

# SD - Sewage, dry-pit, non-clog pump

60 Hz, North America

Installation and operating instructions





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## English (US)

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## English (US) Installation and operating instructions

### Original installation and operating instructions

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### 1. Limited warranty

Products manufactured by Grundfos Pumps Corporation (Grundfos) are warranted to the original user only to be free of defects in material and workmanship for a period of 24 months from date of installation, but not more than 30 months from date of manufacture. Grundfos' liability under this warranty shall be limited to repairing or replacing at Grundfos' option, without charge, F.O.B. Grundfos' factory or authorized service station, any product of Grundfos manufacture. Grundfos will not be liable for any costs of removal, installation, transportation, or any other charges that may arise in connection with a warranty claim. Products which are sold, but not manufactured by Grundfos, are subject to the warranty provided by the manufacturer of said products and not by Grundfos' warranty. Grundfos will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Grundfos' printed installation and operating instructions and accepted codes of good practice. The warranty does not cover normal wear and tear. To obtain service under this warranty, the defective product must be returned to the distributor or dealer of Grundfos' products from which it was purchased together with proof of purchase and installation date, failure date and supporting installation data. Unless otherwise provided, the distributor or dealer will contact Grundfos or an authorized service

station for instructions. Any defective product to be returned to Grundfos or a service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed. Grundfos will not be liable for any incidental or consequential damages, losses, or expenses arising from installation, use, or any other causes. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction. Products which are repaired or replaced by Grundfos or authorized service center under the provisions of these limited warranty terms will continue to be covered by Grundfos warranty only through the remainder of the original warranty period set forth by the original purchase date.

### 2. General information

#### 2.1 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

The hazard statements are structured in the following way:



#### SIGNAL WORD

##### Description of the hazard

Consequence of ignoring the warning

- Action to avoid the hazard.

#### 2.2 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.

## 2.3 Target group

This installation and operating instructions are intended for professional installers and for the operators of the product.

We recommend that installation is carried out by skilled persons with technical qualifications required by the specific legislation in force.

## 3. Receiving the product

### 3.1 Inspecting the product

After transport and before installation, the product must be inspected.

To complete the inspection, follow the steps below:

1. Check the product for transport damage. Contact the transporter immediately in case of damage.
2. Check that the delivered products correspond to the order.
3. Check the positions and sizes of fittings.
4. Retighten various connections, as they may have become loose during transport.

#### Related information

[6.2 Short-term storage. See page 9.](#)

[6.3 Long-term storage. See page 9.](#)

### 3.2 Transporting the product

You must observe the following points:

- You must fix the product securely during transport.
- You must not drop the product.
- You must not drag the product over the ground.

#### WARNING



##### Overhead load

Death or serious personal injury

- Transport the product by means of a lifting strap or fork-lift.

#### Related information

[6.1 Handling the product. See page 9.](#)

### 3.3 Component and accessory manuals

Pumps delivered with components or accessories are not furnished with the manuals from the manufacturer. Grundfos recommends that the manuals from the manufacturer for the components and accessories be referenced.

## 4. Installing the product

### 4.1 Factory support

For Engineered to Order (ETO) products, we recommend that you invite a Grundfos service engineer to supervise installation and startup. This is to ensure a proper installation. You will have the opportunity to review the factory-recommended instructions.

### 4.2 Locating the pump

Install the product in a location that meets the following requirements:

1. Locate the pump as close as possible to the liquid supply. Use the shortest and most direct inlet pipe practical with the least number of elbows and fittings.
2. Locate the pump below the system level wherever possible. This will facilitate priming, assure a steady liquid flow, and provide a positive inlet pressure.

3. The net positive suction head (NPSH) available must always be equal to or exceed the required NPSH specified on the pump performance curve. Make sure the required NPSH is provided at the inlet.
4. Always allow sufficient accessibility space for maintenance and inspection with ample headroom for use of a hoist strong enough to lift the product.
5. Do not expose the product to flooding or sub-zero temperatures to prevent the pumped liquid from freezing.

