SQ, SQE

Installation and operating instructions

GB D F I E P GR NL S FIN DK
PL RU H SI HR SER RO BG CZ SK TR
EE LT LV

(GB) Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the products SQ and SQE, 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).
  Standard used: EN 809: 2009.
- 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 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 and EN 61000-3-3: 1995.

(D) Konformitätserklärung

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

- Maschinenrichtlinie (2006/42/EG).
  Norm, die verwendet wurde: EN 809: 2009.
- 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 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 und EN 61000-3-3: 1995.

(F) Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits SQ et SQE, 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).
  Norme utilisée : EN 809 : 2009.
- 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 55014-1 : 2006, EN 55014-2 : 1997, EN 61000-3-2 : 2006 et EN 61000-3-3 : 1995.

(I) Dichiarazione di Conformità

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti SQ e SQE, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il riavvicinamento delle legislazioni degli Stati membri CE:

- Direttiva Macchine (2006/42/CE).
  Norma applicata: EN 809: 2009.
- Direttiva Bassa Tensione (2006/95/CE).
  Norme applicate: EN 60335-1: 2002 e EN 60335-2-41: 2003.
- Direttiva EMC (2004/108/CE).
  Norme applicate: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 e EN 61000-3-3: 1995.

(E) Declaración de Conformidad

Nosotros, Grundfos, declaramos bajo nuestra entera responsabilidad que los productos SQ y SQE, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de las Estados Miembros del EM:

- Directiva de Maquinaria (2006/42/CE).
  Norma aplicada: EN 809: 2009.
- Directiva de Baja Tensión (2006/95/CE).
  Normas aplicadas: EN 60335-1: 2002 y EN 60335-2-41: 2003.
- Directiva EMC (2004/108/CE).
  Normas aplicadas: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 y EN 61000-3-3: 1995.

(P) Declaração de Conformidade

A Grundfos declara sob sua única responsabilidade que os produtos SQ e SQE, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE:

- Directiva Máquinas (2006/42/CE).
  Norma utilizada: EN 809: 2009.
- Directiva Baixa Tensão (2006/95/CE).
  Normas utilizadas: EN 60335-1: 2002 e EN 60335-2-41: 2003.
- Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
  Normas utilizadas: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 e EN 61000-3-3: 1995.

(GR) Δήλωση Συμμόρφωσης

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα SQ και SQE στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβουλίου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

- Οδηγία για μηχανήματα (2006/42/ΕC).
  Πρότυπο που χρησιμοποιήθηκε: EN 809: 2009.
- Οδηγία χαμηλής τάσης (2006/95/ΕC).
  Πρότυπα που χρησιμοποιήθηκαν: EN 60335-1: 2002 και EN 60335-2-41: 2003.
- Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (EMC) (2004/108/ΕC).
  Πρότυπα που χρησιμοποιήθηκαν: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 και EN 61000-3-3: 1995.

(NL) Overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten SQ en SQE waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

- Machine Richtlijn (2006/42/EC).
  Gebruikte norm: EN 809: 2009.
- Laagspannings Richtlijn (2006/95/EC).
  Gebruikte normen: EN 60335-1: 2002 en EN 60335-2-41: 2003.
- EMC Richtlijn (2004/108/EC).
  Gebruikte normen: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 en EN 61000-3-3: 1995.

(S) Försäkran om överensstämmelse

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

- Maskindirektivet (2006/42/EG).
  Tillämpad standard: EN 809: 2009.
- Lågspänningsdirektivet (2006/95/EG).
  Tillämpade standarder: EN 60335-1: 2002 och EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EG).
  Tillämpade standarder: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 och EN 61000-3-3: 1995.

(FIN) Vaatimustenmukaisuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet SQ ja SQE, joita tämä vakuutus koskee, ovat EY:n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti:

- Konedirektiivi (2006/42/EY).
  Sovellettu standardi: EN 809: 2009.
- Pienjännitedirektiivi (2006/95/EY).
  Sovellettavat standardit: EN 60335-1: 2002 ja EN 60335-2-41: 2003.
- EMC-direktiivi (2004/108/EY).
  Sovellettavat standardit: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 ja EN 61000-3-3: 1995.

(DK) Overensstemmelseserklæring

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

- Maskindirektivet (2006/42/EF).
  Anvendt standard: EN 809: 2009.
- Lavspændingsdirektivet (2006/95/EF).
  Anvendte standarder: EN 60335-1: 2002 og EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EF).
  Anvendte standarder: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 og EN 61000-3-3: 1995.

(PL) Deklaracja zgodności

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby SQ oraz SQE, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE:

- Dyrektywa Maszynowa (2006/42/WE).
  Zastosowana norma: EN 809: 2009.
- Dyrektywa Niskonapięciowa (LVD) (2006/95/WE).
  Zastosowane normy: EN 60335-1: 2002 oraz EN 60335-2-41: 2003.
- Dyrektywa EMC (2004/108/WE).
  Zastosowane normy: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 oraz EN 61000-3-3: 1995.

(RU) Декларация о соответствии

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

- Механические устройства (2006/42/EC).
  Применявшийся стандарт: EN 809: 2009.
- 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 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 и EN 61000-3-3: 1995.

(SI) Izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki SQ in SQE, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Sveta o približevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

- Direktiva o strojih (2006/42/ES).
  Uporabljena norma: EN 809: 2009.
- Direktiva o nizki napetosti (2006/95/ES).
  Uporabljeni normi: EN 60335-1: 2002 in EN 60335-2-41: 2003.
- Direktiva o elektromagnetni združljivosti (EMC) (2004/108/ES).
  Uporabljeni normi: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 in EN 61000-3-3: 1995.

