SEWERIN
Technologies for leak detection.

FERROPHON®

FG 150 generator

Operating Instructions

01.03.2022 a - 108761 - en

FG 150 generator

Fig. 1: **FG 150** generator with opened case

Fig. 2: Case with earthing spike (view from below)

Fig. 3: Control panel

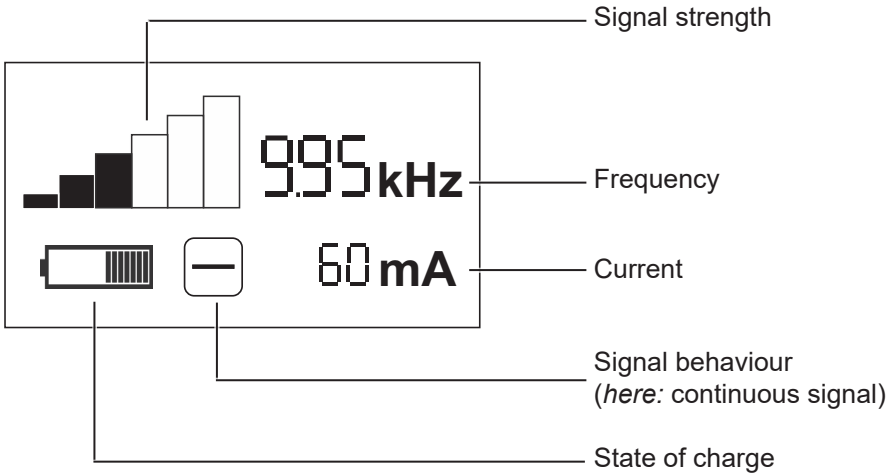

Fig. 4: Display with main view

Illustration of warnings in this document

WARNING!
Risk of personal injury. Could result in serious injury or death.

CAUTION!
Risk of personal injury. Could result in injury or pose a risk to health.

NOTICE!
Risk of damage to property.

1 Introduction

1.1 Information about this document

This document is a component part of the product.

- Read the document before putting the product into operation.
- Keep the document within easy reach.
- Pass this document on to any subsequent owners.
- Unless otherwise specified, the information in this document refers to the product as delivered (factory settings) and applies to all product variants.

Translations

Translations are produced to the best of our knowledge. The original German version is authoritative.

Right of reproduction

Registered trademarks

Registered trademarks are generally not indicated in this document.

1.2 Purpose

The portable **FG 150** generator is part of the **FERROPHON** system. The generator is suitable for energizing pipelines laid outdoors.

1.3 Intended use

The product is suitable for the following uses:

- Professional
- Industrial
- Commercial

The product must only be used for the applications specified in section 1.2.

The product may only be used by the following persons[1]:

- Technicians
- Trained persons

1.4 Safety information

This product was manufactured in keeping with all binding legal and safety regulations.

The product is safe to operate when used in accordance with the instructions provided. However, when handling the product, there may be risks to persons and property. For this reason, observe the following safety information without fail.

- Observe all the applicable safety standards and accident prevention regulations.
- Use the product only as intended.
- Do not make any changes or modifications to the product unless these have been expressly approved by Hermann Sewerin GmbH.
- Only use accessories approved by Hermann Sewerin GmbH.
- Always observe the permitted operating and storage temperatures.
- Handle the product carefully and safely, both during transport and when working. For example:
  - Do not drop the generator.
  - Always set the generator down carefully.
  - Secure the generator against slipping when transporting it in the vehicle.
- Always adequately cordon off the work area.
- Do not use the product if it is damaged or faulty.
- Protect the ports and sockets against dirt, and electrical ports in particular against moisture.
- Proceed with extreme caution in the vicinity of electrical lines.

[1] as defined in EN 62368-1

2 Product description

2.1 General

The **FG 150** generator can energize electroconductive pipelines directly or indirectly. A continuous or pulsed alternating current is transmitted. The frequency and signal strength of the generator can be adapted to local conditions.

To locate a pipeline energized by the generator, a receiver is required whose reception frequency can be brought into line with the generator's transmission frequency.

The generator is permanently installed in a case. Overviews with the names of the generator parts can be found in the front cover (fig. 1 to fig. 3).

The scope of delivery of the generator includes:

- **FG 150** cable set
- Extension for cable set
- Earthing spike

As soon as the cable set is connected to the generator, the generator can energize directly. Without the cable set connected, the generator energizes indirectly.

