic connection	10
7.4	Electrical connection	12
8	Use and maintenance	13
8.1	Start and stop	13
8.2	Functioning	14
9	Maintenance	14
10	Faults, causes and remedies	15
11	Spare parts	16
12	Annex	17
13	Disposal	17

1 General

About this document

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

These 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.

These installation and operating instructions correspond to the relevant version of the product and the underlying safety 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 operating instructions. If a technical modification is made on the designs named there without our agreement, this declaration loses its validity.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these 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.

2.1 Symbols and signal words used in these operating instructions

Symbols:



General danger symbol



Danger due to electrical voltage



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/symbol for direction of flow,
 - identification for 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.

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.

2.5 Safety instructions for the operator

This appliance is 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 appliance.

- 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.
- Highly flammable materials are always to be kept at a safe distance from the product.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and local power 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 on 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 operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and interim storage

When receiving the material, check that there has been no damage during the transport. If shipping damage has occurred, take all necessary steps with the carrier within the allowed time.



DANGER! Risk of death!

To reduce risks during lifting and handling operations, be sure to operate in security conditions checking that equipments are complying with safety rules and suitable for the weight, dimensions and shape of the pump. Handle the pump with protective gloves avoiding hand injuries.

Only suitable lifting gear and load carrying equipment with valid test certificates and adequate lifting capacity for the loads involved (such as belts/wire ropes/slings) should be used for lifting & transporting the product. If chains are used, they should be secured against slipping along with protective cover to prevent damage to the product, paint and/or injury to personnel.

Before handling and lifting check:

- Weight of the pump (reported on the plate)
- The lifting hook position



CAUTION! Risk of damage to the pump! Risk of falling!

Always take the weight and centre of gravity into consideration.

Never use the motor eye bolts when slinging assembled pump sets.

Never put down or pick up the product when it is not secured.

Examples of correctly handling the pump: see fig.1



DANGER! Risk of death!

During handling the pump respect a safety distance from the lifting device. When lifting and placing the pump be sure of its stability before releasing the lifting equipment.



CAUTION! Outside influences may cause damages!

If the delivered material is to be installed later on, store it in a dry place and protect it from impacts and any outside influences (humidity, frost etc.).

In case of a long storage rotate periodically by hand the shaft acting on the coupling to avoid possible locking.

For this operation, wear gloves to protect hands.

Handle the pump carefully so as not to damage the unit prior to installation.

4 Intended use

These horizontal and vertical multistage high pressure pumps are used for the following application areas:

- Irrigation
- Water supply
- Pressure boosting
- Fire-fighting
- Aqueducts

Liquid to be pumped is clear water, chemically and mechanically non-aggressive.

Never exceed use limits reported on the catalogue as regards:

- Capacity
- Suction and delivery pressure
- Temperature of pumped liquid
- Rotation speed of the pump
- Absorbed power



DANGER! Risk of explosion!

Don't pump inflammable or dangerous liquids and don't operate in areas with explosion risk.

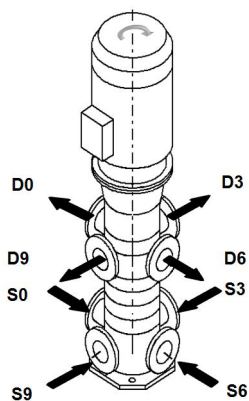
5 Product information

5.1 Type key

Example: Zeox FIRST-V 9004/A-75-2-S20_S6D6	
Zeox FIRST	Wilo pump code
V	V: vertical range H: horizontal range
90	Nominal flow in m ³ /h
04	Number of impellers
A	Impeller type (only relevant for vertical range)
75	Nominal motor power in kW
2	Number of poles
S20	Construction variants: [...]: standard (mechanical seal) L1: bronze impellers S20: with gland packing
S6D6	Variants of flanges and shaft orientations: [...]: standard orientation <i>Further possible orientations, see graphics under "Variants of flanges and shaft orientations" below</i>

Variants of flanges and shaft orientations

Zeox FIRST V

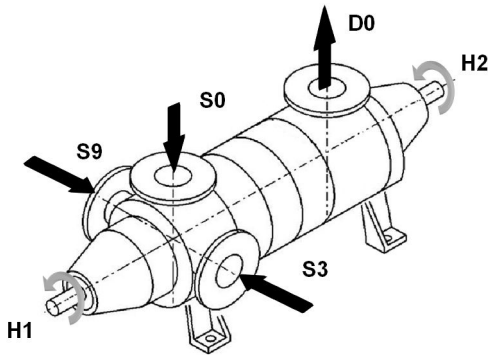


S: Flange on suction side

D: Flange on discharge side

Standard: S3 D9, other configurations on request.