#### Related information

[4.3.5.1 Pipes. See page 6.](#)

### 4.3 Mechanical installation

#### 4.3.1 Recommendation for pump foundation

All rotating equipment generates vibrations when an impeller or rotor is turning at high speeds. Proper installation and anchorage of the pumps and installation accessories are critical to limit vibrations and achieve reliable installation. To ensure acceptable vibration levels in the field, all parts of the system must be sufficiently stiff and firmly anchored to minimize vibrations:



This applies for pumps above 20 hp (15 kW).

- The foundation and concrete must be of adequate strength to support the weight of the pump including accessories, the weight of the liquid passing through the pump, and the forces generated by the pump.
- The mass of the concrete foundation must be a minimum of three to five times the mass of the supported equipment and must have sufficient rigidity to withstand the axial, transverse, and torsional loadings generated by these machines.
- The foundation must be 5.9 in (15 cm) wider than the baseplate for pumps up to 469 hp (350 kW) and 9.8 in. (25 cm) wider for larger pumps.
- The concrete used in the foundation must have a minimum tensile strength of 362 lbf/in<sup>2</sup> (250 N/cm<sup>2</sup>).
- Always use epoxy grout to fasten the pump base plate to the foundation.

#### 4.3.2 Pump foundation



Large pumps will be mounted on a steel base anchored to two concrete pillars.

Install the pump permanently on a firm, raised concrete foundation of sufficient size to dampen any vibration and prevent any deflection or shaft misalignment. The foundation may float on springs or be a raised part of the floor.

Proceed like this:

1. Pour the foundation without interruption to 0.75- 1.5 in (20-40 mm) below the final pump level. Leave the top of the foundation rough. Then clean and wet it down.
2. Scour and groove the top surface of the foundation before the concrete sets to provide a suitable bonding surface for the grout.
3. Place anchor bolts in pipe sleeves for positioning allowance.
4. Allow enough bolt length for grout, base flange, nuts, and washers.
5. Allow the foundation to cure several days before proceeding to install the pump.

### 4.3.2.1 Foundation, grout and anchor bolt installation

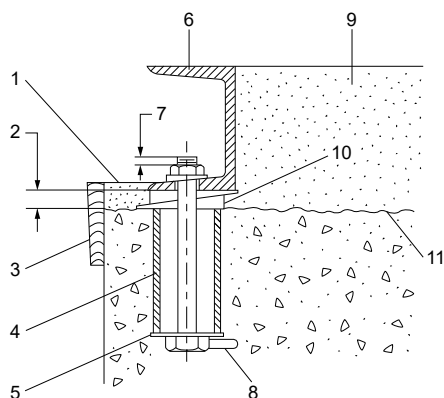


Fig. Foundation, grout, and anchor bolt installation

TM054775

Position	Description
1	Finished grouting
2	0.75-1.25 in (19-32 mm) allowance for grout
3	Formwork
4	Pipe sleeve
5	Washer
6	Base plate
7	0.2-0.4 in (5-10 mm)
8	Lug
9	Grout
10	Wedges or shims left in place
11	Top of foundation

### 4.3.3 Positioning the pump

When the raised concrete foundation has been poured and allowed to set, proceed as follows:

#### WARNING

##### Overhead load

Death or serious personal injury

- Never attempt to lift the pump by means of eyebolts screwed into the driver mounting holes. The bolts are not strong enough to carry the weight of the entire pump.

1. Lower the base plate over the anchor bolts and rest it on loose adjustment wedges or shims placed near each anchor bolt and at intervals not exceeding 24 in. (610 mm) along each side.
2. Place the shims or wedges so that they raise the bottom of the base plate 0.75-1.25 in. (19-32 mm) above the foundation, allowing clearance for grout.
3. Level the pump shaft, flanges, and base plate using a level, adjusting the wedges or shims, as required.
4. Make sure that the pipes can be aligned to the pump flanges without placing any strain on either flange.
5. After pump alignment has been established, put nuts on the anchor bolts and tighten them just enough to keep the baseplate from moving.