2.2 Ports

The generator has the following ports:

- Charging socket

  for connecting AC/DC adapter **L** or vehicle cable **L**
- Cable set port for connecting cable set **FG 150**

2.3 Settings and adjustments

When switched on, temporary adjustments can be made to the generator and certain settings can be saved permanently.

To energize a pipeline, adjustments must be made to allow for the particular local requirements:

- Frequency
- Signal strength
- Signal behaviour

When switching off, the frequency[1] is saved; signal strength and signal behaviour are not saved.

The following settings are saved permanently:

- Activation state of the frequencies (deactivated/activated)
- Individually added frequencies

2.3.1 Frequencies

Various preset frequencies are available for energizing (section 5.2). For direct energizing, individual frequencies can be set up in addition to the preset ones.

Frequencies can be deactivated. Deactivating can be useful if, of all the preset and individual frequencies, only certain frequencies are needed for daily work. In the main view (fig. 4) the number of selectable frequencies becomes smaller by deactivation. A desired frequency can thus be selected more quickly.

The list of frequencies (fig. 1) is always structured as follows:

1. Position 1 - 10

   Frequency list 1 and **Frequency list 2** views

   - Factory-set frequencies for direct and indirect energizing

2. Position 11 - 15

   Frequency list 3 view

   - Individual frequencies for direct energizing

   As long as no individual frequencies are set up, positions 11 - 15 are assigned the lowest possible frequency (200 Hz).

[1] The generator stores the last used frequency for both direct energizing and indirect energizing.

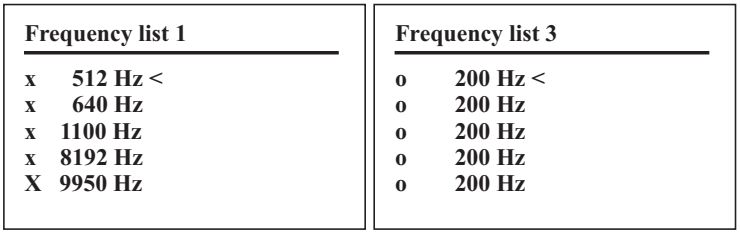

Fig. 5: **Frequency list** view - List of frequencies
- **x** Frequency activated, deactivation possible
- **X** Frequency activated, deactivation not possible
- **o** Frequency deactivated, activation possible
- Left image: **Frequency list 1** with 5 preset frequencies
- Right image: **Frequency list 3** with placeholders for 5 individual frequencies

The list of frequencies is protected against accidental change by PIN code.

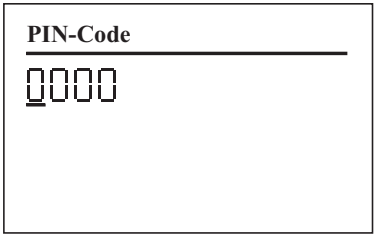

Fig. 6: **PIN-Code** view

2.3.2 Signal strength

The signal strength corresponds to the output power of the generator. The maximum output power depends on the signal behaviour:

- Continuous signal: max. 25 W
- Pulsed signal: max. 50 W

Whether these values are actually achieved depends on local conditions.

The signal strength can be changed in steps.

Current in energized pipelines

In energized pipelines, the current is limited by the generator:

- Continuous signal: max. 0.5 A
- Pulsed signal: max. 1 A

If these values are already reached at medium signal strength, the generator does not increase the actual signal strength any further. This also applies if the Up key is pressed further and an increased signal strength is then displayed.

Safe-to-touch range

As long as the signal strength does not show more than 3 bars (fig. 3, left picture), the generator operates in the touch-safe range ES1[2]. When the **Notice** symbol appears (fig. 3, picture on the right) the generator operates in the ES2 range[3].

NOTICE!

In the ES2 range, contact between metal parts (e. g. clamps, earthing spike) and a body part is painful but is not expected to cause injury. Nevertheless, the user is responsible for ensuring that persons or animals do not accidentally touch the metal parts.

- Secure the work area especially carefully when working in the ES2 range.

To get from range ES2 back to range ES1, the signal strength must be reduced (section 3.3).

[2] ES1: Electrical energy source class 1. Information on this in EN 62368-1 (4.2).

