Submersible Borehole Pump

Ixo N

Installation/Operating Manual

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Installation/Operating Manual Ixo N

Original operating manual

Subject to technical modification without prior notice.

Contents

Glossary

Certificate of decontamination

A certificate of decontamination is enclosed by the customer when returning the product to the manufacturer to certify that the product has been properly drained to eliminate any environmental and health hazards arising from components in contact with the fluid handled.

Close-coupled design

Motor directly fitted to the pump via a flange or a drive lantern

Pump

Machine without drive, additional components or accessories

Pump set

Complete pump set consisting of pump, drive, additional components and accessories

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1 General

1.1 Principles

This operating manual is valid for the type series and variants indicated on the front cover.

The operating manual describes the proper and safe use of this equipment in all phases of operation.

The name plate indicates the type series, the main operating data and the serial number. The serial number uniquely describes the product and is used as identification in all further business processes.

In the event of damage, immediately contact your nearest KSB service facility to maintain the right to claim under warranty.

1.2 Target group

This operating manual is aimed at the target group of trained and qualified specialist technical personnel. (⇨ Section 2.3, Page 8)

1.3 Symbols

Table 1: Symbols used in this manual

Symbol	Description
✓	Conditions which need to be fulfilled before proceeding with the step-by-step instructions
▷	Safety instructions
⇨	Result of an action
⇨	Cross-references
1. 2.	Step-by-step instructions
	Note Recommendations and important information on how to handle the product

1.4 Key to safety symbols/markings

Table 2: Definition of safety symbols/markings

Symbol	Description
⚠ DANGER	**DANGER** This signal word indicates a high-risk hazard which, if not avoided, will result in death or serious injury.
⚠ WARNING	**WARNING** This signal word indicates a medium-risk hazard which, if not avoided, could result in death or serious injury.
CAUTION	**CAUTION** This signal word indicates a hazard which, if not avoided, could result in damage to the machine and its functions.
	**Explosion protection** This symbol identifies information about avoiding explosions in potentially explosive atmospheres in accordance with EU Directive 2014/34/EU (ATEX).
	**General hazard** In conjunction with one of the signal words this symbol indicates a hazard which will or could result in death or serious injury.

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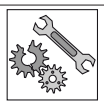
Symbol	Description
	**Electrical hazard** In conjunction with one of the signal words this symbol indicates a hazard involving electrical voltage and identifies information about protection against electrical voltage.
	**Machine damage** In conjunction with the signal word CAUTION this symbol indicates a hazard for the machine and its functions.

2 Safety

DANGER

All the information contained in this section refers to hazardous situations.

In addition to the present general safety information the action-related safety information given in the other sections must be observed.

2.1 General

- This operating manual contains general installation, operating and maintenance instructions that must be observed to ensure safe operation of the system and prevent personal injury and damage to property.
- Comply with all the safety instructions given in the individual sections of this operating manual.
- The operating manual must be read and understood by the responsible specialist personnel/operators prior to installation and commissioning.
- The contents of this operating manual must be available to the specialist personnel at the site at all times.
- Information and markings attached directly to the product must always be complied with and kept in a perfectly legible condition at all times. This applies to, for example:
  - Arrow indicating the direction of rotation
  - Markings for connections
  - Name plate
- The operator is responsible for ensuring compliance with all local regulations not taken into account.

2.2 Intended use

- The pump (set) must only be operated in the fields of application and within the use limits specified in the other applicable documents.
- Only operate pumps/pump sets which are in perfect technical condition.
- Do not operate the pump (set) in partially assembled condition.
- Only use the pump (set) to handle the fluids described in the data sheet or product literature of the pump model.
- Never operate the pump (set) without the fluid to be handled.
- Observe the minimum flow rate and maximum flow rate indicated in the data sheet or product literature (to prevent overheating, mechanical seal damage, cavitation damage, bearing damage, etc).
- Always operate the pump (set) in the direction of rotation it is intended for.
- Do not throttle the flow rate on the suction side of the pump (to prevent cavitation damage).
- Consult the manufacturer about any use or mode of operation not described in the data sheet or product literature.

2.3 Personnel qualification and training

All personnel involved must be fully qualified to transport, install, operate, maintain and inspect the machinery this manual refers to.

The responsibilities, competence and supervision of all personnel involved in transport, installation, operation, maintenance and inspection must be clearly defined by the operator.

Deficits in knowledge must be rectified by means of training and instruction provided by sufficiently trained specialist personnel. If required, the operator can commission the manufacturer/supplier to train the personnel.

Training on the pump (set) must always be supervised by technical specialist personnel.

