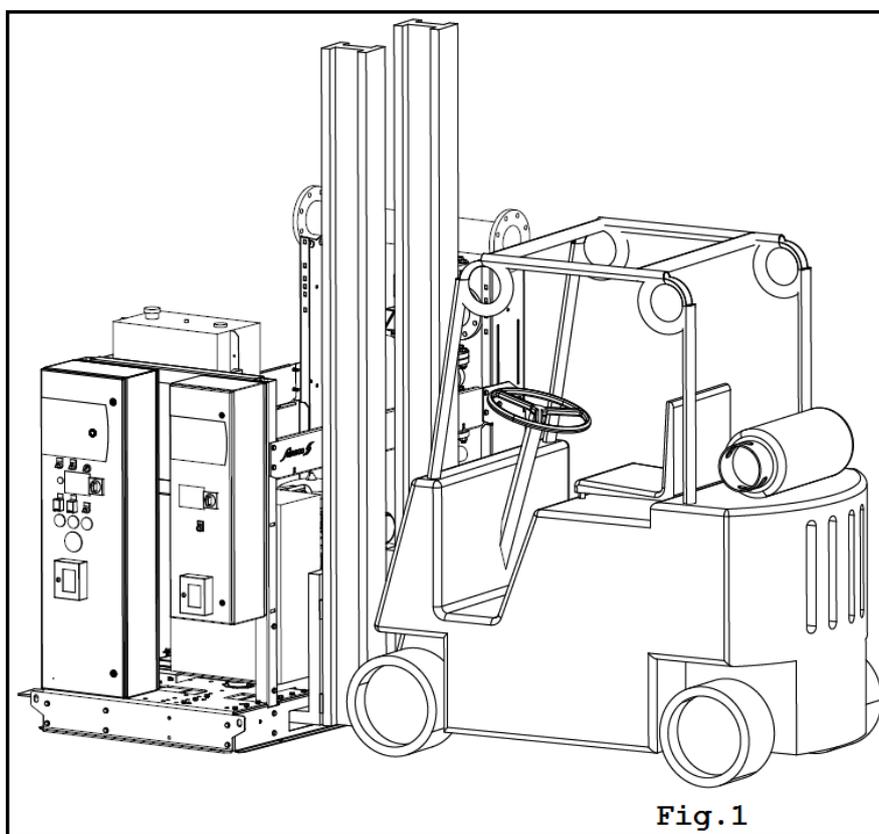


Wilo-SiFire FR



en Installation and operating instructions

FIGURES



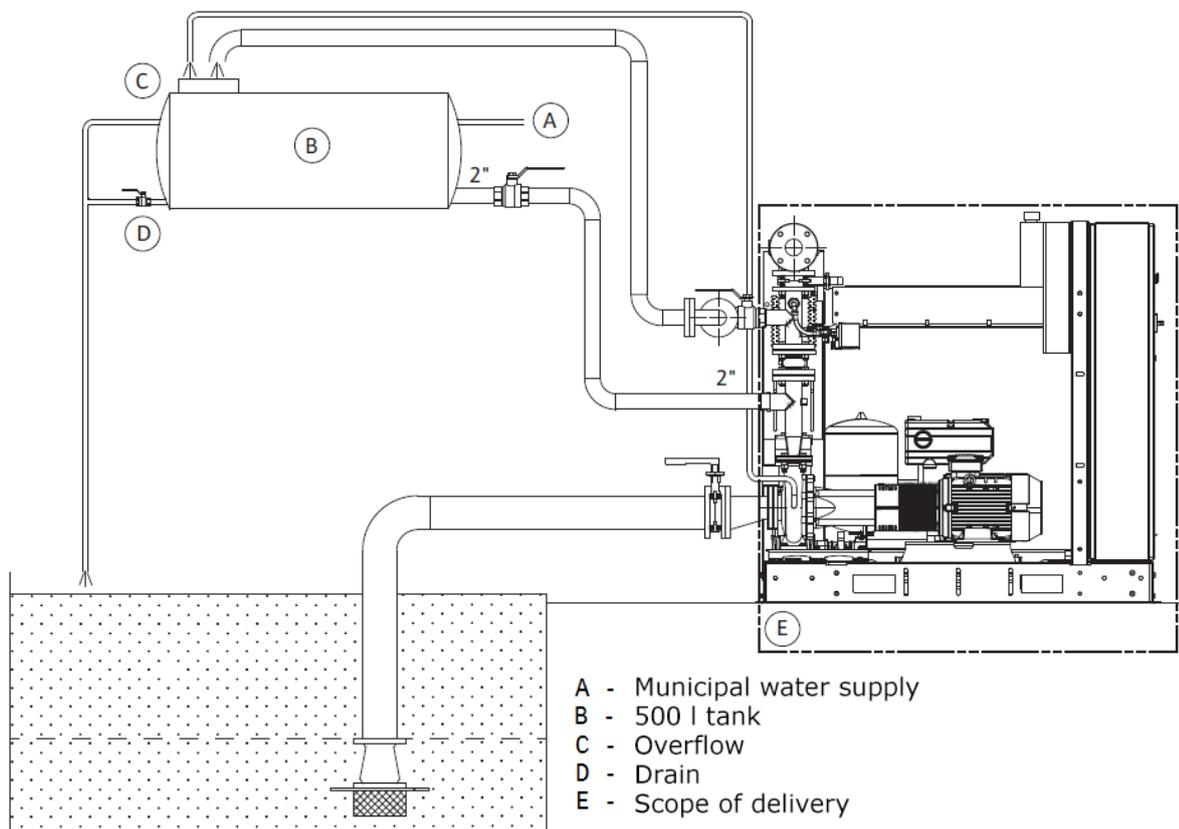


Fig. 2a

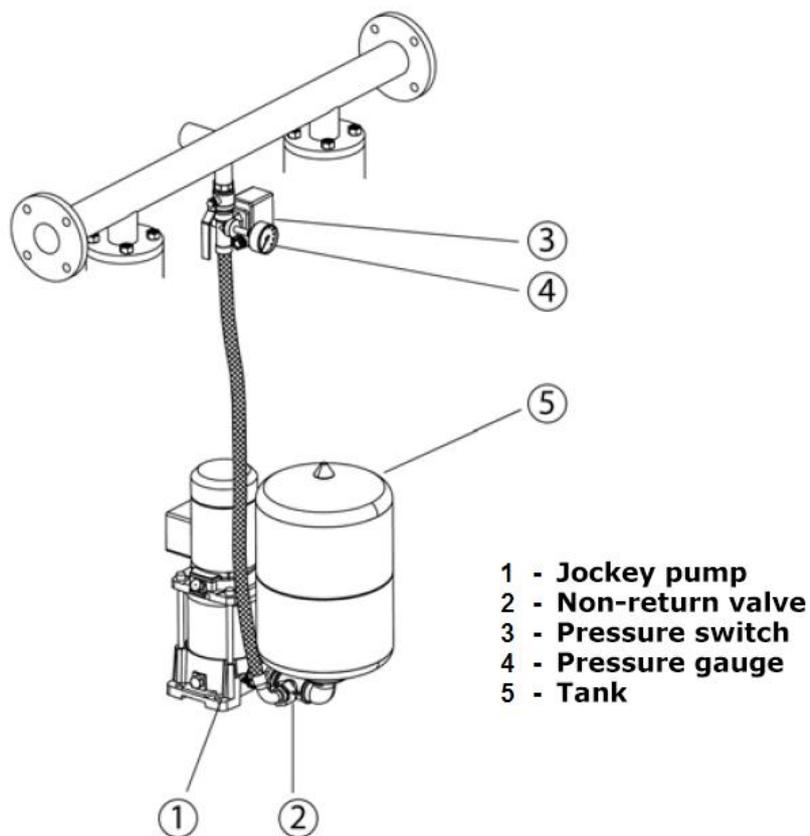


Fig. 2b

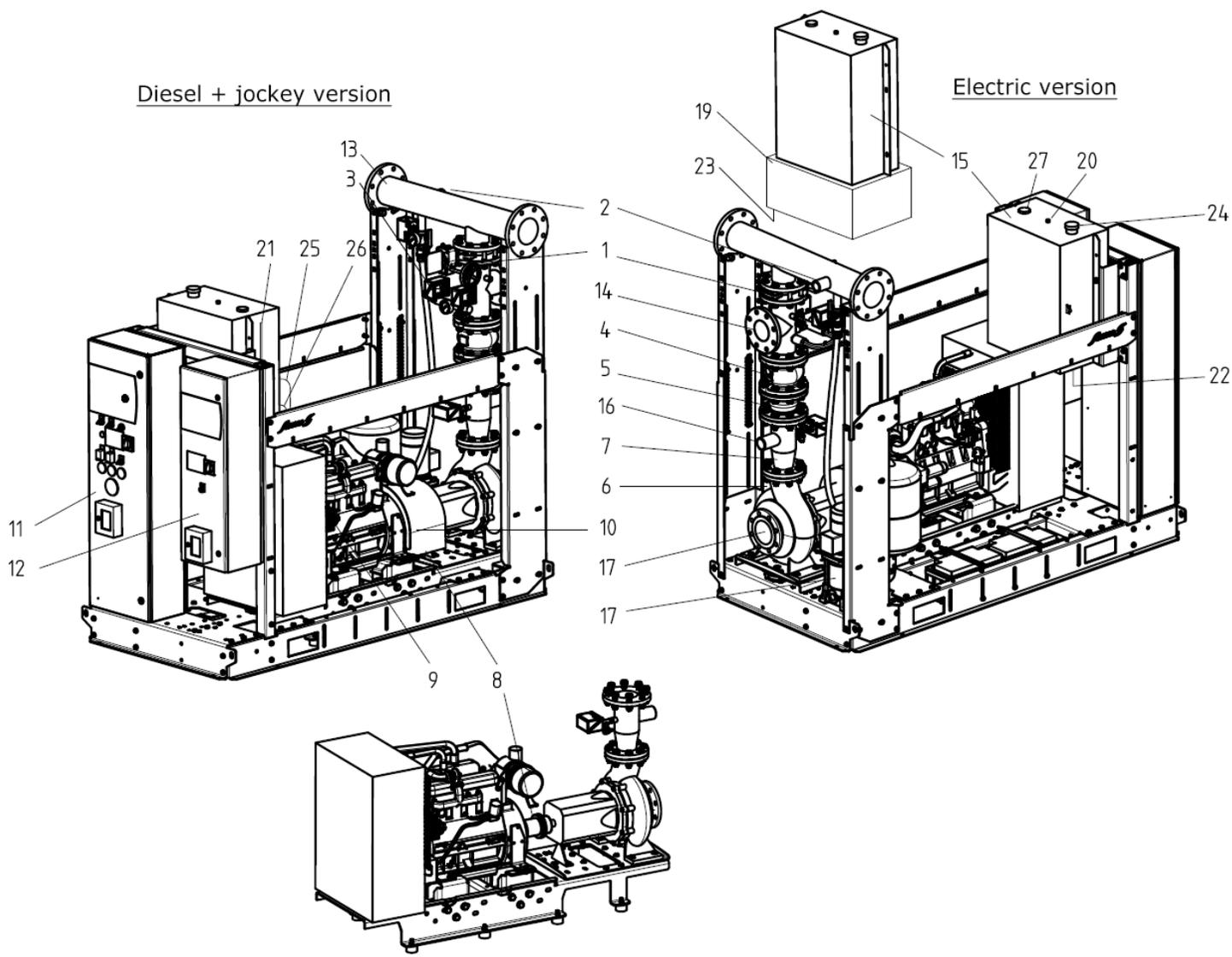


Fig.3

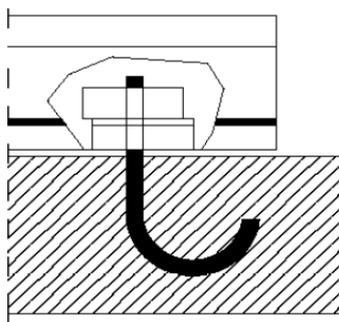
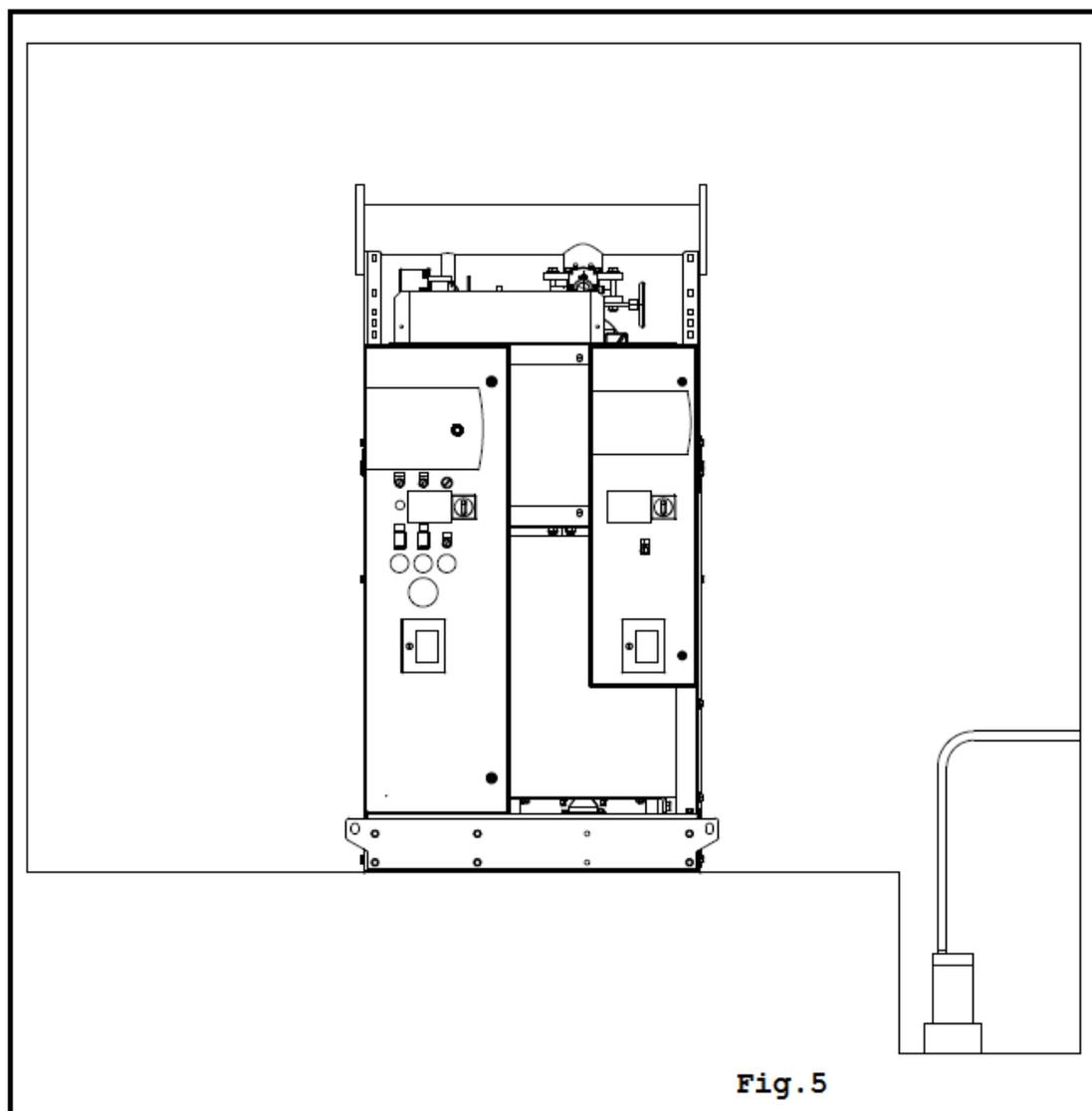


