# SB, SBA

# Installation and operating instructions





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## Original installation and operating instructions

These installation and operating instructions describe Grundfos SB, SBA and SB HF. Sections 1-5 give the information necessary to be

able to unpack, install and start up the product in a safe way.

Sections 6-10 give important information about the product, as well as information on service, fault finding and disposal of the product.

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Read this document before you install the product. Installation and operation must comply with local regulations and accepted codes of good practice.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.



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Make sure that the system in which the pump is incorporated is designed for the maximum pump pressure.

This pump has been evaluated for use with water only.

# 1. General information

## 1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

# DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

# WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

# CAUTION



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

## SIGNAL WORD

**Description of hazard** Consequence of ignoring the warning. - Action to avoid the hazard.

# 1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

# 2. Receiving the product

# 2.1 Inspecting the packaging

On receipt of the product, do the following:

- 1. Check that the product is as ordered. If the product is not as ordered, contact the supplier.
- Check that no visible parts have been damaged. If any visible parts have been damaged, contact the transport company.

## 2.2 Scope of delivery

The box contains the following items:

- 1 pump
- 1 adapter
- 1 installation and operating instructions
- 1 quick guide
- 1 floating inlet strainer, for side inlet variant only
- 1 non-return valve, for SB only.

# 3. Installing the product



Observe local regulations concerning limits for manual lifting or handling.

# CAUTION



## Crushing of feet

Minor or moderate personal injury

Use safety shoes when handling the pump.

# DANGER





 Death or serious personal injury
 Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be accidentally switched on.

# 3.1 Location

Install the pump in a frost-free location.

Before the pump is submerged in the well or tank, make sure that the well or tank does not contain sand or solid sediment.

Install the pipe so that the pump is not exposed to mechanical stress.

#### 3.1.1 Maximum installation depth

Product	Maximum installation depth [m]
SB	10
SBA	10
SB HF	15

#### 3.1.2 Highest tapping point for SBA pumps

Install SBA pumps so that the height between the pump and the highest tapping point does not exceed these values:

SBA 3-35: 13 m. SBA 3-45: 20 m.



Fig. 1 Highest tapping point for SBA

#### 3.1.3 Minimum space

Pumps installed with a float switch require a free space between the float switch and the wall to ensure free movability.

Pumps with side inlet require a free space between the floating inlet strainer and the wall.

If you install the pump in a well or tank, the minimum free space must be as shown in figs 2 and 3.

Pumps installed without a float switch require a space that corresponds to the physical dimensions of the pump.

# SB and SBA pump with a float switch and side inlet



Fig. 2 Minimum space for SB and SBA pump in a well or tank

#### SB HF pump with a float switch



Fig. 3 Minimum space for SB HF pump. This example shows installation in a well

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## 3.1.4 Vertical placement of SB HF pump

#### Tank installation of SB HF

Place the pump on the bottom of the tank. The pump must not run dry.

#### Well installation of SB HF

Install the pump so that the pump inlet is at least 1 m above the bottom of the well to avoid suction of sand and impurities. See fig. 3.

Use rigid metal pipes to hang the pump, and secure the pipes with brackets at the top of the well.



Do not use the power cable to hang the pump above the bottom of the well.

Secure the pump by attaching a wire to the lifting eye on the top of the pump. Do not hang the pump on the lifting wire.

#### 3.1.5 Adjustment of the float switch

To make sure that the float switch can start and stop the pump, adjust the start and stop level by changing the free cable length between the float switch and the lifting handle.

A reduced free cable length results in more starts and stops and a small difference in level. The minimum free cable length is 10-18 cm. See fig. 4.

• An increased free cable length results in fewer starts and stops and a large difference in level.

Make sure that the float switch can move freely.

Make sure that the stop level does not fall below the pump inlet strainer.



Fig. 4 Minimum free cable length for float switch

## 3.2 Mechanical installation

#### 3.2.1 Lifting the product

Lift the pump by the lifting handle. Never lift the pump by the power cable. Tie a rope to the lifting handle or lifting eye instead.



Do not lift the product by the power cable. Lift the product by means of a rope.













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## 3.3 Pump position

#### 3.3.1 Pump position of SB and SBA

Use the pump in the vertical position as shown in fig. 5.



Fig. 6 Position of SB, SBA pumps

#### 3.3.2 Pump position of SB HF

The pump is suitable for both vertical and horizontal installation. However, the pump shaft must never fall below the horizontal plane. See fig. 7.



