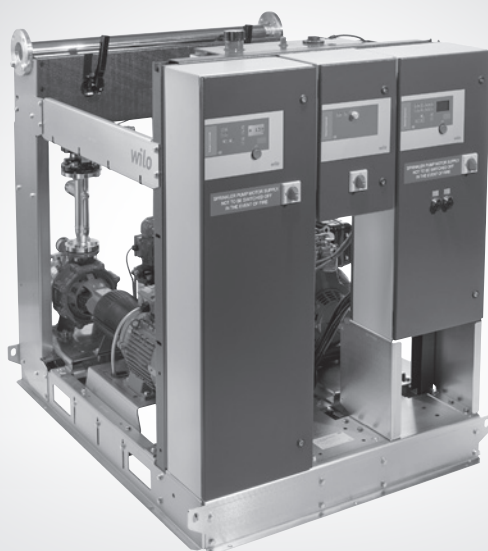


Wilo-SiFire EN



de Einbau- und Betriebsanleitung
en Installation and operating instructions

fr Notice de montage et de mise en service
nl Inbouw- en bedieningsvoorschriften

Fig. 1:

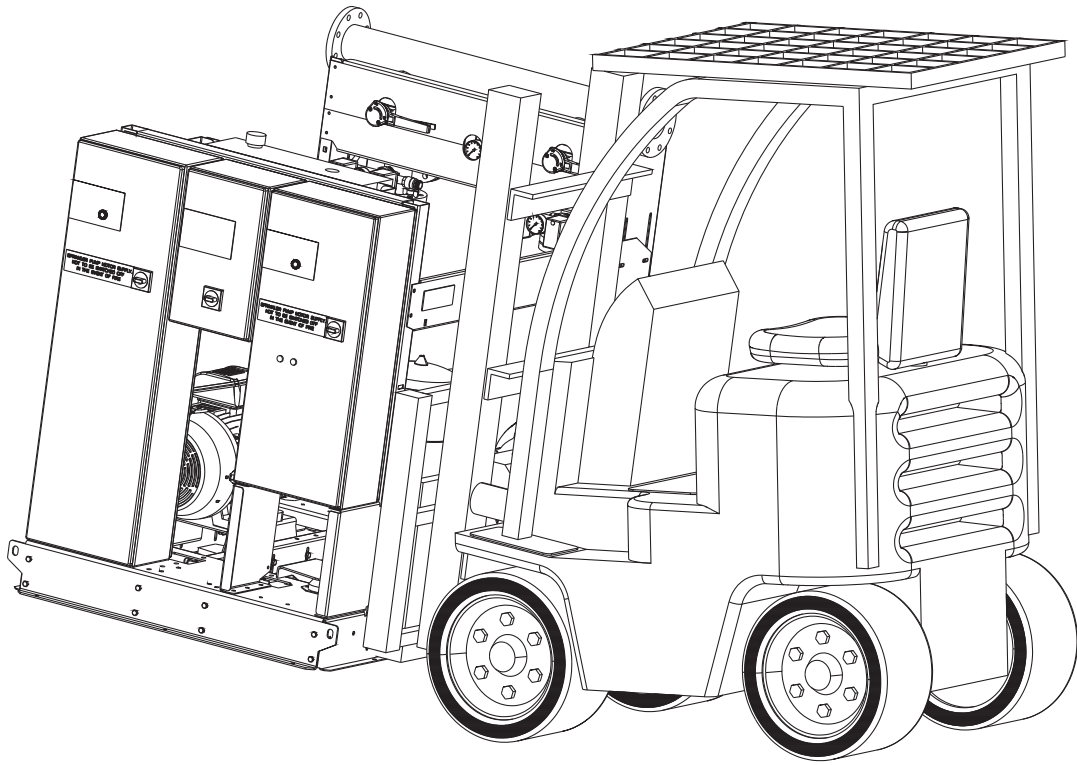


Fig. 2a:

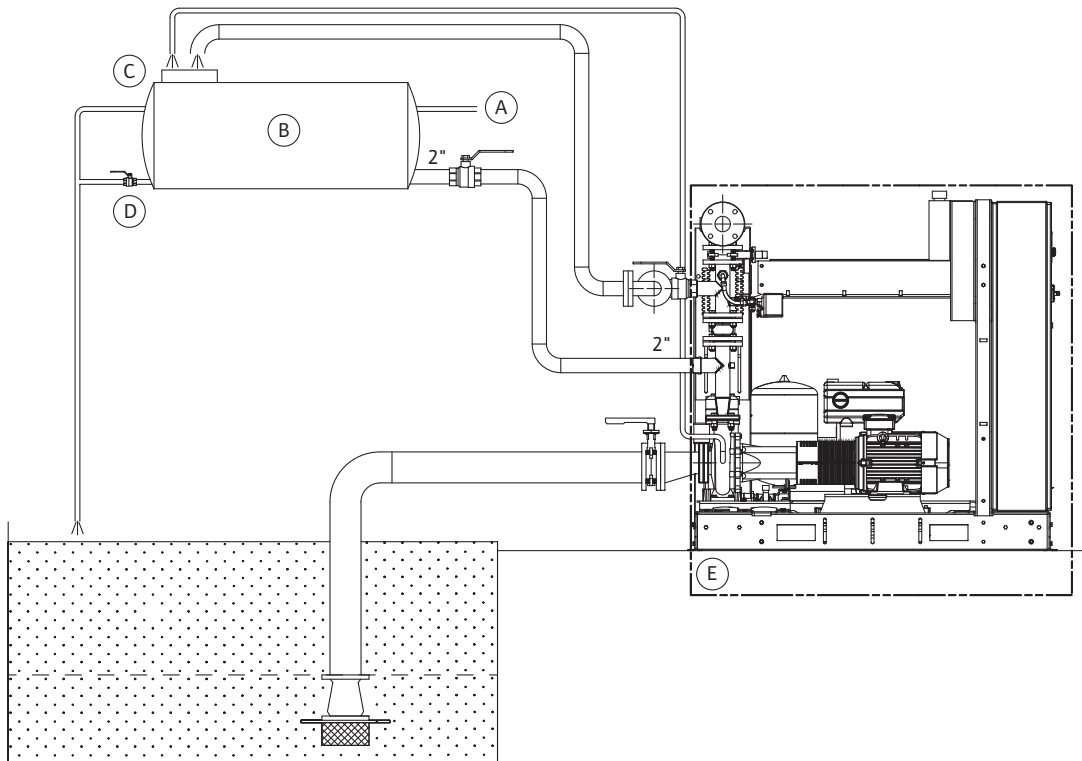


Fig. 2b:

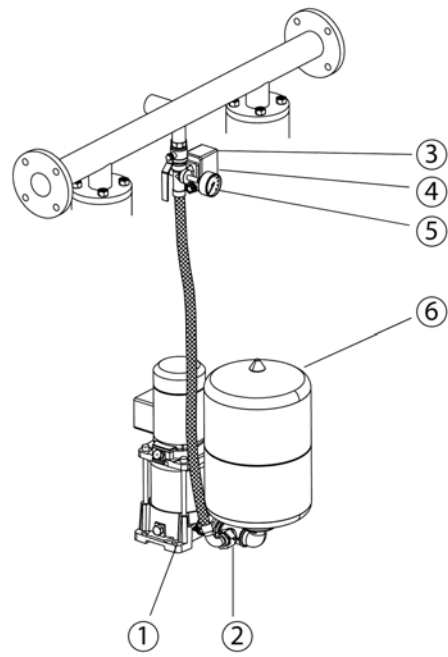


Fig. 3:

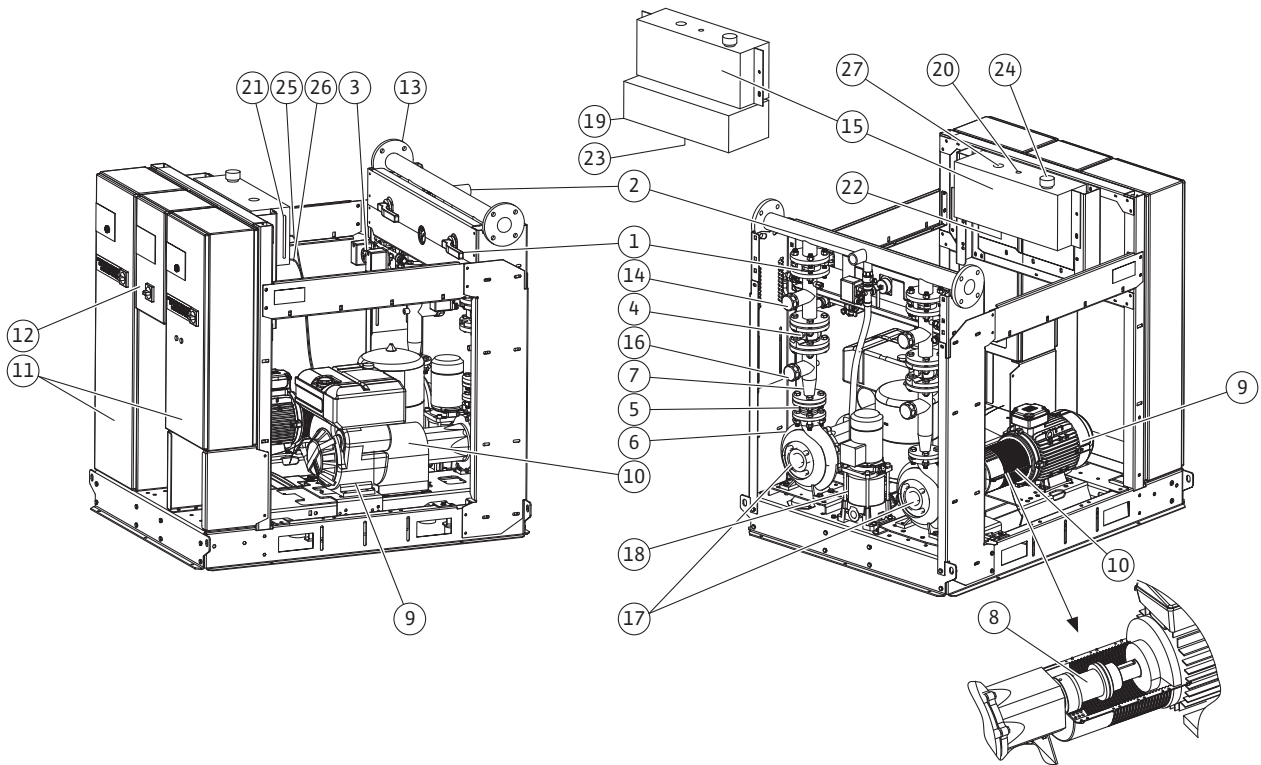


Fig. 4:

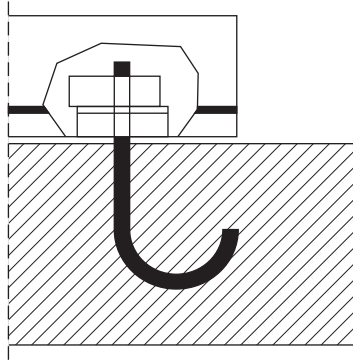


Fig. 5:

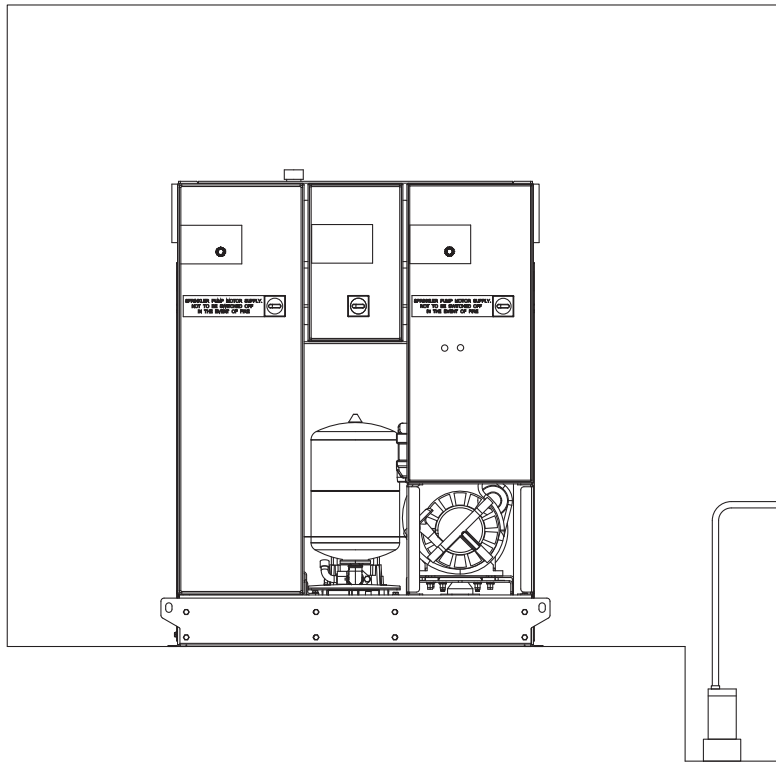


Fig. 6a:

