



Wilo-Helix V 110, 190, 270

- GB** Installation and operating instructions
- F** Notice de montage et de mise en service
- E** Instrucciones de instalación y funcionamiento

Fig. 1:

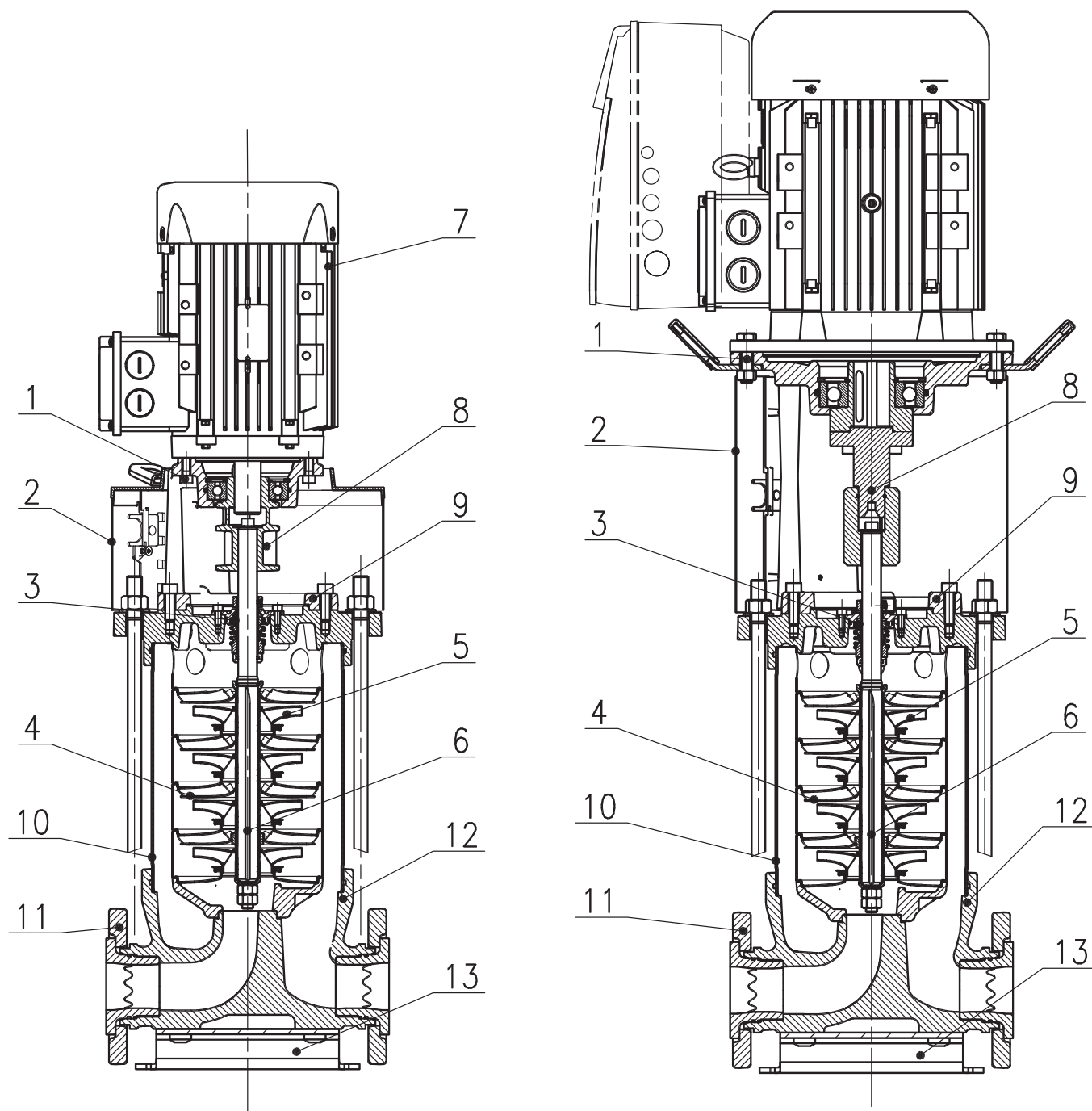


Fig. 2:

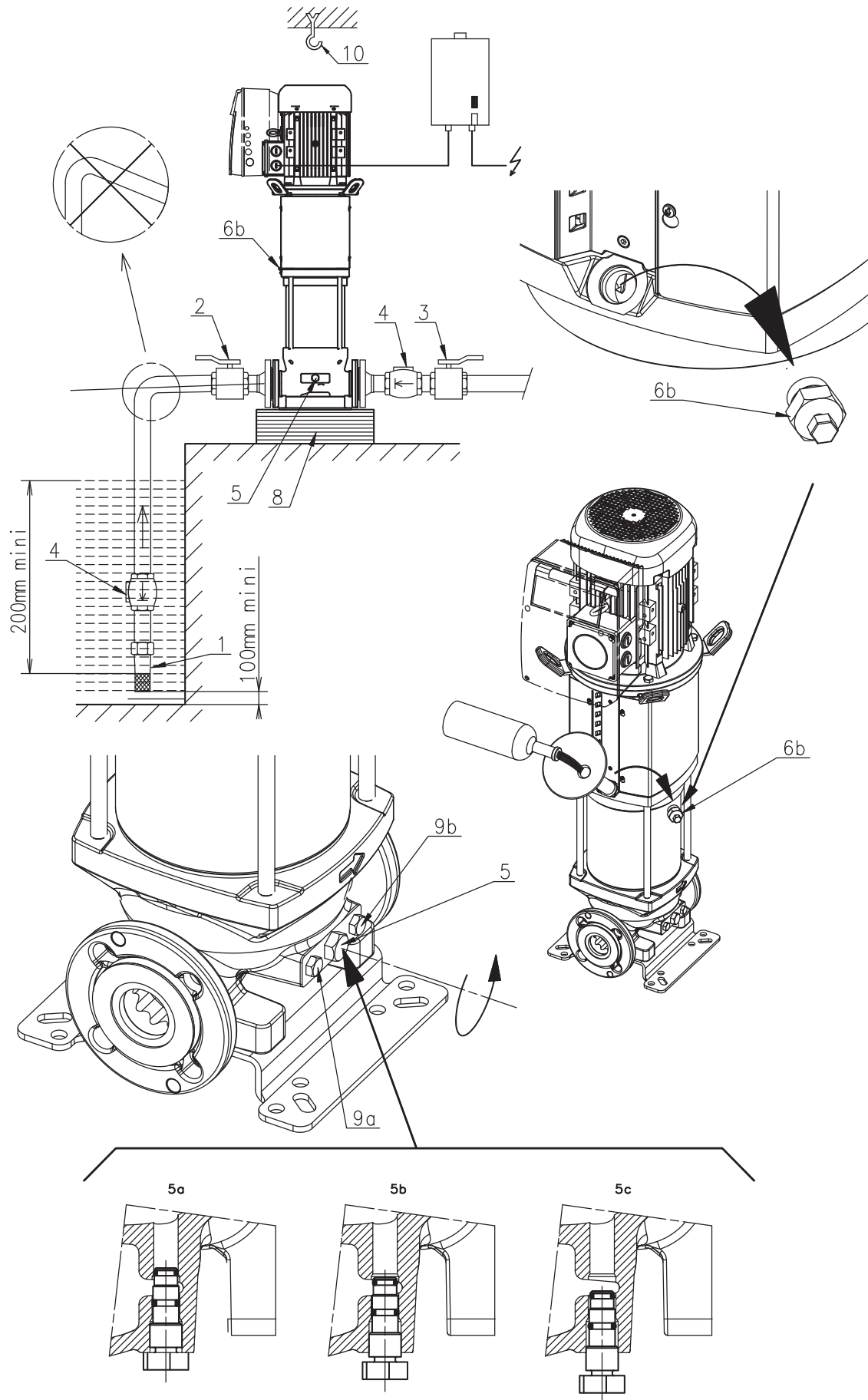


Fig. 3:

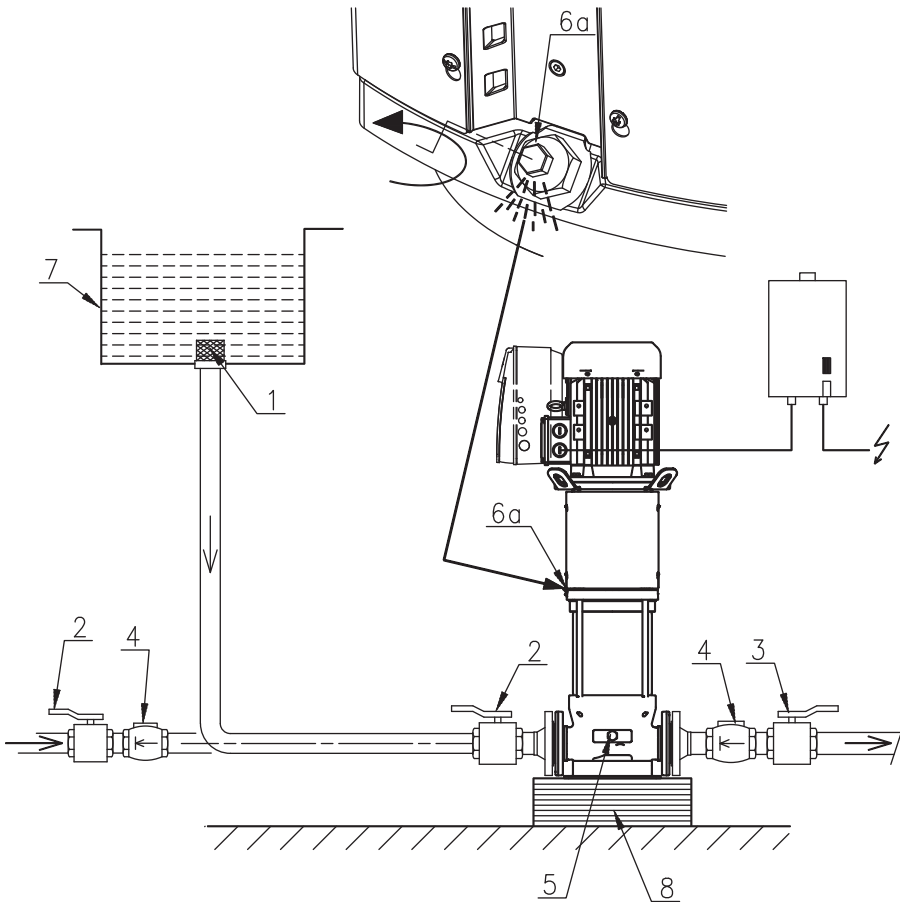


Fig. 4:

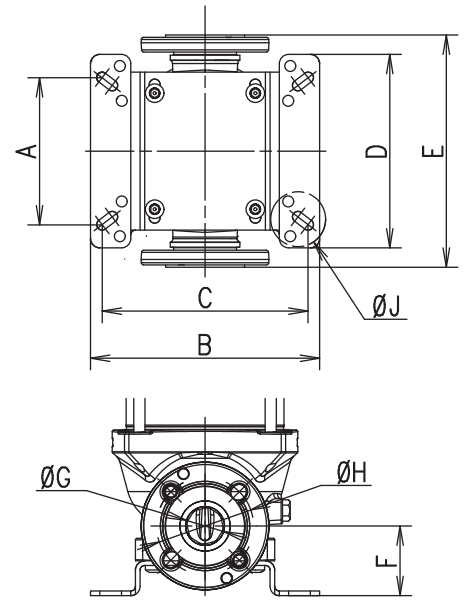


Fig. 5:

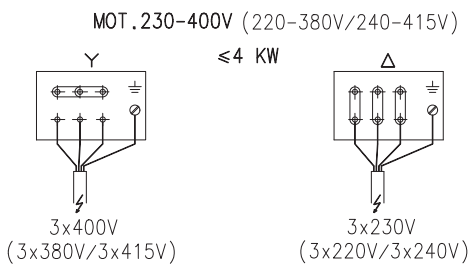


Fig. 6:

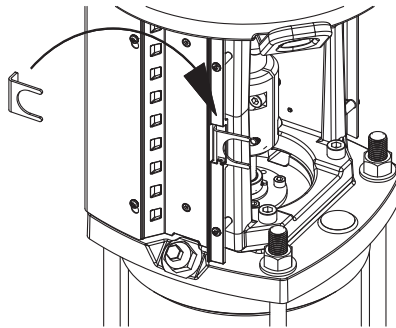


Fig. 7:

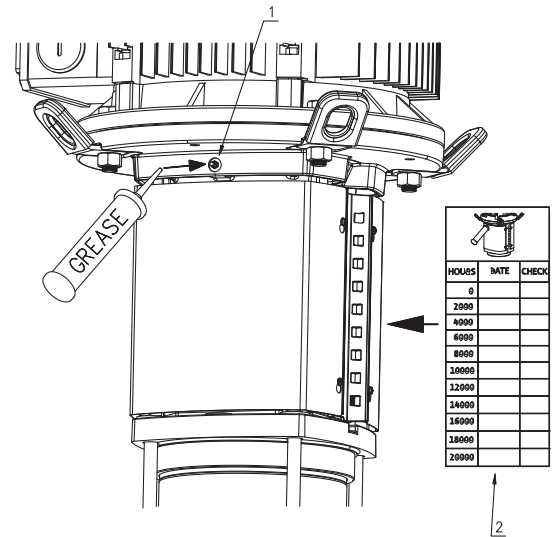


Fig. 5:

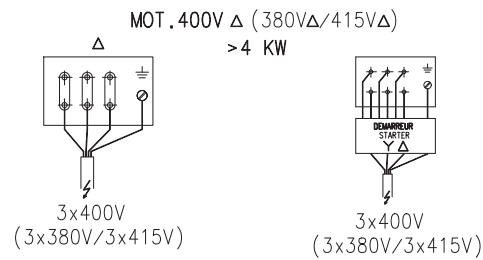


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1 General

About this document

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.

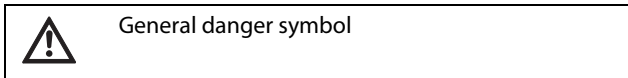
2 Safety

These operating instructions contain basic information which must be adhered to during installation and operation. For this reason, these operating instructions must, without fail, be read by the service technician and the responsible operator before installation and commissioning.

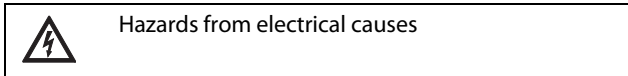
It is not only the general safety instructions listed under the main point "safety" that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Indication of instructions in the operating instructions

Symbols:



General danger symbol



Hazards from electrical causes



NOTE:...

Signal words:

DANGER!
Imminently hazardous situation.
Will result in death or serious injury if not avoided.

WARNING!
Risk of (serious) injury. 'Warning' implies that failure to comply with the safety instructions is likely to result in (severe) personal injury.

CAUTION!
Risk of damage to the pump/installation. 'Caution' refers to potential product damage if this information is disregarded.

NOTE:

USEFUL INFORMATION ON THE HANDLING OF THE PRODUCT. IT ATTENDS THE USER TO POSSIBLE PROBLEMS.

2.2 Personnel qualification

The personnel installing the pump must have the appropriate qualification for this work.