Fig. 7 Position of SB HF pumps

## 3.4 Connecting the outlet hose or pipe

Product	External pipe thread [inch]
SB	G 3/4 or 1
SBA	G 3/4 or 1
SB HF	G 1 1/4

The outlet hose or pipe can be connected to the pump outlet port by means of an adapter. You can also connect a pipe directly to the pump outlet.

SB and SBA pumps include an adapter. Cut off the adapter so that it matches the outlet port diameter.



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Fig. 8 SB and SBA adapter

## 3.5 Non-return valve for SB pumps

Connect the non-return valve to the SB pump outlet. The non-return valve has G 1" threads for connection to the adapter or the pipe.



Fig. 9 Non-return valve

# 3.6 Electrical connection

# DANGER

# Electric shock

Death or serious personal injury



Switch off the power supply before you start any work on the product. Make

sure that the power supply cannot be accidentally switched on.

- The pump must be earthed.

# DANGER

## Electric shock

Death or serious personal injury



The protective earth of the socket outlet must be connected to the protective earth of the pump. The plug must therefore have the same PE connection system as that of the socket outlet. If not, use a suitable adapter.



We recommend that you fit the permanent installation with a residual-current circuit breaker, RCCB, with a tripping current less than 30 mA.

# DANGER

## Electric shock

Death or serious personal injury



If the pump is used for cleaning or other maintenance of swimming pools, garden ponds or similar places, make sure that the pump is supplied through a residual-current circuit breaker, RCCB.

with a tripping current of 30 mA.

# DANGER

## Electric shock



 Death or serious personal injury
 Connect pumps that are delivered without cable and/or plugs to an external main switch with a minimum contact gap of 3 mm in all poles.



Make sure that there is at least 3 m free cable above the liquid level.

Check that the supply voltage and frequency correspond to the values stated on the pump nameplate.

The electrical connection must be carried out by an authorised electrician in accordance with local regulations.

# 3.6.1 Thermal protection

The pump has a built-in thermal switch and requires no additional motor protection. If the pump is running without water, or if it is otherwise overloaded, the built-in thermal switch will cut out. When the motor has cooled to normal temperature, it will restart automatically.

## 3.6.2 Connecting to external controller

## SB

SB pumps must be connected to an external controller. We recommend a Grundfos Pressure Manager: net.grundfos.com/qr/i/97506325

## SBA

SBA pumps have an integrated control unit.

## SB HF

SB HF pumps must be connected to an external controller. We recommend a Grundfos Pressure Manager: net.grundfos.com/qr/i/97506325

#### 3.6.3 Power supply failure

In case of a power supply failure, the pump restarts automatically when power returns and runs for at least 10 s.

# 4. Starting up the product

#### WARNING

Flammable material

Death or serious personal injury



Do not use the pump for flammable liquids, such as diesel oil, petrol or similar liquids.

## DANGER

#### Electric shock



Death or serious personal injury

Do not use the pump in swimming pools, garden ponds or similar places if there are people in the water.

- 1. Open a tap in the system.
- 2. Switch on the power supply.
- 3. Check that the pump is running and water is coming out of the tap.
- 4. Check that the pump is running and pressure is being built up in the system.
- 5. Close the tap.
- 6. Check that pressure has been built up in the system.
- 7. Check that the pump stops after a few seconds.

During operation, the SB HF pump inlet strainer must always be completely submerged in liquid.

Do not run the SB HF pump against a closed outlet valve.



Connect SB pumps to an external controller.

# 4.1 SBA starting and stopping conditions

When water is consumed in the water supply system. the pump starts when the starting conditions are fulfilled. This happens for example when a tap is opened which makes the pressure in the system drop. The control unit stops the pump again when consumption stops, that is when the tap is closed.

#### Starting conditions

The pump starts when one of the following conditions is fulfilled:

- The flow rate is higher than the minimum flow rate.
- The pressure is lower than the start pressure.

#### Stopping conditions

The pump stops with a time delay of 10 s when the flow rate is lower than the minimum flow rate.

The start pressure and minimum flow rate values are shown in section 9. Technical data.

#### Automatic restart of SBA pumps

SBA pump models with a float switch automatically restart when water is added. Models without a float switch will attempt to restart every 24 hours.