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2.4 Consequences and risks caused by non-compliance with this manual

- Non-compliance with these operating instructions will lead to forfeiture of warranty cover and of any and all rights to claims for damages.
- Non-compliance can, for example, have the following consequences:
  - Hazards to persons due to electrical, thermal, mechanical and chemical effects and explosions
  - Failure of important product functions
  - Failure of prescribed maintenance and servicing practices
  - Hazard to the environment due to leakage of hazardous substances

2.5 Safety awareness

In addition to the safety information contained in this operating manual and the intended use, the following safety regulations shall be complied with:

- Accident prevention, health regulations and safety regulations
- Explosion protection regulations
- Safety regulations for handling hazardous substances
- Applicable standards, directives and laws

2.6 Safety information for the operator/user

- Fit protective equipment (e.g. contact guards) supplied by the operator for hot, cold or moving parts, and check that the equipment functions properly.
- Do not remove any protective equipment (e.g. contact guards) during operation.
- Provide the personnel with protective equipment and make sure it is used.
- Contain leakages (e.g. at the shaft seal) of hazardous fluids handled (e.g. explosive, toxic, hot) so as to avoid any danger to persons and the environment. Adhere to all relevant laws.
- Eliminate all electrical hazards. (In this respect refer to the applicable national safety regulations and/or regulations issued by the local energy supply companies.)
- If stopping the pump does not increase potential risk, fit an emergency-stop control device in the immediate vicinity of the pump (set) during pump set installation.

2.7 Safety information for maintenance, inspection and installation

- Modifications or alterations of the pump (set) are only permitted with the manufacturer's prior consent.
- Use only original spare parts or parts/components authorised by the manufacturer. The use of other parts/components can invalidate any liability of the manufacturer for resulting damage.
- The operator ensures that maintenance, inspection and installation are performed by authorised, qualified specialist personnel who are thoroughly familiar with the manual.
- Only carry out work on the pump (set) during standstill of the pump.
- Only perform work on the pump set when it has been disconnected from the power supply (de-energised).
- The pump (set) must have cooled down to ambient temperature.
- Pump pressure must have been released and the pump must have been drained.

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- When taking the pump set out of service always adhere to the procedure described in the manual.
- Decontaminate pumps which handle fluids posing a health hazard.
- As soon as the work has been completed, re-install and re-activate any safety-relevant devices and protective devices. Before returning the product to service, observe all instructions on commissioning. (⇨ Section 6.1, Page 20)

2.8 Unauthorised modes of operation

Never operate the pump (set) outside the limits stated in the data sheet and in this manual.

The warranty relating to the operating reliability and safety of the supplied pump (set) is only valid if the equipment is used in accordance with its intended use. (⇨ Section 2.2, Page 8)

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3 Transport/Storage/Disposal

3.1 Checking the condition upon delivery

1. On transfer of goods, check each packaging unit for damage.
2. In the event of in-transit damage, assess the exact damage, document it and notify KSB or the supplying dealer and the insurer about the damage in writing immediately.

NOTE

The pump set/pump/motor is supplied by the manufacturer/supplier in packaging which largely prevents sagging or other damage during transport and/or storage.

3.2 Transport

CAUTION

Improper pump transport

Damage to the pump!

- ▷ Always transport the pump/pump set in the specified position.
- ▷ Never suspend the pump (set) from the power cable.
- ▷ Prevent the pump (set) from getting knocked or dropped.
- ▷ Always secure a pump set in upright position against tipping over.
- ▷ Wear personal protective equipment.

Use lifting equipment which is suitable for the weight of the pump set.
Make sure that the power cable is not kinked or damaged during transport.

3.3 Storage/preservation

If commissioning is to take place some time after delivery, we recommend that the following measures be taken:

⚠ WARNING

Pump set tilting or rolling off

Risk of personal injury!

- ▷ Always secure vertically positioned pump sets against tipping over.
- ▷ Always secure horizontally positioned pump sets against rolling off.

CAUTION

Damage during storage due to frost, humidity, dirt, UV radiation or vermin

Corrosion/contamination of the pump!

- ▷ Store the pump (set) in a dry, dark, frost-proof room not exposed to sunlight where the atmospheric humidity is as constant as possible.

Store the pump as follows:

- In a dry environment
- Protected against direct sunlight and heat
- Protected against dirt and dust
- Protected against freezing
- Protected against vermin

Further information on storing the pump set after it has been in use (⇨ Section 6.4, Page 21) .

3.4 Return to supplier

1. Drain the pump as per operating instructions.
2. Flush and clean the pump, particularly if it has been used for handling noxious, explosive, hot or other hazardous fluids.
3. If the pump has handled fluids whose residues could lead to corrosion damage in the presence of atmospheric humidity or could ignite upon contact with oxygen also neutralise the pump and blow through with anhydrous inert gas to ensure drying.
4. Always complete and enclose a certificate of decontamination when returning the pump.
   Indicate any safety measures and decontamination measures taken.
   (⇨ Section 11, Page 30)

NOTE

If required, a blank certificate of decontamination can be downloaded from the following web site: www.ksb.com/certificate_of_decontamination

3.5 Disposal

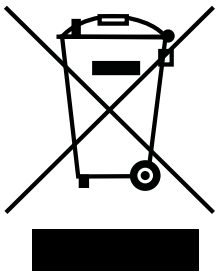
⚠ WARNING

Fluids, consumables and supplies posing a health hazard

Hazard to persons and the environment!

- ▹ Collect and dispose of any preservatives, flushing liquids and fluid residues.
- ▹ Wear safety clothing and a protective mask, if required.
- ▹ Observe all legal regulations on the disposal of fluids posing a health hazard.