6. Construct a formwork around the concrete foundation and pour grout inside the base plate. The grout will compensate for the uneven foundation, distribute the weight of the pump, and prevent shifting.\*1
7. Allow at least 24 hours for the grout to set before proceeding with the pipe connections.
8. After the grout has thoroughly hardened, check the anchor bolts and tighten them if necessary. Recheck the pump alignment after tightening the anchor bolts.

\*1



Use an approved, non-shrinking grout.

#### Related information

4.3.2.1 Foundation, grout and anchor bolt installation. See page 6.

4.3.4 Alignment. See page 6.

6.1 Handling the product. See page 9.

### 4.3.4 Alignment



Coupling alignment must be performed according to the manufacturer's instructions.



Alignment must be checked periodically after installation.

#### Vertical pedestal mounted pumps:

The pump is aligned at the factory and the motor support is indexed on the top and bottom to maintain factory alignment.



Vertical open shaft pumps must be aligned according to the shaft manufacturer's instructions.

#### Horizontally mounted pumps:

Pumps and drivers shipped from the factory on a common baseplate are aligned.



Coupling halves are shipped separated from the pump and must be aligned during installation.

#### Related information

3.3 Component and accessory manuals. See page 5.

### 4.3.5 Pipe connections

#### 4.3.5.1 Pipes



Do not let the pump support the pipes. Use pipe hangers or other supports at proper intervals to provide pipe support near the pump.

- Make sure that both the inlet and outlet pipes are independently supported and properly aligned so that no strain is transmitted to the pump when flange bolts are tightened.
- Make sure the pipes are as straight as possible, so as to avoid unnecessary bends and fittings. Where necessary, use 135° or long-sweep 90° pipe bends to decrease friction loss.
- Where flanged joints are used, make sure that the inside diameters match properly and that mounting holes are aligned.
- Do not apply force to pipes when making any connections.

#### 4.3.5.2 Inlet pipe

The inlet pipe must be installed in a manner that minimizes pressure loss and permits sufficient liquid flow into the pump during starting and operation.

- ! At no point must the diameter of the inlet pipe be smaller than that of the pump inlet port.

Observe the following precautions when installing the inlet pipe:

- Run the inlet pipe as direct as possible, and ideally, make sure the length is at least ten times the pipe diameter. A short inlet pipe can be the same diameter as the inlet port. A long inlet pipe must be one or two sizes larger than the inlet port, depending on the length, and with a reducer between the pipe and the inlet port.
- Use an eccentric reducer, with the tapered side down.
- If possible, run a horizontal inlet line along an even gradient. We recommend a gradual upward slope to the pump operating in suction lift conditions, and a gradual downward slope operating in positive inlet pressure conditions.
- Avoid any high points, such as pipe loops, as this may create air pockets and throttle the system or cause erratic pumping.
- Install a gate valve in the inlet line to be able to isolate the pump during shutdown and maintenance, and to facilitate pump removal. Where two or more pumps are connected to the same inlet pipe, install two gate valves to be able to isolate each pump from the pipe.



Always install isolation valves in positions that prevent air pockets.



Do not use globe valves, particularly when NPSH is a critical operating factor.

- During pumping operation, the valves on the inlet line must always be fully open.
- Install properly sized pressure gauges in the tapped holes on the pump inlet and outlet flanges or pipes



Pressure gauges will enable the operator to monitor the pump performance and determine whether the pump conforms to the parameters of the performance curve



If cavitation, vapor binding, or other unstable operating situations occur, the pressure gauges will indicate with wide fluctuation in the inlet and outlet pressures.