Fig.4



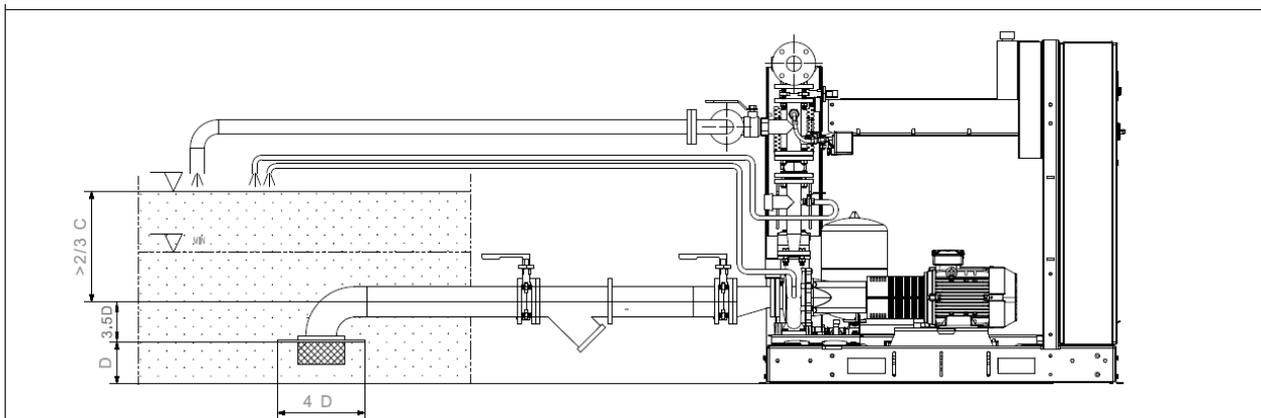


Fig.6a

C= TANK CAPACITY

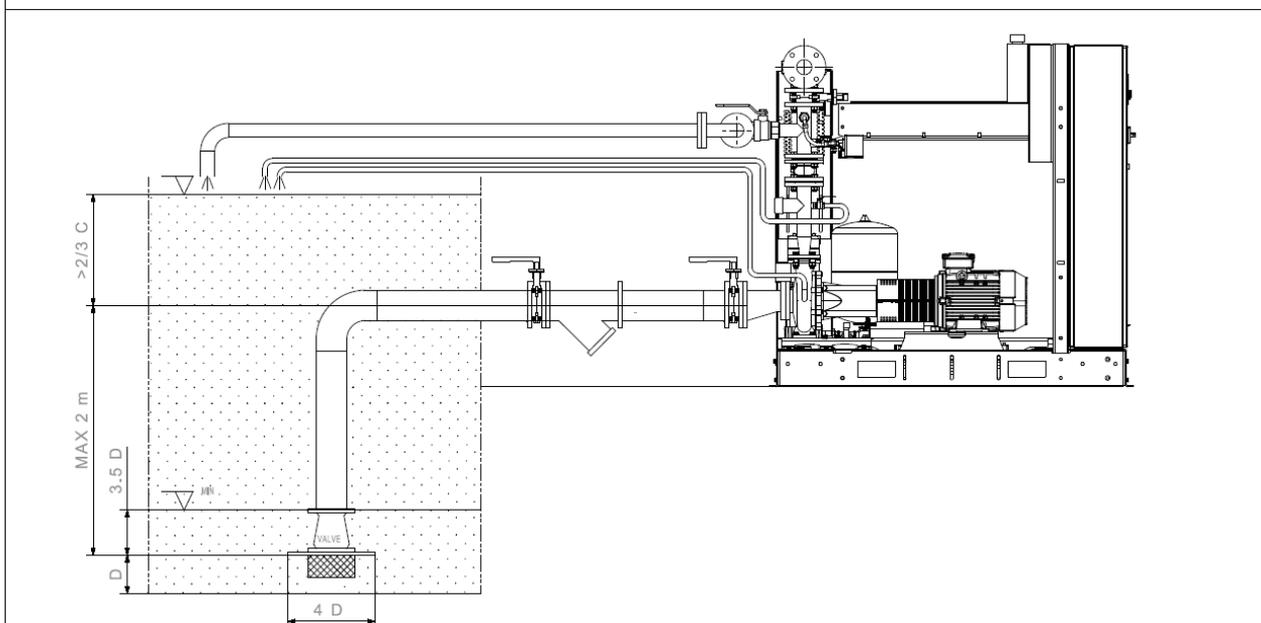


Fig.6b

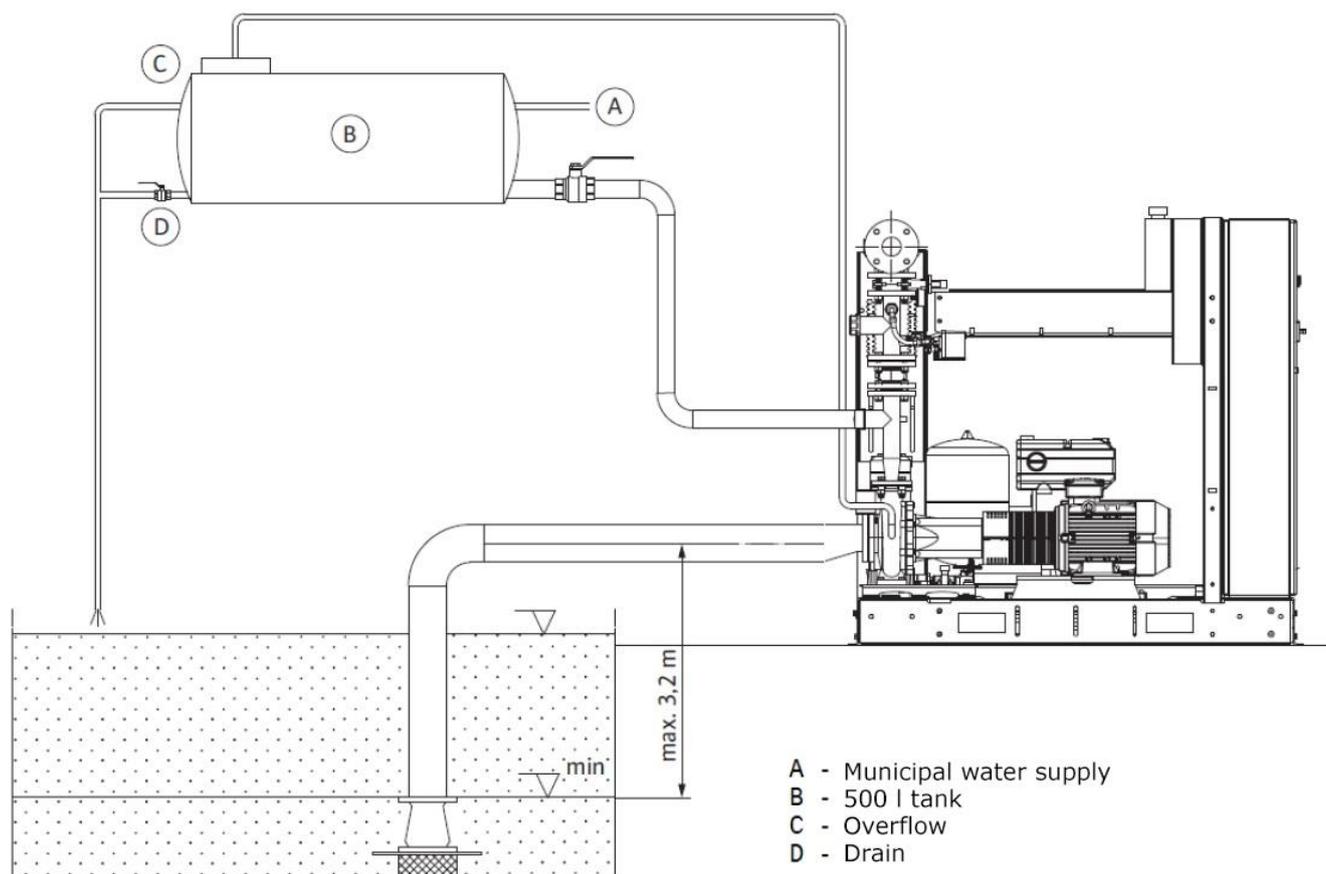


Fig. 7

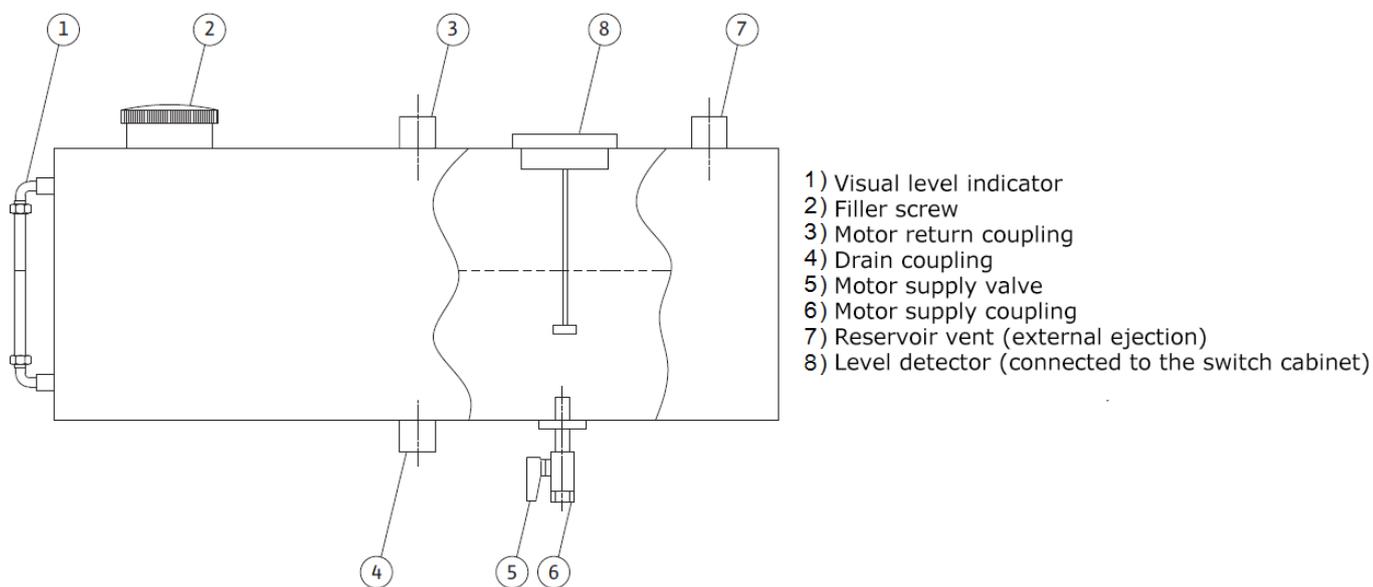


Fig. 8

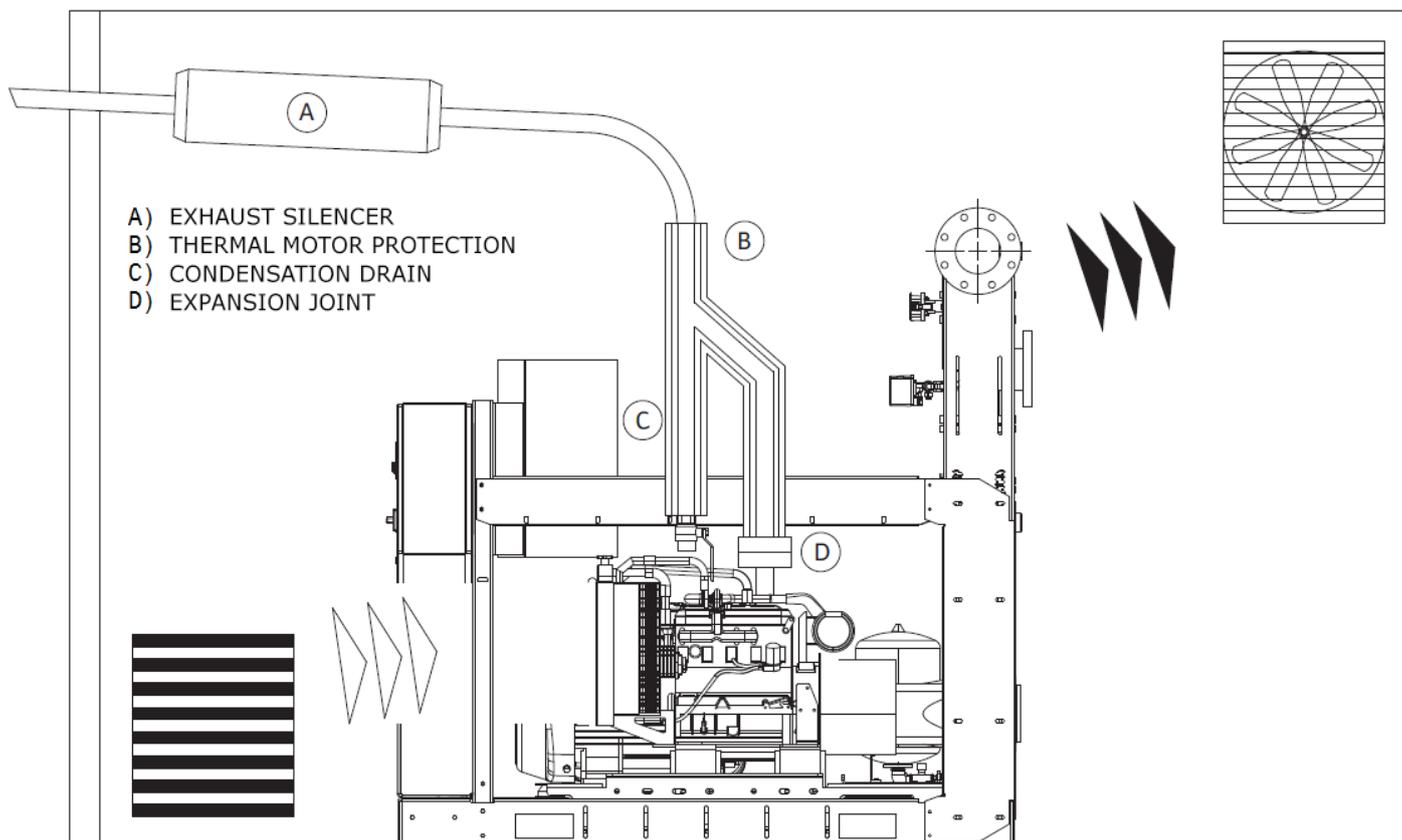


Fig. 9a

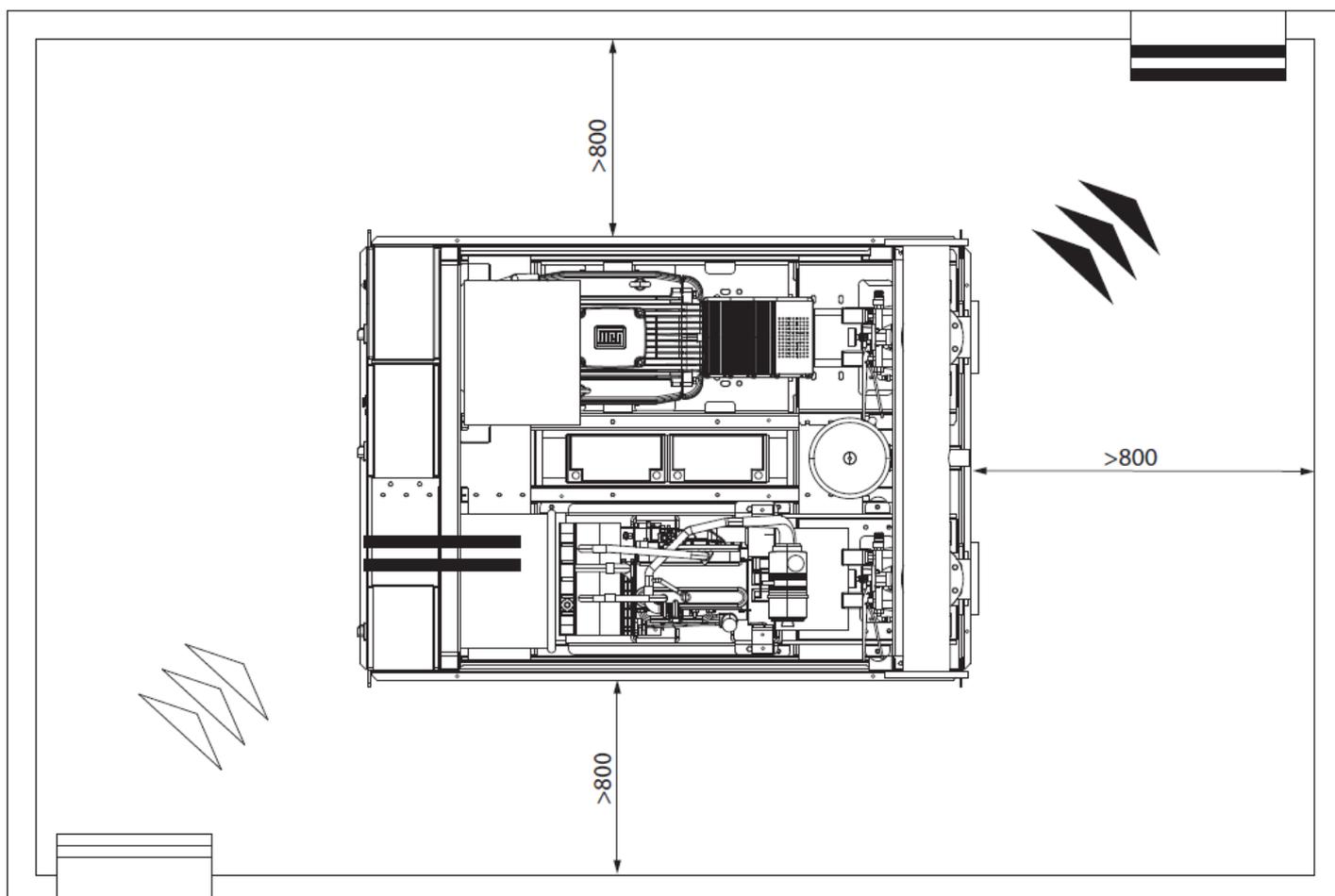


Fig. 9b

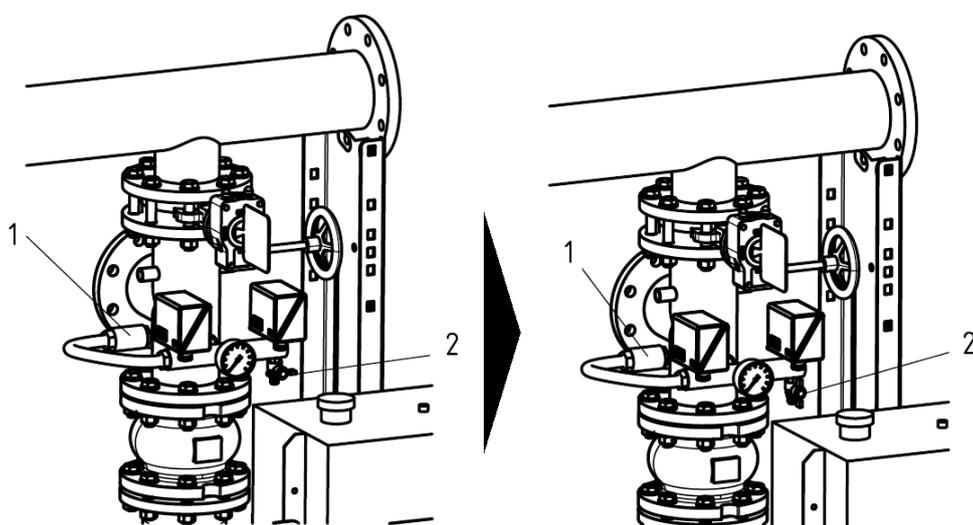


Fig. 10

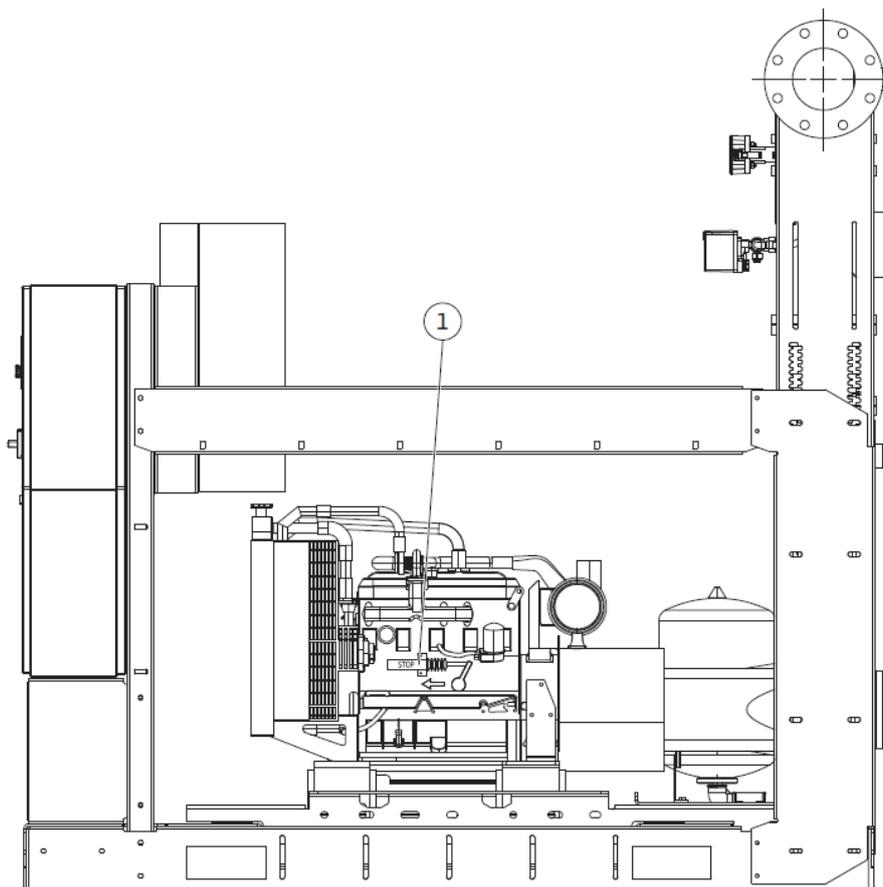


Fig. 11

1 General information

About this document

The language of the original Installation and operating instructions is French. All other languages are translations of the original Installation and operating instructions.

These Installation and operating instructions are an integral part of the product. They must be kept readily available close by the product. 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 to legal provisions and underlying safety standards valid at the time of printing.

EC Declaration of Conformity:

A copy of the EC Declaration of Conformity is a key component of these Installation and operating instructions. If a technical modification is made on the designs named therein without our agreement, or if the declarations made in the Installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These Installation and operating instructions contain important 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 chapter on general safety instructions 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 in the operating instructions

Symbols:



General danger symbol



Instructions relating to electrical voltage



Instructions relating to suspended loads



Instructions relating to flammable materials



Electrocution



Poisoning



Instructions relating to hot surfaces



Instructions relating to hot products



Instructions relating to cuts



Falling



Irritation



Pollution



Explosion



Access prohibited for unauthorised persons!



Do not touch live parts!



Smoking and naked flames are prohibited



General symbol indicating a prohibited activity



NOTICE: ...

Signal words:**DANGER!**

Acutely dangerous situation.

Non-observance will result in death or the most serious of injuries.

WARNING!

The user may suffer (serious) injuries. "Warning" signifies that (serious) personal injury is probable if this instruction is not observed.

CAUTION!

There is a risk of damaging the product/unit. "Caution" signifies that damage to the product and its functioning is likely if this instruction is not observed.

NOTICE:

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

Information that appears directly on the product, such as

- the arrows indicating the direction of rotation,
- identifiers for fluid connections,
- the rating plate, and
- warning stickers 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 to complete this work. The operator must ensure the personnel's areas of responsibility, terms of reference and their supervision. If the personnel are not in possession of the necessary knowledge, they must be trained and instructed. If necessary, this training can be carried out by the product's manufacturer on the operator's behalf.

