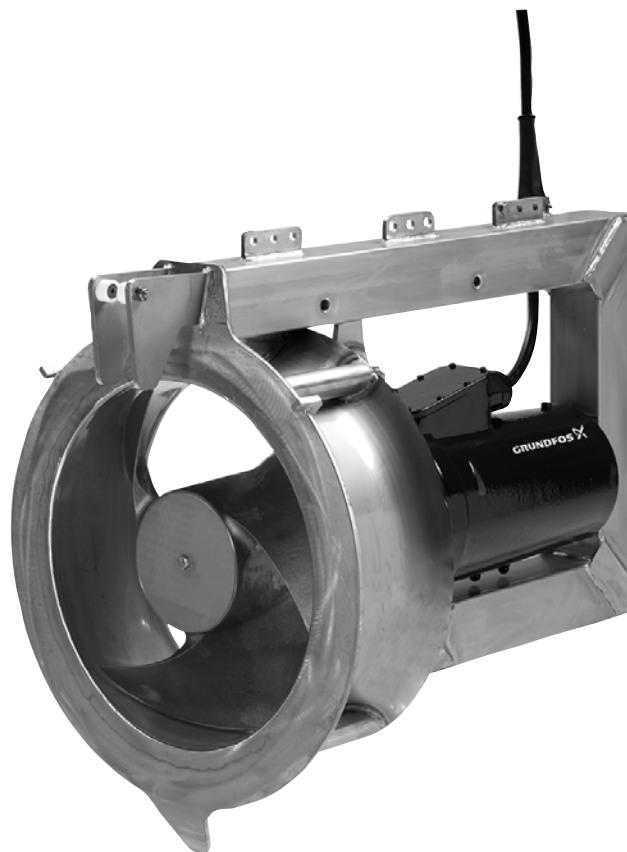


SRG

60 Hz, North America

Installation and operating instructions



English (US) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos SRG 60 Hz recirculation pumps.

Sections 2-6 gives the information necessary to unpack, install and start up the product in a safe way.

Sections 7-11 give important information about the product, as well as, information on service, fault finding, and disposal of the product.

CONTENTS

	Page
1. Limited warranty	2
2. General information	3
2.1 Symbols used in this document	3
3. Safety instructions	3
4. Receiving the product	4
4.1 Transporting the product	4
4.2 Inspecting the product	4
4.3 Storing the product	4
5. Installing the product	5
5.1 Positioning	5
5.2 Torques	6
5.3 Mechanical installation	6
5.4 Electrical connection	8
5.5 Electrical protection	10
5.6 Protection against electro-chemical corrosion	11
6. Starting-up the product	12
7. Product introduction	12
7.1 Applications	12
7.2 Identification	13
8. Servicing the product	14
8.1 Contaminated pump	14
8.2 Service chart	15
8.3 Oil	16
8.4 Changing the oil	16
9. Fault finding the product	17
10. Technical data	18
10.1 General technical data	18
10.2 Motor	18
10.3 Gearbox	18
10.4 Shaft seals	18
10.5 Impeller	18
10.6 Sound pressure level	18
11. Disposing of the product	18



Prior to installation, read this document. Installation and operation must comply with local regulations and accepted codes of good practice.

The use of this product requires experience with and knowledge of the product.



Persons with reduced physical, sensory or mental capabilities must not use this product, unless they are under supervision or have been instructed in the use of the product by a person responsible for their safety.

Children must not use or play with this product.

1. Limited warranty

New equipment manufactured by seller or service supplied by seller is warranted to be free from defects in material and workmanship under normal use and service for a minimum of twelve (12) months from date of installation, eighteen (18) months from date of shipment, unless otherwise stated in product warranty guide (available upon request). In the case of spare or replacement parts manufactured by seller, the warranty period shall be for a period of twelve months from shipment. Seller's obligation under this warranty is limited to repairing or replacing, at its option, any part found to its satisfaction to be so defective, provided that such part is, upon request, returned to seller's factory from which it was shipped, transportation prepaid. Parts replaced under warranty shall be warranted for twelve months from the date of the repair, not to exceed the original warranty period. This warranty does not cover parts damaged by decomposition from chemical action or wear caused by abrasive materials, nor does it cover damage resulting from misuse, accident, neglect, or from improper operation, maintenance, installation, modification or adjustment. This warranty does not cover parts repaired outside seller's factory without prior written approval. Seller makes no warranty as to starting equipment, electrical apparatus or other material not of its manufacture. If purchaser or others repair, replace, or adjust equipment or parts without seller's prior written approval, seller is relieved of any further obligation to purchaser under this paragraph with respect to such equipment or parts, unless such repair, replacement, or adjustment was made after seller failed to satisfy within a reasonable time seller's obligations under this paragraph. Seller's liability for breach of these warranties (or for breach of any other warranties found by a court of competent jurisdiction to have been given by seller) shall be limited to: (a) accepting return of such equipment exw plant of manufacture, and (b) refunding any amount paid thereon by purchaser (less depreciation at the rate of 15 % per year if purchaser has used equipment for more than thirty [30] days), and canceling any balance still owing on the equipment, or (c) in the case of service, at seller's option, redoing the service, or refunding the purchase order amount of the service or portion thereof upon which such liability is based. These warranties are expressly in lieu of any other warranties, express or implied, and seller specifically disclaims any implied warranty of merchantability or fitness for a particular purpose, and in lieu of any other obligation or liability on the part of the seller whether a claim is based upon negligence, breach of warranty, or any other theory or cause of action. In no event shall seller be liable for any consequential, incidental, indirect, special or punitive damages of any kind. For purposes of this paragraph, the equipment warranted shall not include equipment, parts, and work not manufactured or performed by seller. With respect to such equipment, parts, or work, seller's only obligation shall be to assign to purchaser the warranties provided to seller by the manufacturer or supplier providing such equipment, parts or work. No equipment furnished by seller shall be deemed to be defective by reason of normal wear and tear, failure to resist erosive or corrosive action of any fluid or gas, purchaser's failure to properly store, install, operate, or maintain the equipment in accordance with good industry practices or specific recommendations of seller, including, but not limited to seller's installation and operation manuals, or purchaser's failure to provide complete and accurate information to seller concerning the operational application of the equipment.

2. General information

This booklet includes instructions for installing, starting-up and servicing Grundfos 60 Hz recirculation pumps, type SRG, designed for transfer of liquids of low to medium viscosity (≤ 500 cSt (mPas)) from one tank to another.