1. Dismantle the product.
   Collect greases and other lubricants during dismantling.
2. Separate and sort the materials, e.g. by:
   - Metals
   - Plastics
   - Electronic waste
   - Greases and other lubricants
3. Dispose of materials in accordance with local regulations or in another controlled manner.



Electrical or electronic equipment marked with the adjacent symbol must not be disposed of in household waste at the end of its service life.

Contact your local waste disposal partner for returns.

If the used electrical or electronic equipment contains personal data, the operator is responsible for deleting it before the equipment is returned.

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4 Description

4.1 General description

Submersible borehole pump

Pump for handling clean water without suspended solids.

4.2 Product information as per Regulation No. 1907/2006 (REACH)

For information as per chemicals Regulation (EC) No. 1907/2006 (REACH), see https://www.ksb.com/ksb-en/About-KSB/Corporate-responsibility/reach/ .

4.3 Designation

Example: Ixo N 45 E

Table 3: Designation key

Code	Description	
Ixo	Type series	
N	New generation	
4	Number of stages	
5	Maximum permissible flow rate [m^3/h]	
E	Drive	
	E	Single-phase AC motor
	D	Three-phase motor

4.4 Name plate

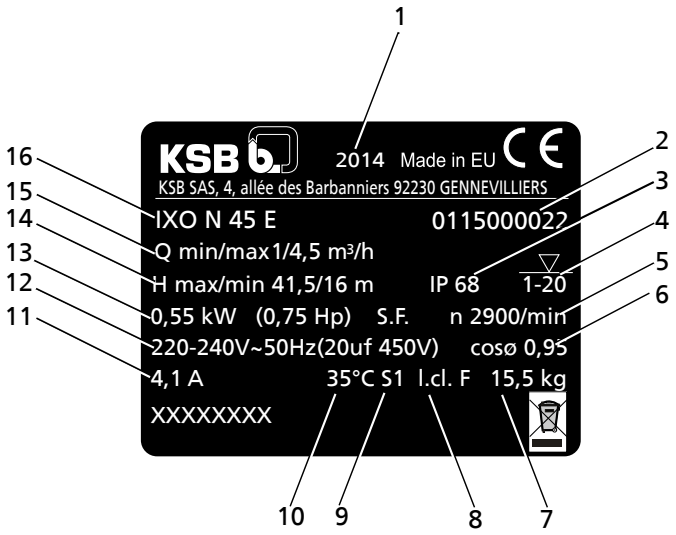

Fig. 1: Name plate (example)

1	Year of construction	2	Series number
3	Enclosure	4	Maximum immersion depth
5	Rated speed	6	Cosine phi
7	Weight	8	Thermal class
9	Mode of operation	10	Maximum fluid temperature
11	Nominal current	12	Voltage, frequency
13	Power output (P_2)	14	Range of heads
15	Range of flow rates	16	Type series, number of stages

4.5 Design details

Design

- Centrifugal pump
- Close-coupled design
- Multistage
- For fully or partly submerged operation (min. immersion depth 0.1 m)
- Low-level inlet
- Suction strainer with a maximum mesh width of 2 mm

Drive

Jacket-cooled single-phase AC motor:

- Thermal overload protection
- 230 V, 50 Hz
- IP68 enclosure
- Capacitor installed
- Motor power cable (H07 RNF) 23 m with mains plug

Jacket-cooled three-phase motor:

- 400 V, 50 Hz
- IP68 enclosure
- Motor power cable 23 m

Bearings

- Deep groove ball bearings
- Grease-lubricated for life

Shaft seal

- Double shaft seal with oil reservoir fitted in between

4.6 Configuration and function

The fluid enters the pump via the suction casing. It is accelerated outward by the rotating impellers. In the flow passage of the diffusers and the pump casing the kinetic energy of the fluid is converted into pressure energy. The fluid is pumped to the discharge side, where it leaves the pump. At the rear side of the impeller, the motor shaft enters the casing via the bearing cover. The shaft passage is sealed by a double mechanical seal. The shaft is supported by rolling element bearings.

4.7 Scope of supply

- Multistage submersible borehole pump
- Single-phase AC motor
  (with integrated thermal protection, 230 V, 50 Hz, IP 68, built-in capacitor, 23-metre motor power cable with mains plug)

or

- Three-phase motor
  (400 V, 50 Hz, IP 68, 23-metre motor power cable)

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4.8 Ixo N

Fig. 2: Pump set dimensions

Table 4: Dimensions

Size	H
	[mm]
Ixo N 45 E/D	504
Ixo N 55 E/D	553
Ixo N 65 E/D	577
Ixo N 48 E/D	529
Ixo N 58 E/D	553

5 Installation at Site

5.1 Installing the pump set

CAUTION

Incorrect installation

Damage to the machine

- ▷ The pump set must always be installed in a vertical position.
- ▷ Never suspend the pump set by the power cable.

NOTE

We recommend securing the suspended pump set with a safety rope or chain made of indestructible material at all times. If a plastic pipe or hose is used as a discharge line, the safety rope must be used for lowering, fastening and pulling up the pump set.