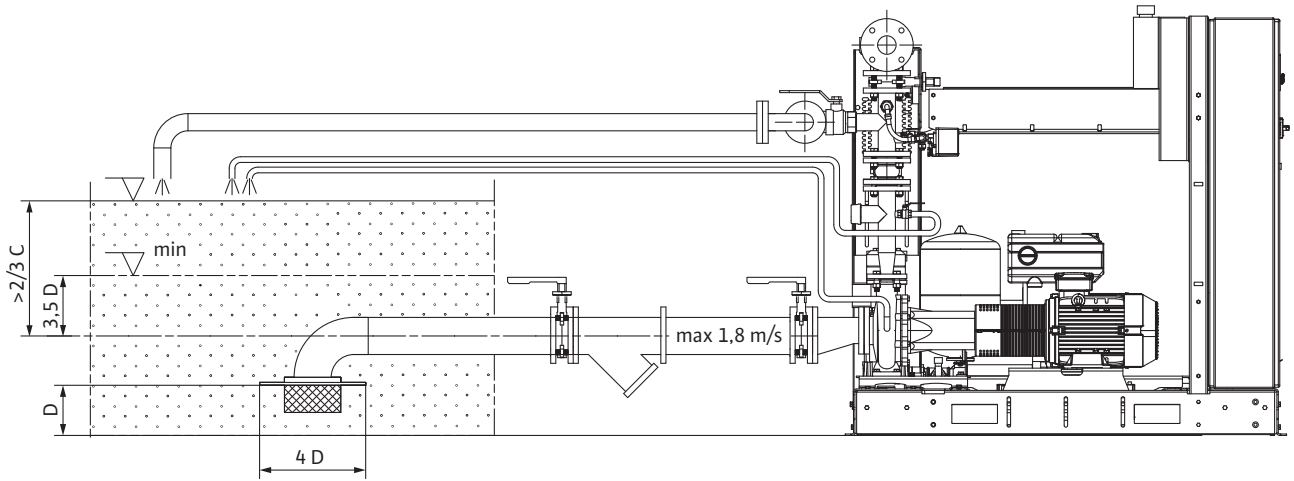


Fig. 6b:

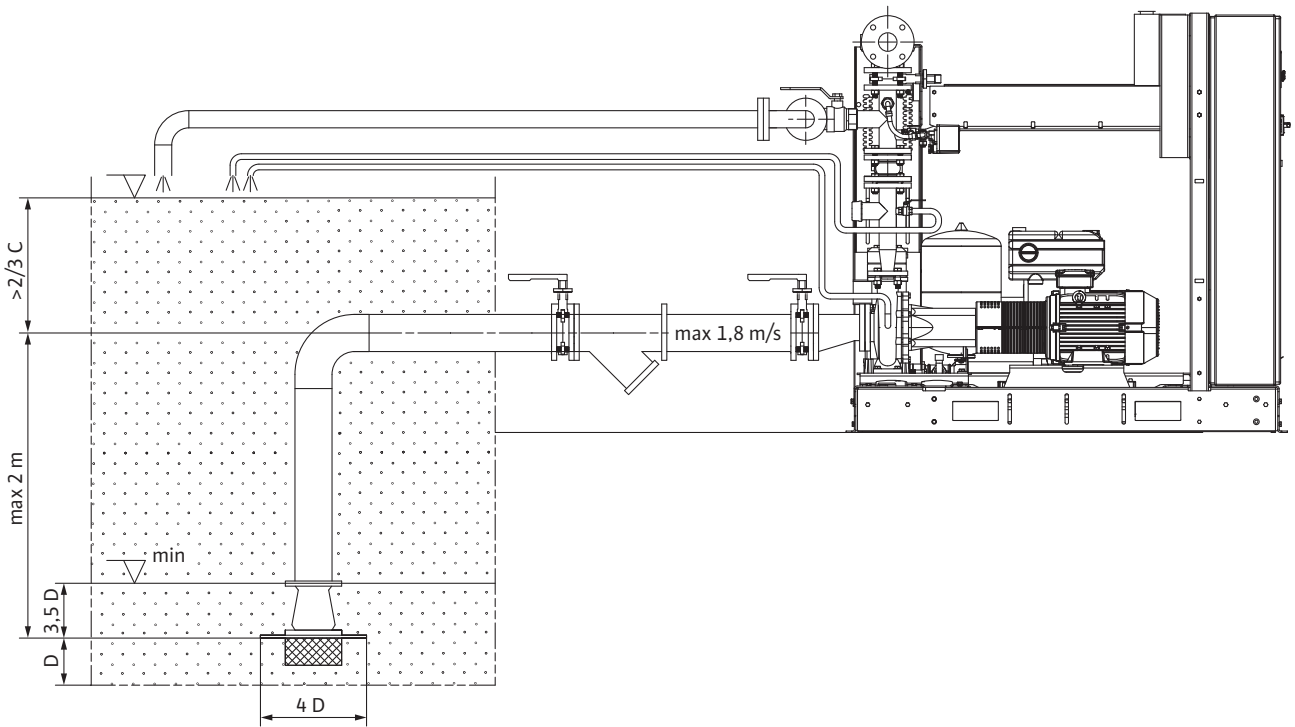


Fig. 7:

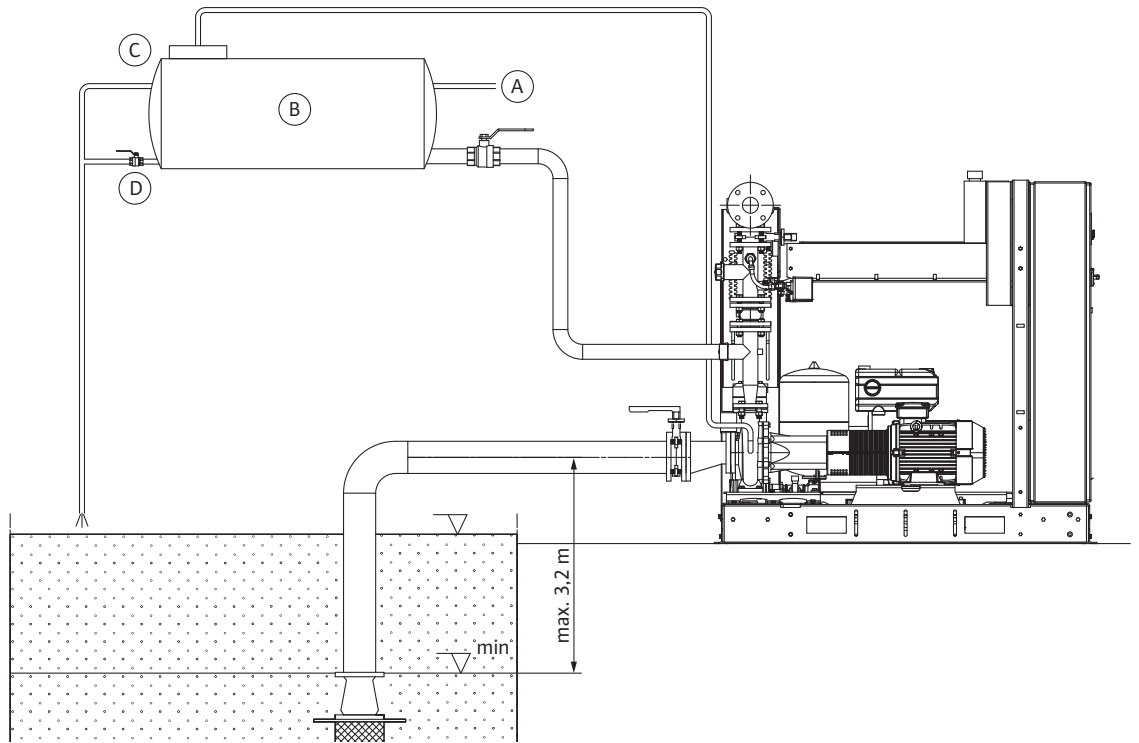


Fig. 8:

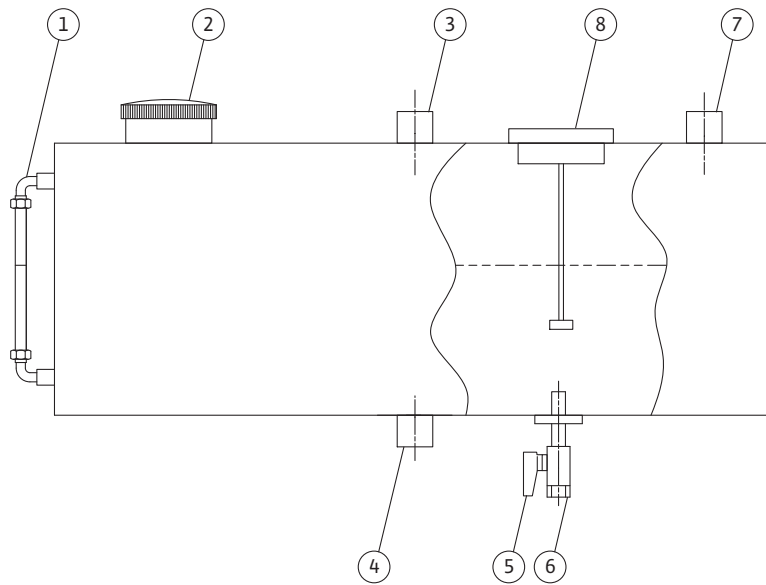


Fig. 9a:

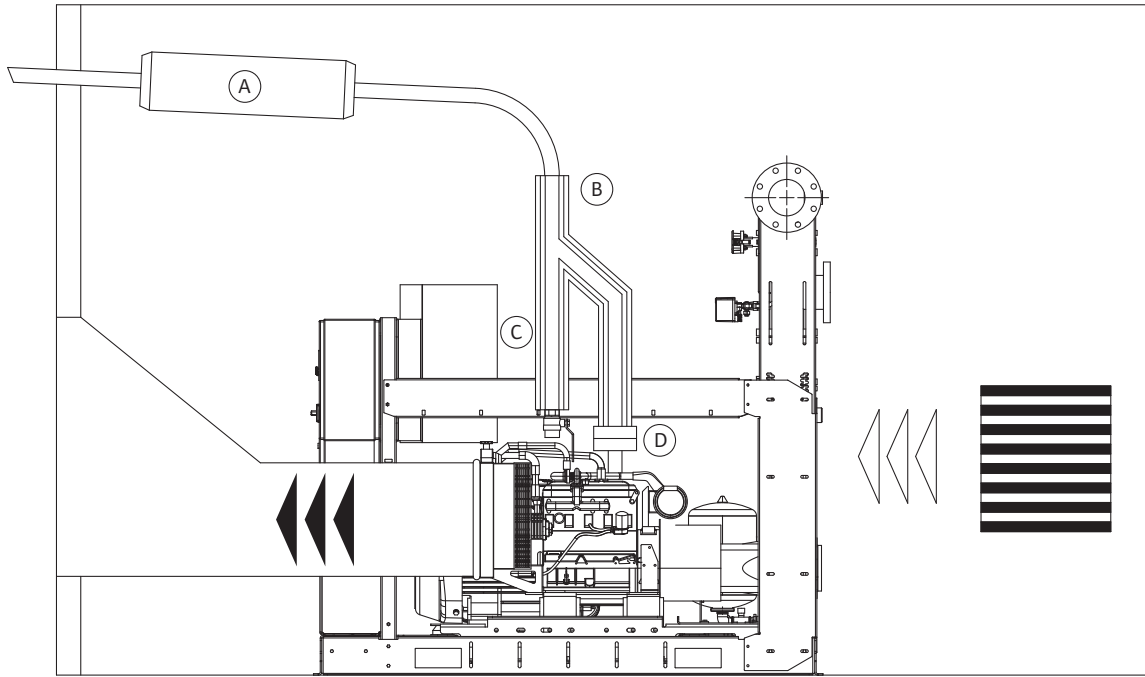


Fig. 9b:

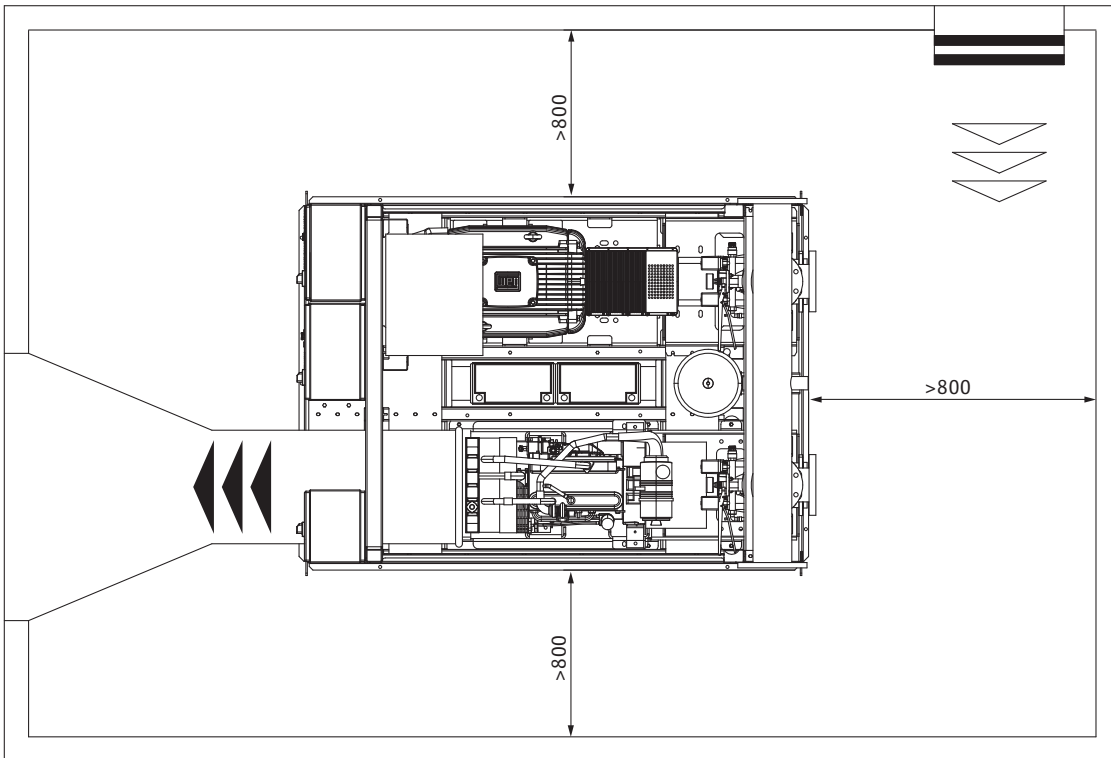


Fig. 9a: (variant)