(SER) Deklaracija o konformitetu

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod SQ i SQE, na koji se ova izjava odnosi, u skladu sa direktivama Saveta za usklađivanje zakona država članica EU:

- Direktiva za mašine (2006/42/EC).
  Korišćen standard: EN 809: 2009.
- Direktiva niskog napona (2006/95/EC).
  Korišćeni standardi: EN 60335-1: 2002 i EN 60335-2-41: 2003.
- EMC direktiva (2004/108/EC).
  Korišćeni standardi: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 i EN 61000-3-3: 1995.

(BG) Декларация за съответствие

Ние, фирма Grundfos, заявяваме с пълна отговорност, че продуктите SQ и SQE, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС:

- Директива за машините (2006/42/EC).
  Приложен стандарт: EN 809: 2009.
- Директива за нисковолтови системи (2006/95/EC).
  Приложени стандарти: EN 60335-1: 2002 и EN 60335-2-41: 2003.
- Директива за електромагнитна съвместимост (2004/108/EC).
  Приложени стандарти: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 и EN 61000-3-3: 1995.

(SK) Prehlásenie o konformite

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky SQ a SQE, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanovením smernice Rady pre zbližienie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

- Smernica pre strojové zariadenie (2006/42/EC).
  Použitá norma: EN 809: 2009.
- Smernica pre nízkonapäťové aplikácie (2006/95/EC).
  Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.
- Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
  Použité normy: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 a EN 61000-3-3: 1995.

(EE) Vastavusdeklaratsioon

Meie, Grundfos, deklareerime enda ainuvastutusel, et tooted SQ ja SQE, mille kohta käesolev juhend käib, on vastavuses EÜ Nõukogu direktiividega EMÜ liikmesriikide seaduste ühitamise kohta, mis käsitlevad:

- Masinate ohutus (2006/42/EC).
  Kasutatud standard: EN 809: 2009.
- Madalpinge direktiiv (2006/95/EC).
  Kasutatud standardid: EN 60335-1: 2002 ja EN 60335-2-41: 2003.
- Elektromagnetiline ühilduvus (EMC direktiiv) (2004/108/EC).
  Kasutatud standardid: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 ja EN 61000-3-3: 1995.

(H) Megfelelőségi nyilatkozat

Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a SQ és SQE termékek, amelyekre jelen nyilatkozik vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelveit összehangoló tanács alábbi előírásainak:

- Gépek (2006/42/EK).
  Alkalmazott szabvány: EN 809: 2009.
- Kisfeszültségű Direktíva (2006/95/EK).
  Alkalmazott szabványok: EN 60335-1: 2002 és EN 60335-2-41: 2003.
- EMC Direktíva (2004/108/EK).
  Alkalmazott szabványok: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 és EN 61000-3-3: 1995.

(HR) Izjava o usklađenosti

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod SQ i SQE, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o usklađivanju zakona država članica EU:

- Direktiva za strojeve (2006/42/EZ).
  Korištena norma: EN 809: 2009.
- Direktiva za niski napon (2006/95/EZ).
  Korištene norme: EN 60335-1: 2002 i EN 60335-2-41: 2003.
- Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
  Korištene norme: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 i EN 61000-3-3: 1995.

(RO) Declarație de Conformitate

Noi, Grundfos, declarăm pe propria răspundere că produsele SQ şi SQE, la care se referă această declarație, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

- Directiva Utilaje (2006/42/CE).
  Standard utilizat: EN 809: 2009.
- Directiva Tensiune Joasă (2006/95/CE).
  Standarde utilizate: EN 60335-1: 2002 şi EN 60335-2-41: 2003.
- Directiva EMC (2004/108/CE).
  Standarde utilizate: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 şi EN 61000-3-3: 1995.

(CZ) Prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky SQ a SQE, na něž se toto prohlášení vztahuje, jsou v souladu s ustanoveními směrnice Rady pro sblížení právních předpisů členských států Evropského společenství v oblastech:

- Směrnice pro strojní zařízení (2006/42/ES).
  Použitá norma: EN 809: 2009.
- Směrnice pro nízkonapěťové aplikace (2006/95/ES).
  Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.
- Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
  Použité normy: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 a EN 61000-3-3: 1995.

(TR) Uygunluk Bildirgesi

Grundfos olarak bu beyannameye konu olan SQ ve SQE ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaştırma üzerine Konsey Direktifleriyle uyumlu olduğunun yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz:

- Makineler Yönetmeliği (2006/42/EC).
  Kullanılan standart: EN 809: 2009.
- Düşük Voltaj Yönetmeliği (2006/95/EC).
  Kullanılan standartlar: EN 60335-1: 2002 ve EN 60335-2-41: 2003.
- EMC Diretifi (2004/108/EC).
  Kullanılan standartlar: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 ve EN 61000-3-3: 1995.

(LT) Atitikties deklaracija

Mes, Grundfos, su visa atsakomybe pareiškiame, kad gaminiai SQ ir SQE, kuriems skirta ši deklaracija, atitinka šias Tarybos Direktyvas dėl Europos Ekonominės Bendrijos šalių narių įstatymų suderinimo:

- Mašinų direktyva (2006/42/EB).
  Taikomas standartas: EN 809: 2009.
- Žemų įtampų direktyva (2006/95/EB).
  Taikomi standartai: EN 60335-1: 2002 ir EN 60335-2-41: 2003.
- EMS direktyva (2004/108/EB).
  Taikomi standartai: EN 55014-1: 2006, EN 55014-2: 1997, EN 61000-3-2: 2006 ir EN 61000-3-3: 1995.