2.1 Symbols used in this document



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 text accompanying the three hazard symbols DANGER, WARNING and CAUTION will be structured in the following way:



SIGNAL WORD

Description of hazard

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



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.



Notes or instructions that make the work easier and ensure safe operation.

3. Safety instructions

DANGER

Electric shock



Death or serious personal injury

- Before starting any work on the product, make sure that the fuses have been removed or the mains switch has been switched off. Make sure that the power supply cannot be accidentally switched on.

These safety instructions as well as the instructions in each individual section must be followed when transporting, storing, handling and operating the pump.



The pump must be installed, connected, started up and serviced by qualified persons.

Beware of rotating parts.

Make sure that persons cannot accidentally fall into the tank, e.g. by installing a cover or railing.

Receiving the product



Make sure that the pump cannot roll or fall over.



Before attempting to lift or otherwise handle the individual components of the pump, observe any local regulations that set limits for the weight of the components to be lifted manually by individuals, i.e. handled without the use of lifting equipment.

Installing the product

DANGER

Electric shock



Death or serious personal injury

- Make sure the power supply to the control cabinet has been switched off.

DANGER

Electric shock



Death or serious personal injury

- Before making any electrical connections, make sure that the fuses have been removed or the mains switch has been switched to off. Make sure that the power supply cannot be accidentally switched on.

DANGER

Electric shock



Death or serious personal injury

- When adjusting the relay, beware of electric voltage.

Starting-up the product**CAUTION****Pressurized System**

- Minor or moderate personal injury
- As pressure may have built up in the oil chamber, do not remove the oil level bolt until the pressure has been fully relieved.



Make sure that no persons can fall into the tank.

Servicing the product

Before starting work on the pump,

- make sure that the fuses have been removed or the mains switch has been switched off
- make sure that the power supply cannot be accidentally switched on
- make sure all rotating parts have stopped moving.

**CAUTION****Biological hazard**

- Minor or moderate personal injury
- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.

CAUTION**Pressurized system**

- Minor or moderate personal injury
- As pressure may have built up in the oil chamber, do not remove the oil level bolt until the pressure has been fully relieved.

Fault finding the product

Before starting work on the pump,

- make sure that the fuses have been removed or the mains switch has been switched off
- make sure that the power supply cannot be accidentally switched on
- make sure all rotating parts have stopped moving.

**4. Receiving the product****4.1 Transporting the product**

The individual components of the pump must be packed carefully to prevent any damage to the surface protection during transportation.



Make sure that the pump cannot roll or fall over.



Before attempting to lift or otherwise handle the individual components of the pump, observe any local regulations that set limits for the weight of the components to be lifted manually by individuals, i.e. handled without the use of lifting equipment.



All lifting equipment must be rated for the purpose and checked for damage before any attempts to lift the components are made. The lifting equipment rating must under no circumstances be exceeded.

4.2 Inspecting the product

Do not install a damaged pump.

On delivery, the pump and any accessories supplied with it must be checked for transport damage. This also applies when the equipment is delivered to the installation site.

If the pump or any accessories have been damaged during transportation, contact your local Grundfos company before continuing to install the equipment. Do not dismantle a damaged new component for further inspection, unless instructed by your local Grundfos company.

The packaging material must be disposed of according to local regulations.

4.3 Storing the product

The pump must be stored in a dry location in which the temperature is not subject to major fluctuations.

If the pump has been stored for more than one year, the gearbox oil must be changed. The oil must be changed even if the pump has never been in use. This is necessary because of natural aging of mineral oil lubricants.

5. Installing the product

During installation, the pump must only be lifted when using the suspension point.

The lifting equipment supplied with the pump as well as the wire used for lifting and lowering the pump into the tank must not be used as universal lifting equipment.



- Never hang the pump by the power supply cable.
- Never let the pump run while suspended from the lifting equipment.

5.1 Positioning

Correct positioning of the pump is essential to ensure trouble-free operation and long life. The following guidelines must be observed:

- If more pumps are installed in the same tank, they must not generate opposite flows.
- The distance from the center of the pump to the tank bottom (H_{\min}) must be equal to the impeller diameter. See fig. 1.
- The distance from the top of the pump rack to the liquid surface (H_{ABOVE}) must fulfil one of the following two requirements:
 - For pumps with vortex shield, the distance must at least be equal to the impeller diameter.
 - For pumps without vortex shield, the distance must at least be equal to 1.5 times the impeller diameter. See fig. 1.

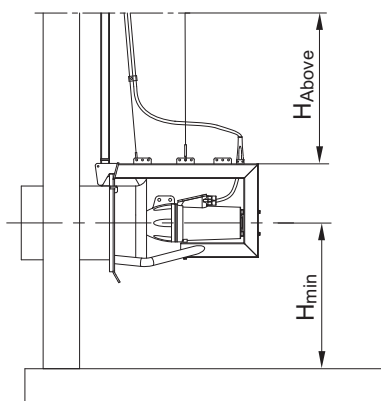


Fig. 1 Distance to liquid surface and tank bottom

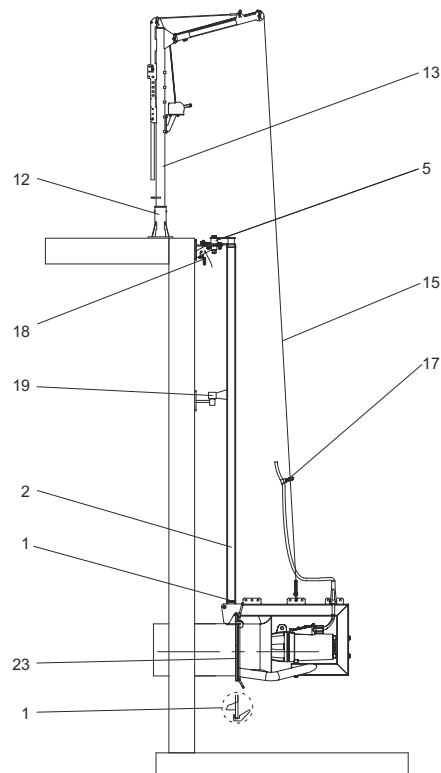


Fig. 2 Open installation

Pos.	Designation
1	Bottom fixation bracket and guide claws on connection flange*
2	Column profile
5	Top fixation bracket
12	Crane foot
13	Crane with winch and lifting wire
15	Lifting wire incl. wire clamp
17	Cable clamp
18	Cable sock, incl. shackle $\varnothing 10$
19	Intermediate fixation bracket
23	Connection flange

* Guide claws are only available for SRG.xx.32.