Zeox FIRST H



S: Flange on suction side

D: Flange on discharge side

H: shaft end position

Standard: H2 S3 D0, other configurations on request.

5.2 Technical data	
Pression maximale	
Maximum operating pressure: (including suction pressure)	See pump rating plate
Maximum suction pressure:	Zeox FIRST H: 16 bar Zeox FIRST V: 6 bar
Temperature range	
Liquid temperature:	-5 to +90 °C
Max ambient temperature:	+40 °C
Max liquid density:	1000 kg/m ³
Max solids content:	40 g/m ³
Electrical data	
Max speed:	See rating plate
Motor efficiency :	Motor according to IEC 60034-30
Motor Protection index :	IP 55
Insulation class :	155
Frequency:	See rating plate
Electrical voltage:	

5.3 Scope of delivery

- Multistage pump.
- Installation and operating instructions.

5.4 Accessories

Please contact your WILO sales office for accessories list.

6 Description

6.1 Description of the product

See Fig. 2

Item No.	Zeox FIRST H	Zeox First V
1	Bearing support	Motor support
2	Shaft	Delivery pump housing
3	Stuffing-box gland	Coupling
4	Packing gland	Diffuser
5	Mechanical seal	Diffuser shell
6	Impeller	Guide bearing
7	Shaft protection bush	Impeller
8	Delivery pump housing	Wear ring
9	Diffuser shell	Tie rod
10	Diffuser	Mechanical seal
11	Wear ring	Circulation pipe
12	Guide bearing	Shaft
13	Spacer	Suction pump housing
14	Tie rod	–
15	Suction pump housing	–

See Fig. 3

Item No.	Item
1	Vacuum gauge
2	Strainer
3	Suction pipe
4	Pipe holder
5	Delivery pipe
6	Gate valve
7	Check valve
8	Pressure gauge
9	Pump
10	Coupling
11	Motor
12	Base frame
13	Prefilling device

6.2 Design of the product

- Zeox FIRST H and V are horizontal and vertical high pressure non-self-priming pumps with offline connection based on multistage design.
- Zeox FIRST H and V pumps combine use of both high efficiency hydraulics and motors.
- Zeox FIRST H pumps are equipped with double support bearing, assembled on a metallic base frame with fully B3 standard motors. Cast iron coupling assure the motion transmission between driven and driving shaft equipped with shock absorbers against crashes and torsional vibrations.
- Zeox FIRST V pumps are equipped with fully flanged standard motors.

7 Installation

7.1 Inspections before installation

Before installation of the pump, check that:

- The data mentioned on the identification plate of the product correspond to the submitted order.
- The place of installation is well aerated, protected against weather inclemencies, and must ensure environmental conditions according to the protection degree and the cooling need of the electric motor.



NOTE:

For the installation of the product keep a free space above or behind the motor at least equal to the height of the motor. This will allow a air circulation to ensure the correct motor cooling and will be necessary for future maintenance, Before pipes connection make sure that the rotating part of the pump rotates freely and is not hampered.

- The inlet of the pump is as much as possible near to the water to be pumped.



DANGER! Risk of death!

Check that implements (ropes, belts, chains etc.) and equipment (winch, crane, hoist, gin, etc.) used for handling and lifting are well dimensioned to the weight, efficient and complying with safety norms. See recommendations chapter 3.

- Verify water quality, temperature and eventual presence of sand, mud and dissolved gas.
- For **Zeox FIRST H** ensure proper anchorage of the base frame since eventual tensions or deflections could modify the alignment of pump and motor. If necessary, shim it before tightening definitively the anchoring bolts.

7.2 Installation

Zeox FIRST H unit is studied for horizontal installation only. Proceed as follow:

Using the suitable lifting equipment, place the unit on the foundation and fix the frame by the suitable anchor points (Fig.4) and tightening them uniformly in the foundation.

