Hydro Solo-S

Installation and operating instructions

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(GB) Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the products Hydro Solo-S, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Machinery Directive (2006/42/EC).
  Standards used: EN 809: 1998 and EN 60204-1: 2006.
- Low Voltage Directive (2006/95/EC).
  Standards used: EN 60335-1: 2002 and EN 60335-2-41: 2003.
- EMC Directive (2004/108/EC).
  Standards used: EN 61000-6-2: 2005 and EN 61000-6-3: 2007.
- Pressure Equipment Directive (97/23/EC).
  Standard used: EN 13831: 2007.

(D) Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte Hydro Solo-S, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

- Maschinenrichtlinie (2006/42/EG).
  Normen, die verwendet wurden: EN 809: 1998 und EN 60204-1: 2006.
- Niederspannungsrichtlinie (2006/95/EG).
  Normen, die verwendet wurden: EN 60335-1: 2002 und EN 60335-2-41: 2003.
- EMV-Richtlinie (2004/108/EG).
  Normen, die verwendet wurden: EN 61000-6-2: 2005 und EN 61000-6-3: 2007.
- Richtlinie über Druckeinrichtungen (97/23/EG).
  Norm, die verwendet wurde: EN 13831: 2007.

(F) Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits Hydro Solo-S, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous :

- Directive Machines (2006/42/CE).
  Normes utilisées : EN 809: 1998 et EN 60204-1: 2006.
- Directive Basse Tension (2006/95/CE).
  Normes utilisées : EN 60335-1 : 2002 et EN 60335-2-41 : 2003.
- Directive Compatibilité Electromagnétique CEM (2004/108/CE).
  Normes utilisées : EN 61000-6-2: 2005 et EN 61000-6-3: 2007.
- Directive concernant les équipements sous pression (97/23/CE).
  Norme utilisée : EN 13831: 2007.

(S) Försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkterna Hydro Solo-S, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende:

- Maskindirektivet (2006/42/EG).
  Tillämpade standarder: EN 809: 1998 och EN 60204-1: 2006.
- Lågspänningsdirektivet (2006/95/EG).
  Tillämpade standarder: EN 60335-1: 2002 och EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EG).
  Tillämpade standarder: EN 61000-6-2: 2005 och EN 61000-6-3: 2007.
- Direktiv för tryckutrustning (97/23/EG).
  Tillämpad standard: EN 13831: 2007.

(FIN) Vaatimustenmukaisuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet Hydro Solo-S, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

- Konedirektiivi (2006/42/EY).
  Sovellettavat standardit: EN 809: 1998 ja EN 60204-1: 2006.
- Pienjännitedirektiivi (2006/95/EY).
  Sovellettavat standardit: EN 60335-1: 2002 ja EN 60335-2-41: 2003.
- EMC-direktiivi (2004/108/EY).
  Sovellettavat standardit: EN 61000-6-2: 2005 ja EN 61000-6-3: 2007.
- Painelaitteita koskeva direktiivi (97/23/EY).
  Sovellettu standardi: EN 13831: 2007.

(DK) Overensstemmelseserklæring

Vi, Grundfos, erklærer under ansvar at produkterne Hydro Solo-S som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærmelse til EF-medlemsstaternes lovgivning:

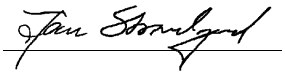
- Maskindirektivet (2006/42/EF).
  Anvendte standarder: EN 809: 1998 og EN 60204-1: 2006.
- Lavspændingsdirektivet (2006/95/EF).
  Anvendte standarder: EN 60335-1: 2002 og EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EF).
  Anvendte standarder: EN 61000-6-2: 2005 og EN 61000-6-3: 2007.
- Trykudstyrsdirektivet (97/23/EF).
  Anvendt standard: EN 13831: 2007.

(RU) Декларация о соответствии

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия Hydro Solo-S, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства (2006/42/EC).
  Применявшиеся стандарты: EN 809: 1998 и EN 60204-1: 2006.
- Низковольтное оборудование (2006/95/EC).
  Применявшиеся стандарты: EN 60335-1: 2002 и EN 60335-2-41: 2003.
- Электромагнитная совместимость (2004/108/EC).
  Применявшиеся стандарты: EN 61000-6-2: 2005 и EN 61000-6-3: 2007.
- Директива по оборудованию, работающему под давлением (97/23/EC).
  Применявшийся стандарт: EN 13831: 2007.