2.3 Risks incurred by failure to comply with the safety instructions

Failure to comply with the safety instructions could result in personal injury or damage to the pump or installation. Failure to comply with the safety instructions could also invalidate any claim for damages.

In particular, failure to comply with these safety instructions could give rise, for example, to the following risks:

- Failure of important pump or installation functions,
- Failure of specified maintenance and repair methods,
- Personal injury due to electrical, mechanical and bacteriological causes,
- Damage to property.

2.4 Safety precautions for the operator

The relevant accident precaution regulations must be observed. Dangers caused by electrical energy must be excluded. Local or general regulations [e.g. NEC, IEC, VDE, etc.] and directives from local electrical supply companies are to be followed.

2.5 Safety precautions for inspection and installation

The operator must ensure that all inspection and installation work is carried out by authorized and qualified specialists who have carefully studied these instructions.

Work on the pump/unit must be carried out only with the pump disconnected (locked out) from the electrical supply and at complete standstill.

2.6 Unauthorized alterations and manufacture of spare parts

Alterations to the pump or installation may only be made in agreement with the manufacturer. The use of original spare parts and accessories authorized by the manufacturer will ensure safety. The use of any other parts may invalidate claims revoking the liability of the manufacturer.

2.7 Improper use

The operating safety of the pump or installation supplied can only be guaranteed if it is used in accordance with paragraph 4 of the operating instructions. All values must neither exceed nor fall below the limit values given in the catalogue or 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.



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.).

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

4 Application

Typical applications for the Helix pumps are clean fluids relatively free of abrasive particles in commercial, agricultural, industrial and municipal areas. Water supply, water towers, irrigation, high pressure wash down, boiler feed, condensate return and pressure boosting stations. The manufacturer's approval is required for use to pump for applications not listed above.



DANGER! Risk of explosion!

Do not use this pump to handle flammable or explosive liquids

Application areas:

- water distribution and boosting installations
- industrial circulation systems
- process fluids
- cooling water circuits
- washing stations
- watering installations, etc.

5 Technical data

5.1 Pump designation

Type key for pump with motor

Example: Helix V110-02/2-X/A3	
Helix V	Pump family
110	nominal flow in GPM at 60Hz / 2 poles
02	Total number of impellers
2	Number of reduced impellers
X	1 = stainless steel 304 2 = stainless steel 316L 3 = pump casing cast iron cataphoresis coated volute, 304 stainless steel hydraulic
A3	ANSI Flange 300 lb

5.2 Data table	
Maximum operating pressure	
Pump casing	ANSI flanges 300 lb: 360 PSI (25 bar)
Maximum suction pressure	140 PSI (10 bar)
Temperature range	
Liquid temperatures	-4 °F to 250 °F (- 20° to + 120 °C)
Ambient temperature	+104 °F Max (+ 40 °C)
Electrical data	
Motor efficiency	EISA 2011 Compliant
Motor Enclosure	TEFC
Insulation class	F
Frequency	See motor plating
Electrical voltage	

Outline and pipe dimensions (see: Fig. 4)

Type	Dimensions (inch) – standard configuration							
	A	B	C	D	E	F	G	H
Helix V110-01 — V110-09	5-1/8	11-7/8	8-1/2	10	11-7/8	3-1/2	2	8 x M16
Helix V190-01/1 — V190-07/2	6-11/16	11-7/8	9-7/16	10	12-5/8	4-1/8	2-1/2	8 x M16
Helix V270-01/1 — V270-06/2	7-1/2	11-7/8	10-1/2	10	14-3/8	5-1/2	3	8 x M16

5.3 Scope of Supply

Installation and operating instructions

5.4 Accessories

Please contact your WIL0 sales office for accessories list.