[3] anlogue ES1

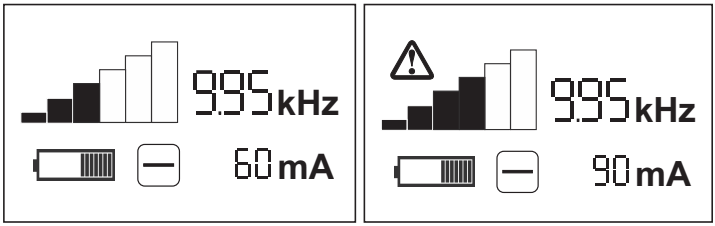

Fig. 7: Main view
Left image: Signal strength in ES1 range (safe-to-touch range)
Right image: Signal strength in ES2 range (**Notice** symbol)

2.3.3 Signal behaviour

The generator can optionally be operated with the following signal behaviour:

- Continuous signal
- Pulsed signal

  with pulsed signal, the signal cycle is 1 : 2 (pulse : pause).

Note:
Operation with pulsed signal extends the operating time of the generator compared to operation with continuous signal.

The signal behaviour determines the maximum output power of the generator as well as the maximum current in the energized pipeline (section 2.3.2).

2.4 Power supply

The generator is powered by a special, permanently installed Pb battery. Information about charging the rechargeable battery can be found in section 4.1.

3 Energizing a pipeline

WARNING!
Danger of electrical shock!
High voltages may be present at exposed parts of pipelines.

- Always observe the current rules when working near live pipelines.
- Do not touch any live parts (e. g. terminals, fittings, earthing spike) during direct energizing.
- Always adhere to the specified sequence of steps.

NOTICE!
When the lid is open, moisture can get into the case. Permanent moisture can cause damage to the generator and the case insert.

- When wet, open the generator case only as long as necessary for operation.

3.1 Switching the generator on and off

Switching on

- Press the On/Off key for approx. 1 second.

  A startup screen appears briefly on the display, indicating the firmware version. Then the main view appears (fig. 4).

Switching off

- Press the On/Off key for approx. 2 seconds.

  The generator switches off.

3.2 Setting the frequency

3.2.1 Selecting the frequency

The frequency for energizing must always be adapted to the local conditions.

Note:
The generator and receiver must operate at the same frequency.

- Adjust the frequency of the receiver to the frequency of the generator.

The generator is switched on. The display shows the main view.

- Press one of the frequency keys repeatedly until the desired frequency is displayed.

3.2.2 Activating and deactivating frequencies

The factory setting is that all preset frequencies are activated. Activated frequencies can be selected in the main view using frequency keys.

Note:
The frequencies for indirect energizing cannot be deactivated.

The generator is switched off.

1. Open the **PIN-Code** view (fig. 6).
   - Simultaneously press both frequency keys and the On/Off key until the **PIN-Code** view appears.
2. Enter the PIN code **0001**.
   - Press the arrow keys to move the cursor right or left.
   - Press the frequency keys to increase or decrease the digits.
   - Press the On/Off key to complete the PIN code entry.

     The **Frequency list 1** view (fig. 5, left image) appears.

3. Deactivate or activate the desired frequencies.
   a) Press the arrow keys to select a frequency.
   b) Press the pulse key to deactivate or activate the selected frequency.
      x Frequency activated
      o Frequency deactivated
   c) Press the On/Off key to apply the setting.
4. Press the Down key repeatedly until the main view appears again.

3.2.3 Adding a frequency

For direct energizing, up to 5 additional frequencies can be added to the factory-set frequencies. If individual frequencies have already been created, these can also be overwritten.

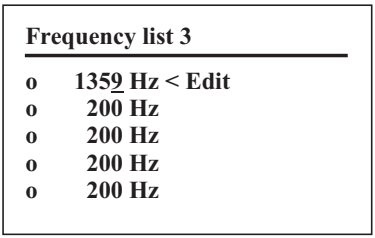

Fig. 8: **Frequency list** 3 view - Individual frequencies (*here:* top placeholder occupied by individual frequency 1359 Hz)

The generator is switched off.

1. Open the **PIN-Code** view (fig. 6).
   - Simultaneously press both frequency keys and the On/Off key until the **PIN-Code** view appears.
2. Enter the PIN code **0001**.
   - Press the arrow keys to move the cursor right or left.
   - Press the frequency keys to increase or decrease the digits.
   - Press the On/Off key to complete the PIN code entry.
   - The **Frequency list 1** view (fig. 5, left image) appears.

3. Press the Down key until the **Frequency list 3** view appears (fig. 5, right image).
4. Use the arrow keys to select a placeholder to be overwritten with an individual frequency.
5. Press the ON/OFF key. The placeholder is marked with **Edit** (fig. 4).
6. Set the desired frequency.

