

Sofrel sensor

Installation and operating instructions



English (GB) Installation and operating instructions

Original installation and operating instructions

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1. General information

1.1 Hazard statements

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

DANGER



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

WARNING



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

CAUTION



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

The hazard statements are structured in the following way:

SIGNAL WORD



Description of hazard

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



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



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

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

1.2 Notes

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



Observe these instructions for explosion-proof products.



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



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



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



Tips and advice that make the work easier.

2. Introduction

The Sofrel LS42 logger is a key component in the Grundfos Demand Driven Distribution system.

The sensor logs the water pressure in the critical points of the customer's distribution network and sends a report to the CU 354 controller controlling the booster pumps that delivers the water.

The sensor has a built-in GSM antenna and must be installed close to the main pipe where there is access to a GSM 2G/3G network. We recommend that you run a signal strength test before installing the sensor, see section 6.2 *Signal test*.

For further information about the Sofrel LS42 logger, see its manual.

3. Receiving the product

3.1 Scope of delivery

Component	Quantity
Sofrel LS42 logger	1
Mounting bracket	1
Cable for logger	1
CNPR 0-16 bar pressure sensor	1
Cable assembly box	1
Silica gel dehumidifier bag	1
Installation and operating instructions	1

4. Installing the product

Carry out the installation in this order:

1. Install the SIM card.
2. Install the sensor.
3. Set up the sensor.
4. Set up the CU 354.

4.1 Installing the SIM card



A SIM card is required for each sensor in the system.

Procedure

1. Insert the SIM card into a mobile phone.
2. Check the signal strength at the site by means of your mobile phone.
3. Remove the PIN code from the SIM card.
4. Open the logger using the supplied tool, see fig. 1.



Fig. 1 Opening the logger

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5. Remove the top cover.



Fig. 2 Removing the top cover

6. Slide the PCB out of the casing.
7. Insert the SIM card into the slot on the PCB.
8. Connect the battery cable.

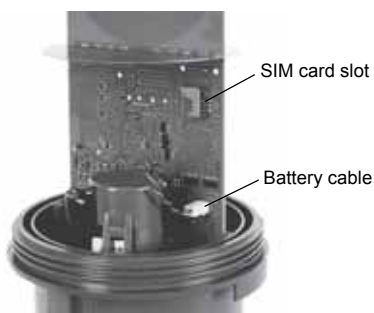


Fig. 3 Connecting the battery cable

9. Slide the PCB back into the casing
10. Place the silica gel dehumidifier bag inside the housing.



Fig. 4 Placing the silica gel

11. If the logger is installed with an external antenna, connect the RF cable inside the housing to the PCB.



Fig. 5 Connecting the RF cable

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TM07 3530 1419

TM07 3529 1419

TM07 3531 1419

12. Check that the seals at the top cover and at the housing are present.



Fig. 6 Checking the seals

13. Assemble the logger using the fastening tool.



Fig. 7 Assembling the logger



Do not tighten beyond the clips.

4.2 Connecting the pressure sensor



Fig. 8 Completely assembled sensor cable

14. Connect the logger cable to the connector box.
See fig. 9.

- 1 = pink
 - 2 = purple
15. Connect the CNPR sensor
- 3 = brown
 - 4 = white
 - Earth = green/yellow

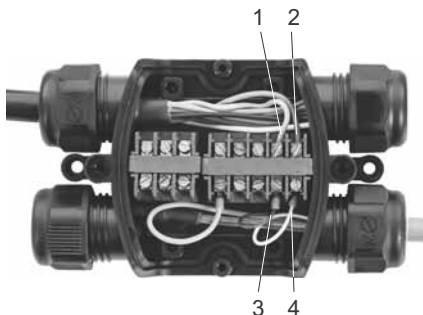


Fig. 9 Connector box

16. Close the unused cable gland with the sealing plug



Fig. 10 Closing the cable gland

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17. Mount the top cover and completely tighten the four screws to ensure a waterproof assembly.
18. Connect the cable to the logger by turning the cap while pressing the connector towards the logger.



Fig. 11 Connecting the cable to the logger

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4.3 Installing the logger

1. Find a suitable location for the logger, typically in a pit or close to the main pipe.
2. Mount the bracket

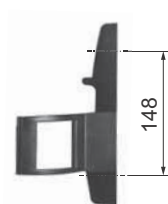


Fig. 12 Mounting the bracket

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3. Slide the logger in to the bracket



Fig. 13 Sliding the logger in to the bracket

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5. Setting the product

5.1 Preparing logger configuration



When you start this procedure, the sensor leaves freight mode and becomes active.