#### Inlet pipe installation

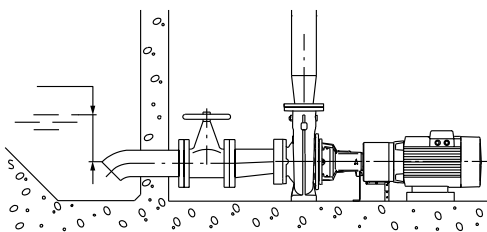


Fig. Correct inlet pipe installation with an eccentric reducer

#### 4.3.5.3 Outlet pipe

- A short outlet pipe can be the same diameter as the pump outlet port. A long outlet pipe must be one or two sizes larger than the outlet port, depending on the length.
- It is best to use long horizontal outlet pipes.
- install a non-return valve to protect the pump from backflow and excessive backpressure. The check valve should be installed between the isolation valve and pump.



Pump backspin and hydraulic shock can cause severe damage to the pump and driver.

- Install a gate valve near the outlet port to be able to isolate the pump during shutdown and maintenance, and to facilitate pump removal
- Any high points in the outlet pipe may entrap air or gas and thus retard pump operation.

#### Related information

8.2 Stopping the product. See page 13.

#### 4.4 Electrical connection

All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

All electrical connections must be carried out in accordance with the separate wiring diagrams delivered with the system.

#### WARNING

##### Electric shock

Death or serious personal injury

- Switch off the power supply before making any electrical connections.
- Make sure that the power supply cannot be switched on accidentally.
- Check that the supply voltage and frequency correspond to the values stated on the nameplate.
- Make sure all earth connections are established correctly before switching on the power supply.



#### DANGER

##### Explosive environment

Death or serious personal injury

- Observe the rules and regulations generally or specifically imposed by the relevant responsible authorities or trade organizations in relation to running powered equipment in an explosive environment.



### 5. Starting up the product

#### 5.1 Priming

##### 5.1.1 Priming the pump with positive inlet pressure

The pump should not be started unless it is completely filled with liquid.

1. Close the outlet valve.
2. Open the inlet valve and allow the volute to be filled with liquid.
3. Open all vents until air is forced out by liquid.
4. Rotate the shaft to free entrapped air from the impeller passageways.
5. Close all vents when only liquid is flowing out.

##### 5.1.2 Priming the pump with negative inlet pressure

If the pump will be operating with a suction lift, priming must be accomplished by other methods.

1. Replace air vents on the inlet with air ejectors.
2. Install a foot valve on the inlet pipe.
3. Fill the inlet pipe and volute.

#### 5.2 Preparing the pump for start-up

Before starting up the pump, the following items must be performed:

1. Ensure that all electrical switches are in the off position.
2. Ensure that all relevant components are properly aligned and lubricated.

- Turn the shaft by hand or use a strap wrench to ensure that it rotates freely.



If it binds or turns with difficulty the pump must be disassembled and inspected.

- Ensure that inlet and outlet pressure gauges are properly installed and operating.
- Ensure that the voltage, frequency, and current on the pump nameplate match the electrical properties of the power supply.
- Ensure that the direction of rotation is the same as shown by the arrow on the pump volute.
  - Check the rotation by turning the power on momentarily.



The power should be on long enough to observe the shaft rotation.

- Observe the coupling direction of rotation.
- If the coupling is not rotating in the direction that is intended, interchange any two of the motor leads and recheck.



This is only applicable to three-phase motors.

- Ensure that the valve on the outlet pipe is closed and the inlet valve is completely open.



To prevent overheating, operating against a close outlet valve must be limited to five minutes.



Prolonged operation against a closed outlet valve may damage the pump due to increased vibrations and internal recirculation.

- Refer to driver and controller manuals for specific pre-start instructions.

### 5.2.1 Pre start-up Lubricating

#### 5.2.1.1 Radial and thrust bearings

The bearings have been properly lubricated at the factory. Some horizontal pumps are equipped with an oil splash lubrication system. The system provides a constant supply of fresh oil to the bearings.



Excessive grease causes the bearing to over-heat and fail prematurely.



Contact Grundfos for lubrication recommendations in high temperature applications or other unusual conditions.

#### 5.2.1.2 Couplings

Refer to the manufacturer's lubrication instructions or contact Grundfos.

#### 5.2.1.3 Flexible shafting

Refer to the manufacturer's lubrication instructions or contact Grundfos.