Bjerringbro, 25th January 2010



Jan Strandgaard
Technical Director

Hydro Solo-S

Original installation and operating instructions.

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CONTENTS

Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance 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. General description

1.1 Applications

The Grundfos single-pump booster set is designed for water boosting and transfer in small blocks of flats, farms, cottages, etc. where the water requirements are relatively low.

1.2 Operating conditions

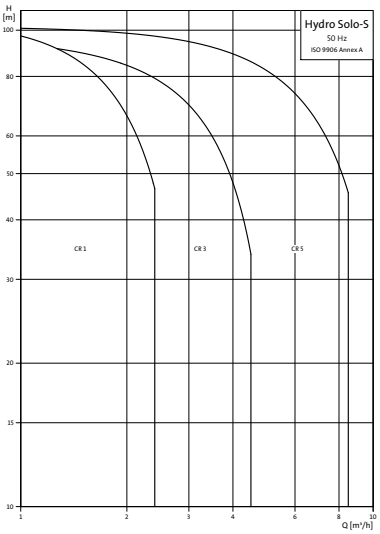

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Fig. 1

Water temperature	Maximum +60°C
System pressure	
CR 1-4, 1-7, 1-10	Maximum 6 bar
CR 1-13, 1-17	Maximum 10 bar
CR 3-4, 3-7, 3-10	Maximum 6 bar
CR 3-12, 3-15	Maximum 10 bar
CR 5-3, 5-4, 5-5, 5-8	Maximum 6 bar
CR 5-10, 5-15	Maximum 10 bar
Flow, Q	1-8 m³/h

2. System configuration

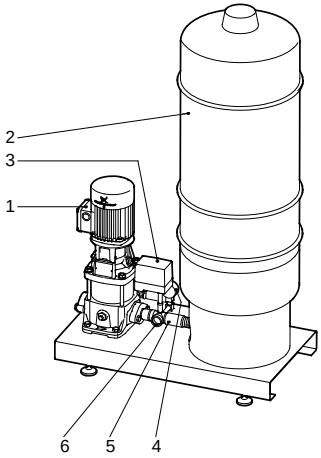

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Fig. 2

Pos.	Description
1	Pump
2	Diaphragm tank
3	Pressure switch
4	Pressure gauge
5	Discharge pipe, brass
6	Isolating valve

2.1 Function

The booster set is cut in and out by means of the pressure switch. When water is consumed, this is tapped from the diaphragm tank.

Then the pressure drops to a preset pump cut-in pressure and the pump starts.

When the water consumption falls, the discharge pressure rises. The pump stops when the cut-out pressure preset on the pressure switch is reached.

3. Installation

3.1 Location

The booster set should be installed and electrically connected in accordance with local regulations.

The booster set should be located in a well ventilated room. The motor requires an adequate air supply to prevent overheating.

3.2 Pipe connection

Arrows on the pump base show the direction of flow of water through the pump.

The pipes connected to the booster set must be adequately sized.

Caution: The booster set has no non-return valve. A non-return/foot valve must be fitted to the suction pipe.

3.3 Priming

Do not start the pump until it has been filled with liquid.

Closed systems or open systems where the liquid level is above the pump inlet:

1. Close the isolating valve on the discharge pipe.
2. Remove the priming plug (pos. 1) from the pump head. See fig. 3.
3. Gradually open the isolating valve on the suction pipe until a steady stream of liquid runs out the priming port.
4. Refit the priming plug and tighten securely.
5. Open the isolating valve(s).

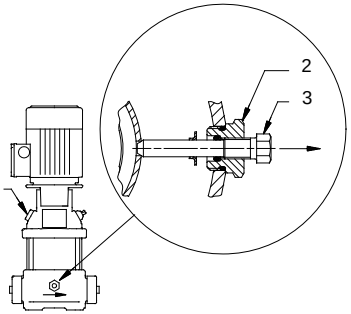

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Fig. 3

Pos.	Description
1	Priming plug
2	Drain plug
3	Drain plug/bypass valve

Open systems where the liquid level is below the pump inlet:

1. Close the isolating valve on the discharge pipe.
2. Slacken the small screw of the bypass valve (pos. 3) and pull it out against stop. See fig. 3.
3. Remove the priming plug (pos. 1) from the pump head.
4. Pour liquid through the priming hole (use a funnel) until the suction pipe and pump are completely filled with liquid. The liquid can be seen in the priming hole.
5. Tighten the screw of the bypass valve.
6. Refit the priming plug and tighten securely.
7. Open the isolating valve(s).