Softools needs to be installed on the PC used. Download Softools from GTI.



Grundfos DDD standard configuration needs to be saved on the PC. Download the standard configuration from GTI.



When the logger is configured, the time on the PC is pushed to the logger.

Ensure that the time on your computer and the CU 354 controller are synchronised.



Manuals and guides are available in Softools.

For fault finding, see manuals and guides in Softools.

1. Start the Softools program on your PC
2. Right-click on [My RTU's] window
3. Click on [Import Remote Terminal Unit]

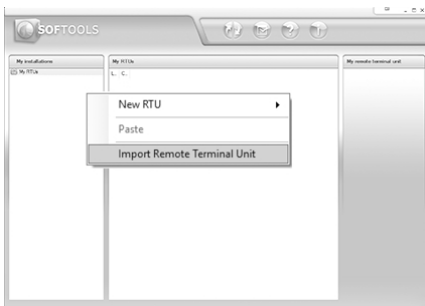


Fig. 14

4. Browse to the location for the Grundfos DDD standard configuration, once successful loaded, it will appear in Softools.
5. Click [Configure] to setup phone numbers and GSM network.

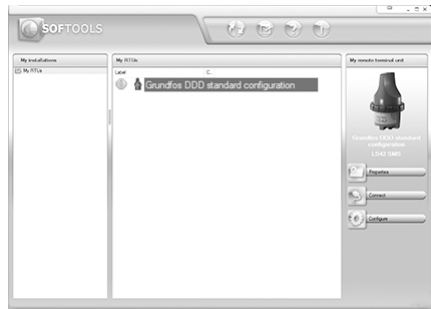


Fig. 15

6. Click [Communication]

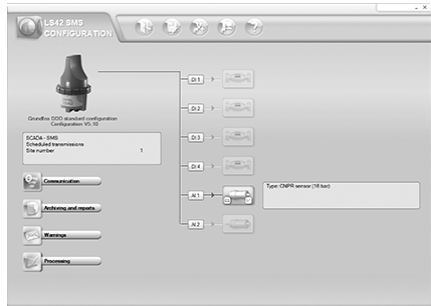


Fig. 16

7. The following can be configured. Please make your configuration and then click [OK] to save:

Access code	0 as default
Site number	must be changed if there are several CP sensors in the installation
Antenna	either internal or external
Network	2G, if the country network allows it
GSM frequency band	depending on the geography of the site
Call number	SCADA no. 1 is the CU354 i.e. the SIM-card in the DDD CIM250. Remember the country cod a prefix
Scheduled transmission	1 time pr. day, at 00:00

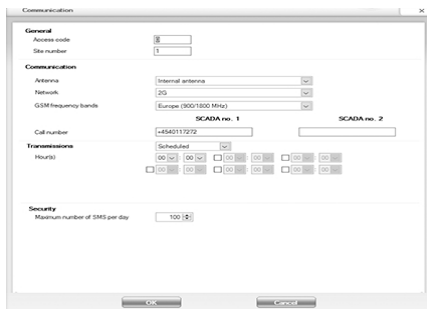


Fig. 17

8. Click [Processing] to change the alarm threshold level, see fig. 16. Default settings are 0.8 bar.
9. Set "Threshold 1" and "Threshold 2" and click [OK].

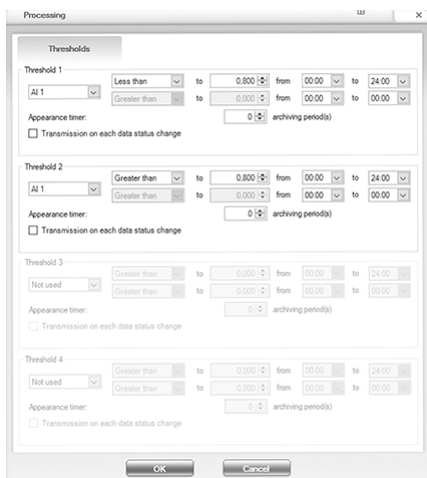


Fig. 18



Note that all other settings are preconfigured in the Grundfos DDD standard configuration.

10. Click [Warnings] to set alarm for low pressure, see fig. 16. Insert the host (CU354) phone number as SMS transmission number.
- "Threshold 1" is the alarm limit
 - "Threshold 2" is when the alarm is cleared.



Fig. 19



Note: Low pressure alarm has to be enabled for the logger to send status about battery and signal strength.