   The frequency can be between 200 Hz - 116.000 kHz.

   - Press the arrow keys to move the cursor right or left.
   - Press the frequency keys to increase or decrease the digits.
   - Press the On/Off key to finish entering the frequency. The **Edit** marking disappears.
7. Press the pulse key to activate the new frequency.
8. Press the Down key repeatedly until the main view appears again.

3.3 Adjusting the signal strength

The signal strength can be changed in steps.

The generator is switched on. The display shows the main view.

- Press the Up key to increase the signal strength.
- Press the Down key to reduce the signal strength.

  The signal strength changes with each keystroke.

Notes:
Even if in the **Signal strength** display no segment is filled, the generator still supplies power.
Observe the notes on working in the touch-safe range in section 2.3.2.

3.4 Selecting the signal behaviour

On the generator it is possible to select between continuous signal and pulsed signal.

The generator is switched on. The display shows the main view.

- Press the pulse key to switch between continuous signal and pulsed signal.

  The symbol of the selected signal behaviour is displayed.

3.5 Energizing a pipeline directly

During direct energizing, the generator sends a signal by means of cable to the pipeline to be located. The prerequisite is that a connection can be made at at least one exposed part of the pipeline.

The following options are available for direct energizing:

- Connection via conductor loop
- Connection with earthing spike

3.5.1 Connection via conductor loop

For connection via a conductor loop, two connection points are required on the pipeline. The pipeline to be located must run between the two connection points.

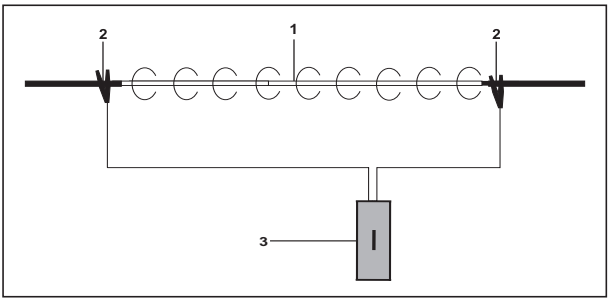

Fig. 9: Energizing via conductor loop
1 Energized section of pipeline
2 Terminals of the cable set
3 Generator

1. Make sure that the generator is switched off.
2. Connect the cable set to the generator.
3. Attach a clamp of the cable set to an exposed part of the pipeline to be energized.
4. Attach the second clamp of the cable set to the second connection point.
   - Select the second exposed connection point so that the pipeline to be located is within the two connection points.
5. Switch on the generator.
6. Select the frequency.
7. Adjust the signal strength.
8. Choose between continuous signal or pulsed signal.

   The pipeline is energized with the selected settings.

Ending direct energizing

1. Switch off the generator.
2. Disconnect the cable set from the generator.
3. Disconnect the terminals from the pipeline.

3.5.2 Connection with earthing spike

If there is only one connection option on a pipeline, an earthing spike can be used.

CAUTION! Risk of injury from tip

The earthing spike has a tip.

- Always be especially careful when working with the earthing spike, especially in the vicinity of other persons.
- Avoid dropping the earthing spike.

The earthing spike is placed in the ground. SEWERIN recommends: The distance from the earthing spike to the pipeline should be at least 3 m.

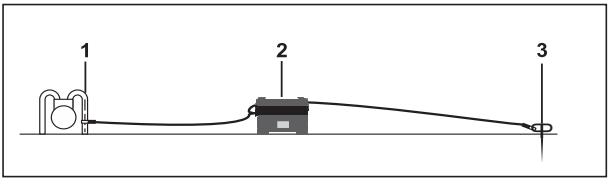

Fig. 10: Energizing with earthing spike
1 Electrical connection to the pipeline to be located
2 Generator
3 Earthing spike

1. Make sure that the generator is switched off.
2. Connect the cable set to the generator.
3. Insert the earthing spike firmly into the ground.
4. Attach a clamp to the earthing spike.
5. Attach the second clamp of the cable set to the exposed part of the pipeline to be energized.
6. Switch on the generator.
7. Select the frequency.
8. Adjust the signal strength.
9. Choose between continuous signal or pulsed signal.

   The pipeline is energized with the selected settings.

Ending direct energizing

1. Switch off the generator.
2. Disconnect the cable set from the generator.
3. Disconnect the clamps from the pipeline and from the earthing spike.