- After the installation check the correct alignment of elastic coupling, and re-check after a short period of running and rectify if necessary.
- The pumping unit is well aligned when a ruler placed on the external face of the half-couplings has the same distance from the axes along all the joint periphery (Fig.5 dimensions a and b). The shiftings among the two half couplings **cannot be more than 0,1 mm**.
- Verify, furthermore, that after the assembly there is between the half-joints a small radial shifting allowance of 3mm on coupling faces (Fig.5).
- For eventual alignment adjustments unloose the bolts fixing the pump/motor to the frame and insert necessary sized steel shims.



CAUTION! Risk of product damages!

Incorrect alignment can cause serious problems to the whole pumping set.

Zeox FIRST V unit is studied for vertical installation only.

Using the suitable lifting equipment, place the unit on the foundation and fix the base

plate by the suitable bolts tightening them uniformly in the foundation.

There are no special settings to make for the motor/pump coupling.

7.3 Hydraulic connection



CAUTION! Risk of product damages!

Suction and delivery pipes must be correctly fitted and should not be subject to stress during the pump operation. The pump cannot be used as support for pipes.

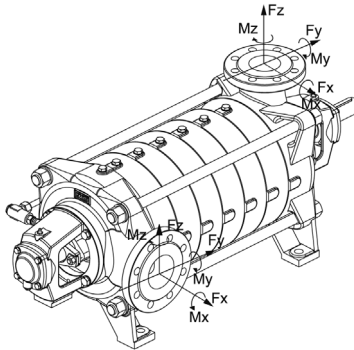
See maximum allowable forces and moments on pump flanges in the following tables.

Ensure on suction side that:

- Suction pipe has a diameter larger than the inlet of pump and that the horizontal section of the suction pipe has an ascending inclination towards the pump of at least 2 % (see Fig. 3).
- All joints are perfectly airtight.
- Anchorages and supports to prevent damages and possible breakage of suction flange are properly secured.
- The foot valve is vertically positioned and equipped with grid of adequate size to protect against possible obstructions (free surface of filter must be minimum twice suction pipe-line surface).
- The suction pipe has not narrow bends and diameter variations.

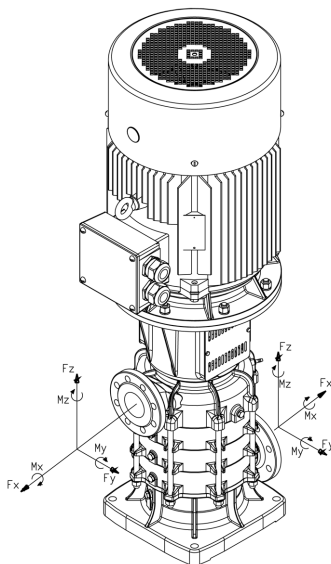
Ensure on discharge side that:

- All pipes and fittings are adequately dimensioned to reduce pressure losses and to withstand the maximum operating pressure of the pump.
- A gate valve is fitted to regulate delivery flow.
- A check-valve is mounted against possible water hammer and, especially, in presence of differences in height and long pipeline.
- Anchorages and supports to prevent damages and possible breakage of delivery flange are properly secured.

Maximum allowable forces and moments on pump flanges**Zeox FIRST H**

		Fy	Fz	Fx	ΣF	My	Mz	Mx	ΣM
Flanges DN		N							
Suction flange	65	550	1300	550	1515	400	300	400	640
	80	650	1600	650	1545	200	400	500	810
	100	750	1800	750	2090	700	600	700	1060
	150	950	3400	950	3660	1200	800	1000	1755
Delivery flange	50	600	1400	600	1640	400	300	500	710
	65	600	1400	600	1640	400	300	500	710
	80	700	1400	400	1715	500	400	600	880
	125	900	2250	900	2085	800	600	750	1250

Zeox FIRST V:



		Fy	Fz	Fx	ΣF	My	Mz	Mx	ΣM
Flanges DN		N							
Suction flange	80	700	640	780	1230	390	440	540	800
	100	950	860	1050	1660	420	500	600	880
Delivery flange	65	550	1300	550	1515	400	300	400	640
	80	650	1600	650	1545	500	400	500	810

7.4 Electrical connection



WARNING! Electrical shock hazard!
Improper installation and electrical connection can result in fatal injury. Danger from electrical current must be eliminated.