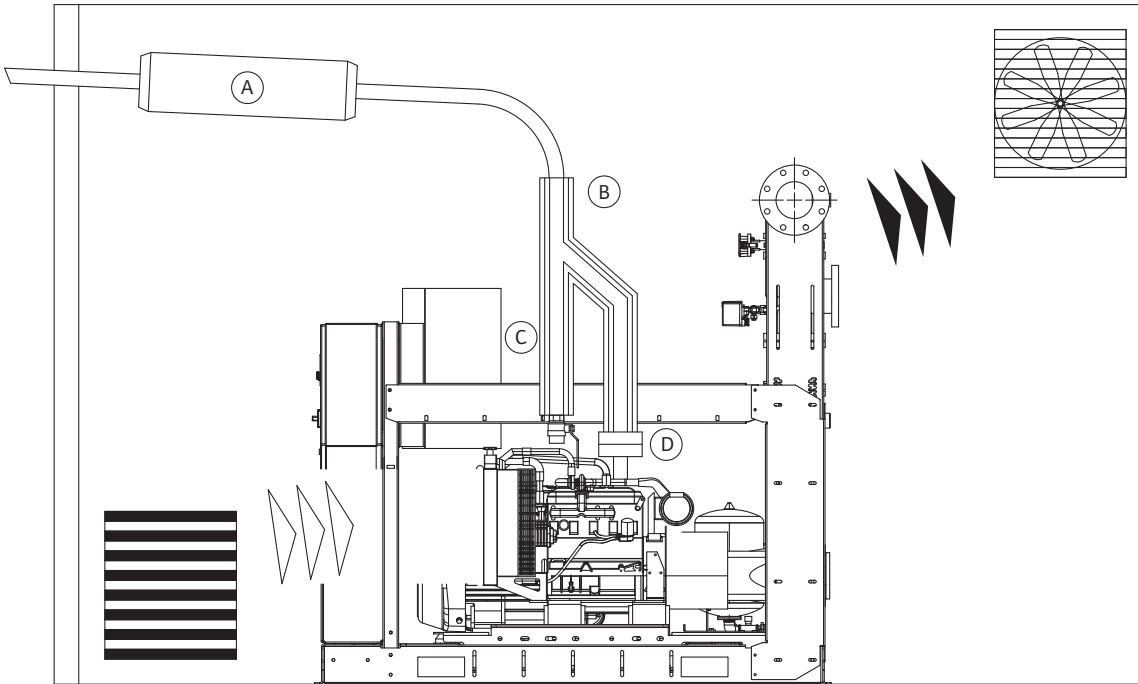


Fig. 9b: (variant)

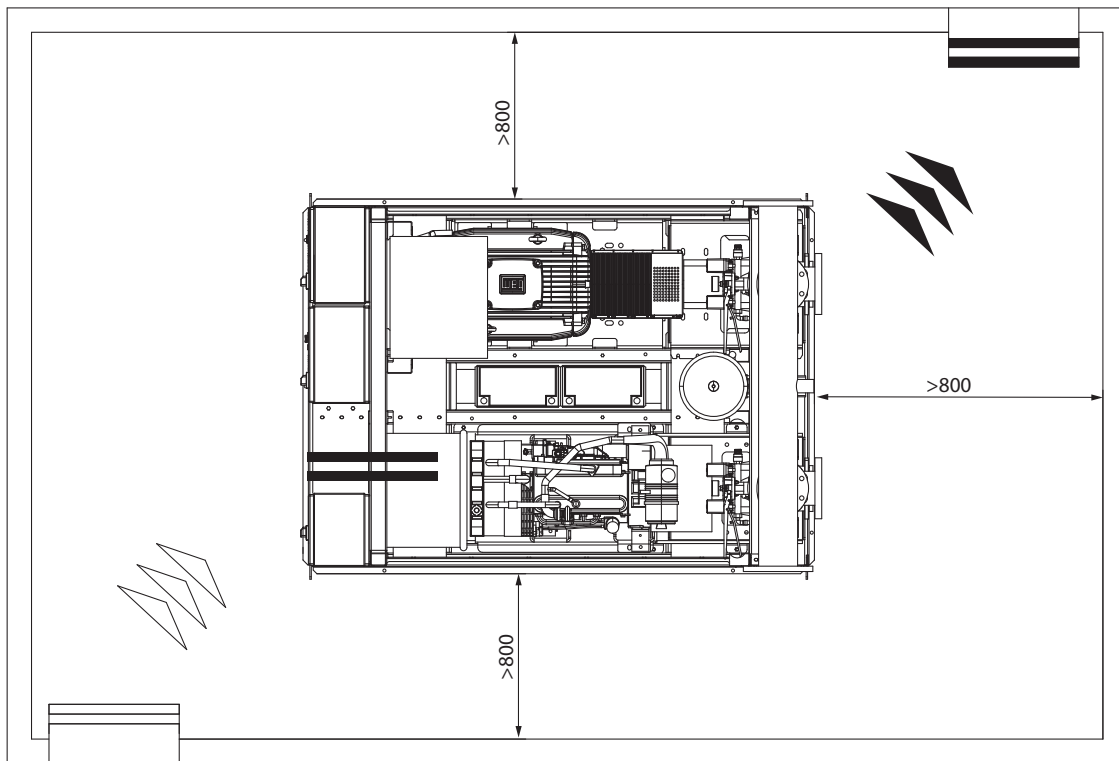


Fig. 10:

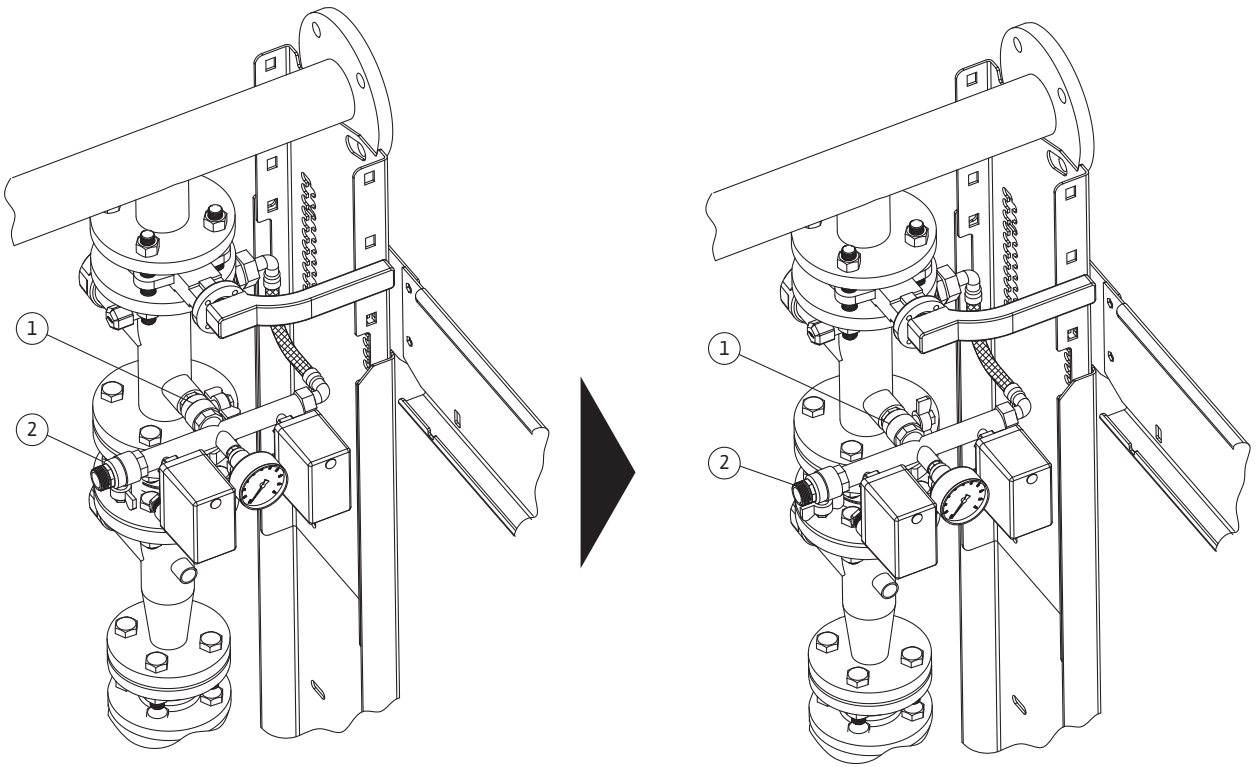
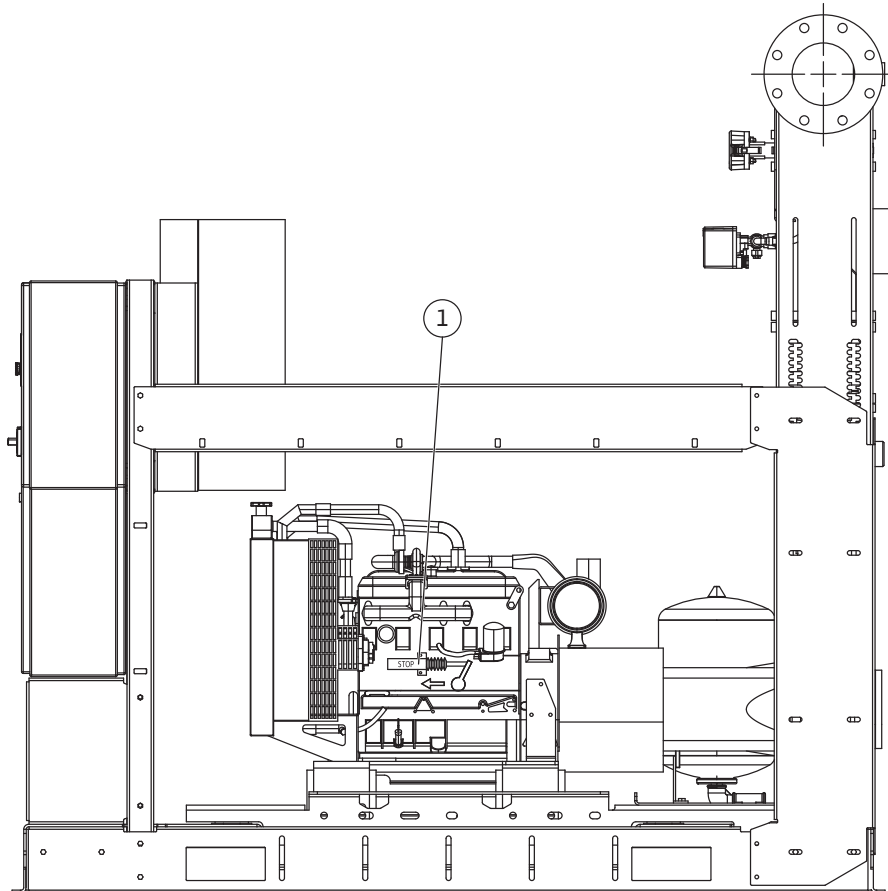


Fig. 11:



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Captions

Fig. 1 Transport (example)

| Fig. 2a Installation diagram | |
|------------------------------|----------------------------|
| A | From water mains |
| B | Tank 500 L |
| C | Overflow |
| D | Drain |
| E | Standard scope of delivery |

| Fig. 2b Installation diagram | |
|------------------------------|---------------------------|
| 1 | Jockey pump |
| 2 | Non-return valve |
| 3 | Test discharge |
| 4 | Pressure switch |
| 5 | Pressure gauge |
| 6 | Diaphragm pressure vessel |

Fig. 3 The booster

| | |
|----|--|
| 1 | Gate valve |
| 2 | Connection for local sprinkler |
| 3 | Double pressure switch circuit main pump |
| 4 | Non return valve |
| 5 | Flexible vibration-damping sleeves for diesel pump |
| 6 | Connection for recirculation circuit with diaphragm |
| 7 | Divergent cone on discharge side main pump |
| 8 | Pump/motor coupling with spacer |
| 9 | Main pump electric/diesel motor |
| 10 | Coupling guard |
| 11 | Main pump control panel |
| 12 | Jockey pump control panel |
| 13 | Discharge manifold |
| 14 | Connection for setting of flow meter option |
| 15 | Fuel tank (for diesel pump) |
| 16 | Connection for priming circuit of main pump |
| 17 | Main pump |
| 18 | Jockey pump |
| 19 | Tank for fuel leakages |
| 20 | Fuel tank vent valve |
| 21 | Fuel level gauge |
| 22 | Drain for cleaning of deposit in fuel tank |
| 23 | Drain for cleaning of deposit in tank for fuel leakage |
| 24 | Fuel filler cap |

Fig. 3 The booster

| | |
|----|---|
| 25 | Connection for motor return pipe |
| 26 | Connection for fuel supply to the motor |
| 27 | Level gauge for fuel |

Fig. 4 Anchoring to the floor**Fig. 5 Pump test drainage****Fig. 6a Unit with positive head**

| Fig. 6b | |
|---------|---------------|
| C = | Tank capacity |

Fig. 7 Unit with suction lift

| | |
|---|------------------|
| A | From water mains |
| B | Tank 500 L |
| C | Overflow |
| D | Drain |

Fig. 8 Fuel tank

| | |
|---|--|
| 1 | Fuel level indicator |
| 2 | Filling cap |
| 3 | Fitting for return pipe from motor |
| 4 | Drain for removing deposits in tank |
| 5 | On/Off valve for fuel to motor |
| 6 | Fitting for fuel supply to motor |
| 7 | Tank vent valve (should vent outside room) |
| 8 | Electric float connected to motor pump control panel |

Fig. 9a Exhaust air for combustion and cooling diesel engine

| Fig. 9b | |
|---------|----------------------------|
| A | Muffler |
| B | Exhaust thermal protection |
| C | Condensation drain |
| D | Expansion joint |

| | |
|----------------|---|
| Fig. 9a | Variant; |
| Fig. 9b | Exhaust air for combustion and cooling diesel engine |
| A | Muffler |
| B | Exhaust thermal protection |
| C | Condensation drain |
| D | Expansion joint |

Fig. 10 Automatic test of running

Fig. 11a Solenoid valve

| | | |
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1 General information

About this document

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

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

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

EC-Declaration of conformity:

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

2 Safety

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

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

2.1 Danger symbols used in this operating instruction

Symbols:



General danger symbol



Danger due to electrical voltage



Danger due to suspended loads



Danger due to inflammable materials



Risk of electrification



Risk of poisoning



Danger due to hot surfaces



Danger due to hot products



Risk of cuts



Risk of Fall



Risk of irritation



Risk of pollution



Risk of explosion



General ban symbol



No access for unauthorised persons!