Observe the following when selecting a place of installation:

- Never install the pump set too close to the inner walls of the tank / rainwater storage tank.
- Observe the installation heights of max. 20 m.
- To prevent intake of sand install the pump set at a distance of at least 0.5 m from the bottom of the well.

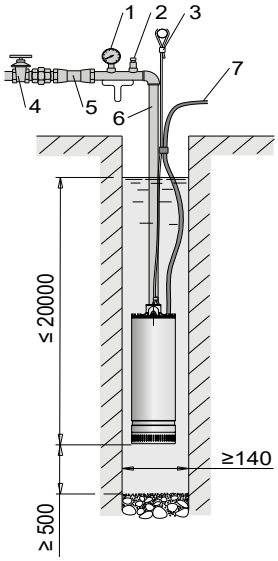

Fig. 3: Pump set suspended from discharge line [mm]

1	Pressure gauge	5	Lift check valve
2	Vent valve	6	Discharge line
3	Safety rope	7	Power cable
4	Gate valve		

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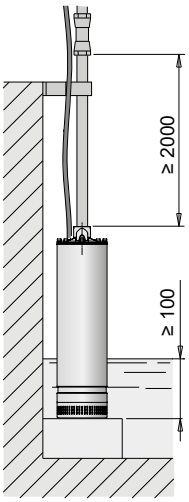

Fig. 4: Pump set standing on floor [mm]

5.2 Connecting the piping

⚠ DANGER

Using damaged power cables in the tank / rainwater storage tank

Electric shock!

- Do not kink the power cable. Observe the minimum bending radius[1)] of the cable. Do not drag the cable over sharp edges.
- Fasten the power cable to the riser or piping every 3 m with suitable fasteners (e.g. cable clips, sleeves). (Provide sufficient slack between the fasteners to prevent the power cable from any tension caused by the expansion of the pipe under load.)
- Do not use any tools, equipment or accessories with sharp edges (e.g. sharp-edged pipe sockets) for the installation.

⚠ WARNING

Persons falling into unsecured tanks / rainwater storage tanks

Risk of injury!

- Always secure open tanks / rainwater storage tanks during the entire installation procedure to prevent persons from falling in.
- Suitably fence off the work area.

CAUTION

Pump set falling into the tank / rainwater storage tank

Damage to the pump set!

- Secure the pump set during the entire installation procedure.
- Dimension any securing devices (supporting clamps, supports, etc.) so that they can carry all weights during the installation.

1 See cable manufacturer's documentation or DIN VDE 0298-3.

CAUTION

Unsuitable pipeline

Faulty operation of the pump!

- ▷ If using plastic pipelines, make sure they are designed to withstand the pump pressure.
- ▷ Do not kink the plastic pipeline.

CAUTION

Incorrect assembly

Damage to the pump set!

- ▷ Never hold or transport the pump set by its power cable.

Installation information

- The pump sets can be connected to pipelines with a G 1 1/4 thread (DN 32).
- The inside diameter of the riser must not be smaller than the pump connection with a thread of G 1 1/4 (DN 32).
- Position the pump sets vertically with the discharge nozzle on top.
- The pump set can be supported by the metal discharge line. For this purpose, firmly tighten the threaded connections to prevent them from loosening.

NOTE

Using a discharge line of a larger diameter is recommended in the case of very high static heads or very long pipelines in order to prevent pressure losses.

1. Install the pipelines in accordance with the manufacturer's documentation.
2. Lower the pump set into the tank / rainwater storage tank.

5.3 Electrical connection

DANGER

Electrical connection work by unqualified personnel

Danger of death from electric shock!

- ▷ Always have the electrical connections installed by a trained and qualified electrician.
- ▷ Observe regulations IEC 60364.

WARNING

Incorrect connection to the mains

Damage to the mains network, short circuit!

- ▷ Observe the technical specifications of the local energy supply companies.

DANGER

Connection of damaged power cables

Danger of death from electric shock!

- ▷ Check the power cables for damage before connecting them.
- ▷ Never connect damaged power cables.
- ▷ Replace damaged power cables.

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	CAUTION
	Galvanic corrosion using the pump set in water containing chloride (or in salt water) Damage to the pump set! ▷ Connect the pump set to earth, also if using non-metal pipelines and safety ropes.

- Install a device for switching off each phase conductor at the mains (switch). Provide a minimum opening distance of 3 mm for the contacts.
- If the water level cannot be checked visually, a float switch or another protective device must be installed to prevent dry running of the pump set and to set the water levels for automatic start-up/stop of the pump set.
- **Pump sets with single-phase AC motor (Ixo N E)**
  These pump sets are fitted with a capacitor, thermal protection plug and, optionally, with a float switch. Connect the plug to a socket with earth contact. Excessive temperatures lead to the motor cutting out. When the winding temperature decreases again (after 2 to 4 minutes), the thermal switch starts up the motor again.
- **Pump sets with three-phase motor (Ixo N D)**
  For these pump sets install a motor protection switch (curve type D) in the control cabinet. Observe the current requirement indicated on the name plate.