(LV) Paziņojums par atbilstību prasībām

Sabiedrība GRUNDFOS ar pilnu atbildību dara zināmu, ka produkti SQ un SQE, uz kuriem attiecas šis paziņojums, atbilst šādām Padomes direktīvām par tuvināšanos EK dalībvalstu likumdošanas normām:

– Mašīnbūves direktīva (2006/42/EK).
  Piemērotais standarts: EN 809: 2009.
– Zema sprieguma direktīva (2006/95/EK).
  Piemērotie standarti: EN 60335-1: 2002 un EN 60335-2-41: 2003.
– Elektromagnētiskās saderības direktīva (2004/108/EK).
  Piemērotie standarti: EN 55014-1: 2006, EN 55014-2: 1997,
  EN 61000-3-2: 2006 un EN 61000-3-3: 1995.

Bjerringbro, 6th May 2010

Svend Aage Kaae
Technical Director
Grundfos Holding A/S
Poul Due Jensens Vej 7
8850 Bjerringbro, Denmark

Person authorised to compile technical file and
empowered to sign the EC declaration of conformity.

SQ, SQE

Original installation and operating instructions.

CONTENTS

GB

Warning

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.

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.

1. General

On page 314 of these installation and operating instructions, you will find copies of the pump and motor nameplates.

Before the SQ/SQE pump is lowered into the borehole, this page should be filled in with the relevant nameplate data.

These installation and operating instructions must be kept in a dry place near the installation site for reference purposes.

1.1 Applications

The **SQ** and **SQE** pumps are designed for pumping thin, clean, non-aggressive, non-explosive liquids, not containing solid particles or fibres.

Typical applications:

- Groundwater supply for
  - private housing,
  - small waterworks,
  - irrigation systems in for instance green houses.
- Liquid transfer in tanks.
- Pressure boosting.

The **SQE-NE** pumps are designed for pumping thin, clean, non-explosive liquids, not containing solid particles or fibres.

These pumps are suitable for pumping contaminated or hydrogen-carbonate containing groundwater, e.g. from

- dumps,
- chemical depots,
- industrial areas,
- oil and petrol filling stations,
- environmental applications.

The **SQE-NE** pumps can also be used for sampling and monitoring and to some extent for incorporation in water treatment systems.

Information applying to all pump types:

The maximum sand content of the water must not exceed 50 g/m³. A larger sand content will reduce the life of the pump and increase the risk of blocking.

Note: If liquids with a viscosity higher than that of water are to be pumped, please contact Grundfos.

pH values:

SQ and SQE:	5 to 9.
SQE-NE:	Please contact Grundfos.

Liquid temperature:

The temperature of the pumped liquid must not exceed 35 °C.

2. Technical data

Supply voltage:

1 x 200-240 V –10 %/+6 %, 50/60 Hz, PE.
Operation via generator: As a minimum, the generator output must be equal to the motor P_1 [kW] + 10 %.

Starting current:

The motor starting current is equal to the highest value stated on the motor nameplate.

Power factor:

PF = 1.

Motor liquid:

Type SML 2.

Motor cable:

1.5 m, 3 x 1.5 mm², PE.

Liquid temperature:

Maximum 35°C.

Pump outlet size:

SQ 1, SQ 2, SQ 3: Rp 1¼.
SQ 5, SQ 7: Rp 1½.

Pump diameter:

74 mm.

Borehole diameter:

Minimum 76 mm.

Installation depth:

Maximum 150 m below static water level.
See also section *5.8.2 Installation depths*.

Net weight:

Maximum 6.5 kg.

2.1 Storage

Storage temperature: –20 °C to +60 °C.

2.1.1 Frost protection

If the pump has to be stored after use, it must be stored on a frost-free location or it must be ensured that the motor liquid is frost-proof.

The motor must not be stored without being filled with motor liquid.

2.2 Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

3. Preparation

Grundfos MS 3 and MSE 3 submersible motors have water-lubricated slide bearings. No additional lubrication is required.

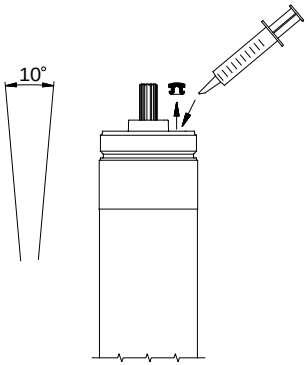
The submersible motors are factory-filled with a special Grundfos motor liquid (type SML 2), which is frost-proof down to –20 °C and preserved to prevent the growth of bacteria.
The level of motor liquid is decisive for the operating life of the bearings and consequently the life of the motor.

3.1 Refilling of motor liquid

If for any reason the motor liquid has been drained or lost, the motor must be refilled with Grundfos motor liquid SML 2.

To refill the motor, proceed as follows:

1. Remove the cable guard and separate the pump part from the motor.



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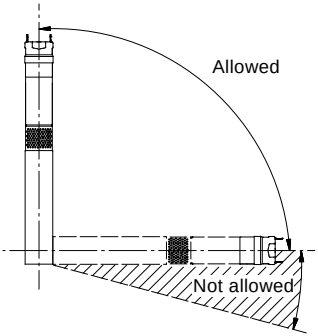
2. Place the motor in vertical position with an inclination of approx. 10 °.
3. Remove the filling plug using a screwdriver or a similar tool.
4. Inject motor liquid into the motor with a filling syringe or the like.
5. To allow possible air to escape, move the motor from side to side.
6. Refit the filling plug and make sure it is tight.
7. Assemble pump part and motor.
8. Refit the cable guard.

The pump is now ready for installation.

GB

3.2 Positional requirements

The pump is suitable for vertical as well as horizontal installation, however, the pump shaft **must never** fall below the horizontal plane, see fig. 1.



TM01 1375 4397

Fig. 1

If the pump is to be installed horizontally, e.g. in a tank, and there is a risk that the pump might be covered by mud, it must be fitted in a flow sleeve.