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

Non-observance of the safety instructions may result in risk of injury to persons and damage to the environment and the product or unit. It also results in the invalidation of any claims to damages. In detail, non-observance can, for example, result in the following risks:

- Danger to persons due to electrical, mechanical and bacteriological influences
- Damage to the environment as a result of leakage of hazardous materials
- Damage to property
- 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 must be respected.

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 a lack of experience or knowledge, unless they have been given supervision or detailed instruction concerning use of the appliance by a person responsible for their safety.

Children must be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit create hazards, it is the customer's responsibility to guard them against being touched.
- Guards which protect personnel from coming into contact with moving components (e.g. couplings) must not be removed while the product is in operation.

- Hazardous fluids (i.e. which are explosive, toxic or hot) which have leaked (e.g. from the shaft seals) must be disposed of so that they pose no danger to persons or to the environment. National statutory provisions must be complied with.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. IEC, VDE etc.] and instructions from local energy supply companies must be respected.

2.6 Safety instructions for installation and maintenance work

The user must have all installation and maintenance operations performed by a specialised, qualified person, with due regard to the contents of these instructions.

Work on the product/unit must only be carried out when it is at a standstill. Compliance with the procedures described in the Installation and operating instructions for shutting down the product/unit is mandatory.

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

2.7 Unauthorised modification of components and use of unauthorised spare parts

Unauthorised modification of components and use of unauthorised spare parts will impair the safety of the product/personnel, and will render the manufacturer's declarations regarding safety void. Modifications to the product are only permissible following consultation with the manufacturer.

Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts absolves the manufacturing company of any and all liability.

2.8 Improper use

The operational reliability of the supplied product is only guaranteed for conventional use in accordance with Chapter 4 of the Installation and operating instructions. The limit values must on no account fall below or exceed the values specified in the catalogue/data sheet.

3 Transport and temporary storage

The system is delivered on a pallet. It is protected from moisture and dust by a plastic shrink-wrap.