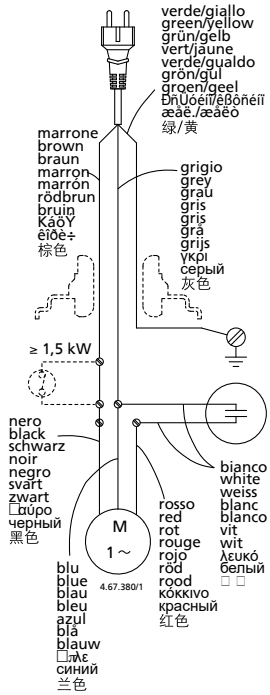

Fig. 5: Circuit diagram

✓ Check the available mains voltage against the data on the name plate.

✓ The mains is protected by a residual current device of ≤ 30 mA.

1. Plug the mains plug into the mains socket.

6 Commissioning/Start-up/Shutdown

6.1 Commissioning/Start-up

6.1.1 Starting up and stopping

CAUTION

Prolonged operation of the pump set against a closed shut-off element

Damage to the pump set!

- ▷ Never operate the pump set against a closed shut-off element for more than 5 minutes.

CAUTION

Insufficient lubrication of the mechanical seal

Damage to the mechanical seal!

- ▷ Never operate the pump set in dry condition, not even for testing.

NOTE

In the event of any malfunctions immediately disconnect the pump set from the mains.

The pump set starts pumping as soon as it is connected to the power supply. When the power supply is interrupted, the pump set stops.

✓ The minimum immersion depth of 100 mm has been observed.

1. For three-phase motors check the direction of rotation.
   To do so, start the pump set (with the shut-off element in any open position) and check the pressure (with a pressure gauge) or the flow rate (visually). Then disconnect the pump set from the power supply. Interchange two phase connections in the control cabinet. Re-start the pump set. Check the pressure and flow rate again. The correct direction of rotation results in a significantly higher pressure and larger flow rate.
2. Verify that the pump set operates within its operating range and that the power intake indicated on the name plate is not exceeded. If necessary, adjust the shut-off element in the discharge line or the pressure switches (if any).

6.2 Operating data

Table 5: Operating properties

Characteristic		Value
Flow rate	Q [m³/h]	≤ 8
	Q [l/s]	≤ 2,22
Head	H [m]	≤ 65
Fluid temperature	T [°C]	≥ +5
		≤ +35

6.3 Operating limits

- Only suitable for vertical operation.
- Maximum immersion depth: 20 m
- Maximum particle size: 2 mm
- Maximum number of start-ups/hour: 30

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6.4 Taking the pump set out of service

If the pump set is not in service for a prolonged period of time, taking the following measures is recommended.

1. Remove the pump set from the tank / rainwater storage tank.
2. Drain the pipelines and the pump set.
3. Store the pump set properly. (⇨ Section 3.3, Page 11)

7 Servicing/Maintenance

7.1 Safety regulations

DANGER

Power supply not disconnected

Danger to life!

- ▷ Pull the mains plug and secure the pump against unintentional start-up.

DANGER

Work on the pump set by unqualified personnel

Danger of death from electric shock!

- ▷ Have pump components modified and dismantled by authorised personnel only.

WARNING

Hot surface

Risk of injury!

- ▷ Allow the pump set to cool down to ambient temperature.

WARNING

Insufficient stability

Risk of crushing hands and feet!

- ▷ During assembly/dismantling, secure the pump (set)/pump parts to prevent tilting or tipping over.

WARNING

Fluids handled, consumables and supplies posing a health hazard

Hazard to persons and the environment!

- ▷ Clean the pump prior to any maintenance and installation work.
- ▷ Make sure persons cannot come into contact with the fluid handled.

NOTE

If the power cable is damaged, replace the complete pump set. The power cable is not replaceable.

7.2 Maintenance/inspection

Clean the pump set once a month.

7.2.1 Cleaning the pump set

1. Check that the suction strainer is free from any foreign matter. Remove any foreign matter.
2. Wipe the outer casing of the pump set with a cloth and clean water.

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7.3 Ordering spare parts

Always quote the following data when ordering replacement or spare parts:

- Type series
- Size

Refer to the name plate for all data.

Also specify the following data:

- Quantity of spare parts
- Part number and description
- Shipping address
- Mode of dispatch (freight, mail, express freight, air freight)

7.4 Spare parts

Table 6: Available spare parts

Part No.	Description	Size									
		45 E	45 D	48 E	48 D	55 E	55 D	58 E	58 D	65 E	65 D
106	Suction-side filter	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
109.01	Stage casing, 1st stage	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
109.02	Stage casing	3	3	3	3	4	4	4	4	5	5
230	Impeller	4	4	4	4	5	5	5	5	6	6
321.01	Ball bearing	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
321.02	Pump-end ball bearing	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
99-9	Set of O-rings, complete (412.01 - 412.13)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
433.01	Mechanical seal, top	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
433.02	Mechanical seal, bottom	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
506	Retaining ring (506 + 50.3)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
525	Spacer sleeve (525.01/02/03 + 523)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
554	Washer (554.01/02/03/04)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
81-59	Motor shroud with winding	-	✗	-	-	-	✗	-	-	-	-
		✗	-	-	-	✗	-	-	-	-	-
		-	-	-	✗	-	-	-	✗	-	✗
		-	-	✗	-	-	-	✗	-	✗	-
818	Rotor	-	✗	-	-	-	-	-	-	-	-
		✗	-	-	-	-	-	-	-	-	-
		-	-	-	✗	-	-	-	-	-	-
		-	-	✗	-	-	-	-	-	-	-
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		-	-	-	-	-	-	-	-	-	✗
		-	-	-	-	-	-	-	-	✗	-
824	Cable, length 23 m (829.01/02/03+733.02/03)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
837	Capacitor 20 µF	✗	-	-	-	✗	-	-	-	-	-
	Capacitor 25 µF	-	-	✗	-	-	-	✗	-	✗	-