- **Electrical work carried out by a qualified electrician only!**
- **All electrical work must be performed after the electrical supply has been switched off and secured against unauthorized switching.**
- **For safe installation and operation a proper grounding of the pump to the power supply's grounding terminals is required.**
- Check that operating current, voltage and frequency used comply with motor plating data.
- The pump must be connected to the power supply by a solid cable equipped with a grounded plug-connection or a main power switch.

- Three-Phase motors must be connected to an approved safety switch. The set nominal current must correspond to the electrical data on the motor name plate.
- The supply cable must be laid so that it never touches the pipework and/or the pump and motor casing.
- The pump/installation should be grounded in compliance with local regulations. A ground fault interrupter can be used as extra protection.
- The connection to the network must be in accordance with the connection plan (see Fig. 6).

8 Use and maintenance

8.1 Start and stop

For starting refer also to the motor/engine instructions. Before starting check again electric and hydraulic connections and relevant rating.



DANGER! Risk of death!

Starting must be carried on by competent personnel only.

Check that all safety procedures and their good functioning have been activated.

Isolate the surrounding area within a radius of 2 m at least with no admittance of non-authorized persons during functioning.



WARNING! Risk of personal injury!

When the pump runs, coupling guards must be in place, tightened with all appropriate screws.



CAUTION! Risk of product damages!

Never operate the pump dry. The system must be filled before starting the pump.

Grease lubricated rolling bearings are supplied with adequate grease ensuring a correct functioning. In case of insufficient, contaminated or degraded grease due to incorrect storage or inadequate transport, proceed to its replacement. This intervention, to be carried on when pump is stopped, consists in removing the remaining grease through the lower outlet holes and replace it with fresh one through the suitable greasers. Suggested greaser frequency is every 2000–3000 working hours and, in any case, once a year with grease NGLI2 consistence.



CAUTION! Risk of product damages!

An excessive quantity of grease could cause bearing overheating.

Fill pump and suction pipeline with water, ensuring that there are no air pockets. If possible, turn the shaft of the pump by hand acting from the coupling.

Start the pump with delivery gate slightly open, check that pump rotation is in the same direction indicated by the arrow on the pump body. With pump running, open gradually the gate to requested performances.

When pump is equipped with stuffing box seal, dripping must be of 20/60 drop/minute to ensure cooling and good lubrication of the shaft. Adjust the flow releasing or tightening slowly and gradually the nuts of the stuffing box flange.



CAUTION! Risk of damage of the installation!

Before stopping the set, close almost completely the delivery gate to avoid dangerous water hammering.

8.2 Functioning



CAUTION! Risk of malfunction or product damages!

When respecting use limits, the pump will operate without vibrations or anomalous noises.

Keep the operating conditions (capacity–pressure) within the values shown on the plate.

The non-respect of these values always causes dangerous damages.

After starting check again the alignment of the pump set.

Every 1000 hours approx. it's necessary to check that operating data are respected; in case of anomalies or variations of operating data refer to chapter 8 following relevant suggestions.

Refer also to information reported on the motor/engine manual.

9 Maintenance

All servicing should be performed by an authorized service representative!



WARNING! Electrical shock hazard!

Danger from electrical current must be eliminated.

- All electrical work must be performed after the electrical supply has been switched off and secured against unauthorized switching.



WARNING! Risk of scalding!

At high water temperatures and system pressure close isolating valves before and after the pump.

First, allow pump to cool down.

Before performing any disassembly and/or maintenance operation it is necessary to empty the pump.



WARNING! Risk of scalding!

When the pump remains inactive for long periods, particularly during the winter, drain out the water to prevent freezing problems.

It is advisable to protect the rotating internal parts with antirust oil and to rotate periodically the pump shaft by hand.

10 Faults, causes and remedies



WARNING! Electrical shock hazard!

Danger from electrical current must be eliminated.

- All electrical work must be performed after the electrical supply has been switched off and secured against unauthorized switching.



WARNING! Risk of scalding!

At high water temperatures and system pressure close isolating valves before and after the pump.

First, allow pump to cool down.