# 5. Handling and storing the product

## 5.1 Handling the product



Do not lift the product by the power cable. Lift the product by means of a rope. Do not drop or shake the product.

## 5.2 Storing the product

Store the product indoors in a dry and dust-free environment. Protect the product from vibrations. Storage temperature: -10 to +40 °C.

#### 5.3 Frost protection

It the pump is not used during periods of frost, drain the pump and the pipe system before you take the pump out of operation.

# 6. Product introduction

## 6.1 Product description

The pumps are submersible booster pumps available in two main versions:

- pump with integrated inlet strainer with 1 mm mesh
- pump with side inlet, which includes a flexible inlet hose with floating inlet strainer with 1 mm mesh.

Both versions are available with or without float switch. The float switch can be used for automatic operation or dry-running protection of the pump.

## 6.2 SB pumps

The SB submersible booster pump is available with integrated inlet strainer or floating inlet strainer. The SB pump must be connected to an external controller, see section 3.6.2 Connecting to external controller.

## 6.3 SB HF pumps

SB HF is a high-flow submersible pump with a stainless steel body. The integrated inlet strainer enables the pump to draw water from a low level in the installation. The SB HF pump must be connected to an external controller, see section 3.6.2 Connecting to external controller.

6.4 SBA pumps

The SBA pump is a complete submersible booster pump available with integrated inlet strainer or floating inlet strainer.

SBA has a built-in control unit, eliminating the need for a controller.

The pump has built-in protection against overheating.

## 6.5 SBA dry-running protection

The built-in control unit incorporates dry-running protection that automatically stops the pump in case of dry running.

The dry-running protection functions differently during priming and operation.

## 6.5.1 Dry running during priming

If the control unit does not detect any pressure and flow within 5 min after it has been connected to a power supply and the pump has started, the dryrunning function is activated and the pump stops.

#### 6.5.2 Dry running during operation

If the control unit does not detect any pressure and flow within 40 s during normal operation, the dryrunning function is activated and the pump stops.

#### 6.5.3 Resetting of dry-running alarm

If a dry-running alarm has been activated, you can restart the pump manually by switching off the power supply, wait for 2 min and reconnect power. If the control unit does not detect any pressure and flow within 40 s after restarting, the dry-running alarm is reactivated.

#### 6.6 Intended use

Grundfos SB, SBA and SB HF pumps are designed for pumping clean water. The pumps are especially suitable for rainwater applications and small private wells.

Typical applications:

- traditional wells
- shallow wells
- rainwater collection in tanks
- boosting of public water
- emptying of garden ponds
- irrigation.

## 6.7 Pumped liquids

The pumps are suitable for thin, clean, nonaggressive and non-explosive liquids, not containing solid particles or fibres that may attack the pump mechanically or chemically.

The pump is not suitable for these liquids:

- · liquids containing long fibres
- inflammable liquids (oil, petrol, etc.)
- aggressive liquids.

# 6.8 Identification

## 6.8.1 Nameplate



Fig. 10 Example of nameplate

Pos.	Description
1	Product type
2	Frequency [Hz]
3	Production code, year and week
4	50 Hz, P1: Power input [W] 60 Hz, P2: Motor output [HP]
5	Serial number
6	Full-load current [A]
7	Maximum installation depth [m]
8	Maximum liquid temperature [°C]
9	Enclosure class
10	Manufacturer
11	Motor insulation class
12	Maximum head [m]
13	Country of origin
14	Approval marks
15	Waste electrical and electronic equipment
16	Maximum flow rate [l/min]
17	Supply voltage [V]
18	Product number

# 7. Maintaining the product

# DANGER

Electric shock



Death or serious personal injury

If the power supply cable is damaged, it must be replaced by the manufacturer, his service agent or similarly qualified persons in order to avoid hazard.

Clean the strainer every fall with a brush and a water jet when needed. In normal operation, the pump does not require any specific maintenance.

# 8. Fault finding the product

## DANGER

Electric shock



Death or serious personal injury - Switch off the power supply before you start any work on the product. Make sure that the power supply cannot be accidentally switched on.

See also the quick guide.