Part No.	Description	Size									
		45 E	45 D	48 E	48 D	55 E	55 D	58 E	58 D	65 E	65 D
81-45	Float switch (81-45+733.01/04/05+554.04)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
99-20	Set of bolts/screws (900.01 - 900.11)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
921	Shaft nut	2	2	2	2	2	2	2	2	2	2
931	Lock washer	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
932.01/02	Circlip	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

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8 Trouble-shooting

⚠ WARNING

Improper work to remedy faults

Risk of injury!

- ▷ For any work performed to remedy faults, observe the relevant information given in this operating manual and/or in the product literature provided by the accessories manufacturer.

A Motor not starting up

B Pump set blocked

C Pump set running but not pumping any fluid

D Flow rate too low

E Unusual noises and vibrations at the pump set

F Leakage at the shaft seal

Table 7: Trouble-shooting

A	B	C	D	E	F	Possible cause	Remedy
✗	-	-	-	-	-	Incorrect supply voltage	Verify the existing voltage and frequency against the data on the name plate of the motor. Make sure that the cable cross-section of any extension cable used meets the requirements of the motor.
✗	-	-	-	-	-	Incorrect electrical installation	Check the connection to the power supply. Correct it, if necessary. Check that the protective switch has been set correctly (observe the data on the name plate). Check that the motor cable is properly connected to the control cabinet.
✗	-	-	-	-	-	Motor protection device (protective switch) has tripped.	Check power supply. Check whether the motor shaft can be easily rotated. Verify the correct setting of the motor protection switch (observe the data on the name plate of the motor).
✗	-	-	-	-	-	Fuses defective or tripped	Replace fuses. Check power supply. Check if motor protection switch has tripped.
✗	-	-	-	-	-	Shaft blocked	Remove the cause of blockage. To do so, dismantle the pump casing and remove the solid particles. If necessary, involve an authorised service partner.
✗	-	-	-	-	-	If all of the above remedies have been checked, the motor might be defective.	Have the motor replaced or repaired by an authorised service partner.
-	✗	-	-	-	-	Solid particles in the pump chamber block the rotor unit.	If possible, dismantle the pump casing and remove the solid particles. If necessary, involve an authorised service partner.
-	✗	-	-	-	-	Bearing seized	Replace defective bearings. If necessary, involve an authorised service partner.
-	-	✗	-	-	-	Check if valves are clogged, blocked or closed.	Check lift check valves and other check valves. Replace them, if necessary.
-	-	✗	-	-	-	Gate valve closed	Open the gate valve.
-	-	✗	-	-	-	Pump strainer clogged	Remove the suction strainer to clean or replace it as required.
-	-	✗	-	-	-	Pump not submerged in the water (dry running)	Check and correct the installation of the pump set.
-	-	✗	-	-	-	Wrong direction of rotation	Have the motor connection (cable connection) checked by specialist personnel.
-	-	-	✗	-	-	Pipelines and valves with too small a nominal diameter are causing excessive losses.	Use pipelines and valves in accordance with the corresponding recommendations for use.

A	B	C	D	E	F	Possible cause	Remedy
-	-	-	✘	-	-	Solid particles have clogged impellers or diffusers.	Remove the pump and contact an authorised service partner.
-	-	-	✘	-	-	Impellers damaged	Remove the pump and contact an authorised service partner.
-	-	-	✘	-	-	Impellers and diffusers worn.	Remove the pump and contact an authorised service partner.
-	-	-	✘	-	-	Water level in the well has dropped.	Increase the immersion depth. Reduce the flow rate by closing a shut-off valve in the discharge line. Water consumption exceeds well capacity. Selected pump too large for the well capacity
-	-	-	✘	-	-	Wrong direction of rotation	Have the motor connection (cable connection) checked by specialist personnel.
-	-	-	✘	-	-	Leakage in the discharge line	Check the entire pipeline. Detect and seal the leaking areas or replace the pipeline. Involve specialist personnel as required.
-	-	-	✘	-	-	Large percentage of air in the water	Contact an authorised service partner.
-	-	-	-	✘	-	Unbalance of the rotor unit	Check that the impeller is free from solid particles.
-	-	-	-	✘	-	Motor bearing defective	Replace the bearing.
-	-	-	-	✘	-	Pump and piping not fastened	Fasten the pump and piping.
-	-	-	-	✘	-	Flow rate too large for existing pipeline.	Use pipelines of a larger diameter or reduce the flow rate.
-	-	-	-	✘	-	Power supply fault	Verify the existing voltage and frequency against the data on the name plate.
-	-	-	-	-	✘	Defect caused by dry running or by gluing together of contact faces.	Make sure that the pump is completely primed and vented.
-	-	-	-	-	✘	Contact faces damaged by abrasive particles, score marks, rubbing marks.	Install a suction-side filter. If necessary, also select a special shaft seal for the fluid handled.