#### 5.2.1.4 Stuffing box



The stuffing box gland must be loose when the pump is first put into operation.



Tightly pressed packing will result in burnt packing and scoring of the shaft or shaft sleeve.



The stuffing box should slowly leak fluid during operation. When the leak can no longer be controlled by adjusting the stuffing box gland, all packing rings must be replaced.



Do not add an additional packing ring to the stuffing box to adjust leakage.

- The stuffing box is packed at the factory.
- Each ring is cut to the proper length.



The end of the rings must come together and not overlap.

- The rings are placed in the stuffing box so that the joints of the packing rings are staggered.
- The stuffing box is furnished with a lantern or seal ring.
- The box has a tapped connection for grease lubrication.
- 3 oz. (89 mL) of grease must be injected into the stuffing box every 24 hours of operation.



Automatic grease seal lubrication systems can be installed as an accessory.

#### 5.2.1.5 Mechanical seal box



Grundfos recommends mechanical seals for pumps handling hazardous or expensive liquids.

- The standard seal arrangement is a single cartridge or split seal.
- The sealing fluid is injected in the mechanical seal box through the seal gland ports or a port in the box.



Grundfos recommends clean water as the sealing fluid in the seal box.



The sealing fluid must flow through the seal box at a pressure higher than the maximum operating pressure of the pump.



Reference the seal manufacturer's recommendation for sealing fluid flow rate.

#### 5.2.1.6 Accessories

Refer to the manufacturer's lubrication instructions for drives, motors, and other accessories or contact Grundfos.

### 5.3 Starting the pump

- Open the inlet valve completely and close the outlet valve completely.
- Switch the power supply on.
- Start the pump.
- Immediately make a visual check of the pump and inlet pipe.
- Allow the pump to ramp up to full speed.
- Slowly open the outlet valve until the operational flow is achieved.
- Check the outlet pipe for leaks.
- Open the isolating valves for the pressure gauges.



9. Record the pressure readings.
10. Verify the pump performance is within the tolerance of the pump performance curve.

### 5.3.1 Observations during startup

Observe the operation of the pump for the first day and at frequent regular intervals for the first two weeks. The initial controls may not function as intended and therefore, the system should be checked to verify performance is as intended.

1. Check and monitor the bearing temperature to ensure they are not overheating.
2. Check that there is the adequate but not excessive weepage from the stuffing box or that lubrication system to the mechanical seal is functioning.
3. Verify the pipe connections are tight and the valves are functioning.
4. Verify that the control system is starting and stopping the pump as intended.
5. For vertical open shaft installations, verify the flexible shafting is not whipping or excessively vibrating.

## 6. Storing and handling the product

### 6.1 Handling the product

You must observe the following points:

- You must use approved straps of textile or similar materials when lifting the product.
- You must handle and lift according to the local regulations.
- Point loads must not occur.



#### **DANGER**

##### **Crushing hazard**

Death or serious personal injury

- Place the product on a level surface to prevent overturning.



If the product is equipped with lifting points, use the points during handling.

### 6.2 Short-term storage

- The pump and equipment, as shipped, have adequate protection for short-term storage for up to three months.
- If the product is not to be installed and operated immediately after receiving it, store it in a clean, dry area at a moderate ambient temperature.
- For packed-type pumps, the packing glands may be left on the pump shaft and securely fastened in position. All exposed machined surfaces should be thoroughly coated with a film of rust preventative material.
- For packed-type pumps, the stuffing box packing must be removed and stored in a sealed plastic bag. Seal the end of the stuffing box with rolled vapor phase inhibitor paper and seal with weatherproof tape.
- Rotate the shaft by hand periodically, at least monthly, to coat the bearing with a lubricant to retard oxidation and corrosion.
- Make sure the pump cannot roll or fall over
- Follow the motor manufacturer's storage recommendations where applicable.