See fig.2 and 3:

- 1 Strainer
- 2 Pump suction valve
- 3 Pump discharge valve
- 4 Check valve
- 5 Drain + priming plug
- 6 Air bleed screw + Filling plug
- 7 Tank
- 8 Foundation

6 Description and function

6.1 Product description

see Fig. 1

- 1 Motor bolt
- 2 Coupling guard
- 3 Cartridge seal
- 4 Hydraulic stage casing
- 5 Impeller
- 6 Pump shaft
- 7 Motor
- 8 Coupling
- 9 Motor Stool
- 10 Tube liner
- 11 Flange
- 12 Pump housing
- 13 Base plate

6.2 Design of product

- HELIX V110, V190 and V270 are vertical multistage, high pressure, non-self priming, inline pressure boosting pumps.
- HELIX pumps combine use of both high efficiency hydraulics and motors.
- All metallic parts in contact with water are made of stainless steel or grey cast iron.
- For aggressive fluid, special versions exist with 100 % stainless steel of all wetted components.
- A cartridge seal is used as standard for all HELIX range in order to ease maintenance.
- In addition, for 7 ½ Hp and above, a spacer coupling allows to change this seal without removing the motor.
- HELIX motor stool design integrates an additional ball bearing to absorb downthrust, eliminating motor bearing.
- Special handling devices are integrated in order to facilitate pump installation.

7 Installation and electrical connection

Installation and electrical work only in compliance with any local codes and by qualified personnel!



WARNING! Bodily injury!
Existing regulations for the prevention of accidents must be observed.



WARNING! Electrical shock hazard
Dangers caused by electrical energy must be excluded.

- **Electrical work by a qualified electrician only!**
- **National Electrical Codes, local codes and regulations must be strictly followed.**
- **All electrical connections 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.**

7.1 Commissioning

- Unpack the pump and dispose of the packaging in an environmentally-responsible manner.

7.2 Installation

The pump must be installed in a dry, well-ventilated and frost-free place.



CAUTION! Possible damage of the pump!
Dirt and solder in the pumps hydraulic can affect the pump operation.
It is recommended that any welding and soldering work be done before installing the pump.
Thoroughly flush the system out before installing the pump.

- The pump must be installed in an easily accessible position to facilitate inspection or replacement.



WARNING! Risk of accident by hot surfaces!
The pump must be positioned to eliminate contact with the hot pump surfaces while in operation.

- Install the pump in a dry place protected from frost, on a flat concrete block using appropriate screws. If possible, use an insulating material under the concrete block (cork or reinforced rubber) to avoid any noise and vibration transmission into the installation.



WARNING! Risk of pump displacement!
The pump must be secured to the ground.

- Place the pump where it will be easily accessible, to facilitate inspection and removal work. The pump must be installed perfectly upright on a sufficiently heavy concrete base.



CAUTION! Risk of parts inside the pump!
Take care to remove pump flange covers prior to installation.



NOTE:
Each pump could be tested to confirm hydraulic performance in the factory, consequently some testing fluid could still be present inside the pump. It is recommended for hygienic purposes, to flush the pump internals before any using with potable water supply.

- The installation and connection dimensions are given §5.2
- Lift the pump carefully by using the integrated rings, if necessary with a hoist and suitable slings according to the current hoist guidelines.



WARNING! Risk of fall!
Take care to pump lifting lugs especially for the highest pumps whose centre of gravity could cause the pump/motor assembly to fall over.



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Take care to pump lifting lugs especially for the highest pumps whose centre of gravity could cause the pump/motor assembly to fall over.

7.3 Pipe connection

- Connect the pump to the piping system with flanges, nuts, bolts and gaskets supplied by others.



CAUTION!
Tightening of bolts must not exceed 74 ft.-lbs.
Use of impact wrench is prohibited.

- The flow direction of the fluid is indicated on the identification label of the pump.
- Pump must be installed in such a way that it is not stressed by the pipework. The pipes must be attached so that the pump does not bear their weight.
- It is recommended that isolation valves be installed on the suction and discharge side of the pump.
- Use of expansion joints may reduce noise and vibration of the pump.
- The inlet pipe diameter should not be less than the flange pipe size.
- A check valve could be placed on the discharge pipe in order to protect the pump against water hammer (hydraulic shock).