TM02 9478 0215

TM04 3962 0215

5.2 Torques

All nuts and bolts used for the installation must be made of stainless steel.

Use grease (Alu-paste) together with a spring washer or lock nut; otherwise, use Loctite or a similar product for lubrication and locking.

Tighten all stainless-steel nuts and bolts to the following torques:

Size	Bolts ASTM F593 (V/W) [lbf (Nm)]
1/4" (M6)	6.5 (8.8)
5/16" (M8)	15.8 (21.4)
7/16" (M10)	32.5 (44)
1/2" (M12)	54.6 (74)
5/8" (M16)	135 (183)
3/4" (M20)	273 (370)

5.2.1 Anchor bolts

Anchor bolts used for mounting components in concrete must have the following pull-out strength:

Size	Pull-out strength [kipf (kN)]
1/2" (M12)	1.35 (6)
5/8" (M16)	3.15 (14)

5.3 Mechanical installation

See section 5.2 *Torques* and fig. 2.

1. Weld the connection flange to the cast-in pipe end in the tank.
2. Weld the profile section to the connection flange and pipe end. Place it in position 12 o'clock.

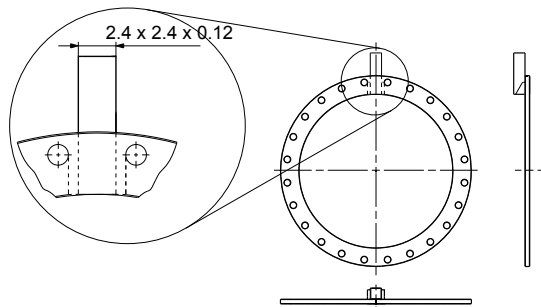


Fig. 3 Profile section on connection flange

TM03 0572 0205

3. SRG.xx.32.xx: Weld the guide claws to the connection flange. See fig. 4.

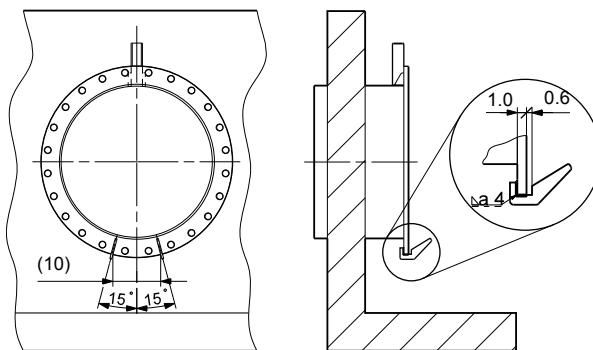


Fig. 4 Position of guide claws

TM03 3028 0106

4. Drill the holes for the anchor bolts for the top fixation bracket in the concrete.
5. Mount the bolts and fit the top fixation bracket.
6. Depending on the length of the column profile, weld the turnable part of an intermediate fixation bracket to the column profile.

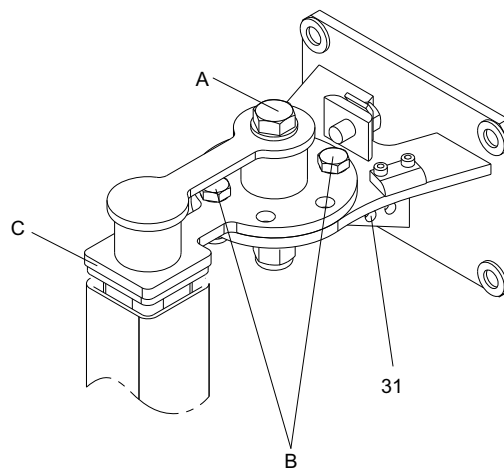


Fig. 5 Top fixation

TM04 2719 2908

7. Position and align the column profile with the profile section on the connection flange. Shorten the column profile (2) to the correct length to match the position of epoxy insulator (C) at the top fixation bracket. A gap of 0.20 to 0.40 in (5 to 10 mm) between collar of epoxy and column profile is optimal. See fig. 5.
8. Remove the epoxy insulator and the turnable metal part by removing the centre bolt (A) and the two fixation bolt (B).
9. Adapt the outside of the square epoxy insulator to the inside of the column profile. The epoxy insulator must fit tightly inside the column profile.

10. Place the column profile on the profile section on the connection flange and mount the top end with the epoxy insulator and the turnable metal part on the already installed top fixation bracket. Tighten the three bolts (A) and (B) in the desired position. It is possible to adjust the angle in steps of 7.5 °.
11. Fit an intermediate fixation bracket to the turnable part welded on to the profile tube in step 6. Drill holes in the tank wall, fit bolts in the bracket and tightening the bolts.
12. Drill the holes for the mounting bolts for the crane foot in the concrete.
13. Mount the crane foot and fit and tighten the bolts.
14. Mount the lifting wire on the pump rack using the shackle. See fig. 6.

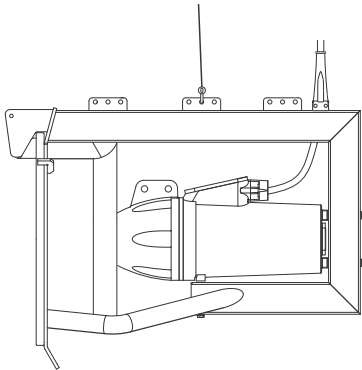


Fig. 6 Mounting of lifting wire on the pump rack

15. Mount the top end of the safety wire to the hole (31, fig. 5) of the top fixation bracket by means of a shackle. The other end of the safety wire ends in a shackle through which the lifting wire must run.

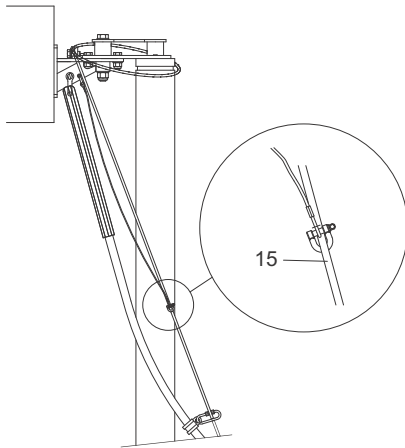


Fig. 7 Safety wire

16. Fix the power supply cable to the lifting wire by means of a cable clamp approx. 2.6 ft (0.8 m) above the pump. This will prevent the cable from falling down and becoming entangled in the impeller during operation. Connect the cable clamp to the lifting wire above the wire clamp by means of a snap hook. See fig. 8. Attach the power supply cable to the lifting wire by means of cable clamps placed at 3 ft (~1 m) intervals.