Do not touch live parts!



Smoking and



open fire prohibited!



NOTE: ...

Signals:

DANGER!

Acutely dangerous situation.

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

WARNING!

The user can suffer (serious) injuries. "WARNING" implies that (serious) injury to persons is probable if this information is disregarded.

CAUTION!

There is a risk of damaging the product/unit. "CAUTION" implies that damage to the product is likely if this information is disregarded

NOTE:

Useful information on handling the product. It draws attention to possible problems. Information that appears directly on the product, such as

- Direction of rotation arrow,
- Identifiers for connections,
- Name plate,
- Warning sticker

must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

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

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

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

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

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

2.4 Safety consciousness on the job

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

2.5 Safety instructions for the operator

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

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

2.6 Safety instructions for installation and maintenance work

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

Work on the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating

instructions for shutting down the product/unit be complied with.

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

2.7 Unauthorised modification and manufacture of spare parts

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

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

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalogue/data sheet.

3 Transport and storage before use

The system fire extinguishing booster is supplied on a pallet. It is protected from moisture and dust by a plastic bag.

The equipment must be transported by means of authorised load devices. (See example on fig. 1) WARNING! Risk of personal injury!



The static stability of the unit must be taken into account. Handling of the material must be carried out by qualified personnel, using only suitable and authorised equipment.

Lifting straps must be fastened to the ring bolts placed on the base frame.

The manifolds do not fit with the handling of the system and should not be used to fix loads in transit.



CAUTION! Risk of product damages!

Handling by using discharge manifold can cause leakages!

When the product is delivered, check it for any damage in transit. In case of damage, take any necessary measures from the delivery company (forwarding agent).



CAUTION! Risk of product damages!

If the product shall be installed later on, store it in a dry place. Protect it from impacts and any outside influences (moisture, frost, etc. ...). Handle the product with care.

3.1 Residual risk during transport and storage



WARNING! Risk of Cut!
Sharp edges or any not protected threaded parts entail the risk of getting cut.
Take necessary cautions to avoid injuries and use protective equipment (wear specific gloves).



WARNING! Risk of personal injury!
Do not stand or put members under the suspended parts during handling and installation.
Use clothing dedicated to protection against accidents (wear helmet and safety shoes).



WARNING! Risk of impact!
Be careful of prominent parts and parts at head level. Use clothing dedicated to protection against accidents.



DANGER! Risk of fall!
Prohibit access to wells or tanks, where pumps are installed. Wells must have closing cover.



WARNING! Risk of irritation!
During handling, avoid spillage of battery acid solution which could cause irritations or material damages. Use special protections to avoid contact.



CAUTION! Risk of environmental pollution!
Avoid dumping of oil from the engine or diesel fuel from the tank. During handling, keep them flat. Use suitable protection and implement the necessary measures to prevent pollution of soil, water, etc.

4 Intended use

The fire extinguishing boosters are designed for a professional use. They are used when an increase or a maintaining under pressure of the fire network is necessary.

The system must be installed in a special room which is protected from frost and rain, fireproof and ventilated enough, with necessary spaces around pumps for movements and regular maintenance. The room must be in accordance with the EN 12845 standards. Airflow for ventilation and for cooling of engines, more specifically diesel engine –if present– has to be sufficient.

5 Product data

5.1 Type key

| Example | SiFire EN 40-200 180 7,5/10.5/0.55 EDJ |
|---------------|---|
| SiFire | Name of the Fire Extinguishing System |
| EN | In accordance with EN 12845 standards |
| 40/200 | Type of main pump |
| 180 | Impeller diameter of main pump |
| 7,5/10.5/0.55 | Nominal power of the pump motors [kW] (electrical motor/diesel engine/jockey motor) |
| EDJ | Configuration: E : 1 electric pump D : 1 diesel pump EJ : 1 electric pump + 1 jockey pump EEJ : 2 electric pumps + 1 jockey pump EDJ : 1 electric pump + 1 diesel pump + 1 jockey pump DJ : 1 diesel pump + 1 jockey pump |

5.2 Technical data

| | |
|------------------------------------|---|
| Maximum operating pressure: | 10 bar/16 bar according to the pump |
| Maximum ambient temperature: | +4 to +40 °C (10 to 40°C if diesel pump is installed) |
| Maximum water temperature: | +4 to +40 °C |
| Supply voltage: | 3~400 V ± 10 % (1~230 V ± 10 %, for diesel pump control panel) |
| Frequency: | 50 Hz |
| Maximum relative humidity: | 50 % with Tmax.: 40 °C (*) |
| Protection class of Control box: | IP54 |
| Protection class of pump: | IP54 |
| Motor IE2 insulation class: | F |
| Maximum altitude for installation: | 1000 m above sea level (*) |
| Minimum atmospheric pressure: | 760 mmHg (*) |
| Nominal current: | refer to the rating plate |

(*) Seen the specific graphs and tables in the catalogues and maintenance manuals for the details of class variations for electric machines and diesel engines with regard to different temperatures, altitudes, atmospheric pressure, fuel temperature and viscosity compared to standard test conditions.

5.3 Scope of delivery

- Fire Extinguishing Booster
- Operating instructions for fire extinguishing system.
- Operating instructions for pumps (1 manual per kind of pump)
- Operating instructions for panels (1 manual per kind of panel)
- Operating instructions and maintenance of diesel motor if present.

5.4 Accessories

- Priming tank(s) complete with electrical float.
- Electric contacts limit for the check valve of the pumps.
- Flexible vibration-damping sleeves.
- Eccentric suction cone kit with vacuum gauge for suction side of the pumps.
- Butterfly valves.
- Silencer for diesel engine.
- Water/water heat exchanger for diesel engine cooling.
- Flow meter.
- Diesel engine spare parts kit.
- Remote alarm panel.

The installer is responsible for the assembly of the equipment supplied and for completion of the system in compliance with the requirements of EN 12845 standards, as well as for integration of our supply with all other necessary components (circulation piping, flow rate metering circuits with meter, priming tank, etc).

See the specific instructions provided in the relevant instruction manuals and/or the indications provided on the items themselves for details of how to assemble, set and adjust the accessories listed above or other particular accessories requested at the order stage and supplied with the standard pumping unit.

The installer is responsible for issuing the final certification "installation built-in compliance with EN 12845 standard", as required by the relevant standards, and for issuing the end user with all the documents required by the applicable standard.

6 Description and function

6.1 General description

The fire extinguishing units in the SiFire series are built in several variants and models, as indicated in our catalogues, or in versions modified in order to satisfy particular customer requirements (transport/handling difficulties, particular performances, etc), using the main components described below:

- main normalised "back pull out" pumps, coupled to an electrical motor or diesel engine by a spacer allowing the dismantling of the pump and/or motor without having to work on the other. It also allows the extraction of the rotating part of the pump for maintenance without having to remove the motor and/or the end suction pump housing.
- vertical multistage jockey pump for correcting small losses and for keeping the system pressure constant.
- electrical control panels for the main and jockey pumps (one per pump).
- piping and discharge manifolds in steel.
- valves on the pump discharge that can be locked in the open position.
- non-return valves on the pump discharge.
- butterfly valves, manometers, pressure switches.
- Connection for flow meter to control the performance of the pumps.
- double pressure switch circuit for start-up of the main pumps and control of the working order of each individual pressure switch.
- pressure switch for automatic start-up of the jockey pump.
- support frame(s) for control panels and manifolds.
- independent fuel tank for the diesel engine, completed with accessories.
- Two batteries for the start-up of the diesel engine (if present).

The system is assembled on a base frame in accordance with the EN 12845 standard, within the limit of delivery, indicated on installation diagram from fig. 2a-2b.

Each pump is installed on a steel base frame. Diesel pumps are connected to hydraulic elements with intermediary vibration damping joints to avoid the transmission of vibrations from diesel motors but also the possible piping or mechanical structure breaks.

For connection to the public water distribution, rules and existing standards must be respected, and possibly completed with rules of water distribution companies. Besides, local particularities have to be taken into account, for example a too high or too variable suction pressure which requests the assembly of a pressure reducing valve.

6.2 Description of the product

6.2.1 The booster – See fig. 3 – Position:

- | | |
|--|--|
| <ol style="list-style-type: none"> 1 Gate valve 2 Connection for local sprinkler 3 Double pressure switch circuit main pump 4 Non–return valve 5 Flexible vibration–damping sleeves for diesel pump 6 Connection for recirculation circuit with diaphragm 7 Divergent cone on discharge side main pump 8 Pump/motor coupling with spacer 9 Main pump electric/diesel motor 10 Coupling guard 11 Main pump control panel 12 Jockey pump control panel | <ol style="list-style-type: none"> 13 Discharge manifold 14 Connection for setting of flow meter option 15 Fuel tank (for diesel pump) 16 Connection for priming circuit of main pump 17 Main pump 18 Jockey pump 19 Tank for fuel leakages 20 Fuel tank vent valve 21 Fuel level gauge 22 Drain for cleaning of deposit in fuel tank 23 Drain for cleaning of deposit in tank for fuel leakage 24 Fuel filler cap 25 Connection for motor return pipe 26 Connection for fuel supply to the motor 27 Level gauge for fuel |
|--|--|

| Ø discharge of main pump | Ø Accessories | Ø Manifolds |
|--------------------------|---------------|-------------|
| DN32 | DN50 | DN65 |
| DN40 | DN65 | DN65 |
| DN50 | DN65 | DN80 |
| DN65 | DN80 | DN100 |
| DN80 | DN100 | DN125 |
| DN100 | DN125 | DN150 |
| DN125 | DN150 | DN200 |

6.2.2 Control box

- Ensure complete automatic operations of each pump and associated functions
- Waterproof, protection class IP 54.

6.3 Function of the product

The operational logic for the fire extinguishing unit is based on the cascade calibration of the pressure switches for pump starting. The jockey pump of pressure boosting is the first to start and maintains the system full of water and under pressure. It starts when the pressure drops in the system. Start and stop control is set up via the suitably calibrated pressure switch.

When a larger quantity of water is requested, due to the opening of one or more circuits or due to a broken sprinkler, pressure decreases in the system. This drives the main pump to start.

For systems with more than one pump, if the main electric pump does not start, due to electricity problems for example, the drop in pressure will activate the standby pump pressure switch which starts the diesel engine. In some cases, two or more electric pumps could be used.

Once the sprinkler circuit or the gate valve that supply the sprinkler system is closed, the system reaches the maintaining pressure of the installation; it will be necessary to press the –Stop– buttons on panels to stop the main pump and standby pump. The jockey pump is automatically stopped.



7 Installation and electrical connection

DANGER! Risk of electric shock!

Personnel dedicated to the connection of electrical equipment and motors must be skilled for such work. They shall make the connection according to the wiring diagrams supplied, in accordance with regulations and laws in force. In addition, they must ensure that they have shut-down power before performing any operation which provides the possible contact with the electrical parts. Check earth continuity.

7.1 Installation

Install the booster in an easily accessible room, ventilated and protected from rain and frost. To make sure that the booster can pass through the room door.

For maintenance works, a sufficient place must be provided. The unit must be easily accessible. Installation place has to be horizontal and flat. It must be robust enough to support the system weight.

The room must be exclusively dedicated to fire equipment, directly accessible from the outside, and having a fire resistance of at least 60 minutes (see standards).

The room must be, in order of preference:

- separate from the protected building (isolated)
- closed to the protected building
- Inside the protected building.



NOTE:

For rooms with closed walls or inside the building, it is preferable to have a fire resistance superior to 120 minutes. The temperature inside the room must not be less than 10 °C (4 °C in the presence of electric pumps) or more than 25 °C (40 °C in the presence of electric pumps).

The room shall be equipped with openings to the outside to ensure adequate ventilation for cooling engines (electric and diesel) and for diesel engine combustion.

The room also shall be equipped with a sprinkler-type protection (EN 12845).

Sprinkler protection can be directly supplied by the discharge manifold of the booster, as required by the EN 12845 standard.

Access to the room must be guaranteed and easy for people, even if the installation of fire is on, without light, if there is snow or rain, and in any case that can affect access negatively. Access to the room must be sufficiently reported and admitted only to authorised, specialised and properly trained personnel.



Avoid access to the system for unauthorised persons!

The booster is a fire equipment using **AUTO-MATIC START and MANUAL STOP ONLY**. For this reason, there must have a clearly visible sign in the system room warning that this logic operation makes the possibility of an unexpected auto start.

The pump unit is **NOT** equipped with emergency stop. The main pumps can only be manually stopped (see corresponding manual of control box).

For this reason, before an intervention on group of pumps, make sure you switch off power supply and avoid any start of pumps.

If possible, pumps must be installed under the charge of water. 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 useful level of the water in the tank is not more than two meters below the axis of the pump.

If the conditions mentioned above are not respected, the booster is considered on suction conditions, which are accepted after installation of special devices, explicitly described by the standard (priming tanks, separated pipes suction, etc).

7.2 Safety recommendations



WARNING! Risk of Cut!

Do not remove the protection on any rotating parts, belts, hot surfaces etc. Never leave tools or disassembled parts of the booster on it or around it.



DANGER! Risk of fatal injury!

Do not remove the protection of live parts. Prevent each possibility for operate any element that isolates the installation or subassemblies on which to work.

Take all precautions to avoid a risk of electrocution. Control earth connection, presence and continuity, and if a device for protection against indirect contact is installed (differential switch). If necessary, make operation on the unit by using required equipment (insulating gloves, isolating base plate).

Never leave the electrical panel or the terminal box of electrical motor powers opened. Check if there is no possibility of contact with live parts. Check if electrical connections and auxiliary power are correctly connected. Check the label data of electrical panels, in particular tension and availability of an adapted power supply.