Fault		Ca	use	Re	medy
1.	The pump does not run.	a)	The fuses in the electrical installation are blown.	Re too the	place the fuses. If the new fuses blow , check the electrical installation and power cable.
		b)	The residual-current circuit breaker, RCCB, has tripped.	Cut	t in the circuit breaker.
		c)	No power supply.	Co	ntact the power supply company.
		d)	The motor protection has cut off the power supply due to overload.	Che SB 1.	eck if the pump is blocked. and SBA only: Switch off the power supply to the pump.
				2.	Remove the rubber plug. See figs 1 to 3 (25) in the appendix.
				3.	Try to turn the pump shaft with a screwdriver.
				4.	If the pump shaft is stuck, follow the instructions in point 1, h.
				No	te: Remember to refit the rubber plug.
		e)	The pump or the power cable is defective.	Re	pair or replace the pump or cable.
		f)	The float switch is in dry-running position.	Chi for <b>No</b> swi larg	eck the water level and the float switch free movability. te: If the tank is empty, and the float itch is often in this position, install a ger tank.
		g)	SBA: The dry-running protection of the pump has stopped the pump.	Ch Sw mir	eck the water level. itch off the power supply and wait 2 n before switching it back on.
		h)	The pump is blocked.	Ch 1.	eck and clean the pump. Switch off the power supply to the pump.
				2.	Remove the screws at the bottom of the pump with a cross-head screwdriver. See figs 1 and 2 (84b) and fig. 3 (115) in the appendix.
				3.	Remove the pump base. See figs 1 and 2 (56) and fig. 3 (104) in the appendix.
				4.	Clean the inlet strainer and hydraulic parts with a brush and a water jet.
				5.	Reassemble the pump.

Fault		Cause		Remedy	
2.	The pump runs but	a)	The outlet valve is closed.	Open the valve.	
	gives no water.	b)	No water or too low water level in the tank.	Increase the installation depth of the pump. Reduce the pump performance, or replace the pump by a pump with a lower performance.	
		c)	The non-return valve is stuck in its closed position.	Pull out the pump, and clean or replace the valve.	
		d)	The inlet strainer is clogged.	Pull out the pump, and clean the inlet strainer with a brush and a water jet.	
		e)	The pump is defective.	Repair or replace the pump.	
3.	The pump runs at reduced	a)	The valves in the outlet pipe are partly closed or blocked.	Check and clean or replace the valves.	
	performance.	b)	The outlet pipe is partly blocked by impurities.	Clean or replace the pipe.	
		c)	The non-return valve in the outlet pipe is partly blocked.	Clean or replace the valve.	
		d)	The pump and outlet pipe are partly blocked by impurities.	Pull out the pump. Check and clean or replace the pump. Clean the pipes.	
		e)	The inlet strainer is clogged.	Clean the inlet strainer.	
		f)	The pump is defective.	Repair or replace the pump.	
		g)	Leakage in the pipes.	Check and repair the pipes.	
		h)	The outlet pipe is defective.	Replace the outlet pipe.	
		i)	Undervoltage has occurred.	Check the power supply.	
4.	Frequent starts and stops.	a)	The float switch has not been adjusted correctly.	Adjust the float switch to ensure suitable time between the cutting-in and cutting- out of the pump.	
		b)	The non-return valve is leaking or stuck half-open.	Clean or replace the non-return valve. See the position in the appendix. SB: fig. 1 (149) SBA: fig. 2 (151) SB HF: fig. 3 (no valve included)	
		c)	The supply voltage is unstable.	Check the power supply.	
		d)	The motor temperature is too high.	Check the water temperature.	
		e)	The pump is blocked.	<ul> <li>Check and clean the pump.</li> <li>1. Switch off the power supply to the pump.</li> <li>2. Benevo the service at the bettern of</li> </ul>	
				<ol> <li>Remove the screws at the bottom of the pump with a cross-head screwdriver. See figs 1 and 2 (84b) and fig. 3 (115) in the appendix.</li> </ol>	
				<ol> <li>Remove the pump base. See figs 1 and 2 (56) and fig. 3 (104) in the appendix.</li> </ol>	
				<ol> <li>Clean the inlet strainer and hydraulic parts with a brush and a water jet.</li> <li>Reassemble the nump</li> </ol>	
		f)	Leakage in the pipes	Check and repair the pines	
		1)	Leakaye III lile pipes.	oneon and repair the pipes.	