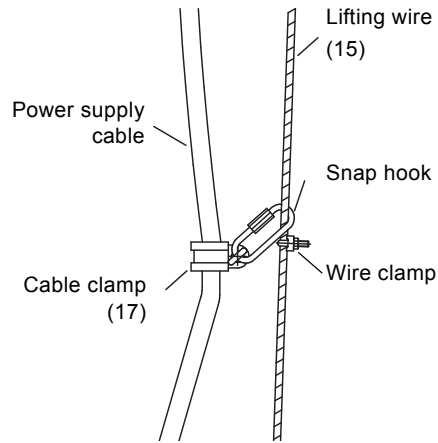


Fig. 8 Attaching the power supply cable to the lifting wire

17. Position the crane in the foot and mount the lifting wire in the drum of the winch.



Always leave at least three turns of wire on the drum. Otherwise the wire may break loose from the drum fixation.



Follow the separate installation and operating instructions for cranes.

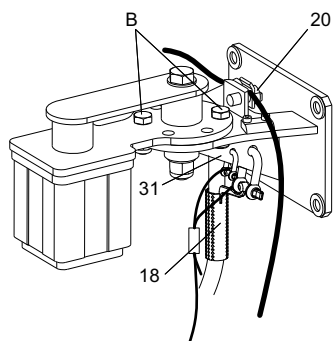
18. Lift the complete pump (pump rack with motor) using the crane and slide it over the column profile.
19. Slowly lower the pump into the tank and down to position on the connection flange.

TM04 4006 0215

TM04 3932 4914

TM02 4938 1802

20. Mount the cable sock (18) to the top fixation bracket using the shackle, and pull the motor cable through it to the desired position. See fig. 9. The power supply cable should be slightly tightened.



TMD04 3929 2813

Fig. 9 Top fixation bracket with lifting and safety wires and cable sock



Remove the lifting wire from the crane before starting the pump.

21. Remove the lifting wire from the winch and fit it to the wire clamping (20) on the top fixation bracket.
Use the lifting wire as a relief for the power supply cable. For this reason, the lifting wire must always be tightened.

DANGER



Electric shock

Death or serious personal injury
- Make sure the power supply to the control cabinet has been switched off.

22. Connect the power supply cable to the terminals in the control cabinet.

5.4 Electrical connection

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

All national and local regulations relating to safety and accident prevention must be observed.

DANGER

Electric shock



Death or serious personal injury

- Before making any electrical connections, make sure that the fuses have been removed or the mains switch has been switched to off. Make sure that the power supply cannot be accidentally switched on.

The supply voltage and frequency are marked on the pump nameplate. Make sure that the pump is suitable for the power supply available at the installation site.

The pump is supplied complete with a power supply cable of 33 ft (10 m) which is standard length suitable for up to 22 ft (7 m) deep tanks. Standard cable lengths are 33 and 49 ft (10 and 15 m), longer cables are available on request. See section [7.2 Identification](#).

The motor is marked either with a Y (star) or Δ (delta). Make this connection in an external control panel using conductors 1 to 6 of the power supply cable.

Figure 10 shows a schematic drawing of these star and delta connections. See also section [5.4.2 Wiring diagrams](#).

5.4.1 Starting method

Start the recirculation pump via a soft starter or frequency converter.

5.4.2 Wiring diagrams

For voltage and starting method 1H, wire the motor using the delta connection. For voltage and starting method 0H, wire the motor using the star connection method. Connection methods are shown in fig. 10. See also section 7.2.2 Nameplate, fig. 16, position 1 and section 7.2.1 Type key to determine your pump's voltage and starting method.

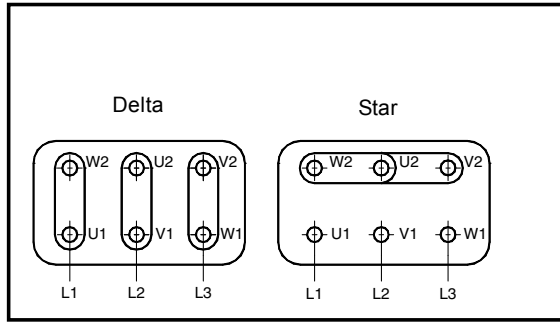


Fig. 10 Schematic drawing of delta and star connection

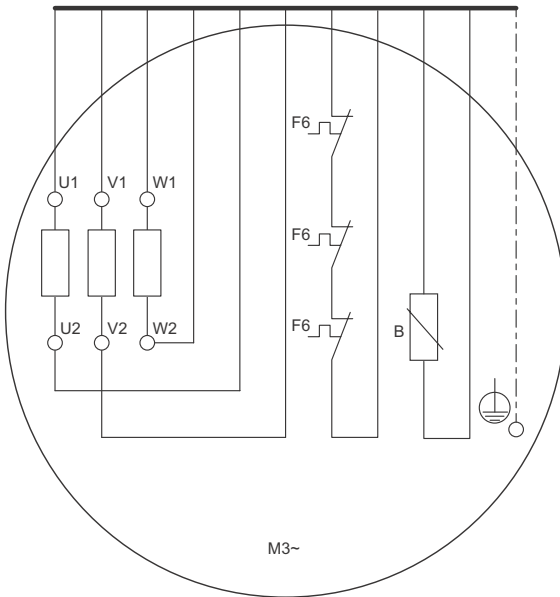


Fig. 11 Three thermal switches (PTO)

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U1, U2, V1, V2, W1, W2)
11, 12	Thermal switches (F6)
21, 22	Leak sensor in gearbox (B)

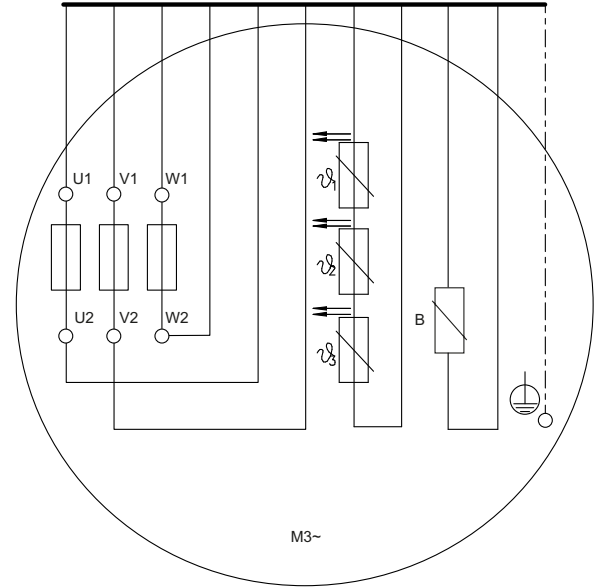


Fig. 12 Three PTC sensors

Terminals	Description
1, 2, 3, 4, 5, 6	Ends of the three stator windings (U1, U2, V1, V2, W1, W2)
31, 32	PTC sensors (according to DIN 44 081) (ϑ1, ϑ2, ϑ3)
21, 22	Leak sensor in gearbox (B)

5.4.3 Direction of rotation

When the electrical connections have been carried out, check that the impeller is rotating in the correct direction. When viewed from the motor, the impeller must rotate clockwise. An arrow on the motor housing shows the correct direction of rotation.