WARNING! Risk of fire or flash fire!

The charging diesel pump batteries may produce potentially explosive gas; avoid flames and sparkles.

Never leave flammable liquids or rags dipped in acid around the booster or electrical equipments.

**DANGER! Risk of fatal injury!**

Ensure the right ventilation of the pump room. Check that the exhaust of the diesel engine is free and the tube allows the removal of exhaust gases to outside the room safe, away from doors, windows and vents.

**WARNING! Risk of burn!**

Check that exhausting pipes are correctly supported, equipped with anti-vibration couplings/flexible vibration-damping sleeves and protected against accidental contacts.

**CAUTION! Risk of damage of the installation!**

Check if suction and discharge pipes of pumps are correctly supported and equipped with flexible vibration-damping sleeves.

**CAUTION! Risk of product damages!**

Check that the fluid level of the diesel engine (oil/water) is correct and that plugs of the water and oil circuit are properly fastened. For internal combustion engines with heat exchanger water/water, check that the valve of the cooling circuit is locked in the OPEN position.

Check oil and diesel fuel, then control if there are no fluid losses.

**CAUTION! Risk of product damages!**

For the heating of the oil/water of the diesel engine, an immersion or contact resistor supplied with 230 V may be installed.

7.3 Control and environment

- Control electrical pumps or diesel pumps, as mentioned on the instruction manuals for both kind of pumps.
- Provide sufficient space for maintenance of pumps, motors, boxes and installed accessories.
- Prepare a surface with reinforced concrete for installation of the pressure booster. It has to be perfectly flat and horizontal as shown in the book project, complete with bolts which have diameter adapted to the weight of the group (see fig. 4).
- Make connections to pipes of different circuits, without mechanical stresses transmitted, which can damage equipment or pipes themselves.
- Check fluid levels of the diesel pump unit (engine oil, fuel, water for cooling, battery fluid, etc). If necessary, adjust the levels in accordance with instructions mentioned in the operating manual for diesel motor.

The group can be attached to the foundation through special holes provided in the four corners, in many ways; the method chosen depends on the size, location and installation limitations of acoustic and vibration levels. In order not to transmit tension to the frame, get the defects of alignment between the anchors and the support surface with metal shims, as shown in the figure 4.

**CAUTION! Risk of contamination and damage to health!**

For groups with diesel pump, waterproof the floor of the system room to avoid contamination of the subsoil because of possible diesel or engine oil losses.

**NOTE:**

We recommend equipping the pump electrical panel with an alarm system for pump failure, under voltage condition, etc.

7.4 Electrical connection**7.4.1 General****DANGER! Risk of fatal injury!**

Electrical connections must be carried out by authorised and skilled personnel in accordance with standards and laws in force. Power supply must be available at any times (EN 12845 10.8.1.1).

- Check the type of power supply and the available voltage, and compare them with data of pumps, motors, electrical panels and other devices. Before performing an intervention, control the earth connection.
- For connection to power supply networks, use cables in one piece, without joints, exclusively dedicated to the pump unit for the fire department, connected before the main power supply switch of buildings.
- Use cables with a suitable diameter, whose characteristics and dimensions are in compliance with IEC standards in force and with specifications required by the EN 12845 standard.
- To protect the cables from direct exposure in case of fire, they must pass through pipes buried outside the building or through parts of the building where the fire hazard is negligible. If it is not possible, they also must have an additional direct protection with a 180 minutes fire resistance.
- Make connections as shown in the wiring diagrams supplied with the control boxes.
- The main electrical box must be located in a fire protected compartment, used exclusively for power supply.
- Electrical connections in the main box must be made to ensure that electricity continues to be supplied to the pump control panel even when power is cut to other utilities.
- The fire extinguishing pump supply lines, classified as safety service supply lines CEI 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 of the electricity project (earth connection, equipotential bonding)
- Connect batteries for diesel pumps
- Check the tightening of all electrical connections

7.4.2 Hydraulic connection

Connect the following circuits to pumping tank or to priming tanks, by respecting the requirements imposed by standard:

- Flow rate metering circuit for the pump test. If the return to the tank is not possible, plan draining towards the mains drainage (see fig. 5).
- Recirculation pipes. The recirculation circuit is used to prevent overheating and damage to pumps that remain in operation when the level of pressure in the system is reached and before they are turned off manually by authorised personnel.
- Sprinkler supply circuit of the fire extinguishing system room.
- Connect main pumps and jockey pump to the fire extinguishing system in accordance with the EN 12845 standard and with installation diagram.
- Connect the jockey pump directly to the water tank by using a suction pipe which is adequately proportioned to avoid priming pump troubles.
- Check the tank of the jockey pump pre-inflation and adjust it according to the value of pressure which has to be maintained in the system according to the instructions written on the tank or in its instruction manual.

7.4.3 Protection of the system

- The specific standard for fire extinguishing systems includes protections against short-circuits with the use of high breaking capacity fuses, which allow the passage of initial current for electric motors start-up for a period longer than 20 seconds. These fuses are held inside the electric pump control panels. No thermal protections for the main fire extinguishing pumps are provided.
- Thermal protection against overload of jockey pump is installed inside its control box. It must be calibrated at a value slightly higher than the absorbed or nominal current (in) for the motor.
- Standard does not envisage protection against lack of water of pumps. In case of emergency, pumps must use all the available water of tanks to extinguish fire.
- If diesel engines are present, the diesel engine electronic control panel manages engine operating parameters and possible alarms. For more information concerning diesel engine boxes, see the specialised instruction manual of the control panel.

Advise for installation

- According to the type of installation planned by the project, the booster can correctly operate if these following points are checked:
 - pipes are positioned in such a way as to avoid air accumulation.
 - suction pipes between the intake point and the pumping has to be as shortest as possible. Its diameter must be suitable and equal or exceed the minimum required to maintain the maximum speed as indicated by the EN 12845 standard
 - pipes do not have leakages or air infiltration



CAUTION! Risk of malfunction of the pump! Valves or gate valves must not be directly installed on the pump suction.

- **Include an eccentric cone as indicated by the EN 12845 standard**

7.4.4 Unit with positive head

[Fig. 6a – 6b] (As defined in EN 12845, point 10.6.2.2)

- Check the minimum level given for the storage tanks or the minimum historical level for virtually inexhaustible tanks in order to agree the conditions for installation of the unit.
- Ensure that the diameter of the suction pipes is not less than DN 65, and check if the maximum suction speed does not exceed more than 1.8 m/s.
- Check if the NPSH available on the suction side of the pump is at least 1 meter higher than the NPSH required for flow rate and at the max water temperature.
- Fit a strainer outside the water tank on the suction pipes, having a diameter measuring at least 1.5 the nominal diameter of the pipe, and that does not allow the passage of parts bigger than 5mm in diameter.
- Install a gate valve between the strainer and the water tank.

7.4.5 Unit with suction lift

[Fig. 7] (as defined in EN 12845, point 10.6.2.3)

- Check the minimum level given for storage tanks, or the minimum historical level for virtually inexhaustible tanks.
- Ensure a diameter of the suction pipes equal or higher than DN 80, and check if the max suction speed does not exceed 1.5 m/s.
- Check if NPSH available on the suction side of the pump is at least 1 meter higher than the NPSH required for flow rate and at the max water temperature.
- Include independent intake pipes for the pumps equipped at the lowest point of the bottom valve.
- Fit a strainer on the suction pipes, before the bottom valve. This strainer must be set up so that it can be cleaned without having to empty the tank. It must have a diameter measuring at least 1.5 the nominal diameter of the pipe and does not allow the passage of parts bigger than 5 mm in diameter.
- The distance between the rotation axis of the pump and the minimum water level must not exceed 3.2 meters.
- Each pump must have automatic priming devices in compliance with the requirements of EN 12845, point 10.6.2.4.

7.4.6 Exhaust air for combustion and cooling diesel engine

(Fig. 8) (Fig. 9a – 9b & variant)

If the system is assembled with a pump driven by a diesel engine, the combustion gases of the engine must be evacuated outside by a pipe supplied with an adequate silencer.

Back pressure cannot exceed recommendations for the type of diesel engine installed. The exhaust pipe must have an adequate size relative to the length of piping. It must be isolated and supplied with sufficient protections against accidental contacts with surfaces at high temperatures.

Exhaust tailpipe cannot be close to windows or doors. Besides, exhaust gas must not come again in the pump room.

Exhaust tailpipe must be protected from weather and must not allow the introduction of rainwater into the exhaust pipe or return of condensates back to the engine.

Hoses have to be as short as possible (ideally no longer than 5.0 m), with the fewest possible curves and a radius less than 2, 5 times the pipe diameter.

Pipes must be supported, and a condensate drain system must be supplied with a material resistant to the acidity of the condensate.

The ventilation system in a pump room with diesel pumps with air cooling or air/water exchanger is crucial. This determines the correct functioning of the fire system.

The ventilation system must allow dissipation of heat produced during operation of the diesel pump system and ensure a correct air flow to cool the engine.

The room's openings must consider the air flow necessary for the engine, which may vary according to altitude. (See manufacturers' data of diesel engine).

8 Commissioning

For the first commissioning, we advise you to hire the closest Wilo after-sales service agent or to contact our after-sales call centre.

Commissioning of the booster must be performed by qualified people.

8.1 General preparations and check

- Before switching on for the first time, check that the wiring has been done correctly, particularly the earth connection.
- To make sure that rigid connections are not associated to mechanical stress.
- Fill the installation and during visual inspection, search the possible faults.
- Open gate valves on pump sides and on the discharge pipe.



CAUTION! Risk of product damages!

Never make the system running dry. The dry running destroys the pump mechanical seal tightness.

- **The jockey pump tank is empty of water; inflate it to a 0.5 bar lower pressure than the pressure allowing the start of the jockey pump.**
- **Don't exceed the maximum inflation value for the vessel.**



CAUTION! Risk of product damages!

Tighten all the supply terminals before the commissioning of the booster!

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

Before filling the pump unit with water, check the tightness of components, which could be loosened during transport and handling.

Do not let the booster in automatic mode before the fire extinguishing system is completed assembled according to the standard; the commissioning of an incomplete fire extinguishing system rules out the warranty.

Procedure for commissioning

- During the pumping system automatic mode setting, maintenance program procedures and responsibility of operation in case of accidental starting must be defined.
- For models with diesel engine, before operating, check the correct filling of batteries.
- For inspection of batteries, follow instructions given by manufacturer.
- Keep batteries away from flames and sparkles. For safety reasons do not lean above the batteries in operating and during installation or removal.
- Check the correct level of fuel in tanks of diesel engines and possibly add some fuel when engines are cold.
- Be careful to not spill fuel on motors, on rubber or plastic materials of the system.
- DO NOT add fuel when the engines are warm.

- Before turning on the main pumps, check the correct motor-pump alignment. Respect operation from the specific manual delivered with pumps. The motor-pump alignment operations must be performed by skilled persons.
- If the group is provided with pumps placed on a separate base frame, each base frame must be fixed to the ground, with a special attention to the alignment of the discharge manifolds.
- The installation must be performed by qualified technicians.

8.2 Group under the charge of water

For the commissioning of a system installed under the charge of water, perform the following operations:

- Check that the air ventilation valve of each pump is open.
- Close valves on the discharge side of the pumps.
- Slowly open the valves on discharge side and check if water is coming out from the air ventilation circuits of each pump.
- Briefly start pumps by using the manual mode.
- Make sure air is not present in circuits and pumps.
- Repeat the operation until to be sure that all the air in the pipe is eliminated.
- Close the ventilation plug of the jockey pump.
- Completely open the valves on the suction and discharge.
- Make sure there are no problems of water flow (presence of dirt, solids, etc).

8.3 Group over the charge of water (Suction)

For the commissioning of a system installed above the level of water charge, perform the following operations:

- That the ventilation valve of each pump is open.
- Close valves on the discharge side of the pumps.
- Fill the main pumps through circuits from priming tanks.
- Fill the jockey pump through the filler cap by following instructions given the instruction manual.
- Briefly start pumps by using the manual mode.
- Make sure air is not present in circuits and pumps.
- Repeat the operation until to be sure that all the air in the pipe is eliminated.
- Completely open the valves on the suction and discharge.
- Make sure there are no problems of water flow (presence of dirt, solids, etc).

8.4 Control operating

8.4.1 Commissioning of the main electric pump

- Make sure all hydraulic, mechanical, and electrical connections, indicated in this manual, are correctly done.
- Make sure the valves at the suction and discharge side of the pump are open.
- Make sure the pump is primed and filled with water.
- Check that the power supply matches with the one reported on the label and that three-phase power supply is connected.

Follow commissioning instructions with help of each manual of electric pump box.

CAUTION! Risk of product damages!

In order to avoid overheating risking to damage main pumps, always check through recirculation circuit that the water flow is in accordance with instructions on technical manual of the pump. If troubles appear concerning recirculation circuit or if the minimum level necessary for testing start-up and pump running is not guaranteed, provide to open other circuits (for example, the flow meter, valve for testing the tightness of gate valve, drain valve, etc)

CAUTION! Risk of product damages!

Make sure that none of the following points exist. Otherwise, immediately stop the pump and remove malfunctioning causes before starting it again (also refer to chapter faults, causes and solutions):

- Rotating parts in contact with fixed parts
 - Unusual noises and vibrations
 - Loose bolts
 - High temperature on motor housing
 - Differences in current at each phase
 - Leakages on mechanical seal
- Vibrations, noise and excessive temperatures could be due to misalignment of motor/pump coupling.**



8.4.2 Commissioning of the main diesel pump

- Make sure all hydraulic, mechanical, and electrical connections have been made as indicated in this manual.
- Make sure that valves on suction and discharge side of the pump are open.
- Make sure the pump is primed and full of water, and drain air by using the tap on the pump housing.
- Check if the supply voltage is in accordance with data reported on the label and if it is present.
- Make sure the fuel is compatible with engine functioning, then that the fuel tank is full of fuel (the fuel level inside the tank can be seen via the pipe gauge near to the tank).
- Make sure that connections are correctly made with pipes, without any connection between the tank and the engine
- Make sure the electric float cable of tank is correctly connected to the electrical control panel of the diesel pump.