Do not change the alarm text.

11. Click [SAVE] and exit.



Fig. 20

A yellow warning should appear next to the Grundfos DDD Standard configuration. This means that the configuration has not been pushed to a logger yet.

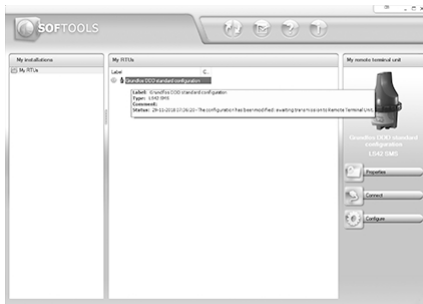


Fig. 21

6. Setting the logger

6.1 Configuration of logger



Use the magnet supplied with the starter kit to activate the logger for programming. The magnet can be ordered separately. See section 10. *Accessories*.



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Fig. 22



The logger communicates via Bluetooth. If the PC is not equipped with Bluetooth, a Bluetooth dongle is needed.

1. Check the state of the logger by holding the magnet in front of the "on/off" symbol for 2 seconds.
 - If the LED flashes blue, the device is running. Continue to step 5.
 - If the LED flashes green and yellow, the device is off. Continue to step 2.

See section 8. *Using the indicator lights* for more information.

2. Hold the magnet in front of the "on/off" symbol for 8 seconds until the yellow and green LED light on the logger flashes.



The logger will take up to 2 minutes to power on the first time.

3. Prepare the logger for communication by holding the magnet in front of the "on/off" symbol for 2 seconds. The blue LED will turn on, then flash and stabilise.
4. Once the blue LED is stable, the logger is ready for communication via Bluetooth.



If no connection has been made to the logger after 20 seconds, all 4 LEDs will turn on. After 5 minutes the logger will go to standby mode if left idle, and all 4 LEDs will turn off. Either in the absence of communications with Softools, or in the absence of user action.

5. In Softools, click [Connect], see fig. 16. Softools will search for available loggers.



Fig. 23

6. Enter the access code (default code is 0) and click [OK]



Fig. 24

7. Verify that the serial number in the window corresponds with the serial number on the logger, see fig. 25.



Fig. 25



Softools will display an error, indicating that 'device 41-911-xxxxx' cannot be found. In this case, simply click [Search] to connect to the current logger.



Fig. 26

8. Press the arrow towards the logger. This will push the configuration to the logger.

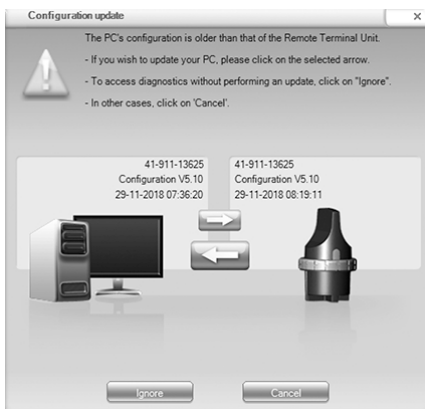


Fig. 27



If the logger contains an existing configuration, a reverse arrow will appear which allows you to download the configuration from the logger. See fig. 27

9. Click [OK] to allow the logger to disconnect after successful programming. Wait a couple of minutes for the logger to shut down completely.



Fig. 28

6.2 Signal test



The yellow (!), see fig. 21, in front of the Grundfos DDD standard configuration will now have disappeared because the configuration file has been sent to a logger.

The [Connect] button has two functions:

- The first time a configuration is moved to the logger, use the [Connect] button as described in the previous step.
- When the configuration is moved to the logger and the yellow (!) has disappeared, use the [Connect] button to view and change the configuration in the logger.

Note

To run a signal strength test, start the Softools program on your PC, and follow the steps below.

1. Hold the magnet in front of the "on/off" symbol for 2 sec. until the LED flashes blue.
2. In Softools, click [Connect] and Softools will search for available loggers.
3. Enter the access code (default code is 0) and Click [OK].



A new window will appear with the current settings. It is not possible to change any settings here as it will require a new configuration file.

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TM07 3518 0619

TM07 3519 0619

4. Click [Reception level] and [Delayed test], see fig. 30.



Fig. 29



Perform the test as realistically as possible, for example under the manhole cover.

The test result will appear in the window in Softools. 31 is the best possible result.

Results below 7 indicate a bad reception. In that case, use an external antenna to improve the signal.