3.6 Energizing a pipeline indirectly

If no direct connection to a pipeline is possible, the generator can be used to indirectly energize a pipeline without a cable connection. For optimum indirect energizing, the generator must be positioned as accurately as possible lengthways over the pipeline (fig. 7).

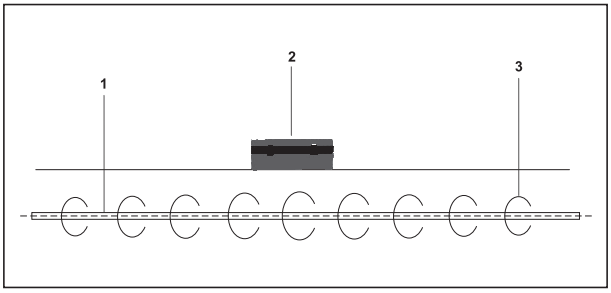

Fig. 11: Indirect energizing - alignment of the generator to the pipeline
1 Energized pipeline
2 Generator
3 Electromagnetic field

The generator is switched off.

1. Place the generator as accurately as possible lengthways over the pipeline to be located.
2. Switch on the generator.

   In the main view, the **Indirect energizing** icon appears.
3. Select the frequency.
4. Adjust the signal strength.

   The pipeline is energized with the selected settings.

Ending indirect energizing

- Switch off the generator.

4 Maintenance

4.1 Recharging the battery

The battery of the generator must be charged when necessary. The typical charging time is less than 7 hours.

Always observe the permitted temperature range during charging. If the temperature falls below or exceeds the limit values, charging stops until the temperature returns to within the permitted range.

NOTICE! Danger due to moisture

The AC/DC adapter is not protected against moisture penetration.

- Only charge the battery in dry rooms.

- To charge the battery, connect the generator using the AC/DC adapter **L** or vehicle cable **L** to the power supply (230 V~ or 12 V=).

  The display shows that charging is in progress (fig. 8).

  The AC/DC adapter and the vehicle cable are available to buy as accessories.

The battery is protected against overcharging. Therefore the generator can be left connected to the power supply once it is fully charged.

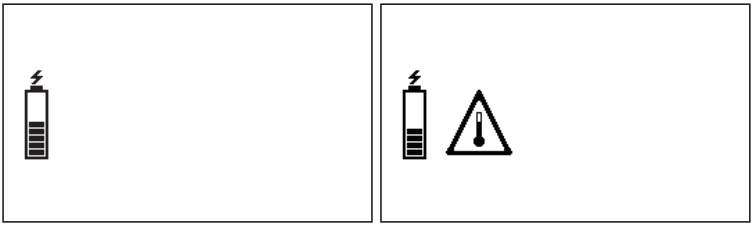

Fig. 12: Display when charging
Left image: Battery is being charged
Right image: Charging interrupted due to impermissible charging temperature

NOTICE!

Shortened battery life due to deep discharge

The Pb battery of the generator can discharge (self-discharge) even when not in use.

- You should charge the battery at least once every 6 months.

4.2 Care

All that is necessary to care for the generator is to wipe it down with a damp cloth.

NOTICE! Risk of damage

The display surface of the generator is sensitive to mechanical and chemical stress.

- Always use a clean, soft cloth to clean the display surface.
- Never use cleaning agents containing aggressive components (e.g. acidic or abrasive components) to clean the display surface.

SEWERIN recommends: Always remove significant contamination immediately.

If the inside of the case has become wet during use:

- Wipe dry with a cloth.
- Then allow the case to dry in a suitable environment with the lid open.

4.3 Maintenance

SEWERIN recommends: Have the generator serviced regularly by SEWERIN Service or an authorised professional. Only regular servicing can ensure that the generator is always ready for use.