Transport must be completed using a lifting device duly authorised to bear the load. (See example in Fig. 1)



WARNING! Risk of personal injury!

The static stability of the unit must be taken into account. Maintenance must be performed by qualified personnel using suitable and authorised equipment.

Lifting straps must be fastened to the transport lugs designed for this purpose.

The collector tank is not suitable for handling the system and must not be used to fix loads.



CAUTION! Risk of damage to the installation!

Handling by using collector tank can cause loss of impermeability!

When you receive the equipment, check that it has not been damaged during transport. If you notice a fault, take all necessary action with the carrier.



CAUTION! Risk of damage to the installation!

If the product is to be installed later on, store it in a dry place. Protect it from impacts and all external influences (moisture, frost, etc.). Move the device with care.

3.1 Residual risk during transport and storage



DANGER! Risk of cutting fingers!

Take the necessary precautions to ensure that nobody is hurt by unprotected sharp edges or threaded parts. Wear special gloves.



DANGER! Risk of being crushed!

Do not stand or put body parts under the suspended parts during handling and installation. Wear suitable clothing and equipment to protect against accidents.



CAUTION! Risk of impact injury!

Be careful of prominent parts and parts at head height. Wear suitable clothing and equipment to protect against accidents.

**DANGER! Risk of electrocution!**

The personnel assigned to connect electrical devices and motors must be qualified for this kind of work and must make the connections in accordance with the wiring diagrams provided and valid regulations and laws. In addition, they must ensure that they have cut the power supply before performing any operation which provides possible contact with electrical parts that would normally be live. Check earth continuity.

**CAUTION! Risk of falling!**

Prohibit access to tanks or wells where pumps are installed. Wells must not be left uncovered, and must be sealed with a locked cover.

**DANGER! Risk of irritation!**

During handling, avoid spillages of battery acid solution which could cause irritation or material damage. Use special protections to avoid contact.

**DANGER! Risk of pollution!**

Avoid all spillages of oil from the diesel motor or of fuel from the tank. When handling, keep the unit flat. Use suitable protection and implement the necessary measures to prevent pollution of soil, water, etc.

4 Intended use

The fire extinguishing pressure-boosting system is designed for professional use. It makes it possible to pressurise the fire extinguishing network, and to keep it pressurised.

The system must be installed in a special room which is sufficiently ventilated, fireproof, protected from frost and rain, conforms with APSAD R1 and which offers sufficient space around the pumps for movement and regular maintenance. Sufficient airflow for ventilation and for cooling of motors, specifically diesel internal combustion motors, must be ensured.

5 Product characteristics

5.1 Type key

Example:	Wilo-SiFire-100/250-256-100/1.1DJ FR
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SiFire: System name

100-250: Type of pump

256: Diameter of pump impeller

100/1.1: Pumps' performance in kW – diesel motor/jockey motor

DJ: Configuration

E : 1 electric pump

D : 1 diesel pump

EJ : 1 electric pump + 1 jockey pump

EEJ : 2 electric pumps + 1 jockey pump

DJ : 1 diesel pump + 1 jockey pump

FR: Conforms with installation regulation APSAD R1; cabinets certified according to A2P

5.2 Technical data

Maximum operating pressure:	10 bar/16 bar depending on the pump
Maximum ambient temperature:	4 to 40 °C (10 to 40 °C if diesel pump)
Maximum water temperature:	4 to 40 °C
Supply voltage:	Three-phase 400 V +/-10 % for electric and jockey control cabinets Single-phase 230 V +/-10 % for diesel control cabinets
Frequency:	50 Hz
Maximum relative humidity:	50 % with max. temperature 40 °C (*)
Switchgear protection rating:	IP44
Pump protection rating:	IP55
Motor IE3 class:	F
Maximum installation altitude:	1000 m above sea level (*)
Minimum atmospheric pressure:	760 mmHg (*)
Rated current:	refer to the rating plate

(*) Refer to the tables and graphics in the catalogue and maintenance manual for details concerning the different categories of electric and diesel motors concerning temperature, altitude, atmospheric pressure and the temperature and viscosity of the fuel in comparison with regulatory tests.

5.3 Scope of delivery

- Fire-fighting system
- Operating instructions for the fire-fighting system (present manual)
- Operating instructions for the pumps (one manual per pump type)
- Operating instructions for the switchgear (one manual per switchgear type)
- Operating and maintenance instructions for the diesel motor (if applicable)

5.4 Accessories

- Priming tanks complete with electric floater
- Electric limit switch for pumps' stop valves
- Flexible vibration-damping bushings
- Eccentric cone kit with air pressure gauge for suction section of the pumps
- Isolation valves for the wheel (CNPP listed)
- Exhaust silencer for diesel motor
- Flow meter
- Spare parts kit for the diesel motor

The assembly and completion of the unit are in conformity with the requirements of APSAD R1, including our delivery with all necessary components (relief diaphragm and recirculation pipes, circuits to measure the flow with a flow meter, priming tank, etc.), and are the responsibility of the installer, who must work in conformity with the plans.

The installer must obtain the N1 Declaration of Compliance, confirming that the installation has been completed in accordance with APSAD R1 as required by the regulations currently in force, and must leave all requisite documents with the final user.

6 Description and function

6.1 General description

There are several versions of the fire protection unit, as indicated in our catalogues, in addition to special versions modified in order to satisfy particular requirements (transport/handling difficulties, particular services, etc.). The units are assembled using the main components described below:

- Normalised main pumps, coupled to an electric or diesel motor by a spacer, which allows the pump and/or motor to be dismantled without dismantling other parts and also allows the rotating part of the pump to be extracted for maintenance without the motor and/or pump housing needing to be removed
- Multistage vertical jockey pump to compensate for small leakages and to keep the sprinkler system pressurised
- Electric switchgears (one switchgear per pump)
- Piping and discharge manifold in painted steel
- Isolating valve on each pump discharge
- Non-return valves on each pump discharge
- Butterfly valves, air pressure gauges, pressure switches
- Connections for the flow meter in order to control pump performance
- Recirculation circuit with relief diaphragm for each main pump
- Manual test circuit for the pumps
- Two pressure switches to activate each main pump
- One pressure switch to activate the jockey pump
- Support frame for switchgears and collector tank
- Independent fuel tank for the diesel motor, complete with accessories
- Two batteries to start up the diesel motor, if applicable

The system is assembled on a baseplate within the delivery scope indicated on the installation wiring diagram in Fig. 2a – 2b.

Each pump is installed on a steel baseplate. Diesel pumps are connected to hydraulic elements with intermediary vibration damping bushings so as to avoid the vibrations from diesel motors from being transmitted and to prevent potential breakages in the piping or mechanical structure.

For the connection to the public water mains, regulations and currently valid standards must be respected and potentially fulfilled pursuant to the regulations of water distribution companies. In addition, local specificities must be taken into account: for example, if the suction pressure is too high or too variable, a pressure reducer must be fitted.

6.2 Product description

6.2.1 System composition:

See the components indicated on Fig. 3:

1. Isolating valve
2. Connection for local sprinkler
3. Double circuit for main pump pressure switches
4. Non-return valve
5. Anti-vibration bushing for diesel motor pump
6. Connection for recirculation circuit with relief diaphragm
7. Divergent cone on the main pump pressure connection
8. Pump/motor coupling with spacer sleeve
9. Electric/diesel motor for main pump
10. Protective caps for pump/motor coupling
11. Main pump switchgear
12. Jockey pump switchgear
13. Discharge manifold
14. Connection for installing optional flow meter
15. Fuel tank (for diesel motor pump)
16. Connection for priming circuit of main pump
17. Main pump
18. Jockey pump
19. Collecting pan for fuel leakages
20. Vent valve for fuel tank
21. Fuel level indicator
22. Drain for removing deposits in fuel tank
23. Drain for cleaning deposits in collecting pan for fuel leakages
24. Fuel filler screw
25. Connection to motor return core
26. Connection to supply fuel to the motor
27. Fuel level sensor

Ø Main pump outlet	Ø Accessories	Ø Collector tanks
DN 32	DN 50	DN 65
DN 40	DN 65	DN 65
DN 50	DN 65	DN 80
DN 65	DN 80	DN 100
DN 80	DN 100	DN 125
DN 100	DN 125	DN 150
DN 125	DN 150	DN 200

6.2.2 Switchgear

- Conforms to technical design regulations T1-1 and T1-2, and is certified according to A2P
- Ensures complete automatic operations of each pump and associated functions
- IP44 protection rating

6.3 Product function

The operating logic for the fire extinguishing unit is based on the cascade setting of the pressure switches to activate the pumps.

The jockey pump in the pressure-boosting system is the first to start, and keeps the unit full of water and pressurised. It activates during negligible pressure losses. Start and stop control is provided by the pressure switch calibrated for this purpose.

In the event of higher water output due to the opening of one or more circuits or due to a broken sprinkler, the unit pressure decreases which then causes the main pump to be activated.

For units with two electric pumps, if the main pump does not start correctly, the drop in pressure will activate the pressure switch of the standby pump, which then activates.

Once the sprinkler circuit or the valve that supplies the sprinkler system is closed, the system will restore standard pressure levels in the unit. It will be necessary to push the STOP buttons on the switchgear to stop the main pump and standby pump, if present.

The jockey pump stops automatically.

Consult the cabinets' Operating instructions for more detailed information concerning the buttons' functions.

7 Installation and electrical connection



DANGER! Risk of electrocution!

The personnel assigned to connect electrical devices and motors must be qualified for this kind of work and must make the connections in accordance with the wiring diagrams provided and valid regulations and laws. In addition, they must ensure that they have cut the power supply before performing any operation which provides possible contact with electrical parts that would normally be live. Check earth continuity.

7.1 Installation

Install the system in an easily accessible room which is usually ventilated and is protected from rain and frost. Make sure that the pressure-boosting system can pass through the room door.

Ensure that there is adequate space for maintenance and repair operations. The device must be freely accessible.

The surface upon which the unit is installed must be horizontal, flat and sufficiently robust to support the system's weight.

The room must be exclusively dedicated to fire extinguishing installations, directly accessible from outside, and have a fire resistance of at least 60 minutes (consult standards).

The room must be, in order of preference:

- separated (isolated) from the protected building,
- close to the protected building, or
- inside the protected building.



NOTICE:

For rooms with walls adjoining the building or which are inside the building, it is preferable to have a fire resistance of over 120 minutes. The temperature inside the room must not be below 10 °C (4 °C in the presence of electric pumps only) or higher than 25 °C (40 °C in the presence of electric pumps only).

The room must be equipped with exterior openings to ensure adequate ventilation for cooling engines (electric and diesel) and to enable diesel motor combustion.

The room itself must also be equipped with sprinkler-type protection.

The sprinkler protection can be supplied directly by the discharge manifold of the pressure-boosting system.

Access to the room must be ensured and easy for personnel, even if the fire extinguishing unit has been activated, if it is dark, if there is snow or rain, or in the case of any other factors that might otherwise hinder accessibility.

Access must be clearly signposted and admission granted only to authorised, specialised personnel properly trained in use of the fire-fighting system.



Access prohibited for unauthorised persons!

The fire-fighting system operates by AUTOMATIC START and MANUAL STOP ONLY. For this reason, there must be a clearly visible sign in the pump room warning of the possibility of an unexpected automatic activation of the system due to its method of operation.

The pump unit is NOT fitted with an emergency stop. The main pumps can only be stopped manually (see switchgear instructions).

For this reason, before adjusting the pressure-boosting system, make sure that you have switched off the power supply in order to prevent the pumps from starting.

If possible, pumps must be installed below the water source (flooded suction). They are considered as such if at least two thirds of the actual capacity of the suction tank is above the level of the axis of the pump and the minimum useable volume of water in the tank is not more than two meters below the axis of the pump.

If the conditions mentioned above are not fulfilled, the unit is considered to have “suction lift”, which is permitted following the installation of special devices, explicitly described by the standards (priming tanks, separate suction pipes, etc.).

7.2 Safety devices



CAUTION! Risk of death!

Do not remove the protection on any turning parts, belts, hot surfaces etc.
Never leave tools or disassembled parts of the fire-fighting system on it or around it.



CAUTION! Risk of death!

Do not remove the protective components of live parts. Prevent any components that insulate the installation, or sub-components on which they rely, from moving in any way.



DANGER! Risk of death!

Take all precautions to avoid the risk of electrocution. Ensure earthing, presence and continuity, and check that device to protect against indirect contact has been installed (differential switch...).

If required, use necessary equipment when working on the device (insulating platforms, insulating gloves...)

Never leave the electric switchgear or the terminal box of an electric motor open. Ensure that there is no possibility of contact with live parts.

Check that electrical connections for main and auxiliary power are correctly connected. Check the sticker data of the electrical switchgears, in particular regarding voltage and availability of an adapted power supply.



CAUTION! Risk of fire or sparks!

While charging, diesel pump batteries may produce a potentially explosive gas; avoid flames and sparks.

Never leave flammable liquids or rags containing traces of acid around the system or electrical devices.



DANGER! Risk of death!

Ensure that the pump room is properly ventilated.

Check that the diesel motor exhaust is clear and that the piping allows exhaust gases to be removed from the room safely, away from doors, windows and vents.



CAUTION! Risk of burns!

Check that exhaust pipework is correctly supported, equipped with anti-vibration bushings and protected against accidental contact.



WARNING! Risk of damage to the installation!

Check that the pressure connection and pump suction pipework is correctly supported and equipped with anti-vibration bushings.



WARNING! Risk of damage to the installation!

Check that the motor liquids (oil/water) are at the correct levels and that the water circuit and the oil circuit closure plugs are tightened correctly.

For diesel motors with a water/water cooling circuit, check that the cooling circuit's valves are locked in the OPEN position.

Check oil and diesel inlets, then check that there are no fluid leakages.



CAUTION! Risk of damage to the installation!

For oil/water heating in a diesel motor, an immersion or contact resistor supplied with a voltage of 220 V can be installed.