- For direct connection to a public drinking water system, the suction pipe must also have a check valve (or backflow prevention device) and an isolation valve.
- For indirect connection via a tank, the suction pipe must have a strainer to keep any impurities out of the pump and a check valve.

7.4 Motor connection for bare-shaft pump (without motor)

- Remove coupling guards.



NOTE:

Coupling guards can be removed without entirely unscrewing screws.

- Install the motor on the pump by using screws (FT lantern size – see product designation) or bolts, nuts and handling devices (FF lantern size – see product designation) provided with the pump : check motor power and dimension in WILO catalogue.



NOTE:

Depending on fluid characteristics, motor power might be modified. Contact WILO Customer Services if needed.

- Close the coupling guards by screwing all screws provided with the pump.

7.5 Electrical connection



WARNING! Electrical shock hazard
Dangers caused by electrical energy must be excluded.

- **Electrical work by a qualified electrician only!**
- **National Electrical Codes, local codes and regulations must be strictly followed.**
- **All electrical connections 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 nameplate 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 per local electrical codes.
- Three-Phase motors must be connected to an approved safety switch (motor starter). The set nominal current must correspond to the electrical data on the motor name plate
- The electrical cable must be positioned so that it never touches the pipework and/or the pump and motor housing.

- The pump/installation should be grounded in compliance with local regulations. A ground fault interrupter (GFI) can be used as extra protection.
- The connection to the power supply must be in accordance with the wiring diagram (see Fig. 4).

7.6 Operation with frequency converter

- Motors used can be connected to a frequency converter in order to adapt pump performance to duty point.
- The converter must not generate voltage peaks at motor terminals higher than 850V and dU/dt slope higher than 2500 V/μs.
- In case of higher value, an appropriate filter must be used : contact converter manufacturer for this filter definition and selection.
- Strictly follow instructions provided by the converter manufacturer data sheet for installation.
- Minimum variable speed should not be set below 40% of pump nominal speed.

8 Start up

8.1 System filling - Venting



CAUTION! Possible damage of the pump
Never operate the pump dry.
The system must be filled before starting the pump.

8.1.1 Air venting process – Pump with positive supply pressure (see fig.3) :

- Close the two isolation valves [2 + 3].
- Unscrew the air bleed screw from filling plug [6a].
- Slowly open the isolation valve on the suction side [2].
- Retighten the air-bleed screw once the air has been removed (fluid evacuates from the air-bleed screw) [6a].



WARNING! Risk of scalding
When the pumped liquid is hot and the pressure high, the fluid escaping at the air bleed screw may cause burns or other injuries.

- Open the isolation valve on the suction side completely [2].
- Start the pump and check if direction of rotation matches the direction arrow on the pump.



CAUTION! Possible damage of the pump
Reverse rotation will cause reduced pump performance and possible coupling and pump damage.

- Open the isolation valve on the discharge side [3].

8.1.2 Air removal process – Pump in suction lift application (see fig.2) :

- Close the isolation valve on the discharge side [3]. Open the isolation valve on the suction side [2].
- Remove the filling plug [6b].
- Partially open the drain-priming plug [5b].
- Fill the pump and the suction pipe with water.
- Make sure that there is no air in the pump and in the suction pipe : refill until 100% of of the suction pipe and pump is complete.
- Close the filling plug with air bleed screw [6b].
- Start the pump and check if direction of rotation matches the direction arrow on the pump.



CAUTION! Possible damage of the pump
Reverse rotation will cause reduced pump performance and possible coupling and pump damage.

- Slightly open the isolation valve on the discharge side [3].
- Unscrew the air bleed screw from filling plug for air venting [6a].
- Retighten the air-bleed screw once the air has been removed (fluid evacuates from the air-bleed screw) [6a].