- Check the oil and coolant level of the engine.
- If engines are cooled by water through a radiator or heat exchanger, check specific operations specified in the instruction manual of the engine. To top up the level of fluids, use oil and coolant advised by indications given in the instruction manuals of diesel engines in annex to this instruction manual.

Follow the commissioning procedures with help of the instruction manual of diesel pump box.



CAUTION! Risk of product damages!

To avoid overheating which could damage the main pumps, always check that the water flow through the recirculation circuit is fitting with requirements of pump technical sheet. If there are problems in recirculation circuit or if the minimum flow level used to test start and running of pumps is not guaranteed, open other circuits (for example, the flow meter, valve for testing the tightness of gate valve, drain valve, etc).



WARNING! Risk of false reaction of the operator!

The engine's accelerator lever is locked. For that reason, the engine always starts at max speed! Allow the pump to run for 20 minutes to check if the speed motor is compatible with the indication on the group label.



CAUTION! Risk of product damages!

Make sure that none of the following points exist. Otherwise, immediately stop the pump and remove malfunctioning causes before starting it again (also refer to chapter faults, causes and solutions):

- Rotating parts in contact with fixed parts
- Unusual noises and vibrations
- Loose bolts
- High temperature on motor housing
- Exhaust gas in the pump room
- Leakage on mechanical seal



Vibrations, noise and excessive temperatures could be due to misalignment of motor/pump coupling.

8.4.3 Commissioning jockey pump

Manual Start

Follow commissioning instructions with help of the manual of jockey pump box.

If the rotation direction is not correct, turn off the electrical supply of the box and switch two out three positions of phases in the control panel supply line. Do not invert with the yellow-green earth connection wire.



CAUTION! Risk of malfunction!

For the jockey pump which maintains pressure on the installation, make adjustments, for example insert a diaphragm or a valve, to ensure that even if just one sprinkler is opened, the jockey pump does not compensate this.

For adjustments of jockey pumps, see the curves of different models of pumps mentioned in the catalogue.

If there are troubles for starting pumps, refer to the chapter faults, causes and solutions of the jockey pump box and pump instruction manuals.

8.4.4 Filling of installation

If the unit is not filled, use the jockey pump after checking that the operations described in previous chapter have been correctly done.

In that phase, open one or more drain pipes on the sprinkler circuit to bleed air from the system.

Start the jockey pump. The system is slowly filling, expelling air out of the system. Once water starts to flow from drain pipes, close them and wait until the predetermined pressure is reached and the jockey pump stops. If the pump does not stop, check if there are no leaks and check again the calibration of the pressure switch which controls pump.

Once the unit has reached the set pressure, which must be higher than the automatic main pump start-up pressure, wait that the pressure remains stable before turning the system on automatic mode.

8.4.5 Automatic test of running

Main electric pump

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

Start automatically the group by using one pressure switch at a time to check the correct operation of both switches. Close the valve pos.2 fig. 10 and open the valve pos. 1 of fig. 10 to complete and restore the circuit pressure. Then follow pump panel instructions to verify the correct functioning of automatism.



CAUTION! Risk of product damages!

To avoid overheating which could damage the main pumps, always check that the water flow through the recirculation circuit is fitting with requirements of pump technical sheet. If there are problems in recirculation circuit or if the minimum flow level used to test start and running of pumps is not guaranteed, open other circuits (for example, the flow meter, valve for testing the tightness of gate valve, drain valve, etc).



CAUTION! Risk of malfunction!

Before leaving the installation and/or after a manual stop, remember to return the system in automatic mode (refer to the box manual). Otherwise the fire extinguishing system is not activated!



CAUTION! Risk of malfunction!

If the pressure in the system has not recovered to the starting level of the main pump switches, refer to the box manual to manually start the pump.

Test of automatic start with float switch (electric pumps with suction lift)

- Empty the priming tank (or simulate the effect) to start the electric pump through the float signal.
- Then follow pump box instructions to check the correct functioning of automatism.

Pump with diesel engine

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

Then follow pump box instructions to set only the diesel pump in automatic mode.

Automatically start the group by using one pressure switch at a time, to check the correct operation of both switches. Close the valve pos.1 of fig. 10 and open the drain one pos. 2 of fig. 10 for obtain the start-up of the pump.

Then follow pump panel instructions to verify the correct functioning of diesel pump automatism.

Close the valve pos. 2 of fig. 10 and open the valve pos. 1 of fig. 10 to complete the test and restore the circuit pressure.



CAUTION! Risk of product damages!

To avoid overheating which could damage the main pumps, always check that the water flow through the recirculation circuit is fitting with requirements of pump technical sheet. If there are problems in recirculation circuit or if the minimum flow level used to test start and running of pumps is not guaranteed, open other circuits (for example, the flow meter, valve for testing the tightness of gate valve, drain valve, etc).

Automatic start test with float switch (diesel pump with suction lift)

- Empty the priming tank (or simulate the effect), to start the electric pump through the float signal.
- Then follow pump panel instructions to verify the correct functioning of automatism.



CAUTION! Risk of malfunction!

If the pressure in the system has not recovered to the starting level of the main pump switches, refer to the box manual to manually start the pump.

9 Maintenance

The fire extinguishing system is a safety equipment that protects objects and people, therefore possible modifications and repairs that affect its efficiency must be made so as to minimise the 'out of order' state.

Isolate pumps one at a time by the selector switches of electrical panels and the stop valves provided for this purpose.



Prohibit access to the pump room to unauthorised persons.



WARNING! Risk of personal injury!

People must always wear personal protective devices. Maintenance must be performed **ONLY** by qualified personnel. In case of lack of instructions, always contact the supplier or expert staff.

Never work alone on works which require 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 group on it or around it.



Do not remove the protection of live parts; prevent every possibility for operate any element that isolates the installation or subassemblies on which to work.



CAUTION! Risk of product damages!

The booster is **NOT** equipped with an emergency stop. The main pumps can only be manually stopped by cutting automatism.

For this reason before making an intervention on pumps, be sure to be in possession of operation key (if existing) of automatic/manual switches.

Open the general isolating switch on the electrical panel of the concerned pump.



DANGER! Risk of fatal injury!

In case of interventions with the control panel door open, even after opening the main isolating switch, input terminals from the supply line and those of remote transmission of alarms could still be powered.



DANGER! Risk of fatal injury!

For an intervention on the diesel engine, it is advisable to disconnect the positive terminal of battery to prevent undesired start-ups.



DANGER! Risk of fatal injury!

Before changing the engine oil, make sure the temperature is below 60 °C. For water-cooled engines, very slowly remove the radiator cap or the heat exchanger. The cooling systems are normally under pressure and violent hot liquid leaks could occur. Check the correct level of engine fluids (oil/water) and the correct tightening of the water circuit and the circuit oil closure plugs.

Never add coolant to an overheating engine, let it cool first !

For diesel engines, with heat exchanger with water/water, check that the valves of the cooling circuit are locked in open position. Check diesel and oil hoses and see if there is no fluid leakage.



NOTE:

For oil/diesel engine water heating, immersion or contact supplied with 230V resistance can be installed.



WARNING! Risk of fire and personal injury!

Connecting or disconnecting the battery can produce sparks.

Never connect or disconnect the battery cables when the motor is running.



WARNING! Risk of burn!

Hot diesel engine and exhaust pipe surfaces.



DANGER! Risk of explosion!

While charging the diesel pump batteries, potentially explosive gas could be formed; avoid flames and sparks.

Never leave flammable liquids or rags soaked with these liquids around the unit of pumps or electrical devices.



do not smoke nor



use flames during the change of engine oil or fuel provision.

Groups installed in accordance with these instructions will operate normally with a minimum maintenance intervention. Inspections and periodic controls are planned and specified by the EN 12845 standard in order to keep the fire extinguishing system and the pressure boosters efficient. Refer to the weekly, monthly, quarterly, semiannual, annual, triennial and 10-years program of inspections and checks, prescribed by the EN 12845 standard.

Maintenance must be performed by qualified personnel.

9.1 General position from maintenance

- General inspection of the unit (including water and power supplies) to check the apparent conditions of all components
- General Cleaning
- Tightness control of non-return valves
- Check the operating configuration of the electrical panel
- Check the correct operation of alarm pilot lights on the control panel
- Check the correct operation of the minimum tank/well level alarm
- Check electrical connections to see if there are no signs of insulation damages, burning, loosening of terminals
- Check the electric motors insulation resistance. When it is cold, an engine without isolation damages must have a resistance of more than 1000 megohm.
- Check the pre-inflation of membrane tanks.
- See also specific operations indicated in the particular instructions manuals for the various components of the booster.
- Check if minimum service equipment supply, required by the EN 12845 standard for the quick restoration of the fully working order of the system in case of failure, is held in stock.
- Check the correct functioning of the minimum fuel level alarm.
- Check the correct functioning of engine oil heater resistor.
- Check the battery charge level and the efficiency of the battery charger.
- Check the correct functioning of the stop solenoid valve (fig. 11).
- Check the pump cooling oil level and viscosity.
- Check the priming circuit (especially for unit above the level of water charge).
During all checks, the following points have to be controlled:
 - a) All the different pressures of the manometer for water and air of the buildings, pressures for main pipes and pressure tanks.
 - b) All water levels in storage tanks, rivers, canals, lakes (including pump priming tanks and under pressure tanks).
 - c) The correct position of all the main gate valves.

9.2 Test of automatic start of pump

Tests on automatic pumps must include the following:

- a) Control engine oil and fuel level.
- b) Reduce the water pressure on starting device, in this way simulating an automatic start request (cf. chapter 8).
- c) When the pump starts, the starting pressure must be controlled and recorded.
- d) Control the oil pressure on diesel pump and the cooling circuit water flow.



CAUTION! Risk of malfunction of the pump!
Always top up fuel and other fluids after performing the tests.

9.3 Test of automatic start of diesel pump

After testing the start, diesel engines must be tested as follows:

- a) Let the motor run for 20 min, or for the time recommended by the supplier. Then, stop the engine and immediately restart it by using the test button 'manual start'.
- b) Control the water level in the primary cooling circuit.

During the test, you must check the oil pressure, the engine temperature and the coolant flow. Then control the oil hoses and make a general check to detect any possible fuel, coolant or exhaust smoke leakage.

9.4 Periodic tests

Monthly checks

Control level and density of the electrolyte of all lead storage battery cells (including diesel engine starting batteries and batteries used to the electrical control panel power supply). If the density is low, check the battery charger, and if it is correctly working, replace the battery in failure.

Quarterly checks

To perform it maximum every 13 weeks

An inspection report must be recorded, signed and given to the final user. This must include details of each procedure carried out or planned, details of external factors, such as weather conditions, which could have influenced the results.

Check the pipes and supports to check the possible corrosion points and protect them where if necessary.

Check pipes for correct earth connection. Sprinkler pipes cannot be used for electrical equipment earth connection. Remove all of this kind of connection and implement an alternative solution.

Check each water supply on each control station of the system. The pump(s) should automatically start, pressure values and measured flow cannot be less than that reported values on the project. Each change must be recorded.

Check all valves that supply sprinklers with water in order to be sure they are working. Then return them to their normal running position. Realize the same operation for all the water supply valves, the control and alarm valves and all local or auxiliary valves.

Check and control the amount and packaging of spare parts that are in stock.

Semi-annual checks

To perform it maximum every 6 months

Check the alarm system and remotely alarm system report to the central supervision.

Yearly checks

To perform it maximum every 12 months

Test the efficiency of each pump when fully loaded (with the connection between the test pipes to the pump discharge) to control if values of pressure/flow correspond with those indicated on the plate of the pump.

Consider any pressure losses in the supply pipes and in the valves between the water source and each control station.

Test a diesel engine start failure, then check that an alarm in accordance with standards is working. After this control, immediately restart the diesel engine by using the manual startup procedures.

Check that the float valves in the storage tanks are correctly working.

Check the strainers on the pump suction and deposit tank of filtration accessories. Clean them if necessary.

3-yearly checks

To perform it maximum every 3 years

After making drain of all tanks, check the outside and inside to see if there is corrosion. If necessary, all tanks must be painted or, protection against corrosion must be applied again.

Examine all the water supply valves, alarm and control valves. If necessary, replace them or maintain them.

10-yearly checks

To perform it maximum every 10 years

The inside of all water supplies should be cleaned and examined. Tightness must be controlled.

Concerning the review process or replacement of damaged parts of the entire system, which no longer perfectly work, contact the Wilo helpdesk or a specialised centre.

Refer to the detailed maintenance operations indicated on manual attached to the unit.

Always replace the equipment with an original or with identical characteristics certified spare part. The Wilo denies any liability for damage caused by an unskilled personnel intervention or when original spare parts are replaced by other parts with different characteristics.

9.5 Residual risks during facility management

WARNING! Risk of cut!

Sharp edges or any not protected threaded parts entail the risk of getting cut. Take necessary cautions to avoid injuries and use protective equipment (wear specific gloves).

WARNING! Risk of impact injury!

Be careful of prominent parts and height. Wear special protection clothing.

DANGER! Risk of fatal injury!

Do not exceed the nominal pressure limits for the vessel of the jockey pump in order to avoid possible explosions.

DANGER! Risk of electric shock!

The people dedicated to the connection of electrical equipment and motors must have obtained a certificate for this kind of work and shall make the connection in accordance with regulations and laws in force. They should ensure that they have shutdown power before performing any operation which provides the possible contact with the electrical parts. Check earth continuity. Avoid contact with water.

WARNING! Risk of Fall!

Take precautions to protect access to tanks or wells. Wells must have closing cover.

WARNING! Risk of burn!

Take precautions to avoid contact with high temperature parts of engine. Use protections for parts of the engine and the exhaust pipe. Top up fuel in the tank when the diesel engine is cold. During refilling, do not drop fuel on hot parts of diesel engine. Wear special gloves.