For installation depths, see section *5.8.2*.

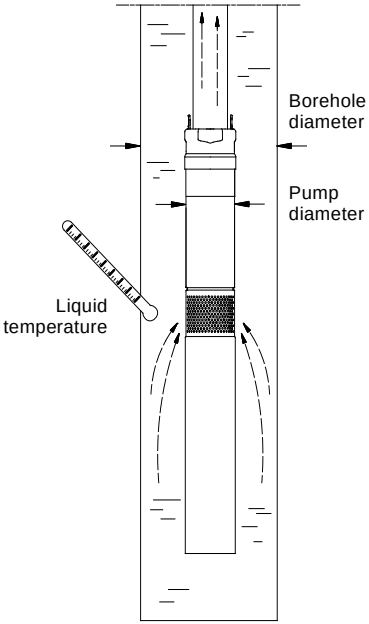
GB

3.3 Liquid temperatures/cooling

Figure 2 shows an SQ/SQE pump installed in a borehole. The pump is operating.

Figure 2 illustrates the following:

- Borehole diameter.
- Pump diameter.
- Temperature of pumped liquid.
- Flow past the motor to the pump suction strainer.



TM01 0518 1297

Fig. 2

To ensure sufficient cooling of the motor, it is important to observe the maximum liquid temperature of 35 °C under all conditions.

Note: The borehole diameter must be at least 76 mm (approx. 3").

The motor should always be installed above the well screen. If a flow sleeve is used, the pump may be installed freely in the borehole.

Note: Do not let the pump run against a closed discharge pipe for more than 5 minutes. When the discharge pipe is closed, there is no cooling flow and there is a risk of overtemperature in motor and pump.

If the actual temperature of the pumped liquid exceeds the specified value or the operating conditions otherwise fall outside the specified conditions, the pump may stop. Please contact Grundfos.

4. Electrical connection

4.1 General

The electrical connection should be carried out by an authorized electrician in accordance with local regulations.

Before starting work on the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

The pump must be earthed.

The pump must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles.

If the motor cable is damaged, it must be replaced by Grundfos, an authorised Grundfos service workshop or similarly qualified persons to avoid a hazard.

The supply voltage, rated maximum current and power factor (PF) appear from the motor nameplate.

The required voltage for Grundfos submersible motors, measured at the motor terminals, is –10%/+6% of the nominal voltage during continuous operation (including variation in the supply voltage and losses in cables).

If the pump is connected to an electric installation where an earth-leakage circuit breaker (ELCB) is used as an additional protection, this circuit breaker **must** trip out when earth fault currents with DC content (pulsating DC) occur.

The earth leakage circuit breaker **must** be marked with the following symbol: ⎍.

Supply voltage:

1 x 200-240 V –10 %/+6 %, 50/60 Hz, PE.

The current consumption can only be measured by means of a true RMS instrument. If other instruments are used, the value measured will differ from the actual value.

On SQ/SQE pumps, a leakage current of 2.5 mA at 230 V, 50 Hz, can typically be measured. The leakage current is proportional to the supply voltage.

The SQE and SQE-NE pumps can be connected to a control box, type CU 300 or CU 301.

Note: The pump must never be connected to a capacitor or to another type of control box than CU 300 or CU 301.
The pump must never be connected to an external frequency converter.

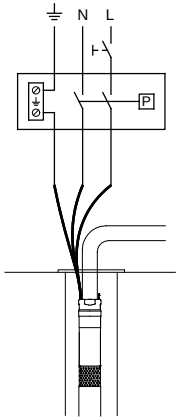
4.2 Motor protection

The motor incorporates thermal overload protection and requires no additional motor protection.

4.3 Connection of motor

The motor incorporates a starter device and can therefore be connected directly to the mains.

Start/stop of the pump will typically be done via a pressure switch, see fig. 3.
Note: The pressure switch must be rated for the maximum amps of the specific pump size.



Pressure switch

TM01 1480 4697

Fig. 3

5. Installation

5.1 General

Before starting any work on the pump/ motor, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

Note: Do not lower or lift the pump by means of the motor cable.

The loose data plate supplied with the pump should be fixed close to the installation site.

5.2 Assembly of pump part and motor

To assemble pump part and motor, proceed as folows:

1. Place the motor horizontally in a vice and tighten it, see fig. 5.
2. Pull the pump shaft out to the position shown in fig. 4.

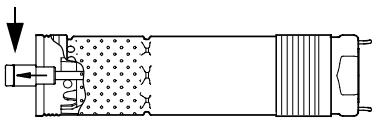


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Fig. 4

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3. Grease the motor shaft end with the grease supplied with the motor.
4. Screw the pump part on the motor (55 Nm).
   Note: The pump shaft must engage with the motor shaft.
   A spanner may be used on the clamping faces of the pump part, see fig. 5.

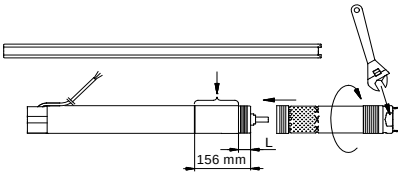


Fig. 5

Motor (P2) [kW]	L [mm]
0.70	120
1.15	102
1.68	66
1.85	66

When pump part and motor have been assembled correctly, there must not be a clearance between pump part and motor.

5.3 Removal of non-return valve

If a pump without non-return valve is required, the valve can be removed as follows:

1. Cut off the legs of the valve guide using side-cutting pliers or a similar tool, see fig. 6.
2. Turn the pump upside down.
3. Check that all loose parts fall out of the pump.

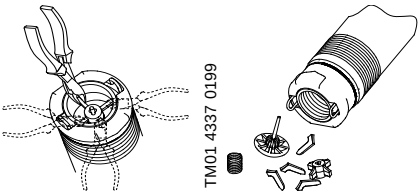


Fig. 6

Note: SQE-NE is supplied without non-return valve.