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9 Related Documents

9.1 General assembly drawing

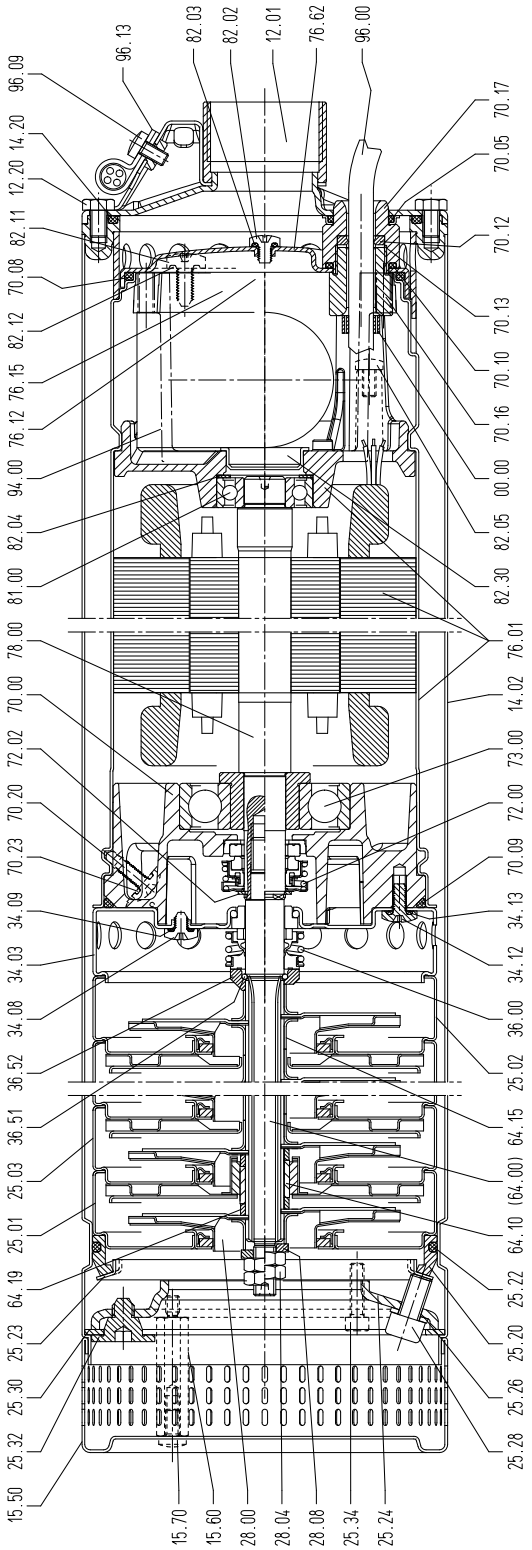


Fig. 6: General assembly drawing

9.2 Exploded view

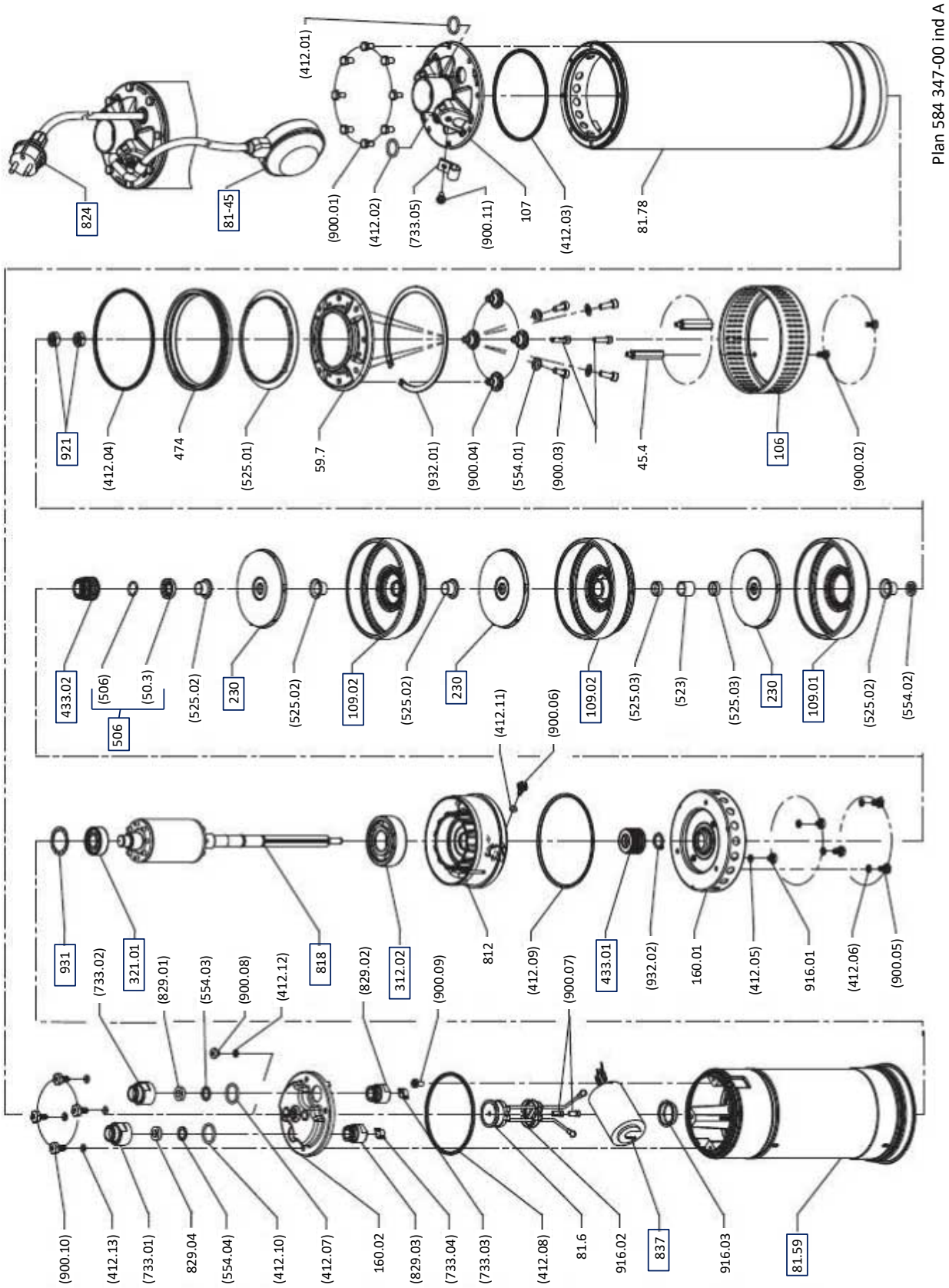


Fig. 7: Exploded view

10 EU Declaration of Conformity

Manufacturer:

KSB S.A.S.
128, rue Carnot,
59320 Sequedin (France)

The manufacturer herewith declares that **the product**:

Ixo N

Serial number: 2021XXXXXX

- is in conformity with the provisions of the following Directives as amended from time to time:
  - Pump set: 2006/42/EC Machinery Directive
  - Electrical components[2)]: 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
  - 2014/30/EU: Electromagnetic Compatibility (EMC)

The manufacturer also declares that

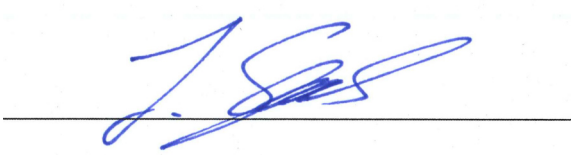
- the following harmonised international standards have been applied:
  - ISO 12100
  - EN 809
  - EN 60034-1, EN 60034-5/A1
  - EN 60335-1/A1, EN 60335-2-41

Person authorised to compile the technical file:

Jennifer Watson
Project Coordination Pump Systems and Drives
KSB SE & Co. KGaA
Johann-Klein-Straße 9
67227 Frankenthal (Germany)

The EU Declaration of Conformity was issued in/on:

Frankenthal, 1 January 2021



Jochen Schaab

Head of Product Development Pump Systems and Drives

KSB SE & Co. KGaA
Johann-Klein-Straße 9

67227 Frankenthal

2 Where applicable

11 Certificate of Decontamination

Type: .....
Order number /
Order item number[3]: .....
Delivery date: .....
Application: .....
Fluid handled[3]: .....

Please tick where applicable[3]:

☐ Corrosive

☐ Oxidising

☐ Flammable

☐ Explosive

☐ Hazardous to health

☐ Seriously hazardous to health

☐ Toxic

☐ Radioactive

☐ Bio-hazardous

☐ Safe

Reason for return:[3]: .....
Comments: .....
.....

The product / accessories have been carefully drained, cleaned and decontaminated inside and outside prior to dispatch / placing at your disposal.

We herewith declare that this product is free from hazardous chemicals and biological and radioactive substances.

For mag-drive pumps, the inner rotor unit (impeller, casing cover, bearing ring carrier, plain bearing, inner rotor) has been removed from the pump and cleaned. In cases of containment shroud leakage, the outer rotor, bearing bracket lantern, leakage barrier and bearing bracket or intermediate piece have also been cleaned.

For canned motor pumps, the rotor and plain bearing have been removed from the pump for cleaning. In cases of leakage at the stator can, the stator space has been examined for fluid leakage; if fluid handled has penetrated the stator space, it has been removed.

☐ No special safety precautions are required for further handling.
☐ The following safety precautions are required for flushing fluids, fluid residues and disposal:

.....
.....

We confirm that the above data and information are correct and complete and that dispatch is effected in accordance with the relevant legal provisions.

.....	.....	.....
Place, date and signature	Address	Company stamp

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3 Required field

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