WARNING! Risk of scalding!
When the pumped liquid is hot and the pressure high, the fluid escaping at the air bleed screw may cause burns or other injuries.

- Open the isolation valve on the discharge side completely [3].
- Close the drain-priming plug [5a].

8.2 Starting up



CAUTION! Possible damage of the pump
The pump must not operate at zero flow (closed discharge valve – dead heading).



WARNING! Risk of injury!
When the pump runs, coupling guards must be in place, tightened with all appropriate screws in place.



WARNING! Important noise!
Noise emitted by high horsepower pumps could be very high: protection must be used during extended periods of close proximity to the pump.



WARNING! Risk of injury!
Install so that no one could be hurt due to fluid leakage (mechanical seal failure ...)

9 Maintenance /Service

All servicing should be performed by an authorized service representative!



WARNING! Electrical shock hazard
Dangers caused by electrical energy must be avoided.
All electrical work must be performed after the electrical supply has been switched off and secured against unauthorized operation.



WARNING! Risk of scalding
At high water temperatures and system pressure close both isolating valves before and after the pump.
First, allow pump to cool down.

- These pumps are of low-maintenance design.
- If needed, the mechanical seal could be easily replaced thanks to its cartridge seal design. Insert the spacer in its housing (see fig. 6) once mechanical seal position is set.
- Always keep the pump clean.
- Pumps which are not being used during periods of frost should be drained to avoid damage: Close the isolation valves, completely open the drain-priming plug and the air bleed screw.

10 Faults, causes and remedies



WARNING! Electrical shock hazard
Dangers caused by electrical energy must be avoided.
All electrical work must be performed after the electrical supply has been switched off and secured against unauthorized operation.



WARNING! Risk of scalding
At high water temperatures and system pressure close both isolating valves before and after the pump.
First, allow pump to cool down.

FAULT	CAUSES	REMEDY
PUMP FAILS TO OPERATE	<ul style="list-style-type: none"> No current The thermistor tripping device has tripped out, cutting off power 	<ul style="list-style-type: none"> Check the fuses, the wiring and the connectors. Eliminate any causes of motor overloads.
PUMP RUNS BUT DOES NOT PROVIDE SUFFICIENT FLOW OR PRESSURE	<ul style="list-style-type: none"> Reverse rotation Parts of the suction pipe are obstructed by foreign material Air in suction pipe Suction pipe too small Valve(s) are not open far enough 	<ul style="list-style-type: none"> Check the direction of rotation of the motor and correct it if necessary. Check and clean the pipe. Make the suction pipe airtight. Install a larger suction pipe. Open the valve properly.
PUMP FLOW SURGES	<ul style="list-style-type: none"> Air in pump 	<ul style="list-style-type: none"> Evacuate the air in the pump; check that the suction pipe is airtight. If required, run the pump for 20–30sec – open the air bleed screw in order to remove air – close the air bleed screw and repeat it several times until no air is escaping out of the pump.
PUMP VIBRATES OR IS NOISY	<ul style="list-style-type: none"> Foreign material in pump Pump not properly mounted to the floor Bearing damaged 	<ul style="list-style-type: none"> Remove the foreign material. Retighten the screws. Call WILO Customer Service.
MOTOR OVERHEATS – OVERLOAD PROTECTION TRIPS	<ul style="list-style-type: none"> A phase is an open-circuit Ambient temperature too high 	<ul style="list-style-type: none"> Check fuses, wiring, and the connectors. Provide cooling.
MECHANICAL SEAL IS LEAKING	<ul style="list-style-type: none"> Mechanical seal is damaged 	<ul style="list-style-type: none"> Replace the mechanical seal.

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

11 Spare parts

All spare parts must be ordered through WILO Customer Service.

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

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

WILO USA LLC
1290 North 25th Ave.
Melrose Park, IL
USA
60160
Phone: (866) 945-6872
(WILO USA)
FAX: (403) 277-9456

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