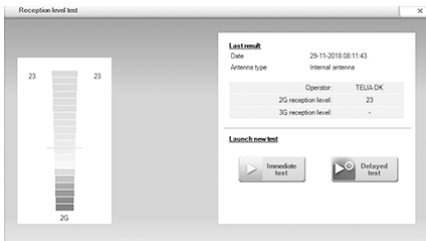


Fig. 30

7. Transmission test

1. Click [Mobile communication], see fig. 29 and enter the telephone number for your test mobile.



Remember the country code as a prefix.

2. Click [Immediate test]. Within a couple of minutes, you should receive a message on your phone containing the result of the reception level. See fig. 31 and 32.



Fig. 31

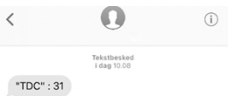


Fig. 32



The level text can be different from the test, as the reception level in the text are done as the texts are sent.

- Go to menu 1.2.10 on the CU354 and note the number of text messages received.



Fig. 33 CU354 GSM

- Click [SCADA communication] see fig. 29 and click [Immediate].



Fig. 34

- Go to menu 1.2.10 and verify that the controller has registered the incoming SMS.
- Close the SCADA communication test window, exit the configuration and close Softools.
- The logger will have all LEDs on for about 2 min, but it will shut down afterwards.



Fig. 35 Configured logger

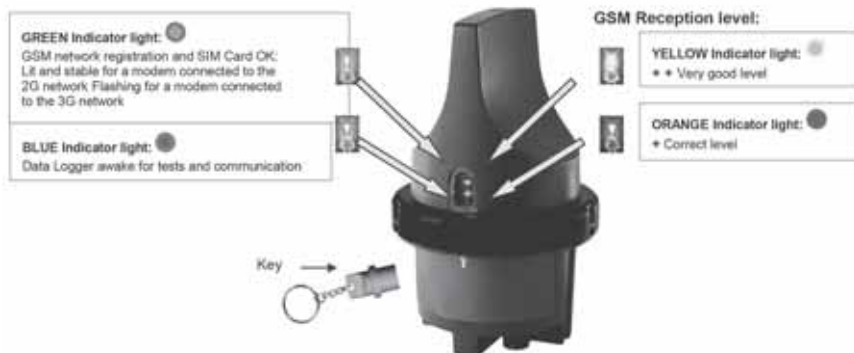
- The logger is now configured.

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8. Using the indicator lights



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8.1 Main visual tests

8.1.1 Is the data logger running?

To find out, place the key in front of the lock for 2 seconds:

- the indicator light flashes blue, meaning that the device is running.
- the green and yellow indicator lights turn on, meaning that the device is off.

8.1.2 Starting the data logger

- If the unit is off, hold the key for 8 seconds until the green and yellow indicator lights are flashing. To start the data logger, release the key (all lights are turned off).

8.1.3 Data logger wake-up for tests and communication

- Position the key in front of the lock printed on the case: the blue indicator light turns on, flashes, and stabilises. The data logger is ready for tests and communication.

8.1.4 Signal strength 2G/3G

- After the data logger is turned on, wait a few seconds (network registration time). If the red and yellow indicator lights fail to turn on, the reception level is too low.

8.1.5 GSM communication diagnostics

- During the tests, the blue indicator light flashes.



After remaining idle for 5 minutes, the unit automatically switches to standby mode: the 4 indicator lights are turned off.



Holding the key in place for 8 seconds 'powers down' the Data Logger; this action is necessary, for example, during transportation.

9. Setting the CU 354

Set the sensors from the CU 354 or use the PC Tool.

For further information, see the installation and operating instructions for the CU 354.

9.1 How to setup the CU 354

1. Go to 4.3.25, "Remote sensors".



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Fig. 36 Remote sensors

2. Enter the phone number for the CU 354 DDD controller and remember the country code; use "+" instead of "00".
3. Set the number of sensors installed. In this example, there are five sensors.
4. Scroll down to the first sensor and press [OK].



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Fig. 37 Remote sensor 1

5. Select sensor "Enabled".
6. Select remote sensor type Sofrel LS42.
7. Enter the name of the sensor. We recommend that you use the same name of the installation site.
8. Enter the phone number of the sensor as '+' followed by the country code and the local number.
9. Set the setpoint at the sensor's position. This will be the minimum pressure setpoint that the CU 354 controller will maintain.
10. Set the low pressure warning to "Manual" or "Auto" reset.
11. Latest response indicates when the latest data were received. This field will be empty until the first data are received. This may take up to 24 hours.
12. Repeat for the remaining sensors.