7.3 Control and environment

- Conduct inspections of electrical pumps or diesel pumps as described in the respective instruction manuals.
- Ensure the requisite space for maintenance of pumps, motors, switchgears and installed accessories.
- Prepare the installation surface for the pressure-boosting system, made of reinforced concrete: it must be perfectly smooth and horizontal as per the information in the plans, complete with fixing bolts of a diameter suitable for the mass of the unit in order to fix it to the ground (see Fig. 4).
- Make the connections to the pipework of the various circuits while ensuring that mechanical stresses are not transferred, as this can damage hydraulic equipment or the circuits themselves.
- Check the fluid levels of the diesel pump unit (motor oil, fuel, coolant, battery fluid, etc.) and, if necessary, make the requisite adjustments by following the instructions given in the specific manual for the diesel motor.

The system can be fixed to the foundation in different ways using the special notches provided in the corners of the fire-fighting unit. The fixture method is selected based on the size, location and acoustic and vibration limits of the unit so as not to transmit tension to the base frame and in order to prevent misalignment of the anchors and the support surface with metal plates, as shown in Fig. 4.



CAUTION! Risk of pollution and personal injury!

For the installation of units with a diesel pump, the floor of the system room must be waterproofed to avoid contamination of the subsoil as a result of potential diesel or motor oil leakages.



NOTICE:

We recommend that the pump's switchgear is equipped with an alarm system for pump failure, loss of voltage, etc.

7.4 Electrical connection

7.4.1 General information



DANGER! Risk of death!

Electrical connections must be carried out by qualified and skilled personnel, in accordance with standards and valid laws. The power supply must be available at all times (R1 Chapter 11).

- Check the type of power supply and the voltage available, and compare these to the specifications of the motors, electric switchgears and other installed devices. Before performing any work on the system, check the earthing.
- For connection to power supply networks, use one-piece cables, without joints, exclusively for the pumping unit of the fire extinguishing system, and connect them upstream of the building's main power supply switch.
- Use cables of a suitable diameter, whose characteristics and dimensions are compliant with current IEC standards, and with specifications as required by R1 Chapter 11.
- In order to protect the cables from direct exposure in the event of fire, the cables must pass through pipes buried outside the building or through parts of the building where the fire hazard is negligible. They must also be provided with supplementary direct protection with a fire resistance of 180 minutes.
- Make the connections as indicated on the wiring diagrams supplied with the switchgears.
- The main electrical cabinet must be located in a fire-resistant compartment used exclusively for electrical power supply.
- Electrical connections in the main cabinet must be made in a manner which ensures that the power supply to the fire-fighting system's switchgears continues, even if power to other utilities is cut.
- The fire extinguishing pump supply lines (considered as safety service supply lines IEC 64.8 – 56) must ONLY be protected against short-circuits and direct contacts.
- **THEY MUST NOT BE PROTECTED AGAINST OVERLOADS.**
- For protection, see the requirements detailed in the electrical schematics (earthing, equipotential bonding).
- Connect batteries for diesel pumps.
- Check that all electrical connections are clamped tight.

7.4.2 Hydraulic connections

Connect the following circuits to the pumping tank or to priming tanks, in accordance with the requirements set by standards:

- Flow rate metering circuit to test the pump. If it is not possible to return water to the tank, plan drainage towards the sewer (see Fig. 5).
- Recirculation circuit. The recirculation circuit is used to prevent overheating of and damage to pumps that remain in operation when the unit pressure is reached before authorised personnel can turn them off manually.
- Sprinkler supply circuit of room in which the fire extinguishing pressure-boosting system is located.
- Connect the main pumps and jockey pump to the fire-fighting system in accordance with regulation R1 and the installation diagram.
- Connect the jockey pump directly to the water tank with a suction pipe, appropriately configured so as to avoid any issues priming the pump.
- Check the pre-inflation of the jockey pump's tank, and adjust it to the pressure to be maintained in the fire-fighting system, either according to the instructions written on the tank itself or in its instruction manual.

7.4.3 System protection

- The specific standard for fire-fighting systems requires protection against short-circuits through the use of high-breaking capacity fuses, which allow the flow of initial current to start the electric motor for a period longer than 20 seconds. These are located inside the electric pumps' power supply cabinet; no thermal protections are provided for the main pumps in the fire extinguishing system.
- For the jockey pump, thermal motor protection against overload is installed inside the motor's switchgear. It must be calibrated at a value slightly higher than the absorbed or the nominal current (in) on the motor's plate.
- The standard does not stipulate protection against a lack of water to the pumps. In case of emergency, the pumps must use any available water in the tanks to extinguish the fire.
- If the system features diesel motors, the switchgear of the diesel motor controls the motors' operating parameters and possible alarms. For more information concerning diesel motors' switchgears, see the instruction manual for the switchgear in question.

INSTALLATION ADVICE

- To ensure the proper functioning of the fire extinguishing unit, and with regard to the type of installation planned, ensure that:
 - the pipes are positioned in such a way that air pockets are avoided,
 - the suction pipes between the intake point and the pumps are as short as possible, with a suitable diameter equal to or greater than the minimum required value to maintain the maximum speed as indicated in regulation R1 Chapter 10, and
 - the pipes do not show leakages or air infiltration.



WARNING! Risk of damage to the pump!

**Valves and isolation valves must not be directly connected on the pump suction section.
Fit an eccentric cone as indicated in R1 Chapter 10.**

7.4.4 Unit with positive suction head (below water load) [Fig. 6a – 6b]

- Check the specified minimum level for the tanks, or the minimum historical level for virtually inexhaustible tanks, in order to fulfil the conditions for installation of the unit.
- Ensure that the diameter of the suction pipes conforms to the requirements given in R1 Chapter 10.3, and ensure that the maximum suction speed does not exceed the indicated value.
- Check that the NPSH available at the input point of the pump is at least 1 m higher than the NPSH required for the flow rate at the maximum water temperature.
- Install a filter on the suction pipes outside the water tank: it should have a diameter of at least 1.5 times the nominal diameter of the pipe and should not allow objects with a diameter of more than 5 mm to pass through.
- Install an isolating valve between the filter and the water tank.

7.4.5 Unit with suction lift [Fig. 7]

- Check the specified minimum level for the tanks, or the minimum historical level for virtually inexhaustible tanks.
- Ensure that the diameter of the suction pipes conforms to the requirements given in R1 Chapter 10.3, and ensure that the maximum suction speed does not exceed the indicated value.
- Check that the NPSH available at the input point of the pump is at least 1 m higher than the NPSH required for the flow rate at the maximum water temperature.
- Provide independent suction circuits for the pumps, fitted at the lowest point of the foot valve.

- Fit a filter on the suction pipes upstream from the foot valve. This filter must be installed so that it can be cleaned without having to empty the water tank. It must have a diameter of at least 1.5 times the nominal diameter of the pipe, and must not allow objects with a diameter above 5 mm to pass through.
- The distance between the rotation axis of the pump and the minimum water level must not exceed 3.2 m.
- Each pump must have automatic priming devices in compliance with the requirements of EN 12845, paragraph 10.6.2.4.

7.4.6 Exhaust air for cooling and combustion in the diesel motor [Fig. 9a and 9b]

- If the system is assembled with a pump driven by a diesel motor, the motor's combustion gases must be removed from the unit by a pipe supplied with an adequate silencer.
- Back pressure cannot exceed recommendations for the type of diesel motor installed. The exhaust pipe must be of an adequate size depending on the length of piping.
- It must be isolated and provided with sufficient protection against accidental contact with hot surfaces.
- The exhaust exits must not be located near to doors or windows, and exhaust gas must not re-enter the pump room.
- The exhaust exits must be protected against the weather and must not allow rain water to enter the exhaust pipe or allow condensates to move towards the motor.
- Pipes must be as short as possible (ideally no longer than 5.0 m), with as few curves as possible and a curve radius less than 2.5 times the pipe diameter.
- Pipes must be supported, while a condensate drain system must be fitted with a material resistant to the acidity of the condensate.
- A ventilation system is essential in a pump room with diesel pumps using air cooling or air/water cooling with a radiator. This determines the correct functioning of the fire-fighting system.
- The ventilation system must allow heat generated during operation of the diesel pump unit to dissipate, and must ensure sufficient air flow to cool the motor.
- The room's openings must provide the requisite air flow for the motor, which may vary depending on the altitude. (See the manufacturer's data for the diesel motor).

8 Commissioning

For initial commissioning of your system, we recommend that you contact your nearest Wilo customer service agent, or simply call our customer service centre.

Unit commissioning must be performed by qualified staff.

8.1 General preparations and control measures

- Before initial commissioning, ensure that all wiring has been done correctly, particularly regarding earthing.
- Ensure that rigid connections are free from mechanical stresses.
- Complete the installation and conduct a visual inspection for potential leakages.
- Open the isolating valves on the pumps and on the pressure pipe.



CAUTION!

Never let the system run dry. Dry running destroys the pump's mechanical seal, which ensures its impermeability.

- **If the jockey pump tank is empty of water, inflate it to a pressure 0.5 bar below the pressure which activates the jockey pump.**

Do not exceed the tank's maximum pre-inflation value.



CAUTION! Risk of damage to the installation!
Tighten all the supply terminals before commissioning the unit!

If it is necessary to conduct tests during installation, make sure that the pumps are properly filled with water before switching them on.

Before filling the system with water, check the tightness of the components, which may have been loosened during transport and handling.

Do not leave the pressure-boosting system to run in automatic mode before the fire extinguishing system has been completely assembled as per defined standards. Commissioning a fire extinguishing system before it has been completed voids the warranty.

PROCEDURE FOR COMMISSIONING

- On starting the pressure-boosting system in automatic mode, the maintenance programme procedures and intervention duties in case of accidental activation must be defined.
- For models equipped with a diesel motor, check that the batteries are sufficiently charged before start-up.
- To inspect the batteries, follow the manufacturer's instructions.
- Keep the batteries a safe distance from flames and sparks. For safety reasons, do not lean over the batteries when in operation, during installation or when removing them.
- Check that the fuel levels in the tanks of diesel motors are sufficient and, if necessary, add more fuel when the motors are cool.
- Take care not to spill fuel on the motors, or on rubber or plastic components in the system.
- DO NOT add fuel when the motors are warm.
- Before turning on the main pumps, check that the motor-pump alignment is correct. Follow the instructions given in the respective manual delivered with the pumps. Motor-pump alignment adjustments must be performed by qualified personnel.
- If the pressure-boosting system includes pumps placed on separate baseplates, it is crucial that each baseplate is fixed to the ground, with special attention given to the alignment of the discharge manifolds. Installation must be performed by qualified technicians.

8.2 Pressure-boosting system with positive net suction height (flooded suction)

For the commissioning of a unit installed below the water source, take the following measures:

- Check that the ventilation valve of each pump is open.
- Close the pumps' discharge valves.
- Slowly open the suction valves and check that water is coming out of each pump through the vents.
- Briefly start pumps in manual mode.
- Check that there is no air in the circuits or the pumps.
- Repeat the operation as required until certain that there is no air in the circuits.
- Close the vent plug on the jockey pump.
- Completely open the suction and discharge valves.
- Make sure there are no water circulation problems (i.e. no dirt present, no solid objects, etc.).

8.3 Pressure-boosting unit in suction mode

For commissioning of a unit installed in suction mode, take the following measures:

- Check that the ventilation valve of each pump is open.
- Close the pumps' discharge valves.
- Fill the main pumps through the circuits from the priming tanks.

- Fill the jockey pump through the filler cap by following the instructions given in the pump's instruction manual.
- Briefly start pumps in manual mode.
- Check that there is no air in the circuits or the pumps.
- Repeat the operation as required until certain that there is no air in the circuits.
- Completely open the suction and discharge valves.
- Make sure there are no water circulation problems (i.e. no dirt present, no solid objects, etc.).

8.4 Function control

8.4.1 Commissioning of the main electric pump

- Make sure that all hydraulic, mechanical and electrical connections indicated in this manual have been made correctly.
- Make sure the pump's suction and pressure valves are open.
- Make sure the pump is primed and filled with water.
- Check that the supply voltage corresponds to the voltage listed on the motor's sticker, and that the three phases are supplied correctly.

Follow the commissioning instructions in the manual for each electric pump switchgear.



CAUTION! Risk of damage to the installation!

In order to avoid overheating which may damage the main pumps, always check that the water flow rate through the recirculation circuit conforms to the requirements of the pump's technical data sheet.

If there is a problem with the recirculation circuit or if the minimum flow rate to test the start-up and running of the pumps is not assured, open other circuits (e.g. the flow meter, the valve for testing the impermeability of the isolating valve, the drain valve, etc.).



CAUTION! Risk of damage to the installation!

Ensure that none of the issues listed below are present. If such an issue is present, stop the pump immediately and resolve the cause of the malfunction before starting the pump again (see also chapter "Faults, causes and remedies"):

- Rotating parts in contact with fixed parts
- Unusual noises and vibrations
- Loosened bolts
- Raised temperature on the motor housing
- Variations in current across the phases
- Leaking mechanical seal

Vibrations, noise and excessive temperatures may be caused by misalignment of the motor/pump coupling.

8.4.2 Commissioning of the main diesel pump

- Make sure that all hydraulic, mechanical and electrical connections indicated in this manual have been made correctly.
- Make sure the pump's suction and pressure valves are open.
- Make sure the pump is primed and filled with water, and then purge the air from the pump using the plug on the pump housing.
- Check that the supply voltage corresponds to the voltage listed on the sticker, and that it is present.

- Make sure that the fuel is compatible with motor functioning, and that the fuel tank is filled (the fuel level inside the tank can be seen via the gauge next to the tank), see Fig. 8.
- Make sure that the pressure connections to the fixed pipes have been made correctly, with no connections between the tank and the motor.
- Make sure the tank's electric float cable is correctly connected to the diesel pump's electric switchgear.
- Check the motor's oil and coolant levels.
- If the motors are cooled by water from a radiator or heat exchanger, check the specific procedures detailed in the motor's instruction manual.

In order to fill-up liquids, use oil and coolant recommended by the details in the instruction manuals for diesel motors appended to this instruction manual.