If the impeller rotates in the wrong direction, interchange two phases of the mains supply (L1, L2, L3).

5.4.4 Frequency converter operation

All SRG pumps are designed for frequency converter operation for energy saving and for soft start. For frequency converter operation, please observe the following information:

- Requirements must be fulfilled.
- Recommendations ought to be fulfilled.
- Consequences must be considered.

5.4.5 Requirements

- Peak voltage and dU/dt must be in accordance with the table below. The values stated are maximum values supplied to the motor terminals. The cable influence has not been taken into account. See the frequency converter data sheet regarding the actual values and the cable influence on the peak voltage and dU/dt.

Product type	Maximum repetitive peak voltage [V]	Maximum dU/dt [V/μs]
SRG.xx.30	1500	15000
SRG.35.50		
SRG.xx.xx	1000	3000

- In case the above values are too high, a dU/dt filter could prevent the voltage peaks.
- The thermal protection of the motor must be connected.
- Do not exceed the frequency indicated on the nameplate. Otherwise, there is a risk of motor overload.
- Local regulations or standards must be fulfilled.

5.4.6 Recommendations

- Do not reduce the motor speed to less than 30 % of the rated speed.
- Do not set any slip compensation, as it may lead to an over speed and therefore to motor overload.
- Set the frequency converter U/f ratio to a linear relation, and use the data from the motor nameplate for settings about rated current, power, voltage and frequency.
- Use input and output filters on the frequency converter. See data sheet for the frequency converter used.
- Keep the power cable as short as possible. The peak voltage will increase with the length of the power cable. See data sheet for the frequency converter used.
- Use a screened power cable if there is a risk that electrical noise can disturb other electrical equipment. See data sheet for the frequency converter used.
- Ramp-up and ramp-down time must be at least 5-10 seconds.

5.4.7 Consequences

- When operating the product via a frequency converter, please be aware of these possible consequences:
- The locked-rotor torque will be lower. How much lower will depend on the frequency converter type. See the installation and operating instructions for the frequency converter used for information on the locked-rotor torque available.
- The working condition of bearings and shaft seal may be affected. The possible effect will depend on the application. The actual effect cannot be predicted.
- The acoustic noise level may increase. See the installation and operating instructions for the frequency converter for advice as to how to reduce the acoustic noise.

5.5 Electrical protection

5.5.1 Motor protection

The pumps are provided with the following type of motor protection:

Standard SRG pumps incorporate three bimetallic PTO thermal switches (PTO = Protection Thermique à Ouverture). See fig. 11.

Function of thermal switches

The motor is protected against overheating by three thermal switches connected in series, one switch in each winding.

When the maximum winding temperature is reached, the switch will open the circuit and stop the motor.

When the windings have cooled to normal temperature, the switch will close the circuit and the motor can be restarted. Manual restarting is necessary.

See wiring diagram in fig. 11.

Thermal switches (F6)

- Two conductors (terminals 11 and 12).
- Maximum operating voltage of switch: 250 V.
- Maximum switching current: 2.5 A at $\cos \varphi = 1$.
- Cutting-out temperature: 150 °C.

Function of PTC sensors (optional)

The motor is protected against overheating by three thermal sensors connected in series, one in each winding. When overheated, the motor will stop. Automatic restarting is not permitted in such cases. This requires a thermistor trigger unit with a reconnection suppressor in the control circuit of the motor contactor.

See wiring diagram in fig. 12.

ϑ1, ϑ2, ϑ3: PTC sensors:

- Two conductors (terminals 31 and 32).
- Maximum voltage at the terminals: $U_{\max} = 2.5 \text{ V (AC/DC)}$.
- Resistance between terminals 31 and 32:
 - at room temperature $R = 150 \text{ to } 750 \ \Omega$.
 - at cutting-out temperature 266 °F (130 °C) $R \geq 4000 \ \Omega$.



For transmission tests at terminals 31 and 32, the test voltage must not exceed 2.5 V (AC/DC).

Use an ohmmeter for the test.

5.5.2 Gearbox protection

The gearbox is monitored for the ingress of water by a leak sensor incorporated in the gearbox.

If the monitoring function is required, the leak sensor must be connected to a Grundfos relay.



The cable between the relay and the pump must not be longer than 164 ft (50 m).

For a longer distance, use an additional, screened cable. An external alarm indicator, if any, must be connected to the potential-free outputs, terminals 1 and 3 or 4, respectively. Maximum load: 250 V, 5 A.

When the Grundfos leakage relay is connected, a current of up to 10 mA will flow through the leak sensor (terminals 5 and 7 in fig. 13 connected to wires 21 and 22). If water penetrates into the oil chamber, the relay will trigger an alarm signal and/or switch off the motor.

See wiring diagram in fig. 11 or 12.

Leak sensor

- Two conductors (terminals 21 and 22).
- Maximum operating voltage: Approx. 12 V.
- Maximum current: 1 to 10 mA.

DANGER

Electric shock

Death or serious personal injury
- When adjusting the relay, beware of electric voltage.



Do not check the leak sensor with an ohmmeter or other measuring instruments. The leak sensor is an electronic component.

5.5.3 Overload relays

The motor must be protected against overload via a thermal delay relay according to local regulations. The relay must be adjusted to the rated current stated on the nameplate.

5.6 Protection against electro-chemical corrosion

Two different metals or alloys cause electro-chemical corrosion if they are connected by an electrolyte. This applies if more than one pump is installed in the same tank. We recommend the following additional protection:

- galvanic separation of the earth conductor from the neutral conductor
- galvanic separation of the mains supply by means of an isolation transformer
- anode kit.