WARNING! Risk of irritation!

During refilling and level controls, avoid spillage of battery acid solution could cause irritations or material damages. Do not approach refilling area with eyes. Use special protections to avoid contact.

DANGER! Risk of fatal injury!

Avoid turning on the diesel pumps if exhaust smoke pipes were not connected towards outside the room.

CAUTION! Risk of environmental pollution!

During controls and refilling, avoid dumping of oil from the engine or diesel fuel. Use appropriate protections and implemented the necessary precautions.



10 Faults, causes and remedies

The operations indicated in the table below must be carried out ONLY by expert personnel. Never carry out any work without having first carefully read and understood this manual. Never attempt to carry out repairs of materials and equipment without a fully and correctly understanding of this one.

If people do not have sufficient knowledge about the product and the operating logic required by specific standards relatives to fire extinguishing systems, or if people do not have the technical skills needed, contact Wilo to make regular maintenance checks.

| Faults | Causes | Remedy |
|--|---|--|
| The control panel is off. | No power supply | Make sure that the supply line is connected and voltage is present. |
| | Out-of-order fuses | Check and/or replace fuses. Check and/or replace the control panel. |
| | Auxiliary circuit failing | Check voltage of primary and secondary circuits in the transformer. Check and/or replace fuses of the transformer. |
| Motor does not start | No power supply | Check connections and electric control panel. |
| | Short-circuit in winding | Check windings of motor |
| | Control panel faulty/Wrong connections | Check connections |
| | Overload | Check sizing of the supply line. Make sure that the pump is not blocked. |
| Pump works, but does not supply water, or has a low flow/height. | Wrong direction of rotation | Invert two of the motor supply phases. |
| | Excessive suction depth. Pump in cavitation | Review calculations to suit pump NPSHr. |
| | Wrong diameter of the suction pipe and valves Pump in cavitation | Review calculations to suit pump NPSHr. |
| | Air inlet in the suction line | Make sure that there are no leaks in the suction line. Check the distance between the suction points if several pumps have been installed. Fit anti-vortex plates. |
| | Valves partially/totally closed | Open the suction and discharge valves. |
| | Worn pump | Check and repair. |
| | Pump rotor obstructed | Check and repair. |
| | Strainer/filters obstructed | Check and repair. |
| | Coupling between pump and worn motor | Check and repair. |
| | Motor fails to reach nominal speed or has vibrations | Check speed, see above |
| | Pump bearings are worn or not oiled | Lubricate with lubricators. |
| Motor fails to reach nominal speed | Too low voltage at motor terminals | Check power supply voltage, connections and the cross-section of the cables in the power line. |
| | False contacts in the power contactor or problem with the start-up device | Check and repair. |
| | Phase failure | Check line, connection and fuses. |
| | False contacts in power supply cables | Check terminal fixing. |
| | Winding to the earth or short-circuit | Dismantle the motor, repair or change it. |
| Non-operational pumps once started | Incorrect sizing of power line | Check and replace. |
| | Insufficient voltage | Check power supply. |
| | Pump sizing | Remove the rotating parts then check. |
| Presence of voltage on motor carter | Contact between line cables and earth | Correct connections. |
| | Humid or old Insulation | Wipe motor or re-wind it. |
| | Short-circuit between terminals and external housing | Check insulation between terminals and carter. |

| Faults | Causes | Remedy |
|---|---|--|
| Unusual overheating of motor exterior | Pump overload | Dismantle and check. |
| | Coupling out of axis | Align correctly. |
| | Ambient temperature higher than 40°C | Ventilate the space. |
| | Voltage higher/lower than nominal value | Check upstream power supply. |
| | Phase failure | Check power supply and fuses. |
| | Insufficient ventilation | Check strainers and pipes. Resize |
| | Sliding between stator and rotor | Repair or change the motor. |
| | Unbalanced voltage on three phases | Check power supply. |
| Main pump starts before jockey pump | Pressure switch on main pump calibrated at a higher value than the jockey pump | Check pressure switch settings. |
| Main pump starts immediately, with inhibition indicator in position 1 | Pressure switch calibrated at a lower value than the system pressure | Check pressure switch settings. Increase the pressure level in the installation. |
| | Water level in priming tank too low | Check level of priming tank. |
| Sudden speed drop | Instantaneous overload/foreign part in pump | Dismantle pump. |
| | Single-phase operation | Check supply and fuses. |
| | Voltage drop | Check supply. |
| Magnetic noise Sudden whistling | Motor winding or short-circuit | Dismantle the motor, then repair or change it. |
| | Friction between stator and rotor | Dismantle the motor, then repair or change it. |
| Mechanical noise | Loosened bolts | Check and tighten. |
| | Loosened screws in fan cover cap/coupling cover cap | Check and tighten. |
| | Sliding between fan and motor, and between coupling and coupling cover cap etc. | Guarantee the correct distance and re-assemble. |
| | Foreign parts in motor or pump | Dismantle and remove. |
| | Not aligned coupling | Re-align. |
| | Bearings few oiled/worn/broken | Lubricate or replace. |
| Pump/motor bearings overheating | Bearings damaged | Replace. |
| | Insufficient lubrication | Lubricate again. |
| | Pump and motor not aligned | Re-align |
| Unusual vibrations | No vibration-damping sleeve devices on the unit | Install or repair. |
| | Pump in cavitation | Review the sizing of installation. |
| | Too much air in water | Make sure that there are no leaks in the suction line. Check the distance between the suction points if several pumps have been installed. Fit anti-vortex plates. |
| | Bearings, pump/motor shaft worn | Replace. |
| | Pump/motor couplings are worn | Replace. |
| | Pump and motor not aligned | Re-align. |
| | Motor does not stop after using of stop button | This is normal if plant pressure is not restored |
| Control panel failure | | Turn off the control panel, then check. |
| Electromagnet for stopping diesel pump control panel failure | | Manually use the fuel lever on which the electromagnet works. |
| | | |
| Engine fails to reach nominal speed or oscillate | Accelerator lever in wrong position | Check and adjust rpm and secure lever. |
| | Dirty fuel strainer | Clean or replace. |
| | Faulty injector/pump | Call customer service centre. |
| The starter pinion does not remove after starting the engine | Speed counter failure | Check the distance from wheel. Replace. |
| | Failure of control panel on control box | Call customer service centre. |

| Faults | Causes | Remedy |
|--|---|--|
| Engine does not start or try to start, then stop | Unloaded batteries | Check battery and loader of battery. Load battery and replace them if necessary |
| | Lack of fuel | If it is not indicated on the control panel indicating light, check the fuel tank and alarm float. Replace. Replace the tank. |
| | Air in fuel circuit | Remove air from circuit by draining the injectors and diesel fuel strainers. |
| | Dirty fuel strainer | Replace. |
| | Dirty air strainer | Replace. |
| | Fuel circuit failure : injectors blocked, injection pump failure | Call customer service centre. |
| | Too low temperature | Check that ambient temperature is not less than 10 °C. Then check the correct working of oil/water heater. Replace. |
| | Loosened or rusty connections between battery/starter/relay | Check cables and terminals. Re-wire. Correctly tighten |
| | Diesel pump control panel failure | Check and replace if necessary |
| | Starter failure | Call customer service centre. |
| Black smoke | Dirty/blocked air strainer | Replace. |
| | Too high oil level | Remove oil excess. |
| | Problem with injector, fuel pump, etc. | Call customer service centre. |
| Unusual heating – too high water/oil temperature | Pump overload (frictions) | Dismantle and check. |
| | Coupling out of axis | Align correctly. |
| | Ambient temperature higher than 40°C | Ventilate the space. |
| | Insufficient ventilation | Check filters and ventilation grille. Clean or resize. |
| | Dirty or blocked radiator/coolant | Dismantle and clean. |
| | Lack of water in radiator/heat exchanger | After the cooling, fill with water and check for if leaks are present. |
| | Closed or not open enough heat exchanger circuit valve | Check that pump has a water flow, then open the butterfly valve. |
| | Water circulation pump failure | Call customer service centre. |
| | Fan belt failure (air-cooled engines) | Check voltage and replace if necessary. |
| | Corresponding alarm failure | Check sensor, connections and control unit on control panel. Replace if necessary. |
| Jockey pump does not start | No power supply | Check connections and the electric panel. |
| | The pressure switch is calibrated to a lower pressure than the main pump. | Check the pressure switch settings. |
| | Short-circuit in winding | Check winding. |
| | Intervention of the thermal protection | Check the sizing of the supply line. Check that the pump is not locked, then check pressure switch setting and the tank inflation. |
| | Control box failure and wrong connections | Check. |

11 Decommissioning and removal

If the system needs to be decommissioned, first disconnect the unit from the power supply and water circuit, and then separate the different materials of the unit in order to eliminate them separately.

Do this with a company in charge of the removal of industrial machinery.

Check that there are no residues of any polluting liquids inside the pump and pipes.

The unit equipped with diesel motor may have batteries which contain lead and electrolytic liquid including acids, solutions of water and antifreeze liquid, oil and fuel.

Pay particular attention to the elimination of batteries and make all actions necessary to prevent any spillage of liquid on the ground that can pollute the environment.

If materials of the unit are spread in the environment, they can create serious environmental damages.

All materials and components must be collected, and eliminated in accordance with the regulations in force. Even during the installation operations and handling, the following materials must be sent to centres specialised in the collection and removal of waste:

- Electromechanical and electronic components
- Electric cables
- Batteries
- Strainers
- Oil drain
- Mix of water and antifreeze
- Rags and smooth material used for various operations or cleaning
- Materials for packaging

Liquids and polluting materials must be eliminated according to the specific standards in force.

Make that a separated elimination allows to retrieve equipment, and to reduce pollution.

12 Spare parts

For rapid intervention and recovery of the fire extinguishing system and according to the type of pumping conditions, it is advisable having a minimum number of spare parts in stock, as follows:

Main electric pump

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

Main diesel pump

Complete mechanical seal, protection fuses, starter kit, oil heater, starting pressure switch, two fuel strainers, two oil strainers, two sets of straps, two injector nozzles for diesel engine, a complete set of connections, gear and oil and fuel circuit hoses, tools recommended by the manufacturer of diesel engine.

Electric jockey pump

Complete mechanical seal, protection fuses and starting pressure switch.



D EG – Konformitätserklärung
GB EC – Declaration of conformity
F Déclaration de conformité CE

(gemäß 2006/42/EG Anhang II,1A und 2004/108/EG Anhang IV,2,
according 2006/42/EC annex II,1A and 2004/108/EC annex IV,2,
conforme 2006/42/CE appendice II,1A et 2004/108/CE l'annexe IV,2)

Hiermit erklären wir, dass die Druckerhöhungsanlagen der Baureihe:

Herewith, we declare that the booster types of the series:

SIFIRE

Par le présent, nous déclarons que les types de surpresseurs de la série :

(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 EG-Maschinenrichtlinie 2006/42/EG 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 2006/42/EC. / 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 2006/42/CE)*

in der gelieferten Ausführung folgenden einschlägigen Bestimmungen entsprechen:

in their delivered state comply with the following relevant provisions:

sont conformes aux dispositions suivantes dont ils relèvent:

EG-Maschinenrichtlinie

2006/42/EG

EC-Machinery directive

Directive CE relative aux machines

Die Schutzziele der **Niederspannungsrichtlinie 2006/95/EG** werden gemäß Anhang I, Nr. 1.5.1 der 2006/42/EG Maschinenrichtlinie eingehalten. / *The protection objectives of the low-voltage directive 2006/95/EC are realized according annex I, No. 1.5.1 of the EC-Machinery directive 2006/42/EC. / Les objectifs de protection de sécurité de la directive basse-tension 2006/95/CE sont respectés conformément à l'annexe I, no1.5.1 de la directive CE relatives aux machines 2006/42/CE.*

Elektromagnetische Verträglichkeit - Richtlinie

2004/108/EG

Electromagnetic compatibility - directive

Directive compatibilité électromagnétique

und entsprechender nationaler Gesetzgebung,

and with the relevant national legislation

et aux législations nationales les transposant,

angewendete harmonisierte Normen, insbesondere:

as well as following relevant harmonized standards:

ainsi qu'aux normes européennes harmonisées suivantes :

EN ISO 12100

EN 60204-1

EN 61000-6-1:2007

EN 61000-6-2:2005

EN 61000-6-3+A1:2011

EN 61000-6-4+A1:2011

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen ist:

Authorized representative for the completion of the technical documentation:

Personne autorisée à constituer le dossier technique est :

Division Pumps and Systems
Quality Manager – PBU Multistage & Domestic
Pompes Salmson
80 Bd de l'Industrie - BP0527
F-53005 Laval Cedex