Follow the commissioning instructions in the instruction manual for the diesel pump's switchgear.



CAUTION! Risk of damage to the installation!

In order to avoid overheating which may damage the main pumps, always check that the water flow rate through the recirculation circuit conforms to the requirements of the pump's technical data sheet.

If there is a problem with the recirculation circuit or if the minimum flow level to test the activation and operation of the pumps is not assured, open other circuits (e.g. the flow meter, the valve for testing the impermeability of the isolating valves, the drain valve, etc.).



CAUTION!

THE MOTOR'S ACCELERATOR LEVER IS LOCKED DURING ITS MANUFACTURE: AS A RESULT, THE MOTOR ALWAYS STARTS AT FULL SPEED.

Allow the pump to run for 20 minutes to check that the motor speed is compatible with the indication on the unit's sticker.



CAUTION! Risk of damage to the installation!

Check that none of the issues listed below are present. If such an issue is present, stop the pump immediately and eliminate the cause of the malfunction before starting the pump again (see also chapter "Faults, causes and remedies"):

- Rotating parts in contact with fixed parts
- Unusual noises and vibrations
- Loosened bolts
- Raised temperature on the motor housing
- Exhaust gas in the pump room
- Leaking mechanical seal



CAUTION!

Vibrations, noise and excessive temperatures may be caused by misalignment of the motor/pump coupling.

8.4.3 Commissioning the jockey pump

Manual start

Follow the commissioning instructions in the instruction manual for the jockey pump's switchgear.

If the direction of rotation is not correct, cut the switchgear's electrical power supply and swap two of the three phases in the switchgear supply line. Never swap with the yellow-green earth connection wire.



CAUTION! Risk of malfunction!

To ensure that the jockey pump keeps the unit pressurised, adjust the settings to prevent jockey pump's flow rate from feeding only one sprinkler's outlet opening (for example, by fitting a relief diaphragm or valve).

To adjust jockey pumps, consult the curves of different pump types indicated in the catalogue.

If there are issues activating the pump, refer to the chapter "Faults, causes and remedies" in the instruction manuals for the jockey pump and its switchgear.

8.4.4 Filling the unit

If the unit is not filled by another means, use the jockey pump after having checked that the operations described in the previous chapters have been completed correctly.

In this phase, open one or more drain cocks in the sprinkler circuit to expel air from the unit.

Start the jockey pump. The unit fills slowly while expelling air. Once the water starts to flow from the drain cocks, close them and wait until the predetermined pressure level is reached and the jockey pump stops.

If the pump does not stop, check that there are no water leaks and check the calibration of the pump's control pressure switch.

Once the unit has reached the requisite pressure level, which must be higher than the automatic main pump activation pressure, wait until the pressure remains stable before switching the system to automatic mode.

8.4.5 Automatic function testing

Main electric pump

Before testing, make sure that the return circuit in the tank is closed and that the main circuit pressure is sufficient to avoid the pump starting up suddenly.

Start the unit automatically by using the activation pressure switches (one pressure switch at a time).

Open the valve located under the pressure switch bottle (Fig. 10, pos. 2): the pressure in the pressure switch bottle falls, the non-return valve (Fig. 10, pos. 1) closes automatically, and the pressure switch activates. To re-establish the circuit, close the valve (Fig. 10, pos. 2).

Then, follow the instructions for the pump's switchgear to check that the automatism is functioning correctly.



CAUTION! Risk of damage to the installation!

In order to avoid overheating which may damage the main pumps, always check that the water flow rate through the recirculation circuit conforms to the requirements of the pump's technical data sheet.

If there is a problem with the recirculation circuit or if the minimum flow level to test the activation and operation of the pumps is not assured, open other circuits (e.g. the flow meter, the valve for testing the impermeability of the isolating valves, the drain valve, etc.).



CAUTION! Risk of malfunction!

**Before leaving the installation and following a manual stop, remember to switch the unit to automatic mode (see the switchgear instruction manual).
IF THIS IS NOT DONE, THE FIRE EXTINGUISHING UNIT IS NOT ACTIVE.**



CAUTION! Risk of malfunction!

If the pressure in the unit has not risen back to the starting level for the main pump switches, refer to the switchgear manual to start the pump in manual mode.

Automatic start test with floater (pumps installed with suction lift or pumps below the water load)

Empty the priming tank (or simulate the effect) to start the electric pump via the signal from the floater. Then, follow the instructions for the pump's switchgear to check that the automatism is functioning correctly.

Main pumps with a diesel motor

Before testing, make sure that the return circuit in the tank is closed and that the main circuit pressure is sufficient to avoid the pump starting up suddenly.

Then, follow the instructions for the pump's switchgear in order to activate the diesel pump only, in automatic mode.

Start the unit automatically by using the activation pressure switches (one pressure switch at a time) to check that the pressure switches are functioning correctly.

Open the valve located under the pressure switch bottle (Fig. 10, pos. 2): the pressure in the pressure switch bottle falls, the non-return valve (Fig. 10, pos. 1) closes automatically, the pressure switch activates and starts the diesel motor.

Then, follow the instructions for the pump's switchgear to check that the automatism and the diesel pump are functioning correctly.

To end the test and return the unit to normal, close the valve (Fig. 10, pos. 2).



CAUTION! Risk of damage to the installation!

In order to avoid overheating which may damage the main pumps, always check that the water flow rate through the recirculation circuit conforms to the requirements of the pump's technical data sheet.

If there is a problem with the recirculation circuit or if the minimum flow level to test the activation and operation of the pumps is not assured, open other circuits (e.g. the flow meter, the valve for testing the impermeability of the isolating valves, the drain valve, etc.).

Automatic start test with floater (pumps installed with suction lift or pumps below the water load)

Empty the priming tank (or simulate the effect) to start the electric pump via the signal from the floater. Then, follow the instructions for the pump's switchgear to check that the automatism is functioning correctly.



CAUTION! Risk of damage to the installation!

If the pressure in the unit has not risen back to the starting level for the main pump pressure switches, refer to the switchgear manual to start the pump in manual mode.

9 Maintenance

The fire extinguishing unit is a protective safety device for people and property and, therefore, possible modifications and repairs that prevent the proper functioning of the system should be effected so as to minimise the system's "downtime".

Isolate one pump at a time using the electric switchgears' switch amplifiers and the valves fitted for this purpose.



Prohibit access to the pump room for unauthorised persons.



DANGER! Risk of personal injury!

Use of personal protective equipment is mandatory.

Maintenance must **ONLY** be performed by qualified personnel.

In case of a lack of instructions, always contact the supplier or specialist personnel.

Never perform work alone that requires the presence of more than one person.



Do not remove the protection on any rotating parts, belts, hot surfaces etc.

Never leave tools or disassembled parts of the pressure-boosting system on it or around it.



Do not remove the protection of live parts: prevent any possibility that an element used to insulate the parts of the installation requiring maintenance might move.



CAUTION! Risk of damage to the installation!

The pressure-boosting system is **NOT** fitted with an emergency stop. The main pumps can only be stopped manually by cutting the automatism.

FOR THIS REASON, BEFORE MAKING AN ADJUSTMENT TO THE PUMPS, ENSURE THAT YOU HAVE ANY NECESSARY KEYS TO OPERATE THE AUTOMATIC/MANUAL CHANGE-OVER SWITCH.

Open the general switch amplifier on the switchgear of the pump in question.



DANGER! Risk of death!

In the event of working on the electric switchgear with the door open, even after opening the main switch amplifier, input terminals on the supply line and the remote alarm transmission system could still be live.



DANGER! Risk of death!

If you must make adjustments to the diesel motor, it is also advisable to disconnect the positive terminal of the batteries to prevent inadvertent start-ups.



DANGER! Risk of death!

To change the motor oil, ensure that the motor's temperature is below 60 °C.

For water-cooled motors, remove the radiator plug or heat exchanger plug very slowly. The cooling circuits are normally pressurised and, as a result, violent leaks of hot liquid could occur.

Check that the motor liquids (oil/water) are at the correct levels and that the water circuit and the oil circuit closure plugs are tightened correctly.

NEVER ADD COOLANT TO A HOT MOTOR. LEAVE THE MOTOR TO COOL FIRST.

For diesel motors with a water/water heat exchanger, check that the cooling circuit valve is locked in the open position. Check the oil and diesel fuel pipes and ensure that there are no leakages.



NOTICE:

To heat oil/water in a diesel motor, an immersion or contact resistor supplied with a voltage of 230 V can be installed.



WARNING! Risk of fire or personal injury!

Never connect or disconnect the battery cables when the motor is in operation.



WARNING! Risk of burns!

Risk from particularly hot surfaces on the diesel motor and the exhaust pipework.



DANGER! Risk of explosion!

While charging, diesel pump batteries may produce a potentially explosive gas: avoid flames and sparks.

Never leave flammable liquids or rags containing traces of acid around the system or electrical devices.



DO NOT SMOKE OR USE FLAMES WHEN CHANGING THE MOTOR OIL OR WHEN REFUELLING THE DIESEL MOTOR.

Pressure-boosting units installed in accordance with these instructions will operate normally with minimal maintenance requirements.

Inspections and periodic checks are required and specified by installation regulation R1. This allows the fire-fighting system and the pressure-boosting system to be maintained in an efficient manner.

Consult the programme of weekly, monthly, three-monthly, six-monthly, annual, triennial and 10-year inspections and checks.

Maintenance must be performed by qualified personnel.

9.1 General maintenance requirements

- General inspection of the unit (including electrical power supplies and hydraulics) to check the visual condition of all components.
- General cleaning.
- Check the impermeability of non-return valves.
- Check the operating configuration of the electrical switchgear.
- Check that the alarm pilot lights on the control panel are functioning correctly.
- Check that the minimum level alarm for the tank/reservoir/well is functioning correctly.
- Check the electrical connections to see if there are any signs of insulation faults, burns or loosening of terminals.
- Check the isolation resistor for the electric motors. (When cool, an undamaged motor must have a resistance of over 1000 MΩ).
- Check the pre-inflation of diaphragm tanks.
- See also the specific operations indicated in the instruction manuals for the various components in the pressure-boosting system.
- Check that the minimum required stock of repair parts is held, as required by the EN 12845 standard for quickly repairing the system in the event of faults.
- Check that the minimum fuel level alarm is functioning correctly.
- Check that the diesel motor oil heating resistor is functioning correctly.
- Check that the batteries are charged and that the chargers are functioning correctly.
- Check that the deactivation solenoid valve is functioning correctly. (Fig. 11)
- Check the level and viscosity of cooling oil in the pump.
- Check the priming circuit (especially in units with suction head).

When making inspections, the following aspects must be checked and recorded:

- a) all air pressure gauge pressure readings for water and air in the building, main pipes and pressurised tanks
- b) all water levels in storage tanks, rivers, canals, lakes (including pump priming tanks and pressurised tanks)
- c) the correct position of all main control valves

9.2 Testing automatic pump start

Tests on automatic pumps must include the following:

- d) Check the fuel and oil levels in diesel motors.
- e) Reduce the water pressure in the starting device in order to simulate an automatic activation request (see Chapter 8).
- f) Check and record the pressure when the pump activates.
- g) Check the oil pressure of diesel pumps and the water flow rate in the cooling circuit.



CAUTION! Risk of pump malfunction!
After conducting tests, always refill fuel and other fluids.

9.3 Restart test for diesel motor

After testing the start up, diesel motors should be tested as follows:

h) Let the motor run for 20 minutes or for the time recommended by the supplier. Then, stop the motor and immediately restart it using the "Manual start test" button.

i) Inspect the water level in the primary cooling circuit.

During the test, check the oil pressure, the motor temperature and the coolant flow rate.

Then, inspect the oil hoses and conduct a general inspection to detect any possible fuel, coolant or exhaust smoke leakages.

9.4 Routine inspections

MONTHLY INSPECTION

Inspect the levels and density of electrolytes in all lead-based batteries (including diesel motor start batteries and batteries used for the electric switchgear's power supply). If the electrolyte density is low, check the battery charger and, if it is working correctly, replace the defective battery or batteries.

THREE-MONTHLY INSPECTION To be performed at least every 13 weeks

An inspection report must be completed, signed and handed to the end-user. This must include details of all completed or planned procedures and details of external factors, such as weather conditions, which might have influenced the results.

Inspect the pipes and supports to check any possible areas of corrosion, and protection them where necessary.

Check the earthing of the pipe network.

Sprinkler pipes cannot be used to earth electrical devices. Remove all such connections and implement an alternative solution.

Check the water supply at each control station in the system. The pump(s) should start automatically, and the pressure values and measured flow rate must not be less than the values specified on the plans. All changes must be recorded.

Check all valves that supply the sprinklers with water to ensure that they are working, and then return them to their normal operating position. Complete the same operation for all water supply valves, the control and alarm valves and all valves on local and auxiliary circuits. Check that the flow rate sensors are functioning correctly.

Check and inspect the quantity and condition of spare parts in storage.

BI-ANNUAL INSPECTION To be performed at least every 6 months

Check the alarm system and the remote alarm system from the central control unit.

ANNUAL INSPECTION To be performed at least every 12 months

Conduct a test of each pump in full load conditions (with the help of test piping at the pump's pressure connection) to check that the pressure and flow rate values correspond to those on the pump's rating plate.

Take into account any load losses in the supply pipes and in the valves between the water source and each control station.

Carry out a diesel motor start failure and then check that this operation triggers an alarm in accordance with regulations. Immediately after this check, restart the diesel motor by using the manual starting procedure. Check that the float valves in the water tanks are working correctly. Check the filters on the pumps' suction section and on the filter deposit tanks. Clean them if necessary.

TRI-ANNUAL INSPECTION To be performed at least every 3 years

After draining, inspect the interior and exterior of all tanks for potential corrosion. The tanks must be repainted or their corrosion protection layer re-applied as necessary.

Examine all water supply valves and the alarm and control valves. Repair or replace them as necessary.

TEN-YEARLY INSPECTION To be performed at least every 10 years

The inside of all water tanks must be cleaned and inspected, and their impermeability checked.