The earth conductor must be separated in such a way as to ensure that no direct current can flow through it. It must still function as a protective conductor. This can be achieved with a limiting unit (polarization cell or anti-parallel diode) or an isolation transformer.

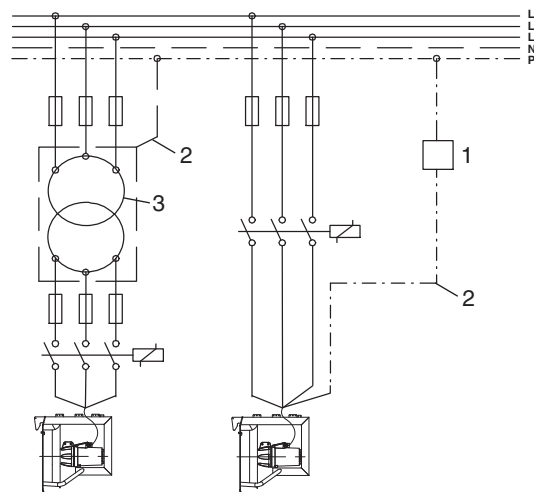


Fig. 13 Protection from electro-chemical corrosion

Pos.	Designation
1	Limiting unit
2	Earth conductor
3	Isolation transformer



When using an isolation transformer, the ratio between starting current and rated current (I_A/I_N) must not be altered.

TM02 9480 2704

6. Starting-up the product

Check the oil level in the gearbox before starting up the pump. The oil must fill up between 50 and 75 % of the gearbox.

CAUTION



Pressurized system

Minor or moderate personal injury

- As pressure may have built up in the oil chamber, do not remove the oil level bolt until the pressure has been fully relieved.

If required, fill oil into the gearbox through the oil filling hole (2 in fig. 14). For oil quality and quantity, see section 8.3 Oil.

If the pump has been in stock for a period before start-up, see section 8.2 Service chart.

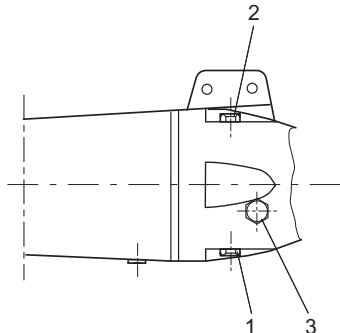


Fig. 14 Oil check and oil filling

Checks before start-up

1. Check that the impeller is rotating in the correct direction. See section 5.4.3 Direction of rotation.
2. Make sure that the pump is completely submerged in the liquid.



The pump must always be submerged during operation.

3. Make sure that there are no solid objects in the tank.



Make sure that no persons can fall into the tank.

7. Product introduction

Grundfos recirculation pumps, type SRG, are designed for transfer of liquids of low to medium viscosity from one tank to another.

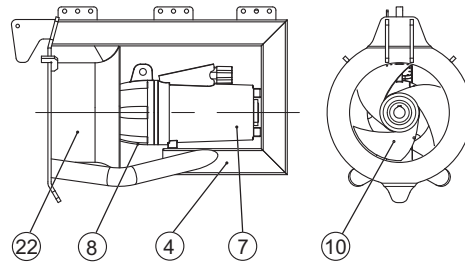


Fig. 15 SRG pump

Pos.	Description
4	Pump rack
7	Motor
8	Gearbox
10	Impeller
22	Hydraulic inlet

7.1 Applications

Grundfos SRG recirculation pumps are used for the pumping of return sludge in sewage treatment plants and for other pump applications involving a high flow rate and low head. The pumps are designed for continuous operation (S1).

In order not to overload the pumps and expose them to corrosion, the following limitations must be observed.

Liquid temperature	41 to 104 °F (5 to 40 °C)
pH value	4-10
Maximum dry solids content	1.5 %
Maximum dynamic viscosity	500 cSt (mPas)
Maximum density	66.2 lb/ft ³ (1060 kg/m ³)
Chloride content	≤ 200 ppm (mg/l) (stainless steel 304 (1.4301))

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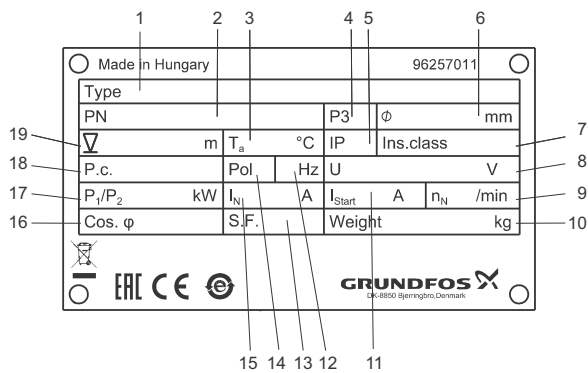
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7.2 Identification

7.2.1 Type key

Example	SRG	11.	12.	524.	08.	6.	0H.
Type range SRG: Submersible recirculation pump with gearbox							
Motor output power, P2 Code from type designation / 10 [hp] 11: 1.1 hp							
Impeller diameter [in] 12: 12 inches							
Impeller speed [RPM] 524: 524 RPM							
Impeller blade pitch [°] 08: 8 °							
Explosion protection []: Non-explosion-proof							
Frequency 6: 60 Hz							
Voltage and starting method 0H: 3 x 460 V, Star 1H: 3 x 460 V, Delta 0Z: Special, DOL							
Generation []: First generation A: Second generation B: Third generation Z: Custom-built products							

7.2.2 Nameplate



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Fig. 16 Nameplate

The nameplate is located on the motor housing. The details on the nameplate are required for ordering of spare parts.

Pos.	Description
1	Type designation
2	Product number
3	Liquid temperature range
4	Production site
5	Enclosure class according to IEC
6	Impeller diameter
7	Insulation class
8	Rated voltage
9	Rated speed (impeller)
10	Weight
11	Starting current
12	Frequency
13	Safety factor
14	Number of poles
15	Rated current
16	Power factor
17	Motor power P_1/P_2
18	Production code
19	Maximum installation depth

Fix the additional nameplate supplied with the pump in a visible position at the installation site.

8. Servicing the product

Before starting work on the pump,



- make sure that the fuses have been removed or the mains switch has been switched off
- make sure that the power supply cannot be accidentally switched on
- make sure all rotating parts have stopped moving.

Before starting any work on a pump used in liquids which could constitute a hazard to health, carry out thorough cleaning/venting of the pump, tank, etc. according to local regulations.