4.4 Troubleshooting

Problem	Possible cause	Corrective action
Generator cannot be switched on.	Power supply insufficient	Recharge battery
	On/Off key pressed too briefly	Press On/Off key for at least 1 s
Energizing does not work	Cable not electrically conductive	—
	Cable set defective	Replace defective cable set
	Cable set not connected correctly	Check connections
Generator shuts down during the energizing process	Power supply insufficient	– Reduce power at generator – Recharge battery

5 Appendix

5.1 Technical data

Device data

Dimensions (W × D × H)	500 × 260 × 190 mm
Weight	8.3 kg
Material	ABS (housing)

Certificates

Certificate	CE

Features

Display	FSTN, 2″, 240 × 128 pixels, LED backlight
Processor	DSP 16 bit
Control	membrane keypad with 6 keys

Operating conditions

Operating temperature	-15 – 50 °C
Storage temperature	-15 – 50 °C
Humidity	15 – 90 % r.h., non-condensing
Protection rating	IP54 (when cover closed)
Non-permitted operating environments	in potentially explosive areas

Power supply

Power supply	Pb battery, built-in
Operating time, minimum	2 h
Operating time, maximum	50 h
Battery power	180 Wh
Battery voltage	12 V
Charging time	< 7 h
Charging temperature	-15 – 40 °C
Charging voltage	12 V
Charging current	3.5 A
Charger	AC/DC adapter L

Detection

Transmitting frequency	• direct energizing: 512 Hz / 640 Hz / 1.100 kHz / 8.192 kHz / 9.950 kHz / 32.768 kHz / 41.666 kHz / 65.536 kHz / 83.078 kHz / 116.000 kHz can also be set to any frequency between 200 Hz - 116.000 kHz. • indirect energizing: 9.950 kHz / 41.666 kHz
Transmitting power	• with continuous signal: 25 W • with pulsed signal: 50 W
Transmitting current	• with continuous signal: 0.5 A • with pulsed signal: 1 A
Transmission voltage, effective	max. 120 V

5.2 Preset frequencies

Frequency	Display in	
	Frequency list	Main view
512 Hz	512 Hz	512 Hz
640 Hz	640 Hz	640 Hz
1.100 kHz	1100 Hz	1,10 kHz
8.192 kHz	8192 Hz	8,19 kHz
9.950 kHz*	9950 Hz	9,95 kHz
32.768 kHz	32768 Hz	32,8 kHz
41.666 kHz*	41666 Hz	41,7 kHz
65.536 kHz	65536 Hz	65,5 kHz
93.078 kHz	93078 Hz	93,1 kHz
116.000 kHz	116000 Hz	116 kHz

* For direct as well as indirect energizing.

5.3 Symbols on the display


Continuous signal


Pulsed signal


Indirect energizing


Notice!


Battery charging


Charging interrupted due to impermissible charging temperature

5.4 Accessories

Part	Order number
AC/DC adapter L12 V	LD26-10000
Vehicle cable L12 V	ZL05-10200

Other accessories are available for the **FERROPHON** system. Please contact the SEWERIN sales department for further information.

5.5 Declaration of conformity

Hermann Sewerin GmbH hereby declares that the **FG 150** generator fulfils the requirements of the following guidelines:

- 2011/65/EU
- 2014/30/EU
- 2014/35/EU

The complete declaration of conformity can be found online.

5.6 Advice on disposal

The European Waste Catalogue (EWC) governs the disposal of devices and accessories in accordance with EU Directive 2014/955/EU.

Waste	EWC code
Device	16 02 13
Rechargeable battery	16 06 05

Alternatively, devices can be returned to Hermann Sewerin GmbH.

6 Index

Hermann Sewerin GmbH
Robert-Bosch-Straße 3
33334 Gütersloh, Germany
Tel.: +49 5241 934-0
Fax: +49 5241 934-444
www.sewerin.com
info@sewerin.com

SEWERIN SARL
17, rue Ampère – BP 211
67727 Hoerdt Cedex, France
Tél. : +33 3 88 68 15 15
Fax : +33 3 88 68 11 77
www.sewerin.fr
sewerin@sewerin.fr

SEWERIN IBERIA S.L.
Centro de Negocios Eisenhower
Avenida Sur del Aeropuerto
de Barajas 28, Planta 2
28042 Madrid, España
Tel.: +34 91 74807-57
Fax: +34 91 74807-58
www.sewerin.com
info@sewerin.es

Sewerin Portugal, Lda
Rua Sr. Dos Milagres, 16, 2º Esq
3800-261 Aveiro, Portugal
Tlf.: +351 234 133 740
Fax.: +351 234 024 446
www.sewerin.com
info@sewerin.pt

Sewerin Sp. z o.o.
ul. Twórcza 79L/1
03-289 Warszawa, Polska
Tel.: +48 22 675 09 69
Tel. kom.: +48 501 879 444
www.sewerin.com
info@sewerin.pl

Sewerin Ltd.
Hertfordshire
UK
Phone: +44 1462-634363
www.sewerin.co.uk
info@sewerin.co.uk