### 6.3 Long-term storage

- For periods of storage up to six months or longer, the pump must be protected against heat and moisture.
- Inspect the pump before putting it into operation. Make sure that the impeller can rotate freely. Pay special attention to the condition of the shaft seals or packing and O-rings.

## 7. Product introduction

### 7.1 Applications

Grundfos recommends this pump for the following applications:

- raw water intake systems
- wastewater treatment plants
- municipal pumping stations
- flood and storm water control
- drainage and irrigation of large quantities of water
- public buildings
- blocks of apartments
- raw sewage
- secondary sewage
- industrial wastewater
- light slurries
- dry dock drainage
- industrial wash water

### 7.2 Installation types

The pumps are available in the following installation configurations:

- Vertical Pedestal-Mounted (VPM) with the driver directly mounted on a pedestal and connected to the pump assembly.
- Vertical Open Shaft (VOS) with the driver mounted remotely at a higher elevation for flood or space requirements.
- Horizontal Ball Bearing (HBB) with a fabricated steel base supporting both the pump and driver in horizontal position.



Vertical mounting is available in both pier and pedestal mount on most models above a 12-inch outlet.

### 7.3 Identification

#### 7.3.1 Nameplate



TMC070260

**Fig.** SD pump nameplate

Position	Description
1	Type designation
2	Product number
3	Pump series
4	Rated speed (rpm)
5	Maximum head (ft)
6	Rated head (ft)
7	Maximum pressure (PSI)
8	Production location
9	Net weight
10	Maximum ambient temperature (°F)
11	Rated flow(GPM)
12	Maximum flow (GPM)
13	Impeller trim
14	Frequency (Hz)
15	Production code (YYWW)
16	Serial number

### 7.3.2 Type key

Example: SD2H.60.A120.A120.559R.12.D3HB.11.Z

Code	Example	Designation
SD	Grundfos SD pump only	Pump type
SDS	Grundfos SD pump with motor or accessories	
2	2-channel impeller	Impeller type
3	3-channel impeller	
4	4-channel impeller	
5	5-channel impeller	
H	High pressure	Pressure range
M	Medium pressure	
L	Low pressure	
25	2.5" (65 mm)	Free passage
30	3" (75 mm)	
40	4" (100 mm)	
50	5" (127 mm)	
60	6" (152 mm)	
65	6.5" (165 mm)	
85	8.5" (216 mm)	
A40	ANSI 4"	Outlet size
A60	ANSI 6"	
A80	ANSI 8"	
A100	ANSI 10"	
A120	ANSI 12"	
A140	ANSI 14"	
A160	ANSI 16"	
A180	ANSI 18"	
A200	ANSI 20"	
A240	ANSI 24"	
A300	ANSI 30"	
A360	ANSI 36"	
A420	ANSI 42"	
A480	ANSI 48"	
A540	ANSI 54"	
A40	ANSI 4"	Inlet size
A60	ANSI 6"	
A80	ANSI 8"	
A100	ANSI 10"	
A120	ANSI 12"	
A140	ANSI 14"	
A160	ANSI 16"	
A180	ANSI 18"	
A200	ANSI 20"	
A240	ANSI 24"	
A300	ANSI 30"	

Code	Example	Designation
A360	ANSI 36"	
A420	ANSI 42"	
A480	ANSI 48"	
A540	ANSI 54"	
	100 = 100 mm	Actual impeller diameter (mm)
R	Right hand (Clockwise)	Rotation
L	Left hand (Counter clockwise)	
4	4-pole	Number of poles
6	6-pole	
8	8-pole	
10	10-pole	
12	12-pole	
14	14-pole	
16	16-pole	
18	18-pole	
20	20-pole	
22	22-pole	
24	24-pole	
26	26-pole	
28	28-pole	
30	30-pole	
32	32-pole	
34	34-pole	
36	36-pole	
D	Vertical pedestal-mounted, (Vertical, motor mounted directly on pump)	Installation type
V	Vertical open shaft (Vertical, motor connected to pump shaft by intermediate shafting)	
H	Horizontal base-mounted (Horizontal, pump and motor mounted on a common base frame)	
1		Bearing frame size
2		
3		
4		
5		
6		
7		
M	Medium duty	Bearing arrangement
H	Heavy duty	
E	Extra duty	
S	Super duty	
B	Stuffing box	Seal
C	Cartridge seal, single	
S	Split seal, single	
X	Custom seal	