The non-return valve can be fitted in a Grundfos service workshop.

5.4 Fitting the cable plug to the motor

The motor plug must under no circumstances be removed by the user.

The following description is exclusively intended for service personel.

If the motor cable is to be replaced, see section 4.1 General.

The cable with plug must be fitted or removed by an authorised Grundfos service workshop or a similarly qualified person.

The cable plug supplied with the motor is factory-greased. Check that the plug is greased correctly.

To fit the cable plug, proceed as follows:

1. Check that the cable is of the correct type, cross-section and length.
2. Check that the mains on the location has correct connection to earth.
3. Check that the motor socket is clean and dry. Make sure that the loose gasket has been fitted.
4. Press the cable plug onto the motor socket. The plug cannot be fitted wrongly, see fig. 7.

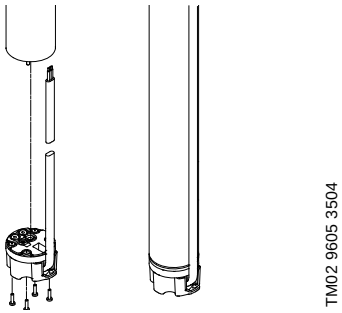


Fig. 7

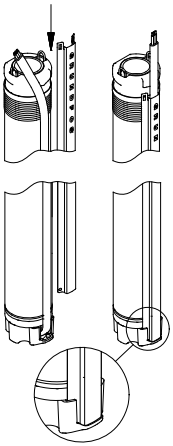
5. Fit and tighten the four screws (1-1.5 Nm), see fig. 7.

When the plug has been fitted, there must not be a clearance between the motor and the cable plug.

5.5 Fitting the cable guard

To fit the cable guard, proceed as follows:

1. Make sure that the submersible drop cable lies flat in the cable guard.
2. Place the cable guard in the groove in the cable plug. The two flaps of the cable guard must engage with the upper edge of the pump sleeve, see fig. 8.



TM02 9613 3504

Fig. 8

3. Fasten the cable guard to the pump suction strainer with the two self-tapping screws supplied, see fig. 9.

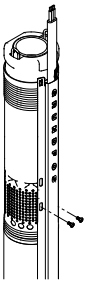


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Fig. 9

5.6 Cable sizing

Grundfos can supply submersible drop cables for any type of installation.

Note: The cross-section of the submersible drop cable must be large enough to meet the voltage requirements specified in section *4.1 General*.

The table values below are calculated from the following formula:

$$q = \frac{I \times 2 \times 100 \times PF \times L \times \rho}{U \times \Delta U}$$

where

q = Cross-section of submersible drop cable [mm²].

I = Rated maximum current of the motor [A].

PF = 1.0.

L = Length of submersible drop cable [m].

ρ = Specific resistance: 0.02 [Ωmm²/m].

U = Nominal voltage [V].

ΔU = Voltage drop [%] = 4 %.

The 4 % voltage drop is according to IEC 3-64, HD-384 Series.

The calculation gives the following maximum cable lengths at a supply voltage of 240 V:

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Max. cable length [m]							
Motor (P2)	**I_N**	**Cable size**					
[kW]	**[A]**	**1.5 mm²**	**2.1 mm²/ 14 AWG**	**2.5 mm²**	**3.3 mm²/ 12 AWG**	**4 mm²**	**6 mm²**
0.7	5.2	80	112	133	176	213	320
1.15	8.4	50	69	83	109	132	198
1.68	11.2	37	52	62	82	99	149
1.85	12	35	49	58	76	92	139

5.7 Fitting the submersible drop cable

It is recommended to join the submersible drop cable and the motor cable by means of a Grundfos cable termination kit, type KM.

Cable termination kit, type KM	
Cross-sectional area	**Product number**
1.5 to 2.5 mm²	96021462
4.0 to 6.0 mm²	96021473

For larger cross-sections, please contact Grundfos.

5.8 Pipework connection

If a tool, e.g. a chain pipe wrench, is used when the riser pipe is fitted to the pump, the pump must only be gripped by the pump discharge chamber.

When connecting plastic pipes, a compression coupling should be used between the pump and the first pipe section.

Note: For pumps fitted with plastic pipes, the expansion of the pipes when loaded should be taken into consideration, when deciding on the installation depth of the pump.

Where flanged pipes are used, the flanges should be slotted to take the submersible drop cable.

Figure 10 shows a pump installation with indication of:

- position of cable clips, pos. 1, and distance between the clips.
- fitting of straining wire, pos. 2.
- maximum installation depth below the static water level.

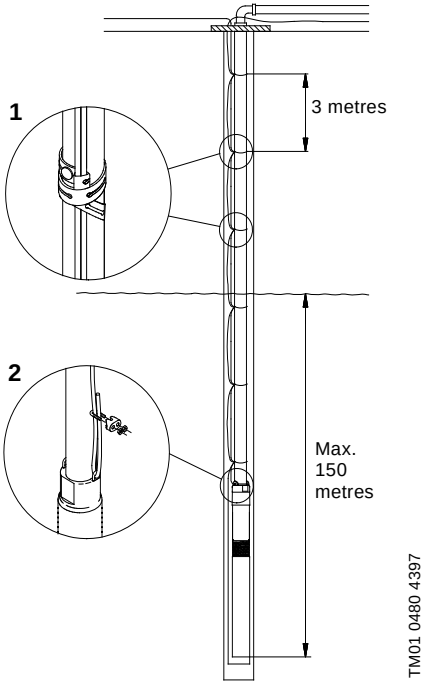

Fig. 10

5.8.1 Cable clips

Cable clips must be fitted every 3 metres, see fig. 10.