CU 354 has now been set up to communicate with all remote sensors.

10. Accessories

All accessories can be ordered for the Sofrel logger after installation

Description	Kit no.
Starter kit (incl. activation key, clamping tool and USB/BLEETOOTH interface for LS/LT)	99562954
LS42 cable	99562962
Terminal box cpl.	99562983
Sensor CNPR, pressure 0-16 bars with 3 m of cable	99562984
Activation key	99562985
Clamping tool	99562987
External antenna with 4 m cable	99562991
HC battery	99563014

11. Battery replacement

See the Sofrel LS42 user manual.

12. 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.



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.

Argentina

Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro
Industrial Garin
1619 Garin Pcia. de B.A.
Phone: +54-3327 414 444
Telefax: +54-3327 45 3190

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

Belarus

Представительство ГРУНДФОС в
Минске
220125, Минск
ул. Шафарнянская, 11, оф. 56, БЦ
«Порт»
Тел.: +7 (375 17) 286 39 72/73
Факс: +7 (375 17) 286 39 71
E-mail: minsk@grundfos.com

Bosnia and Herzegovina

GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A,
BH-71000 Sarajevo
Phone: +387 33 592 480
Telefax: +387 33 590 465
www.ba.grundfos.com
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 Bulgaria EOOD
Slatina District
Iztochna Tangenta street no. 100
BG - 1592 Sofia
Tel. +359 2 49 22 200
Fax. +359 2 49 22 201
email: bulgaria@grundfos.bg

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.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

COLOMBIA

GRUNDFOS Colombia S.A.S.
Km 1.5 vía Siberia-Cota Conj. Potrero
Chico,
Parque Empresarial Arcos de Cota Bod.
1A.
Cota, Cundinamarca
Phone: +57(1)-2913444
Telefax: +57(1)-8764586

Croatia

GRUNDFOS CROATIA d.o.o.
Buzinski prilaz 38, Buzin
HR-10010 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499
www.hr.grundfos.com

GRUNDFOS Sales Czechia and Slovakia s.r.o.

Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111

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
Trukkikuja 1
FI-01360 Vantaa
Phone: +358-(0) 207 889 500

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.
Tópark 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
Graha Intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Phone: +62 21-469-51900
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.
1-2-3, Shin-Miyakoda, Kita-ku,
Hamamatsu
431-2103 Japan
Phone: +81 53 428 4760
Telefax: +81 53 428 5005

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 iela 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

Mexico

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

Romania

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

Russia

ООО Грундфос Россия
ул. Школьная, 39-41
Москва, RU-109544, Russia
Тел. (+7) 495 564-88-00 (495)
737-30-00
Факс (+7) 495 564 8811
E-mail grundfos.moscow@grundfos.com

Serbia

Grundfos Srbija d.o.o.
Omladinskih brigada 90b
11070 Novi Beograd
Phone: +381 11 2258 740
Telefax: +381 11 2281 769
www.rs.grundfos.com

Singapore

GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Phone: +65-6681 9688
Telefax: +65-6681 9689

Slovakia

GRUNDFOS s.r.o.
Prievozská 4D
821 09 BRATISLAVA
Phona: +421 2 5020 1426
sk.grundfos.com

Slovenia

GRUNDFOS LJUBLJANA, d.o.o.
Leskoškova 9e, 1122 Ljubljana
Phone: +386 (0) 1 568 06 10
Telefax: +386 (0) 1 568 06 19
E-mail: tehnika-si@grundfos.com

South Africa

Grundfos (PTY) Ltd.
16 Lascelles Drive, Meadowbrook Estate
1609 Germiston, Johannesburg
Tel.: (+27) 10 248 6000
Fax: (+27) 10 248 6002
E-mail: lgradidge@grundfos.com

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 31 332 23 000
Telefax: +46 31 331 94 60

Switzerland

GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Telefax: +41-44-806 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 Chaloe 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
İhsan 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

Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Телефон: (+38 044) 237 04 00
Факс: (+38 044) 237 04 01
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 4TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.

GRUNDFOS Pumps Corporation
9300 Loiret Blvd.
Lenexa, Kansas 66219
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Uzbekistan

Grundfos Tashkent, Uzbekistan The Representative Office of Grundfos Kazakhstan in Uzbekistan
38a, Oybek street, Tashkent
Телефон: (+998) 71 150 3290 / 71 150 3291
Факс: (+998) 71 150 3292

Addresses Revised 15.01.2019

99529659 0519
ECM: 1246627

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