Blocked pump	<ul style="list-style-type: none"> • Moving parts rusted due to longstop period. • Foreign matter inside the pump. 	<ul style="list-style-type: none"> • Check, repair or replace. • Check, remove the obstruction.
Pump does not prime	<ul style="list-style-type: none"> • Partial priming due to air inside the pump or suction pipes. • Defective or clogged foot-valve which cannot close and that does not allow pipe and pump filling. • Air leaks in the suction pipe. • Excessive suction head (NPSH too low). • Wrong rotation direction. 	<ul style="list-style-type: none"> • Remove air in the pump through the breather holes. • Clean or replace the foot valve. • Locate air passage and stop it. • Reset head of dynamic level, reduce capacity or replace the pump with a suitable model. • Exchange two of the three phases.
Insufficient capacity	<ul style="list-style-type: none"> • Clogged or badly functioning foot valve. • Inadequately dimensioned suction pipe or foot valve. • Impeller worn or clogged. • Impeller wear rings are worn. 	<ul style="list-style-type: none"> • Disassemble, clean or replace. • Disassemble and replace with a more suitable pipe. • Disassemble, clean or replace. • Disassemble the electric pump and repair. Caution! Follow instructions foreseen in the warranty conditions.
Insufficient pressure	<ul style="list-style-type: none"> • Excessive suction head (NPSH too low). • Water contains gas. • Suction pipe with curve upwards where air collects. • Air leaks in the suction pipe. 	<ul style="list-style-type: none"> • Reset head of dynamic level, reduce capacity or replace the pump with suitable model. • Call WILO Customer Service. • Eliminate critical point respecting the requested inclination to the suction pipe. • Locate air passage and stop it.

Excessive power absorption	<ul style="list-style-type: none"> • Pump functions with characteristics different to rated data. • Internal friction of moving parts. • Gland packing too tight. 	<ul style="list-style-type: none"> • Check the working conditions requested by the plant and replace the pump if necessary. • Disassemble and repair. Caution! Follow instructions foreseen in the warranty conditions. • Adjust tightening.
Gland packing drips excessively	<ul style="list-style-type: none"> • The shaft or burst is worn near the gland packing. • Packing not suitable for the conditions of use. 	<ul style="list-style-type: none"> • Disassemble the electric pump and repair. Caution! Follow instructions foreseen in the warranty conditions. • Disassemble and replace.
Noise or vibrations	<ul style="list-style-type: none"> • Moving part unbalanced, motor bearings worn. • Pump and pipes not securely fixed. • Scarce or excessive capacity for the chosen pump. • Functioning in cavitation. • Pump and motor misaligned or wrongly coupled. 	<ul style="list-style-type: none"> • Disassemble, and replace the damage components. • Overhaul the installation. • Replace the pump with one of suitable performances. • Reset head of dynamic level, reduce capacity or replace the pump with suitable model. • Appeal installer of pumping set.
Ball bearing overheating	<ul style="list-style-type: none"> • Excessive wearing of hydraulic components. • Pump and motor disaligned or wrongly coupled. • Insufficient bearing lubrication. 	<ul style="list-style-type: none"> • Contact WILO customer services. • Apply installer of pumping set. • Check grease and integrate.

If the fault cannot be solved, please contact WILO customer services.

11 Spare parts

All spare parts must be ordered through WILO Customer Services.

In order to avoid any mistakes, please specify the name plate data for orders.

Spare parts catalogue is available at www.wilo.com.

12 Annex

Average sound pressure level at 1 meter distance from the pump in an open field.

P2 (kW)	2900 min ⁻¹ dB(A)
5,5	70
7,5	70
9	70
11	70
15	70
18,5	70
22	70
30	72
37	72
45	77
55	77
75	80
90	80
110	80
132	80
160	80
200	81
250	81
315	83

If the noise level is to be guaranteed, please add +3dB for measure or constructive tolerances.

13 Disposal

Information on the collection of used electrical and electronic products

Proper disposal and appropriate recycling of this product prevents damage to the environment and dangers to your personal health.



NOTE! Disposal in domestic waste is forbidden!

In the European Union, this symbol can appear on the product, the packaging or the accompanying documentation. It means that the electrical and electronic products in question must not be disposed of along with domestic waste.

To ensure proper handling, recycling and disposal of the used products in question, please note the following points:

- Only hand over these products at designated, certified collecting points.
- Observe the locally applicable regulations!

Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal. For further information on recycling, go to www.wilo-recycling.com.

Technical information subject to change without prior notice!

wilo



Local contact at
www.wilo.com/contact

Pioneering for You

WILO SE
Wilopark 1
D-44263 Dortmund
Germany
T +49(0)231 4102-0
F +49(0)231 4102-7363
wilo@wilo.com
www.wilo.com