For revision operations to the whole pressure-boosting system or when replacing parts that are damaged or not functioning properly, contact Wilo customer service or a specialist centre.

Consult also the detailed maintenance operations outlined in the instruction manuals delivered with the device.

Always replace components with guaranteed identical parts, or parts certified as having the same characteristics.

Wilo does not accept any liability in the event of damage incurred as a result of adjustment by unskilled persons or in the event that original components are replaced with pieces that have different characteristics.

9.5 Residual risks in facility management



WARNING! Risk of cutting fingers!

Take the necessary precautions to ensure that nobody is hurt by sharp edges. Wear special gloves.



WARNING! Risk of impact injury!

Be careful of prominent parts and parts at head height. Wear suitable clothing and protection.



DANGER! Risk of death!

To avoid possible explosions, do not exceed the rated pressure limits for unit components.



DANGER! Risk of electrocution!

The personnel assigned to connect electrical devices and motors must be qualified for this kind of work and shall make the connection in accordance with valid regulations and laws. They must ensure that they have cut the power supply before performing any adjustment which may involve contact with parts that are normally live. Check earth continuity. Avoid contact with water.

**WARNING! Risk of falling!**

Take precautions to protect against access to tanks or wells. Wells must not be left uncovered, and must be sealed with a locked cover.

**WARNING! Risk of burns!**

Take necessary precautions to avoid contact with hot diesel motor parts. Protect such parts of the motor and the exhaust pipes. Only refuel the diesel motor when it is cool. When refilling, do not spill fuel on hot parts of the diesel motor. Wear special gloves.

**WARNING! Risk of irritation!**

When refilling and checking fluid levels, avoid spilling battery acid solution as this can cause irritations or material damage. Do not put your eyes close to the refilling zone. Use special protections to avoid contact.

**DANGER! Risk of death!**

Avoid turning on the diesel pumps if exhaust smoke pipes have not been directed outside the room.

**CAUTION! Risk of pollution!**

Avoid spilling oil from the motor or diesel fuel during inspection and refilling. Use adequate protection and take necessary precautions.

10 Faults, causes and remedies

The procedures indicated in the table below must ONLY be carried out by specialist personnel.

Never carry out any work without having carefully read and understood this manual.

Never attempt to carry out repairs to components without a full understanding of the procedures required.

If your personnel do not have sufficient knowledge about the product and the operating logic as required by specific standards relating to fire-fighting systems, or if they do not possess the requisite technical skills, contact Wilo to arrange regular maintenance inspections.

FAULTS	CAUSES	REMEDIES
The switchgear is off.	No power supply	Make sure that the supply line is connected and voltage is present.
	Fuse protection is out of service	Check and/or replace fuses. Check and/or replace the switchgear.
	Auxiliary circuit fault	Check voltage of primary and secondary circuits in the transformer. Check and/or replace fuses in the transformer.
Motor does not start.	Lack of power supply	Check the connections and the electric switchgear.
	Short-circuit in the winding	Check motor winding.
	Damage to the switchgear/incorrect connections	Check connections.
	Overload	Check the configuration of the supply line. Make sure that the pump is not blocked.
The pump works, but does not supply water or has a low flow rate.	Wrong direction of rotation	Invert two of the motor supply phases.
	Suction power too high. Pump cavitation	Review calculations to match the pump's NPSHr.
	Pipework and suction valves are of an inappropriate diameter. Pump cavitation	Review calculations to match the pump's NPSHr.
	Air has entered the suction section	Check that there is no air intake in the suction section. If several pumps are installed, check the distance between the suction points. Install anti-vortex plates.
	Valves are partially/totally closed	Open suction and discharge valves.
	Pump is worn out	Inspect and repair.
	Pump impeller is obstructed	Inspect and repair.
	Strainer/filters are obstructed	Inspect and repair.
	Coupling between pump and motor is worn out	Inspect and repair.
	Diesel motor fails to reach nominal speed or vibrates when operating	Check speed. See above.
Pump roller bearings are worn out or not lubricated	Lubricate with grease nipple.	
Motor fails to reach rated speed.	Voltage at motor terminals is too low	Check power supply voltage, connections and the cross-section

		of the cables in the power line.
	False contacts in the power contact or damage to the starter	Inspect and repair.
	Phase failure	Check supply, connections and fuses.
	False contacts in power supply cables	Check power terminals.
	Winding earthed or short-circuit	Dismantle the motor then repair or replace it.
Pump is not operational after start up.	Supply cable is not configured correctly	Inspect and replace.
	Insufficient voltage	Check power supply.
	Pump configuration	Remove the rotating parts and inspect.
Voltage on motor housing	Contact between line cables and earth wire	Correct the connections.
	Insulation is moist or old	Wipe motor or re-wind it.
	Short-circuit between terminals and external housing	Check insulation between terminals and housing.
Unusual heating of the external motor surfaces	Pump overload (frictions)	Dismantle and inspect.
	Coupling is misaligned	Align correctly.
	Ambient temperature above 40 °C	Ventilate the area.
	Voltage is higher/lower than nominal value	Check power supply upstream.
	Phase failure	Check supply and fuses.
	Insufficient ventilation	Check filters and cores, reconfigure.
	Slippage between rotor and stator	Repair or replace the motor.
	Unbalanced voltage across the three phases	Check supply.
Main pump starts before jockey pump.	Pressure switch on the main pump is calibrated at a higher value than the jockey pump	Check pressure switch settings.
Main pump starts immediately.	Pressure switch is calibrated at a lower value than the unit pressure	Check pressure switch settings. Increase the pressure level in the unit.
	Water level in the priming tank is too low	Check level of priming tank.
Sudden drop in speed	Instantaneous overload/foreign body in pump	Dismantle pump.
	Single-phase operation	Check supply and fuses.
	Drop in voltage	Check supply.
Magnetic noise Sudden whistling	Winding earthed or short-circuit	Dismantle the motor then repair or replace it.
	Friction between rotor and stator	Dismantle the motor then repair or replace it.
Mechanical noise	Loosened bolts	Inspect and tighten.
	Screw fan cover cap or coupling	Inspect and tighten.

	loose	
	Slippage between fan and motor hood, between coupling and coupling cover cap etc.	Ensure the correct distance and re-assemble.
	Foreign bodies in motor or pump	Dismantle and remove.
	Misaligned coupling	Re-align.
	Bearings are insufficiently lubricated or worn/broken	Lubricate or replace.
Overheating of pump/motor roller bearings	Roller bearings are damaged	Replace.
	Insufficient lubrication	Lubricate again.
	Pump and motor are misaligned	Re-align.
Unusual vibrations	No vibration-damping bushing on the unit	Install or repair.
	Pump cavitation	Review the unit configuration.
	Air content in water is too high	Check that there is no air intake in the suction section. If several pumps are installed, check the distance between the suction points. Install anti-vortex plates.
	Roller bearings or pump/motor shaft worn out	Replace.
	Pump/motor coupling is worn out	Replace.
	Pump and motor are misaligned	Re-align.
Motor does not stop even when stop button is pressed.	This is normal if unit pressure is not restored	Deactivate automatic mode, then stop the pump.
	Damage to the switchgear	Cut power to the switchgear and inspect.
	Damage to deactivation electromagnet/switchgear of diesel pump	Manually adjust the fuel lever upon which the electromagnet acts.
Diesel motor fails to reach rated speed or oscillates.	Accelerator lever in wrong position	Inspect, adjust RPM and secure lever.
	Fuel filter is clogged	Clean or replace.
	Faulty injector/pump	Call the customer service desk.
The starter pinion does not retract after the motor starts.	Damage to rev counter	Check the distance from the wheel. Replace.
	Damage to switchgear controls	Call the customer service desk.
Motor does not start, or tries to start but stops.	Uncharged batteries	Check batteries and battery charger. Charge batteries and, if necessary, replace them.
	Lack of fuel	If it is not indicated on the switchgear's indicators, check the fuel tank and floater alarm. Replace. Fill the tank.
	Air in fuel circuit	Remove air from circuit by purging the injectors and diesel fuel filter.
	Fuel filter clogged	Replace.
	Air filter clogged	Replace.

	Damage to fuel circuit: - injector blocked - damage to injection pump	Call the customer service desk.
	Temperature is too low	Check that the ambient temperature is not lower than 10 °C. Then check that the oil/water heater is functioning correctly. Replace.
	Connections between the batteries/starter/servo relays are loose or rusty	Check cables and terminals. Re-cable. Tighten well. Replace.
	Damage to diesel pump switchgear	Check and, if necessary, replace.
	Damage to starter	Call the customer service desk.
Black smoke	Air filter clogged/dirty	Replace.
	Oil level too high	Remove excess oil.
	Problem with injector, diesel pump, etc.	Call the customer service desk.
Abnormal heating – water/oil temperature too high	Pump overload (frictions)	Dismantle and inspect.
	Pump and motor are misaligned	Re-align.
	Ambient temperature above 40 °C	Ventilate the area.
	Insufficient ventilation	Inspect the filters and et ventilation circuits: clean or reconfigure.
	Radiator/intermediate cooler dirty or clogged	Dismantle and clean.
	Lack of water in radiator/exchanger	After it has cooled, fill with water and inspect for leaks.
	Heat exchanger circuit valve closed or insufficiently open	Check that pump has a water flow, then open the valve.
	Damage to the pump: no water circulation	Call the customer service desk.
	Damage to the fan belt (for air-cooled motors)	Check voltage and replace if necessary.
Corresponding alarm malfunctioning	Check sensor, connections and switchgear. Replace if necessary.	
Jockey pump does not start.	No power supply	Check the connections and electrical panel.
	The pressure switch is calibrated to a lower pressure than the main pump	Check pressure switch settings.
	Short-circuit in the winding	Check winding.
	Thermal motor protection intervenes	Check the configuration of the supply line. Make sure that the pump is not blocked, check the pressure switch settings and the tank inflation.
	Damage to the switchgear/incorrect connections	Inspect.

11 Decommissioning and disposal

If the unit is to be decommissioned, firstly disconnect the unit from the power supply and water circuit, and then separate the different components of the unit in order to remove them separately.

This work should be performed with the help of a company specialising in the removal of industrial machinery. Check that there are no residues of any polluting liquids inside the pump or pipes.

Units equipped with a diesel motor may have batteries containing lead and electrolytic liquid which contain acids, solutions of water and antifreeze liquid, oil and fuel.

Pay particular attention to the removal of batteries, and take all necessary precautions to prevent any spillages onto the ground that might pollute the environment.



If materials that make up the pressure-boosting system are allowed to enter the wider environment, they can cause serious environmental damage. All materials and components must be collected, recovered and disposed of in accordance with valid regulations.

Even during the installation process and when operating the unit, the following materials must be sent to specialist centres for waste collection and disposal:

- Electromechanical and electronic components
- Electric cables
- Batteries
- Filters
- Used oil
- Water and anti-freeze solutions
- Rags and other materials used for various operations or cleaning
- Packaging materials

Liquids and pollutants must be disposed of in a manner pursuant to valid regulatory standards.

Dispose of waste in a differentiated manner, in order to retrieve equipment and reduce pollution.

12 Spare parts

To make rapid adjustments and repairs to the fire-fighting system, and depending on the pumping conditions, it is recommended that you stock a minimum level of spare parts, such as:

Main electric pump

Complete mechanical seal, protection fuses, activation pressure switch, step relay coil.

Main diesel pump

Complete mechanical seal, protection fuses, activation kit, oil heater, activation pressure switch, two fuel filters, two oil filters, two sets of belts, two injector nozzles for the diesel motor, a complete set of connections, seals and flexible tubing for the oil and fuel circuits, as well as any other tools recommended by the manufacturer of the diesel motor.

Electric jockey pump

Complete mechanical seal, protection fuses, activation pressure switch.

EU/EG KONFORMITÄTSERKLÄRUNG
EU/EC DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE UE/CE

Als Hersteller erklären wir unter unserer alleinigen Verantwortung, daß die Druckerhöhungsanlagen der Baureihe, *We, the manufacturer, declare under our sole responsibility that these booster set types of the series, Nous, fabricant, déclarons sous notre seule responsabilité que les types de surpresseurs de la série,*

SiFire-... FR

(Die Seriennummer ist auf dem Typenschild des Produktes nach Punkten b) & c) von §1.7.4.2 und §1.7.3 des Anhanges I der Maschinenrichtlinie angegeben. / The serial number is marked on the product site plate according to points b) & c) of §1.7.4.2 and §1.7.3 of the annex I of the Machinery directive. / Le numéro de série est inscrit sur la plaque signalétique du produit en accord avec les points b) & c) du §1.7.4.2 et du §1.7.3 de l'annexe I de la Directive Machines.)