Code	Example	Designation
1	Cast iron ASTM 48 CL 35	Material code, volute
2	316SS	
3	Cast iron ASTM 48 CL35 (3% nickel)	
4	Ductile Iron, ASTM A536 65-45-12	
5	CD4MCu ASTM A890, duplex stainless steel	
X	Custom material	
1	Cast iron ASTM 48 CL 35	Material code, impeller
2	316SS	
3	Cast iron ASTM 48 CL35 (3% nickel)	
4	Ductile Iron ASTM A536 65-45-12	
5	CD4MCu ASTM A890, duplex stainless steel	
X	Custom material	
[ ]	Standard pump	Sensor
Z	Custom-built product	Variants

## 8. Operating the product

### 8.1 Normal operation



In the event of mechanical failure, the pump must be shut-down and repaired.



In the event of a main power failure do not allow the automatic restart of the pump.



In the event, the pit is flooded the pump must be removed and rebuilt or replaced.

- The pump must be operated within 10% of the specified duty points on the nameplate.
- The pump should be regularly checked and maintained.
- The main power should be monitored for current and voltage phase imbalance.
- The controllers and drivers must be checked in accordance with the manufacturer's recommendations.
- The pump must operate without excessive noise or vibration.

#### Related information

[10.1 Preventative maintenance schedule. See page 15.](#)

### 8.2 Stopping the product



If loud banging or hammering noises are heard while stopping the pump the system may be experiencing water hammer.



Consult the system engineer or contact Grundfos if water hammer is occurring while stopping the pump.

1. Turn off the power to the driver.
2. Allow the pump to come to a complete stop.

### 8.3 Extended shutdown



**DANGER**  
Electric shock

Death or serious personal injury

- Make sure that the power supply cannot be switched on accidentally.
- Observe local regulations.

1. Disconnect the main power to the driver.
2. Close all valves connected to the inlet, outlet, and lubrication pipes.
3. Remove all drain and vent plugs.  
The pump will be drained of all fluid.
4. Flush the pump.  
Corrosives and abrasives will be removed.

#### Related information

[6.1 Handling the product. See page 9.](#)

[6.2 Short-term storage. See page 9.](#)

[6.3 Long-term storage. See page 9.](#)

## 9. Fault finding the product

Fault	Cause	Remedy
The pump does not start or stops without visible cause.	1. No power supply.	1. Verify the power supply is connected. 2. Check the contractor.
The pump does not start or stops. The control panel of the controller indicates that the motor protective circuit breaker or protection equipment has tripped.	1. A phase is missing. 2. The driver is momentarily overloaded. 3. The impeller is clogged by impurities. 4. The motor protective circuit breaker is not set correctly. 5. The thermal switches have tripped due to insufficient motor cooling. 6. The moisture switch in the motor has tripped. 7. The motor cable is defective. 8. The voltage is fluctuating.	1. Contact the power supplier. 2. Reference the driver manufacturer for troubleshooting. 3. Clear the blockage. 4. Reference the driver manufacturer for troubleshooting. 5. Reference the driver manufacturer for troubleshooting. 6. Reference the driver manufacturer for troubleshooting. 7. Replace the motor cable. 8. Ensure the voltage is within the range of the driver.
The pump runs but does not deliver the rated flow.	1. The direction of rotation is wrong. 2. The impeller is worn or loose. 3. The pump or pipes are blocked by impurities. 4. The pump head is too high. 5. there is air in the pump or inlet pipe. 6. The pumped liquid is too dense. 7. The pump is not properly connected to the coupling. 8. The pipes are leaking.	1. Interchange two phases to the driver. 2. Tighten or adjust the impeller trim. 3. Clear the debris. 4. Measure the differential pressure and compare to the pump curve. Clear any debris in the outlet pipe. 5. Vent the pump and inlet pipe. 6. Dilute the fluid. 7. Verify the alignment and connections are properly fastened. 8. Repair the pipes.
The pump is vibrating or emitting excessive noise.	1. The pump is partially clogged by impurities. 2. The direction of rotation is wrong. 3. The pump is operating outside of the specified operating range. 4. The pump is defective. 5. The pump is not properly connected to the coupling. 6. The pump foundation is damaged. 7. The pump is cavitating. 8. The impeller is not balanced.	1. Clear the debris. 2. Interchange two phases to the driver. 3. Operate the pump at the specified duty point. 4. Repair the pump using an approved service provider. 5. Verify the alignment and connections are properly fastened. 6. Inspect the foundation. If damaged, uninstall the pump and repair the foundation. 7. Ensure the pump has the required net positive suction head. 8. Contact an approved service provider.