When connecting plastic pipes, some slackness must be left between each cable clip as plastic pipes expand when loaded.

Where flanged pipes are used, the cable clips should be fitted above and below each joint.

5.8.2 Installation depths

Maximum installation depth below the static water level: 150 metres, see fig. 10.

Minimum installation depths below the dynamic water level:

- **Vertical installation:**
  During start-up and operation, the pump must always be completely submerged in water.
- **Horizontal installation:**
  The pump must be installed and run at least 0.5 metres below the dynamic water level.
  If there is a risk that the pump might be covered by mud, the pump must always be fitted in a flow sleeve.

5.8.3 When lowering the pump into the borehole

It is recommended to secure the pump by an unloaded straining wire, see fig. 10, pos. 2.

Slacken the straining wire so that it becomes unloaded and lock it to the borehole seal by means of wire locks.

Note: The straining wire must not be used for pulling the pump with riser pipe out of the borehole.

Note: Do not lower or lift the pump by means of the motor cable.

6. Start-up

Make sure that the well is capable of yielding a minimum quantity of water corresponding to the pump capacity.

Do not start the pump until it is completely submerged in the liquid.

Start the pump and do not stop it until the pumped liquid is completely clean, as otherwise the pump parts and the non-return valve may choke up.

7. Operation

7.1 Minimum flow rate

To ensure the necessary cooling of the motor, the pump flow rate should never be set to a value lower than 50 l/h.

If the flow rate suddenly falls, the reason might be that the pump is pumping more water than the borehole can yield. The pump must be stopped and the fault corrected.

Note: The pump dry-running protection is effective only within the recommended duty range of the pump.

7.2 Selection of diaphragm tank and setting of precharge pressure and pressure switch

The installation must be designed for the maximum pump pressure.

As the pump has a built-in soft starter giving a run-up time of 2 seconds, the pressure at the pressure switch and diaphragm tank during starting will be lower than the pump cut-in pressure set on the pressure switch ($p_{cut\text{-}in}$). This lower pressure is called minimum pressure (p_{min}).

p_{min} is equal to the desired minimum pressure at the highest tap + head and head loss in the pipe from the pressure switch and diaphragm tank to the highest tap (p_{min} = B + C), see fig. 11.

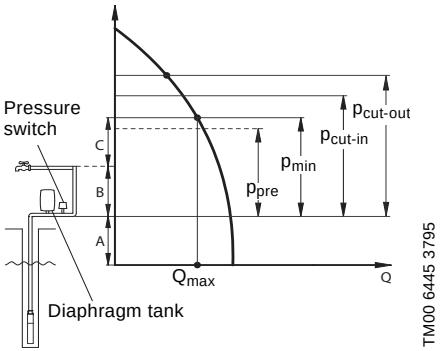

Fig. 11

A: Head + head loss from dynamic water level to diaphragm tank.

B: Head + head loss from diaphragm tank to highest tap.

C: Minimum pressure at highest tap.

Note: Make sure that the selected pump can deliver a pressure higher than $p_{cut\text{-}out}$ + A.

p_{pre}: Precharge pressure of diaphragm tank.

p_{min}: Desired minimum pressure.

$p_{cut\text{-}in}$: Cut-in pressure set on pressure switch.

$p_{cut\text{-}out}$: Cut-out pressure set on pressure switch.

Q_{max}: Maximum flow at p_{min}.

Using p_{min} and Q_{max}, the **minimum** diaphragm tank size, precharge pressure and pressure switch settings can be found in the guideline table below:

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Example:

p_{min} = 35 m head, Q_{max} = 2.5 m³/h.

On the basis of this information, the following values can be found in the table:

Minimum diaphragm tank size = 33 litres.

p_{pre} = 31.5 m head.

$p_{cut\text{-}in}$ = 36 m head.

$p_{cut\text{-}out}$ = 50 m head.

p_{min} [m]	Q_{max} [m³/h]																		p_{pre} [m]	$p_{cut\text{-}in}$ [m]	$p_{cut\text{-}out}$ [m]
	0.6	0.8	1	1.2	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8			
	Diaphragm tank size [litres]																				
25	8	8	18	18	18	18	24	33	33	50	50	50	50	80	80	80	80	80	22.5	26	40
30	8	8	18	18	18	24	33	33	50	50	50	50	80	80	80	80	80		27	31	45
35	8	18	18	18	18	24	33	33	50	50	50	80	80	80	80	80			31.5	36	50
40	8	18	18	18	18	24	33	50	50	50	80	80	80	80	80				36	41	55
45	8	18	18	18	24	33	33	50	50	50	80	80	80	80					40.5	46	60
50	8	18	18	18	24	33	50	50	50	80	80	80	80						45	51	65
55	18	18	18	18	24	33	50	50	50	80	80	80							49.5	56	70
60	18	18	18	18	24	33	50	50	80	80	80	80							54	61	75
65	18	18	18	24	24	33	50	50	80	80	80	80							58.5	66	80

1 m head = 0.098 bar.

7.3 Built-in protection

The motor incorporates an electronic unit which protects the motor in various situations.

In case of overload, the built-in overload protection will stop the pump for 5 minutes. After that period, the pump will attempt to restart.

If the pump has been stopped as a result of dry running, it will start automatically after 5 minutes.

If the pump is restarted and the borehole is empty, the pump will stop after 30 seconds.

Resetting of the pump: Switch off the electricity supply for 1 minute.

The motor is protected in case of:

- dry running,
- voltage surges (up to 6000 V),
  In areas with high lightning intensity, external lightning protection is required.
- overvoltage,
- undervoltage,
- overload and
- overtemperature.