English (GB)

# 9. Technical data

# 9.1 Operating conditions

## 9.1.1 Flow rate

Maximum flow rate	[m <sup>3</sup> /h]
SB	3
SBA	3
SB HF	5
Minimum flow rate	[l/min]
SBA 3-35	1.0
SBA 3-45	1.0
9.1.2 Maximum head	
9.1.2 Maximum head Maximum head	[m]
9.1.2 Maximum head Maximum head SB 3-25	[m] 25
9.1.2 Maximum head Maximum head SB 3-25 SB 3-35	[m] 25 35
9.1.2 Maximum head Maximum head SB 3-25 SB 3-35 SB 3-45	[m] 25 35 45
9.1.2 Maximum head           Maximum head           SB 3-25           SB 3-35           SB 3-45           SBA 3-35	[m] 25 35 45 35
9.1.2 Maximum head           Maximum head           SB 3-25           SB 3-35           SB 3-45           SBA 3-35           SBA 3-45	[m] 25 35 45 35 45

## 9.1.5 Frequency of starts and stops

#### Maximum starts per hour

SB	20
SBA	20
SB HF	30

## 9.2 Mechanical data

Cable length	[m]
SB	15
SBA	15
SB HF	20/30
Maximum installation depth	[m]
Maximum installation depth SB	<b>[m]</b> 10
Maximum installation depth SB SBA	[m] 10 10
Maximum installation depth SB SBA SB HF	[m] 10 10 15

## Protection grade

Enclosure class	IP68
Insulation class	F

# SB HF 5-65 (60 Hz) 9.1.3 Temperature

SB HF 5-70 (50 hz)

SB HF 5-50 (60 Hz)

Liquid temperature	[°C]
SB	0 to 40
SBA	0 to 40
SB HF	0 to 40

70

50

65

Storage temperature	[°C]
SB	-10 to +40
SBA	-10 to +40
SB HF	-10 to +40

#### 9.1.4 Pressure

Start pressure	[bar]	[MPa]
SBA 3-35	1.5	0.15
SBA 3-45	2.2	0.22

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## 9.3 Electrical data

SB	Voltage [V]	Frequency [Hz <u>]</u>	P1.	P2	I <sub>1/1</sub>
			[kW]	[hp]	[Å]
3-25	1 x 230	50	0.57	0.52	2.8
3-35			0.80	0.72	3.8
3-45			1.05	0.83	4.8
3-25	1 x 115	- 60	0.70	0.50	5.5
3-35			0.90	0.75	8.4
3-45			1.10	1.00	9.8
3-25	1 x 230		0.57	0.50	2.5
3-35			0.73	0.75	3.3
3-45			0.92	1.00	4.2

SBA	Voltage [V]	Frequency [Hz]	P1	P2	I <sub>1/1</sub>
			[kW]	[hp]	[Å]
3-35	- 1 x 230	50	0.80	0.72	3.8
3-45			1.05	0.83	4.8
3-35	- 1 x 115	- 60	0.80	0.75	8.4
3-45			1.05	1.00	9.8
3-35	- 1 x 230		0.74	0.75	3.4
3-45			0.90	1.00	4.1

SB HF	Voltage [V]	Frequency [Hz]	P1	P2	I <sub>1/1</sub>
			[kW]	[hp]	[Ä]
5-55	1 x 230	50	1.70	1.36	7.0
5-70			2.00	1.60	9.1
5-50	1 x 230	60	1.67	1.36	7.6
5-65			2.07	1.63	9.4

## 9.3.1 Speed

Speed	50 Hz [min <sup>-1</sup> ]	60 Hz [min <sup>-1</sup> ]
SB	2800	3400
SBA	2800	3400
SB HF	2800	3360

## 9.4 Dimensions



Fig. 11 SB pump. same dimensions with integrated inlet strainer and with floating inlet strainer



Fig. 12 SBA pump. same dimensions with integrated inlet strainer and with floating inlet strainer



Fig. 13 SB HF pump with integrated inlet strainer

Pump type	H [mm]	H1 [mm]	D [mm]
SB 3-25	370	537	_
SB 3-35	392	559	Ø150
SB 3-45	417	584	
SBA 3-35	530	623	~ ~150
SBA 3-45	554	647	- Ø150
SB HF 5-55	608		_
SB HF 5-70	628		~140
SB HF 5-50	588		- Ø140
SB HF 5-65	588		-

# 10. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

- 1. Use the public or private waste collection service.
- 2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheelie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local

waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

# Appendix

# SB pump

Appendix









Appendix





Fig. 3 SB HF pump

#### Argentina

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