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entsprechen:

In their delivered state comply with the following relevant directives:

dans leur état de livraison sont conformes aux dispositions des directives suivantes :

_ Maschinenrichtlinie 2006/42/EG

_ Machinery 2006/42/EC

_ Machines 2006/42/CE

und gemäss Anhang 1, §1.5.1, werden die Schutzziele der Niederspannungsrichtlinie 2014/35/EU eingehalten *and according to the annex 1, §1.5.1, comply with the safety objectives of the Low Voltage Directive 2014/35/EU et, suivant l'annexe 1, §1.5.1, respectent les objectifs de sécurité de la Directive Basse Tension 2014/35/UE*

_ Elektromagnetische Verträglichkeit - Richtlinie 2014/30/EU

_ Electromagnetic compatibility 2014/30/EU

_ Compabilité électromagnétique 2014/30/UE

und entsprechender nationaler Gesetzgebung,

and with the relevant national legislation,

et aux législations nationales les transposant,

sowie auch den Bestimmungen zu folgenden harmonisierten europäischen Normen:

comply also with the following relevant harmonised European standards:

sont également conformes aux dispositions des normes européennes harmonisées suivantes :

EN ISO 12100

EN 60204-1

EN 61000-6-1:2007

EN 61000-6-3+A1:2011

EN 61000-6-2:2005

EN 61000-6-4+A1:2011

Zusätzlich dazu sind diese Druckerhöhungsanlagen **mit den geltenden Anforderungen** an die Pumpenaggregate **entwickelt** nach
In addition, these booster types are designed in accordance with the applicable requirements to the pump units according to
En complément, ces types de surpresseurs sont construits en conformité aux exigences applicables aux unités de pompage suivant

EN 12845

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen ist:

Person authorized to compile the technical file is:

Personne autorisée à constituer le dossier technique est :

Dortmund,



H. HERCHENHEIN

Senior Vice President - Group ITQ

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<p align="center">(BG) - Български език ДЕКЛАРАЦИЯ ЗА СЪОТЕТСТВИЕ ЕС/ЕО</p> <p>WILO SE декларира, че продуктите посочени в настоящата декларация съответстват на разпоредбите на следните европейски директиви и приелите ги национални законодателства:</p> <p>Машини 2006/42/ЕО ; Електромагнитна съвместимост 2014/30/ЕС</p> <p>както и на хармонизираните европейски стандарти, упоменати на предишната страница.</p>	<p align="center">(CS) - Čeština EU/ES PROHLÁŠENÍ O SHODĚ</p> <p>WILO SE prohlašuje, že výrobky uvedené v tomto prohlášení odpovídají ustanovením níže uvedených evropských směrnic a národním právním předpisům, které je přejímají:</p> <p>Stroje 2006/42/ES ; Elektromagnetická Kompatibilita 2014/30/EU</p> <p>a rovněž splňují požadavky harmonizovaných evropských norem uvedených na předcházející stránce.</p>
<p align="center">(DA) - Dansk EU/EF-OVERENSSTEMMELSESESKLÆRING</p> <p>WILO SE erklærer, at produkterne, som beskrives i denne erklæring, er i overensstemmelse med bestemmelserne i følgende europæiske direktiver, samt de nationale lovgivninger, der gennemfører dem:</p> <p>Maskiner 2006/42/EF ; Elektromagnetisk Kompatibilitet 2014/30/EU</p> <p>De er ligeledes i overensstemmelse med de harmoniserede europæiske standarder, der er anført på forrige side.</p>	<p align="center">(EL) - Ελληνικά ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ ΕΕ/ΕΚ</p> <p>WILO SE δηλώνει ότι τα προϊόντα που ορίζονται στην παρούσα ευρωπαϊκή δήλωση είναι σύμφωνα με τις διατάξεις των παρακάτω οδηγιών και τις εθνικές νομοθεσίες στις οποίες έχει μεταφερθεί:</p> <p>Μηχανήματα 2006/42/ΕΚ ; Ηλεκτρομαγνητικής συμβατότητας 2014/30/ΕΕ</p> <p>και επίσης με τα εξής εναρμονισμένα ευρωπαϊκά πρότυπα που αναφέρονται στην προηγούμενη σελίδα.</p>
<p align="center">(ES) - Español DECLARACIÓN DE CONFORMIDAD UE/CE</p> <p>WILO SE declara que los productos citados en la presenta declaración están conformes con las disposiciones de las siguientes directivas europeas y con las legislaciones nacionales que les son aplicables :</p> <p>Máquinas 2006/42/CE ; Compatibilidad Electromagnética 2014/30/UE</p> <p>Y igualmente están conformes con las disposiciones de las normas europeas armonizadas citadas en la página anterior.</p>	<p align="center">(ET) - Eesti keel EL/EÜ VASTAVUSDEKLARATSIOONI</p> <p>WILO SE kinnitab, et selles vastavustunnistuses kirjeldatud tooted on kooskõlas alljärgnevat Euroopa direktiivide sätetega ning riiklike seadusandlustega, mis nimetatud direktiivid üle on võtnud:</p> <p>Masinaid 2006/42/EÜ ; Elektromagnetilist Ühilduvust 2014/30/EL</p> <p>Samuti on tooted kooskõlas eelmisel leheküljel ära toodud harmoniseeritud Euroopa standarditega.</p>
<p align="center">(FI) - Suomen kieli EU/EY-VAATIMUSTENMUKAI SUUSVAKUUTUS</p> <p>WILO SE vakuuttaa, että tässä vakuutuksessa kuvatut tuotteet ovat seuraavien eurooppalaisten direktiivien määräysten sekä niihin sovellettavien kansallisten lakiasetusten mukaisia:</p> <p>Koneet 2006/42/EY ; Sähkömagneettinen Yhteensopivuus 2014/30/EU</p> <p>Lisäksi ne ovat seuraavien edellisellä sivulla mainittujen yhdenmukaistettujen eurooppalaisten normien mukaisia.</p>	<p align="center">(GA) - Gaeilge AE/EC DEARBHŪ COMHLÍONTA</p> <p>WILO SE ndearbhaíonn an cur síos ar na táirgí atá i ráiteas seo, siad i gcomhréir leis na forálacha atá sna treoracha seo a leanas na hEorpa agus leis na dlíthe náisiúnta is infheidhme orthu:</p> <p>Innealra 2006/42/EC ; Comhoiriúnacht Leictreamaighnéadach 2014/30/AE</p> <p>Agus siad i gcomhréir le forálacha na caighdeáin chomhchuibhithe na hEorpa dá dtagraítear sa leathanach roimhe seo.</p>
<p align="center">(HR) - Hrvatski EU/EZ IZJAVA O SUKLADNOSTI</p> <p>WILO SE izjavlja da su proizvodi navedeni u ovoj izjavi u skladu sa sljedećim prihvaćenim europskim direktivama i nacionalnim zakonima:</p> <p>EZ smjernica o strojevima 2006/42/EZ ; Elektromagnetna kompatibilnost - smjernica 2014/30/EU</p> <p>i usklađenim europskim normama navedenim na prethodnoj stranici.</p>	<p align="center">(HU) - Magyar EU/EK-MEGFELELŐSÉGI NYILATKOZAT</p> <p>WILO SE kijelenti, hogy a jelen megfélelőségi nyilatkozatban megjelölt termékek megfelelnek a következő európai irányelvek előírásainak, valamint azok nemzeti jogrendbe átültetett rendelkezéseinek:</p> <p>Gépek 2006/42/EK ; Elektromágneses összeférhetőségre 2014/30/EU</p> <p>valamint az előző oldalon szereplő, harmonizált európai szabványoknak.</p>
<p align="center">(IT) - Italiano DICHIARAZIONE DI CONFORMITÀ UE/CE</p> <p>WILO SE dichiara che i prodotti descritti nella presente dichiarazione sono conformi alle disposizioni delle seguenti direttive europee nonché alle legislazioni nazionali che le traspongono :</p> <p>Macchine 2006/42/CE ; Compatibilità Elettromagnetica 2014/30/UE</p> <p>E sono pure conformi alle disposizioni delle norme europee armonizzate citate a pagina precedente.</p>	<p align="center">(LT) - Lietuvių kalba ES/EB ATITIKTIES DEKLARACIJA</p> <p>WILO SE pareiškia, kad šioje deklaracijoje nurodyti gaminiai atitinka šių Europos direktyvų ir jas perkeliančių nacionalinių įstatymų nuostatus:</p> <p>Mašinos 2006/42/EB ; Elektromagnetinis Suderinamumas 2014/30/ES</p> <p>ir taip pat harmonizuotas Europos normas, kurios buvo cituotos ankstesniame puslapyje.</p>
<p align="center">(LV) - Latviešu valoda ES/EK ATBILSTĪBAS DEKLARĀCIJU</p> <p>WILO SEdeklarē, ka izstrādājumi, kas ir nosaukti šajā deklarācijā, atbilst šeit uzskaitīto Eiropas direktīvu nosacījumiem, kā arī atsevišķu valstu likumiem, kuros tie ir ietverti:</p> <p>Mašīnas 2006/42/EK ; Elektromagnētiskās Saderības 2014/30/ES</p> <p>un saskaņotajiem Eiropas standartiem, kas minēti iepriekšējā lappusē.</p>	<p align="center">(MT) - Malti DIKJARAZZJONI TA' KONFORMITÀ UE/KE</p> <p>WILO SE jiddikjara li l-prodotti speċifikati f'din id-dikjarazzjoni huma konformi mad-direttivi Ewropej li jsegwu u mal-leġislażzjonijiet nazzjonali li japplikawhom:</p> <p>Makkinarju 2006/42/KE ; Kompatibbiltà Elettromanjetika 2014/30/UE</p> <p>kif ukoll man-normi Ewropej armonizzati li jsegwu imsemmija fil-paġna preċedenti.</p>

<p align="center">(NL) - Nederlands EU/EG-VERKLARING VAN OVEREENSTEMMING</p> <p>WILO SE verklaart dat de in deze verklaring vermelde producten voldoen aan de bepalingen van de volgende Europese richtlijnen evenals aan de nationale wetgevingen waarin deze bepalingen zijn overgenomen:</p> <p>Machines 2006/42/EG ; Elektromagnetische Compatibiliteit 2014/30/EU</p> <p>De producten voldoen eveneens aan de geharmoniseerde Europese normen die op de vorige pagina worden genoemd.</p>	<p align="center">(PL) - Polski DEKLARACJA ZGODNOŚCI UE/WE</p> <p>WILO SE oświadcza, że produkty wymienione w niniejszej deklaracji są zgodne z postanowieniami następujących dyrektyw europejskich i transponującymi je przepisami prawa krajowego:</p> <p>Maszyn 2006/42/WE ; Kompatybilności Elektromagnetycznej 2014/30/UE</p> <p>oraz z następującymi normami europejskich zharmonizowanymi podanymi na poprzedniej stronie.</p>
<p align="center">(PT) - Português DECLARAÇÃO DE CONFORMIDADE UE/CE</p> <p>WILO SE declara que os materiais designados na presente declaração obedecem às disposições das diretivas europeias e às legislações nacionais que as transcrevem :</p> <p>Máquinas 2006/42/CE ; Compatibilidade Electromagnética 2014/30/UE</p> <p>E obedecem também às normas europeias harmonizadas citadas na página precedente.</p>	<p align="center">(RO) - Română DECLARAȚIE DE CONFORMITATE UE/CE</p> <p>WILO SE declară că produsele citate în prezenta declarație sunt conforme cu dispozițiile directivelor europene următoare și cu legislațiile naționale care le transpun :</p> <p>Mașini 2006/42/CE ; Compatibilitate Electromagnetică 2014/30/UE</p> <p>și, de asemenea, sunt conforme cu normele europene armonizate citate în pagina precedentă.</p>
<p align="center">(SK) - Slovenčina EÚ/ES VYHLÁSENIE O ZHODE</p> <p>WILO SE čestne prehlasuje, že výrobky ktoré sú predmetom tejto deklarácie, sú v súlade s požiadavkami nasledujúcich európskych direktív a odpovedajúcich národných legislatívnych predpisov:</p> <p>Strojových zariadeniach 2006/42/ES ; Elektromagnetickú Kompatibilitu 2014/30/EÚ</p> <p>ako aj s harmonizovanými európskych normami uvedenými na predchádzajúcej strane.</p>	<p align="center">(SL) - Slovenščina EU/ES-IZJAVA O SKLADNOSTI</p> <p>WILO SE izjavlja, da so izdelki, navedeni v tej izjavi, v skladu z določili naslednjih evropskih direktiv in z nacionalnimi zakonodajami, ki jih vsebujejo:</p> <p>Stroji 2006/42/ES ; Elektromagnetno Zdržljivostjo 2014/30/EU</p> <p>pa tudi z usklajenimi evropskih standardi, navedenimi na prejšnji strani.</p>
<p align="center">(SV) - Svenska EU/EG-FÖRSÄKRAN OM ÖVERENSSTÄMMELSE</p> <p>WILO SE intygar att materialet som beskrivs i följande intyg överensstämmer med bestämmelserna i följande europeiska direktiv och nationella lagstiftningar som inför dem:</p> <p>Maskiner 2006/42/EG ; Elektromagnetisk Kompatibilitet 2014/30/EU</p> <p>Det överensstämmer även med följande harmoniserade europeiska standarder som nämnts på den föregående sidan.</p>	<p align="center">(TR) - Türkçe AB/CE UYGUNLUK TEYİD BELGESİ</p> <p>WILO SEbu belgede belirtilen ürünlerin aşağıdaki Avrupa yönetmeliklerine ve ulusal kanunlara uygun olduğunu beyan etmektedir:</p> <p>Makine Yönetmeliği 2006/42/AT ; Elektromanyetik Uyumluluk Yönetmeliği 2014/30/AB</p> <p>ve önceki sayfada belirtilen uyumlaştırılmış Avrupa standartlarına.</p>
<p align="center">(IS) - Íslenska ESB/EB LEYFISYFIRLÝSING</p> <p>WILO SE lýsir því yfir að vörurnar sem um getur í þessari yfirlýsingu eru í samræmi við eftirfarandi tilskipunum ESB og landslögum hafa samþykkt:</p> <p>Vélartilskipun 2006/42/EB ; Rafseguls-samhæfni-tilskipun 2014/30/ESB</p> <p>og samhæfða evrópska staðla sem nefnd eru í fyrri síðu.</p>	<p align="center">(NO) - Norsk EU/EG-OVERENSSTEMMELSESERKLÆING</p> <p>WILO SE erklærer at produktene nevnt i denne erklæringen er i samsvar med følgende europeiske direktiver og nasjonale lover:</p> <p>EG–Maskindirektiv 2006/42/EG ; EG–EMV–Elektromagnetisk kompatibilitet 2014/30/EU</p> <p>og harmoniserte europeiske standarder nevnt på forrige side.</p>
<p align="center">(RU) - русский язык Декларация о соответствии Европейским нормам</p> <p>WILO SE заявляет, что продукты, перечисленные в данной декларации о соответствии, отвечают следующим европейским директивам и национальным предписаниям:</p> <p>Директива ЕС по машинному оборудованию 2006/42/ЕС ; Директива ЕС по электромагнитной совместимости 2014/30/ЕС</p> <p>и гармонизированным европейским стандартам, упомянутым на предыдущей странице.</p>	

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