SQE pumps/MSE 3 motors:

Note: Via the CU 300 or CU 301, the dry-running stop limit of the MSE 3 motors can be adjusted to match the actual application.

8. Maintenance and service

The pumps are normally maintenance-free.

Deposits and wear may occur. For that purpose, service kits and service tools are available from Grundfos. The Grundfos Service Manual is available on request.

The pumps can be serviced at a Grundfos service centre.

8.1 Contaminated pumps

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

If Grundfos is requested to service the pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

SQE-NE: Only pumps that can be certified as uncontaminated, i.e. pumps containing no hazardous and/or toxic material, may be returned to Grundfos for servicing.

To prevent injury to the health of persons involved and to the environment, a document certifying that the pump is clean is required.

Grundfos must receive this certificate before the product. Otherwise, Grundfos will refuse to accept the product for servicing.

Possible costs of returning the pump are paid by the customer.

9. Fault finding chart

Before starting any work on the pump/motor, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

Fault	Cause	Remedy
1. The pump does not run.	a) The fuses in the electric installation are blown.	Replace the blown fuses. If the new ones blow too, the electric installation and the submersible drop cable should be checked.
	b) The ELCB or the voltage-operated ELCB has tripped out.	Cut in the circuit breaker.
	c) No electricity supply.	Contact the electricity supply authorities.
	d) The motor protection has cut off the electricity supply due to overload.	Check whether the motor/pump is blocked.
	e) The pump/submersible drop cable is defective.	Repair/replace the pump/cable.
	f) Overvoltage or undervoltage has occurred.	Check the electricity supply.
2. The pump runs but gives no water.	a) The discharge valve is closed.	Open the valve.
	b) No water or too low water level in borehole.	See item 3 a).
	c) The non-return valve is stuck in its closed position.	Pull out the pump and clean or replace the valve.
	d) The suction strainer is choked up.	Pull out the pump and clean the strainer.
	e) The pump is defective.	Repair/replace the pump.
3. The pump runs at reduced capacity.	a) The drawdown is larger than anticipated.	Increase the installation depth of the pump, throttle the pump or replace it by a smaller model to obtain a smaller capacity.
	b) The valves in the discharge pipe are partly closed/blocked.	Check and clean/replace the valves, if necessary.
	c) The discharge pipe is partly choked by impurities (ochre).	Clean/replace the discharge pipe.
	d) The non-return valve of the pump is partly blocked.	Pull out the pump and check/replace the valve.
	e) The pump and the riser pipe are partly choked by impurities (ochre).	Pull out the pump. Check and clean or replace the pump, if necessary. Clean the pipes.
	f) The pump is defective.	Repair/replace the pump.
	g) Leakage in the pipework.	Check and repair the pipework.
	h) The riser pipe is defective.	Replace the riser pipe.
	i) Undervoltage has occurred.	Check the electricity supply.

Fault	Cause	Remedy
4. Frequent starts and stops.	a) The differential of the pressure switch between the start and stop pressures is too small.	Increase the differential. However, the stop pressure must not exceed the operating pressure of the pressure tank, and the start pressure should be high enough to ensure sufficient water supply.
	b) The water level electrodes or level switches in the reservoir have not been installed correctly.	Adjust the intervals of the electrodes/level switches to ensure suitable time between the cutting-in and cutting-out of the pump. See installation and operating instructions for the automatic devices used. If the intervals between stop/start cannot be changed via the automatics, the pump capacity may be reduced by throttling the discharge valve.
	c) The non-return valve is leaking or stuck half-open.	Pull out the pump and clean/replace the non-return valve.
	d) The supply voltage is unstable.	Check the electricity supply.
	e) The motor temperature gets too high.	Check the water temperature.

9.1 Megging

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Megging of an installation incorporating SQ/SQE pumps is not allowed, as the built-in electronics may be damaged, see fig. 12.

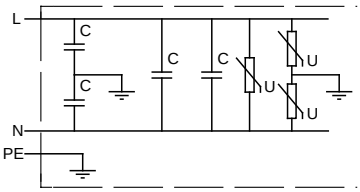
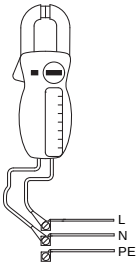
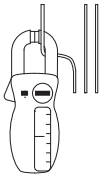


Fig. 12

10. Checking the electricity supply

Before starting any work on the pump/motor, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

1. Supply voltage  TM00 1371 4904	Measure the voltage (RMS) between phase and neutral. Connect the voltmeter to the terminals at the connection.	The voltage should, when the motor is loaded, be within the range specified in section *4. Electrical connection*. Large variations in supply voltage indicate poor electricity supply, and the pump should be stopped until the defect has been remedied.
2. Current consumption  TM00 1372 5082	Measure the current (RMS) while the pump is operating at a constant discharge head (if possible, at the capacity where the motor is most heavily loaded). For maximum current, see nameplate.	If the current exceeds the full load current, there are the following possible faults: • Poor connection in leads, possibly in the cable joint. • Too low supply voltage, see item 1.

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11. Environment

During handling, operation, storage and transport, all environment regulations dealing with the handling of hazardous materials must be observed.

When the pump is taken out of operation, it must be ensured that no hazardous material is left in the pump/motor and the riser pipe, which can be injurious to persons and the environment.

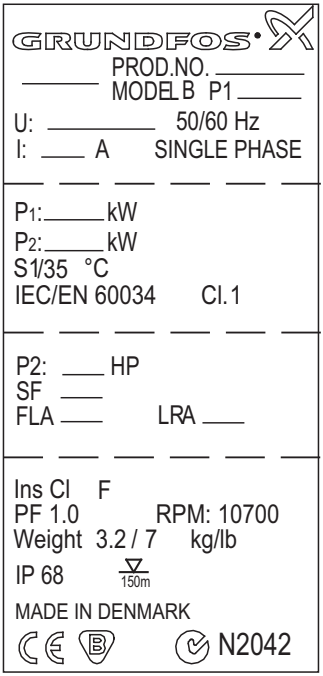
In case of doubt, please contact Grundfos or the local authorities.