3.4 Electrical connection

The electrical connection should be carried out in accordance with local regulations.

Never make any connections in the terminal box or in the pressure switch unless the electricity supply has been switched off.

The operating voltage and frequency are marked on the nameplate. Please make sure that the motor is suitable for the electricity supply on which it will be used.

3.5 Direction of rotation

The direction of rotation of the pump is counter-clockwise when seen from the top.

If the direction of rotation is wrong, switch off the electricity supply and interchange two phases of the mains supply.

3.6 Motor protection

Single-phase motors incorporate thermal protection and consequently require no additional motor protection.

Three-phase motors must be connected to a motor starter in accordance with local regulations.

In order to protect the motor against quick and slow overload, it must be connected to an external thermomagnetic relay, type GV2-ME. See fig. 4.

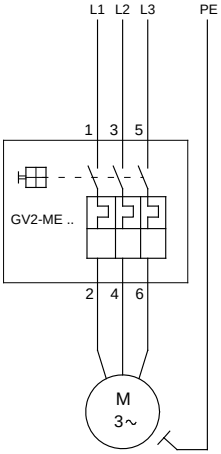

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Fig. 4

4. Settings

All pressure settings are described in the following sections.

Figure 5 shows the relationship between system/cut-out pressure, differential pressure, cut-in pressure and pre-charge pressure of the diaphragm tank.

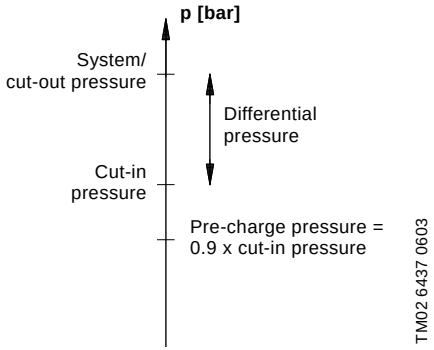

Fig. 5

4.1 Pre-charge pressure

The tank pre-charge pressure has been factory-set to 0.9 x cut-in pressure (see section *4.2 Cut-in pressure*) or to 2 bar.

If not otherwise stated, the factory-set cut-in pressure is 0,5 x maximum pump pressure.

If the cut-in pressure is changed, the tank pre-charge pressure must also be adjusted to ensure optimum operation.

Calculate the pre-charge pressure as follows:

Pre-charge pressure = 0.9 x cut-in pressure.

The pre-charge pressure must be measured in a pressure-less system.

It is recommended to use nitrogen gas for precharging.

Checking of tank pre-charge pressure:

To ensure optimum operation of the system, i.e. frequency of starts and stops, it is recommended to check the pre-charge pressure of the diaphragm tank at regular intervals (at least once a year).

4.2 Cut-in pressure

The cut-in pressure is set on the pressure switch by means of the adjusting screws for cut-out pressure and differential pressure.

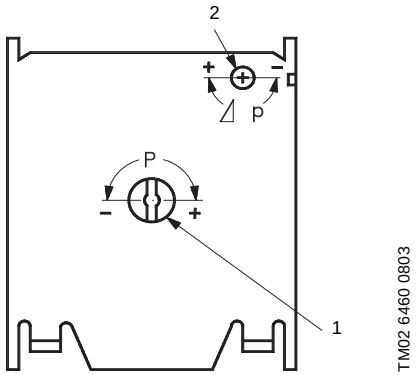

Fig. 6

Pos.	Description
1	Cut-out pressure screw
2	Differential pressure screw

Cut-out pressure: The pump stops.

Differential pressure: Pressure drop – the pump restarts.

The cut-in pressure can be calculated as cut-out pressure – differential pressure.

Example:

Cut-out pressure	5 bar
Differential pressure	1.5 bar
Cut-in pressure	3.5 bar

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4.3 Cut-out pressure

Figure 7 shows the curve for cut-out pressure setting.