## 10. Servicing the product

## 10.1 Preventative maintenance schedule

To ensure satisfactory operation of the pumping equipment, frequent inspection, and periodic maintenance is required.

An inspection and maintenance log should be kept and the inspector must immediately report any problems. Unusual applications with abnormal heat, moisture, dust, or other adverse

conditions will require more frequent inspection and service. A suggested guide for normal applications preventative maintenance is provided below:

Component	Recommended lubricant	Frequency	Method
Bearing frame: thrust and radial bearings <b>(grease lubricated)</b>	<ul style="list-style-type: none"> <li>Contact Grundfos</li> </ul>	<ul style="list-style-type: none"> <li>Every 1500 operating hours.</li> </ul>	<ul style="list-style-type: none"> <li>Add 0.5-1 oz of grease to fitting in the bearing frame.</li> </ul>
Bearing frame: thrust and radial bearings <b>(oil lubricated)</b>	<ul style="list-style-type: none"> <li>Contact Grundfos</li> </ul>	<ul style="list-style-type: none"> <li>Before every startup.</li> <li>Once a week.</li> <li>Change the oil every 3000 operating hours.</li> </ul>	<ul style="list-style-type: none"> <li>Visually inspect the sight glass.</li> <li>Refill when the level falls below the halfway point.</li> </ul>
Packing <b>(grease lubricated)</b>	<ul style="list-style-type: none"> <li>Contact Grundfos</li> </ul>	<ul style="list-style-type: none"> <li>Every 24 hours of operation.</li> <li>If automatic grease lubrication system is used, refer to manufacturer's lubricant recommendations.</li> </ul>	<ul style="list-style-type: none"> <li>Stop the pump and add grease to the stuffing box.</li> <li>Equip the pump with an automatic lubrication system.</li> </ul>
Packing <b>(water lubricated)</b>	<ul style="list-style-type: none"> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Continuously during operation</li> </ul>	<ul style="list-style-type: none"> <li>Visually inspect for slow and steady weepage of water.</li> <li>Water lubrication is provided from the pumped fluid.</li> <li>Equip the pump with a freshwater flow system.</li> </ul>
Mechanical seal <b>(water lubricated)</b>	<ul style="list-style-type: none"> <li>Water</li> </ul>	<ul style="list-style-type: none"> <li>Refer to manufacturers recommendation.</li> </ul>	<ul style="list-style-type: none"> <li>Check flow meter to verify flow.</li> <li>Equip the pump with a freshwater flow system.</li> </ul>
Shafting	<ul style="list-style-type: none"> <li>Reference manufacturer recommendations.</li> </ul>		
Pump general inspection		<ul style="list-style-type: none"> <li>Once a week.</li> </ul>	<ul style="list-style-type: none"> <li>Visually inspect all system components.</li> <li>Verify controller operating modes.</li> <li>Keep the pit dry and clean.</li> </ul>

## 11. Disposing of the product

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

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

See also end-of-life information at [www.grundfos.com/product-recycling](http://www.grundfos.com/product-recycling)

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