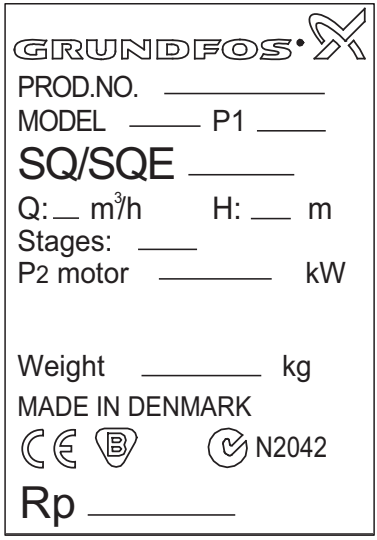
12. Disposal

Disposal of this product or parts of it must be carried out according to the following guidelines:

1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.

Nameplates to be filled in





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Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Lote 34A
1619 - Garin
Pcia. de Buenos Aires
Phone: +54-3327 414 444
Telefax: +54-3327 411 111

Australia
GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria
GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium
N.V. GRUNDFOS Bellux S.A.
Boomsesteenweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Belorussia
Представительство ГРУНДФОС в Минске
220123, Минск,
ул. В. Хоружей, 22, оф. 1105
Тел.: +(37517) 233 97 65,
Факс: +(37517) 233 97 69
E-mail: grundfos_minsk@mail.ru

Bosnia/Herzegovina
GRUNDFOS Sarajevo
Trg Heroja 16,
BiH-71000 Sarajevo
Phone: +387 33 713 290
Telefax: +387 33 659 079
e-mail: grundfos@bih.net.ba

Brazil
BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo Branco, 630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Bulgaria
GRUNDFOS Pumpen Vertrieb
Representative Office - Bulgaria
Bulgaria, 1421 Sofia
Lozenetz District
105-107 Arsenalski blvd.
Phone: +359 2963 3820, 2963 5653
Telefax: +359 2963 1305

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

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
51 Floor, Raffles City
No. 268 Xi Zang Road. (M)
Shanghai 200001
PRC
Phone: +86-021-612 252 22
Telefax: +86-021-612 253 33

Croatia
GRUNDFOS CROATIA d.o.o.
Cebini 37, Buzin
HR-10010 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499
www.grundfos.hr

Czech Republic
GRUNDFOS s.r.o.
Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111
Telefax: +420-585-716 299

Denmark
GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Estonia
GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel: + 372 606 1690
Fax: + 372 606 1691

Finland
OY GRUNDFOS Pumput AB
Mestarintie 11
FIN-01730 Vantaa
Phone: +358-3066 5650
Telefax: +358-3066 56550

France
Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany
GRUNDFOS GMBH
Schlüterstr. 33
40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
e-mail: infoservice@grundfos.de
Service in Deutschland:
e-mail: kundendienst@grundfos.de

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong
GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary
GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India
GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia
PT GRUNDFOS Pompa
Jl. Rawa Sumur III, Blok III / CC-1
Kawasan Industri, Pulogadung
Jakarta 13930
Phone: +62-21-460 6909
Telefax: +62-21-460 6910 / 460 6901

Ireland
GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy
GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan
GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg., 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

Korea
GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Latvia
SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava ielā 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Fakss: + 371 914 9646

Lithuania
GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia
GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

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

Netherlands
GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +31-88-478 6332
e-mail: info_gnl@grundfos.com

New Zealand
GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway
GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland
GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal
Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

România
GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ilfov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia
ООО Грундфос
Россия, 109544 Москва, ул. Школьная 39
Тел. (+7) 495 737 30 00, 564 88 00
Факс (+7) 495 737 75 36, 564 88 11
E-mail grundfos.moscow@grundfos.com

Serbia
GRUNDFOS Predstavništvo Beograd
Dr. Milutina Ivkovića 2a/29
YU-11000 Beograd
Phone: +381 11 26 47 877 / 11 26 47 496
Telefax: +381 11 26 48 340

Singapore
GRUNDFOS (Singapore) Pte. Ltd.
24 Tuas West Road
Jurong Town
Singapore 638381
Phone: +65-6865 1222
Telefax: +65-6861 8402

Slovenia
GRUNDFOS d.o.o.
Šlandrova 8b, SI-1231 Ljubljana-Črnuče
Phone: +386 1 568 0610
Telefax: +386 1 568 0619
E-mail: slovenia@grundfos.si

Spain
Bombas GRUNDFOS España S.A.
Camino de la Fuentecilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden
GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46(0)771-32 23 00
Telefax: +46(0)31-331 94 60

Switzerland
GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-1-806 8111
Telefax: +41-1-806 8115

Taiwan
GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand
GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +66-2-725 8998

Turkey
GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bölgesi
Ihsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine
ТОВ ГРУНДФОС УКРАЇНА
01010 Київ, Вул. Московська 8б,
Тел.:(+38 044) 390 40 50
Фах.: (+38 044) 390 40 59
E-mail: ukraine@grundfos.com

United Arab Emirates
GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971-4- 8815 166
Telefax: +971-4-8815 136

United Kingdom
GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 8TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.
GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Usbekistan
Представительство ГРУНДФОС в Ташкенте
700000 Ташкент ул.Усмана Носира 1-й тупик 5
Телефон: (3712) 55-68-15
Факс: (3712) 53-36-35

Addresses revised 24.03.2010

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