Dortmund, 29. Oktober 2013



Holger Herchenhein
Group Quality Manager

wilo

WILO SE
Nortkirchenstraße 100
44263 Dortmund
Germany

| | | |
|--|--|--|
| <p>NL EG-verklaring van overeenstemming Hiermede verklaren wij dat dit aggregaat in de geleverde uitvoering voldoet aan de volgende bepalingen: EG-richtlijnen betreffende machines 2006/42/EG Elektromagnetische compatibiliteit 2004/108/EG gebruikte geharmoniseerde normen, in het bijzonder: zie vorige pagina</p> | <p>IT Dichiarazione di conformità CE Con la presente si dichiara che i presenti prodotti sono conformi alle seguenti disposizioni e direttive rilevanti: Direttiva macchine 2006/42/EG Compatibilità elettromagnetica 2004/108/EG norme armonizzate applicate, in particolare: vedi pagina precedente</p> | <p>ES Declaración de conformidad CE Por la presente declaramos la conformidad del producto en su estado de suministro con las disposiciones pertinentes siguientes: Directiva sobre máquinas 2006/42/EG Directiva sobre compatibilidad electromagnética 2004/108/EG normas armonizadas adoptadas, especialmente: véase página anterior</p> |
| <p>PT Declaração de Conformidade CE Pela presente, declaramos que esta unidade no seu estado original, está conforme os seguintes requisitos: Directivas CEE relativas a máquinas 2006/42/EG Compatibilidade electromagnética 2004/108/EG normas harmonizadas aplicadas, especialmente: ver página anterior</p> | <p>SV CE- försäkran Härmed förklarar vi att denna maskin i levererat utförande motsvarar följande tillämpliga bestämmelser: EG--Maskindirektiv 2006/42/EG EG--Elektromagnetisk kompatibilitet – riktlinje 2004/108/EG tillämpade harmoniserade normer, i synnerhet: se föregående sida</p> | <p>NO EU-Overensstemmelseserklæring Vi erklærer hermed at denne enheten i utførelse som levert er i overensstemmelse med følgende relevante bestemmelser: EG--Maskindirektiv 2006/42/EG EG--EMV--Elektromagnetisk kompatibilitet 2004/108/EG anvendte harmoniserte standarder, særlig: se forrige side</p> |
| <p>FI CE-standardinmukaisuuseloste Ilmoitamme täten, että tämä laite vastaa seuraavia asiaankuuluvia määräyksiä: EU--konedirektiivit: 2006/42/EG Sähkömagneettinen soveltuvuus 2004/108/EG käytetyt yhteensovitettut standardit, erityisesti: katso edellinen sivu.</p> | <p>DA EF-overensstemmelseserklæring Vi erklærer hermed, at denne enhed ved levering overholder følgende relevante bestemmelser: EU--maskindirektiver 2006/42/EG Elektromagnetisk kompatibilitet: 2004/108/EG anvendte harmoniserede standarder, særligt: se forrige side</p> | <p>HU EK-megfelelősségi nyilatkozat Ezennel kijelentjük, hogy az berendezés megfelel az alábbi irányelveknek: Gépek irányelv: 2006/42/EK Elektromágneses összeférhetőség irányelv: 2004/108/EK alkalmazott harmonizált szabványoknak, különösen: lásd az előző oldalt</p> |
| <p>CS Prohlášení o shodě ES Prohlašujeme tímto, že tento agregát v dodaném provedení odpovídá následujícím příslušným ustanovením: Směrnice ES pro strojní zařízení 2006/42/ES Směrnice o elektromagnetické kompatibilitě 2004/108/ES použité harmonizační normy, zejména: viz předchozí strana</p> | <p>PL Deklaracja Zgodności WE Niniejszym deklarujemy z pełną odpowiedzialnością, że dostarczony wyrób jest zgodny z następującymi dokumentami: dyrektywą maszynową WE 2006/42/WE dyrektywą dot. kompatybilności elektromagnetycznej 2004/108/WE stosowanymi normami zharmonizowanymi, a w szczególności: patrz poprzednia strona</p> | <p>RU Декларация о соответствии Европейским нормам Настоящим документом заявляем, что данный агрегат в его объеме поставки соответствует следующим нормативным документам: Директивы ЕС в отношении машин 2006/42/EG Электромагнитная устойчивость 2004/108/EG Используемые согласованные стандарты и нормы, в частности: см. предыдущую страницу</p> |
| <p>EL Δήλωση συμμόρφωσης της ΕΕ Δηλώνουμε ότι το προϊόν αυτό σ' αυτή την κατάσταση παράδοσης ικανοποιεί τις ακόλουθες διατάξεις: Οδηγίες ΕΚ για μηχανήματα 2006/42/ΕΚ Ηλεκτρομαγνητική συμβατότητα ΕΚ-2004/108/ΕΚ Εναρμονισμένα χρησιμοποιούμενα πρότυπα, ιδιαίτερα: βλέπε προηγούμενη σελίδα</p> | <p>TR CE Uygunluk Teyid Belgesi Bu cihazın teslim edilidği şekliyle aşağıdaki standartlara uygun olduğunu teyid ederiz: AB-Makina Standartları 2006/42/EG Elektromanyetik Uyumluluk 2004/108/EG kısmen kullanılan standartlar için: bkz. bir önceki sayfa</p> | <p>RO EC-Declarație de conformitate Prin prezenta declarăm că acest produs așa cum este livrat, corespunde cu următoarele prevederi aplicabile: Directiva CE pentru mașini 2006/42/EG Compatibilitatea electromagnetică – directiva 2004/108/EG standarde armonizate aplicate, îndeosebi: vezi pagina precedentă</p> |
| <p>ET EÜ vastavusdeklaratsioon Käesolevaga tõendame, et see toode vastab järgmistele asjakohastele direktiividele: Masinadirektiiv 2006/42/EÜ Elektromagnetilise ühilduvuse direktiiv 2004/108/EÜ kohaldatud harmoneeritud standardid, eriti: vt eelmist lk</p> | <p>LV EC – atbilstības deklarācija Ar šo mēs apliecinām, ka šis izstrādājums atbilst sekojošiem noteikumiem: Mašīnu direktīva 2006/42/EK Elektromagnētiskās savietojamības direktīva 2004/108/EK piemēroti harmonizēti standarti, tai skaitā: skatīt iepriekšējo lappusi</p> | <p>LT EB atitikties deklaracija Šiuo pažymima, kad šis gaminys atitinka šias normas ir direktyvas: Mašinių direktyvą 2006/42/EB Elektromagnetinio suderinamumo direktyvą 2004/108/EB pritaikytus vieningus standartus, o būtent: žr. ankstesniame puslapyje</p> |
| <p>SK ES vyhlásenie o zhode Týmto vyhlasujeme, že konštrukcie tejto konštrukčnej série v dodanom vyhotovení vyhovujú nasledujúcim príslušným ustanoveniam: Stroje – smernica 2006/42/ES Elektromagnetická zhoda – smernica 2004/108/ES používané harmonizované normy, najmä: pozri predchádzajúcu stranu</p> | <p>SL ES – izjava o skladnosti Izjavljamo, da dobavljene vrste izvedbe te serije ustrezajo sledečim zadevnim določilom: Direktiva o strojih 2006/42/ES Direktiva o elektromagnetni združljivosti 2004/108/ES uporabljeni harmonizirani standardi, predvsem: glejte prejšnjo stran</p> | <p>BG EO-Декларация за съответствие Декларираме, че продуктът отговаря на следните изисквания: Машинна директива 2006/42/EO Електромагнитна съвместимост – директива 2004/108/EO Хармонизирани стандарти: вж. предната страница</p> |
| <p>MT Dikjarazzjoni ta' konformità KE B'dan il-mezz, niddikjaraw li l-prodotti tas-serje jissodisfaw id-dispożizzjonijiet relevanti li ġejjin: Makkinarju – Direttiva 2006/42/KE Kompatibilità elettromanjetika – Direttiva 2004/108/KE b'mod partikolari: ara l-paġna ta' qabel</p> | <p>HR EZ izjava o skladnosti Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj izvedbi odgovaraju sljedećim važećim propisima: EZ smjernica o strojevima 2006/42/EZ Elektromagnetna kompatibilnost – smjernica 2004/108/EZ primijenjene harmonizirane norme, posebno: vidjeti prethodnu stranicu</p> | <p>SR EZ izjava o usklađenosti Ovim izjavljujemo da vrste konstrukcije serije u isporučenoj verziji odgovaraju sledećim važećim propisima: EZ direktiva za mašine 2006/42/EZ Elektromagnetna kompatibilnost – direktiva 2004/108/EZ primenjeni harmonizovani standardi, a posebno: vidi prethodnu stranu</p> |

WILO SE
Nortkirchenstraße 100
44263 Dortmund
Germany

Wilo – International (Subsidiaries)

Argentina

WILO SALMSON
Argentina S.A.
C1295ABI Ciudad
Autónoma de Buenos Aires
T + 54 11 4361 5929
info@salmson.com.ar

Australia

WILO Australia Pty Limited
Murrarie, Queensland,
4172
T +61 7 3907 6900
chris.dayton@wilo.com.au

Austria

WILO Pumpen
Österreich GmbH
2351 Wiener Neudorf
T +43 507 507-0
office@wilo.at

Azerbaijan

WILO Caspian LLC
1014 Baku
T +994 12 5962372
info@wilo.az

Belarus

WILO Bel OOO
220035 Minsk
T +375 17 2535363
wilo@wilo.by

Belgium

WILO SA/NV
1083 Ganshoren
T +32 2 4823333
info@wilo.be

Bulgaria

WILO Bulgaria Ltd.
1125 Sofia
T +359 2 9701970
info@wilo.bg

Brazil

WILO Brasil Ltda
Jundiaí – São Paulo – Brasil
ZIP Code: 13.213-105
T +55 11 2923 (WILO)
9456
wilo@wilo-brasil.com.br

Canada

WILO Canada Inc.
Calgary, Alberta T2A 5L4
T +1 403 2769456
bill.lowe@wilo-na.com

China

WILO China Ltd.
101300 Beijing
T +86 10 58041888
wilobj@wilo.com.cn

Croatia

Wilo Hrvatska d.o.o.
10430 Samobor
T +38 51 3430914
wilo-hrvatska@wilo.hr

Czech Republic

WILO CS, s.r.o.
25101 Cestlice
T +420 234 098711
info@wilo.cz

Denmark

WILO Danmark A/S
2690 Karlslunde
T +45 70 253312
wilo@wilo.dk

Estonia

WILO Eesti OÜ
12618 Tallinn
T +372 6 509780
info@wilo.ee

Finland

WILO Finland OY
02330 Espoo
T +358 207401540
wilo@wilo.fi

France

WILO S.A.S.
78390 Bois d'Arcy
T +33 1 30050930
info@wilo.fr

Great Britain

WILO (U.K.) Ltd.
Burton Upon Trent
DE14 2WJ
T +44 1283 523000
sales@wilo.co.uk

Greece

WILO Hellas AG
14569 Anixi (Attika)
T +302 10 6248300
wilo.info@wilo.gr

Hungary

WILO Magyarország Kft
2045 Törökbálint
(Budapest)
T +36 23 889500
wilo@wilo.hu

India

WILO India Mather and
Platt Pumps Ltd.
Pune 411019
T +91 20 27442100
services@matherplatt.com

Indonesia

WILO Pumps Indonesia
Jakarta Selatan 12140
T +62 21 7247676
citrawilo@cbn.net.id

Ireland

WILO Ireland
Limerick
T +353 61 227566
sales@wilo.ie

Italy

WILO Italia s.r.l.
20068 Peschiera
Borromeo (Milano)
T +39 25538351
wilo.italia@wilo.it

Kazakhstan

WILO Central Asia
050002 Almaty
T +7 727 2785961
info@wilo.kz

Korea

WILO Pumps Ltd.
618-220 Gangseo, Busan
T +82 51 950 8000
wilo@wilo.co.kr

Latvia

WILO Baltic SIA
1019 Riga
T +371 6714-5229
info@wilo.lv

Lebanon

WILO LEBANON SARL
Jdeideh 1202 2030
Lebanon
T +961 1 888910
info@wilo.com.lb

Lithuania

WILO Lietuva UAB
03202 Vilnius
T +370 5 2136495
mail@wilo.lt

Morocco

WILO MAROC SARL
20600 CASABLANCA
T + 212 (0) 5 22 66 09
24/28
contact@wilo.ma

The Netherlands

WILO Nederland b.v.
1551 NA Westzaan
T +31 88 9456 000
info@wilo.nl

Norway

WILO Norge AS
0975 Oslo
T +47 22 804570
wilo@wilo.no

Poland

WILO Polska Sp. z o.o.
05-506 Lesznowola
T +48 22 7026161
wilo@wilo.pl

Portugal

Bombas Wilo-Salmson
Portugal Lda.
4050-040 Porto
T +351 22 2080350
bombas@wilo.pt

Romania

WILO Romania s.r.l.
077040 Com. Chiajna
Jud. Ilfov
T +40 21 3170164
wilo@wilo.ro

Russia

WILO Rus ooo
123592 Moscow
T +7 495 7810690
wilo@wilo.ru

Saudi Arabia

WILO ME – Riyadh
Riyadh 11465
T +966 1 4624430
wshoula@wataniaind.com

Serbia and Montenegro

WILO Beograd d.o.o.
11000 Beograd
T +381 11 2851278
office@wilo.rs

Slovakia

WILO CS s.r.o., org. Zložka
83106 Bratislava
T +421 2 33014511
info@wilo.sk

Slovenia

WILO Adriatic d.o.o.
1000 Ljubljana
T +386 1 5838130
wilo.adriatic@wilo.si

South Africa

Salmson South Africa
1610 Edenvale
T +27 11 6082780
errol.cornelius@
salmson.co.za

Spain

WILO Ibérica S.A.
28806 Alcalá de Henares
(Madrid)
T +34 91 8797100
wilo.iberica@wilo.es

Sweden

WILO Sverige AB
35246 Växjö
T +46 470 727600
wilo@wilo.se

Switzerland

EMB Pumpen AG
4310 Rheinfelden
T +41 61 83680-20
info@emb-pumpen.ch

Taiwan

WILO Taiwan Company Ltd.
Sanhong Dist., New Taipei
City 24159
T +886 2 2999 8676
nelson.wu@wilo.com.tw

Turkey

WILO Pompa Sistemleri
San. ve Tic. A.Ş.,
34956 İstanbul
T +90 216 2509400
wilo@wilo.com.tr

Ukraine

WILO Ukraina t.o.w.
01033 Kiev
T +38 044 2011870
wilo@wilo.ua

United Arab Emirates

WILO Middle East FZE
Jebel Ali Free Zone-South
PO Box 262720 Dubai
T +971 4 880 91 77
info@wilo.ae

USA

WILO USA LLC
Rosemont, IL 60018
T +1 866 945 6872
info@wilo-usa.com

Vietnam

WILO Vietnam Co Ltd.
Ho Chi Minh City, Vietnam
T +84 8 38109975
nkminh@wilo.vn

wilo

Pioneering for You

WILO SE
Nortkirchenstraße 100
D-44263 Dortmund
Germany
T +49(0)231 4102-0
F +49(0)231 4102-7363
wilo@wilo.com
www.wilo.com