Always replace damaged parts by new approved parts. Do not recondition motor parts by machining, retapping, welding, etc.

8.1 Contaminated pump

CAUTION



Biological hazard

Minor or moderate personal injury

- Flush the pump thoroughly with clean water and rinse the pump parts in water after dismantling.

If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If you request Grundfos to service the product, contact Grundfos with details about the pumped liquid before returning the product. Otherwise Grundfos can refuse to accept the product for service.

Any application for service must include details about the pumped liquid.

The product must be cleaned in the best possible way before it is returned.

Costs of returning the product are to be paid by the customer.

8.2 Service chart

	Type	Service instructions	Lubrication	Inspection
Electric motor	All	Keep the motor housing clean (otherwise cooling is affected). The motor housing may only be dismantled by Grundfos.	The roller bearings are maintenance-free. They must be replaced if they get noisy.	
Power supply cable	All			Check the power supply cable twice a year for surface damage, strain, kinks, etc. If damaged, the cable must be replaced by Grundfos.
Gearbox	All	In case of wear, replace lip seal and wear ring. If the oil contains water, replace the shaft seal.	Change the oil whenever it contains water or is contaminated. Change the oil at least every two years. If refilling is required, see section 8.3 Oil .	If the shaft seal housing is not monitored for the ingress of water, we recommend that you make inspections every 6 months.
Impeller	All			Check the impeller regularly for wear and tear. Remove any material wound round the impeller, such as ropes, threads, etc. which may cause uneven running and oscillation of the installation. In case of strong turbulence, cleaning is absolutely necessary.
Winch	All	Spray the winch with a protective coating of oil at regular intervals to prevent corrosion.	The gear teeth and the bearing bushes must be lubricated twice a year with an all-purpose grease.	
Lifting wire	All	Regular oiling or greasing increases the life of the wire.		Check the wire regularly and always before using the winch. Replace the wire, if required.
Bolts	All	Always check that all bolts in the pump rack are properly tightened.	When tightening the bolts, renew the threadlocker if necessary.	

8.3 Oil

8.3.1 Oil quality

Gear oil designation according to ISO VG 68.

8.3.2 Oil quantity

Type	Gearbox [fluid oz (l)]
SRG.11.12.524.08	
SRG.15.12.628.08	
SRG.20.12.720.08	
SRG.26.12.805.08	
SRG.30.12.883.08	
SRG.40.12.513.25	40.6 (1.2)
SRG.55.12.607.25	
SRG.75.12.722.25	
SRG.95.12.805.25	
SRG.48.20.254.27	
SRG.68.20.299.27	
SRG.95.20.363.27	
SRG.135.20.406.27	
SRG.95.32.260.11	84.5 (2.5)
SRG.160.32.308.11	
SRG.175.32.355.11	
SRG.200.32.334.11	
SRG.270.32.374.11	135 (4.0)
SRG.320.32.418.11	

8.4 Changing the oil

Place the pump in a horizontal position on supports and place a pan underneath to collect the oil.

CAUTION



Pressurised system

Minor or moderate personal injury
- As pressure may have built up in the oil chamber, do not remove the oil level bolt until the pressure has been fully relieved.

1. Remove the bolt (2). See fig. 17.
2. Loosen and remove the oil drain bolt (1), and allow the oil to drain from the chamber into a glass. Leave the oil in the glass for approx. 10 minutes and check if it contains water. If the oil contains water, the shaft seal must be replaced.



Dispose of used oil in accordance with local regulations.

3. Clean and refit the oil drain bolt (1).
4. Fill oil into the oil chamber through the filling hole (2). Quantity according to section [8.3.2 Oil quantity](#).
5. Refit the bolt (2).

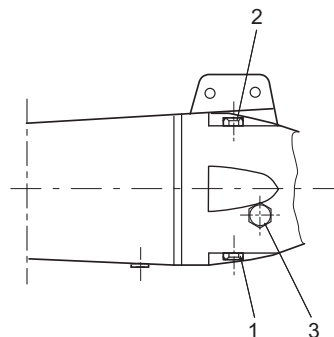


Fig. 17 Position of oil drain and oil filling bolts

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9. Fault finding the product



Before starting work on the pump,

- make sure that the fuses have been removed or the mains switch has been switched off
- make sure that the power supply cannot be accidentally switched on
- make sure all rotating parts have stopped moving.

Fault	Cause	Remedy
1. The pump does not start.	a) No power supply or supply failure.	Call an electrician.
	b) The power supply cable is faulty.	Call an electrician.
	c) The control system is faulty.	Call an electrician.
	d) The impeller cannot rotate freely.	Clean the impeller and check manually that it can rotate freely.
	e) The stator windings are faulty.	Contact Grundfos.
	f) The motor has cut out because of overheating.	Wait until the motor has cooled and attempt to restart the pump.
	g) Different phase voltages.	Call an electrician.
	h) The overload relay is set too low or is faulty.	Check the overload relay. Set the relay to the rated current. See section 5.5.3 Overload relays .
	i) The leak sensor has cut out the pump.	Contact Grundfos.
	j) There is humidity in the motor.	Contact Grundfos.
2. Pump starts, but stops immediately.	a) The stator windings are faulty.	Contact Grundfos.
	b) Different phase voltages.	Call an electrician.
	c) The overload relay is set too low or is faulty.	Check the overload relay. Set the relay to the rated current. See section 5.5.3 Overload relays .
	d) The leak sensor has cut out the pump.	Contact Grundfos.
	e) There is humidity in the motor.	Contact Grundfos.
3. No liquid or inadequate quantity is pumped even if the motor is running.	a) The impeller rotates in the wrong direction.	Interchange two phases of the mains supply.
	b) The pump runs on two phases.	1. Check the electrical connections. 2. Replace faulty fuses. 3. Call an electrician.
	c) The internal parts are worn.	Contact Grundfos.
	d) The impeller is dirty or damaged.	Clean the impeller and inspect for any wear.
4. Pump runs unevenly and makes noise.	a) The internal parts are worn.	Contact Grundfos.
	b) The impeller is dirty or damaged.	Clean the impeller and inspect for any wear.
	c) The motor or gearbox roller bearings are faulty.	Contact Grundfos.
	d) Oscillations caused by the installation (resonance).	Check installation design.
5. High current and power consumption.	a) Wrong voltage supply or supply failure.	Call an electrician.
	b) The power supply cable is faulty.	Call an electrician.
	c) The control system is faulty.	Call an electrician.
	d) The impeller cannot rotate freely.	Clean the impeller and check manually that it can rotate freely.
	e) The stator windings are faulty.	Contact Grundfos.
	f) The pump runs on two phases.	1. Check the electrical connections. 2. Replace faulty fuses. 3. Call an electrician.
	g) The internal parts are worn.	Contact Grundfos.
	h) The motor or gearbox roller bearings are faulty.	Contact Grundfos.