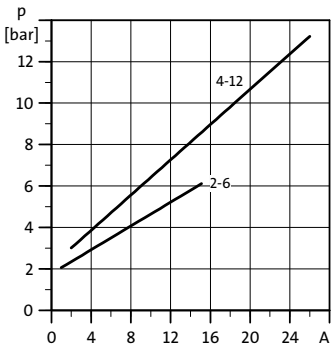

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Fig. 7

A = Number of turns of the cut-out pressure screw (pos. 1), fig. 6.

4.4 Differential pressure

Proceed as follows (see fig. 8 or 9):

1. Mark the cut-out pressure on the axis to the left and the differential pressure on the axis to the right.
2. Draw a line between the two points.
3. Read the value on the number line. This value is the number of turns of the differential pressure screw (pos. 2), fig. 6.

Example:

The example in fig. 8 shows:

Cut-out pressure = 5 bar.
Differential pressure = 1.5 bar.

The number line from 0 to 9 is intersected at a value of 4.5, i.e. that the differential pressure screw must be turned 4.5 times.

Nomogram for differential pressure 2 to 6 bar

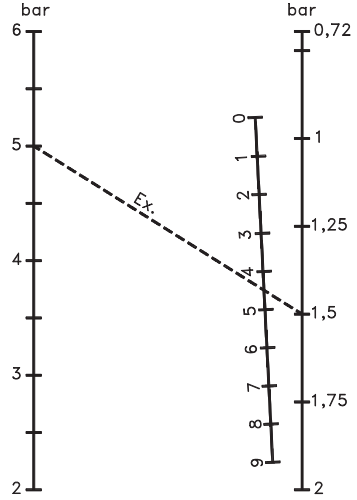

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Fig. 8

Nomogram for differential pressure 4 to 12 bar

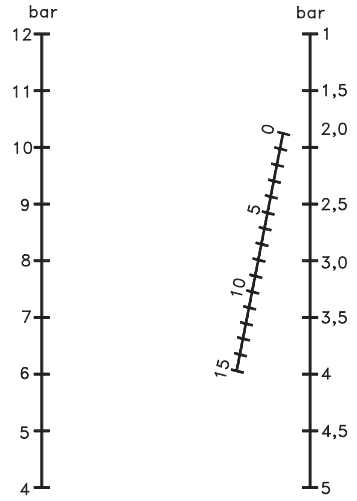

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Fig. 9

Note: If the differential pressure has been set to a value which is higher than the cut-out pressure, the booster set cannot start. Set the differential pressure to a lower value (turn the differential pressure screw clockwise).

5. Fault finding chart

Never make any connections in the terminal box or in the pressure switch unless the electricity supply has been switched off.

Fault	Cause
1. Motor does not run when started.	a) Supply failure. b) Motor protection has tripped out (in the case of single-phase operation, the motor starts automatically after a short time). c) Main contacts in starter are not making contact or the magnetic coil is faulty (three-phase operation).
2. Motor starter overload has tripped out (trips out immediately when supply is switched on).	a) Contacts in starter overload are faulty (three-phase operation). b) Cable connection is loose or faulty. c) Motor winding is defective. d) Pump is mechanically blocked. e) Starter overload setting too low (three-phase operation).
3. Motor starter overload trips out occasionally (three-phase operation).	a) Starter overload setting too low. b) Periodic supply failure. c) Low voltage at peak times.
4. Booster set capacity is not constant.	a) Suction pipe is too small for capacity of booster set. b) Insufficient water is available at the pump inlet. c) Water level is too low. d) Suction pipe is partly blocked by impurities.
5. Booster set runs but gives no water.	a) Suction pipe is blocked by impurities. b) Leakage in suction pipe. c) Air in suction pipe or booster set. d) Non-return/foot valve is blocked in closed position.
6. Pump starts and stops too frequently.	a) Pressure switch setting is incorrect. b) Tank pre-charge pressure is incorrect. c) Non-return/foot valve in suction pipe does not shut tight. d) Leakage in diaphragm of tank. Lower the tank pre-charge pressure. If the diaphragm leaks, water will run out the valve when the booster set is operating.

6. Disposal

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.

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