10. Technical data

10.1 General technical data

Voltage tolerance	+/- 10 % of nameplate value
Enclosure class	IP68
Insulation class	H
Maximum installation depth	66 ft (20 m) below liquid level
Maximum number of starts per hour	20
Length of power supply cable	33 and 50 ft (10 and 15 m) (standard)*
Wire length on all winches	33 ft (10 m) (standard)

* Other cable lengths are available on request.

10.2 Motor

Maximum installation depth	66 ft (20 m) below the liquid surface
Maximum number of starts per hour	20
Enclosure class	IP68
Insulation class	H
Material, motor housing	Cast iron, ASTM 48 class 35B (EN-GJL-250)

10.3 Gearbox

Type	Planetary gearbox
Gears	Hardened and ground steel
Monitoring of shaft seal	Leak sensor incorporated in gearbox
Drive-end bearings	Two tapered roller bearings
Material, gear casing	Cast iron, ASTM 48 class 35B (EN-GJL-250)

10.4 Shaft seals

SRG	Two lip seals and one mechanical shaft seal made of tungsten carbide/tungsten carbide or SiC/SiC
-----	--

10.5 Impeller

Number of blades	3	
Nominal diameter	SRG.xx.12.xxx	12 in (300 mm)
	SRG.xx.20.xxx	20 in (500 mm)
	SRG.xx.32.xxx	32 in (800 mm)
Construction	Self-cleaning, optimum flow design	
Material	Stainless steel	CF8M or 316SS (1.4408 or 1.4581)

10.6 Sound pressure level

The sound pressure level of the pump is lower than 70 dB(A).

11. Disposing of the product

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

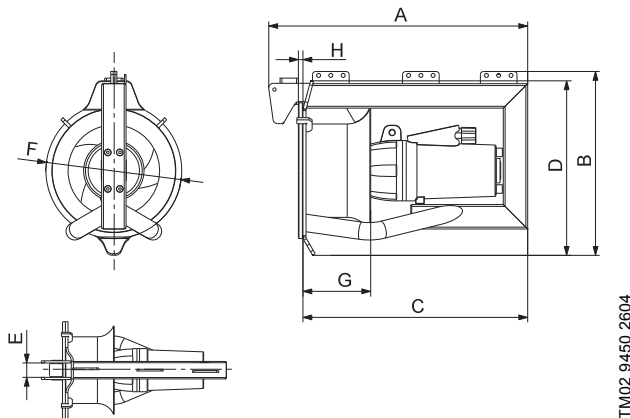
1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheeled 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. See also end-of-life information at www.grundfos.com/product-recycling.

1. Dimensions and weights

1.1 SRG Pump



1.2 60 Hz

Pump type	P ₂ [hp (kW)]	A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	E [in (mm)]	F [in (mm)]	G [in (mm)]	H [in (mm)]	Weight [lb. (kg)]
SRG.11.12.524.	1.1 (0.8)									
SRG.15.12.628.	1.5 (1.1)									
SRG.20.12.720.	2.0 (1.5)	33.4 (848)	23.7 (602)	29.0 (736)	22.5 (571)	2.59 (66)	17.5 (445)	8.66 (220)	0.6 (15)	240 (109)
SRG.26.12.805.	2.6 (1.9)									
SRG.30.12.883.	3.0 (2.2)									
SRG.40.12.513.	4.0 (3.0)	33.4 (848)	23.7 (602)	29.0 (736)	22.5 (571)	2.59 (66)	17.5 (445)	8.66 (220)	0.6 (15)	247 (112)
SRG.55.12.607.	5.5 (4.0)									
SRG.75.12.722.	7.5 (5.5)	33.4 (848)	23.7 (602)	29.0 (736)	22.5 (571)	2.59 (66)	17.5 (445)	8.66 (220)	0.6 (15)	265 (120)
SRG.95.12.805.	9.5 (7.0)									
SRG.48.20.254.	4.8 (3.5)	35.8 (910)	32.9 (835)	29.8 (757)	32.4 (824)	2.59 (66)	26.4 (670)	9.06 (230)	0.98 (25)	331 (150)
SRG.68.20.299.	6.8 (5.0)									
SRG.95.20.363.	9.5 (7.0)	44.1 (1119)	33.7 (855)	39.2 (996)	32.4 (824)	2.59 (66)	26.4 (670)	9.06 (230)	0.98 (25)	529 (240)
SRG.135.20.406.	13.5 (10.0)	44.1 (1119)	33.7 (855)	39.2 (996)	32.4 (824)	2.59 (66)	26.4 (670)	9.06 (230)	0.98 (25)	564 (256)
SRG.95.32.260.	9.5 (7.0)	44.4 (1129)	48.7 (1237)	39.6 (1006)	48.2 (1225)	2.59 (66)	40.0 (1015)	10.5 (267)	0.98 (25)	736 (334)
SRG.160.32.308.	16.0 (12.0)									
SRG.175.32.355.	17.5 (13.0)	44.4 (1129)	48.7 (1237)	39.6 (1006)	48.2 (1225)	2.59 (66)	40.0 (1015)	10.5 (267)	0.98 (25)	772 (350)
SRG.200.32.334.	20.0 (15.0)									
SRG.270.32.374.	27.0 (20.0)	46.5 (1181)	49.5 (1257)	41.7 (1058)	48.2 (1225)	2.59 (66)	40.0 (1015)	10.5 (267)	0.98 (25)	948 (430)
SRG.320.32.418.	32.0 (24.0)									

USA

Grundfos Water Utility Inc.
3905 Enterprise Court
P.O. Box 6620
Aurora, IL 60598-0620
Phone: +1-630-236-5500
Fax: +1-630-236-5511

GRUNDFOS Kansas City
9300 Loiret Blvd.
Lenexa, Kansas 66219
Phone: +1-913 227 3400
Fax: +1-913 227 3500

www.grundfos.us

Canada

GRUNDFOS Canada
2941 Brighton Road
Oakville, Ontario L6H 6C9 Canada
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

www.grundfos.ca

México

GRUNDFOS México
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
C.P. 66600 Apodaca, N.L. México
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

www.grundfos.mx

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