



FERROPHON® FG 155 C

Generator
Striker and stopper



FG 155 C generator



Fig. 1: **FG 155 C** generator with open case



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

FG 155 C generator



Fig. 3: Control panel

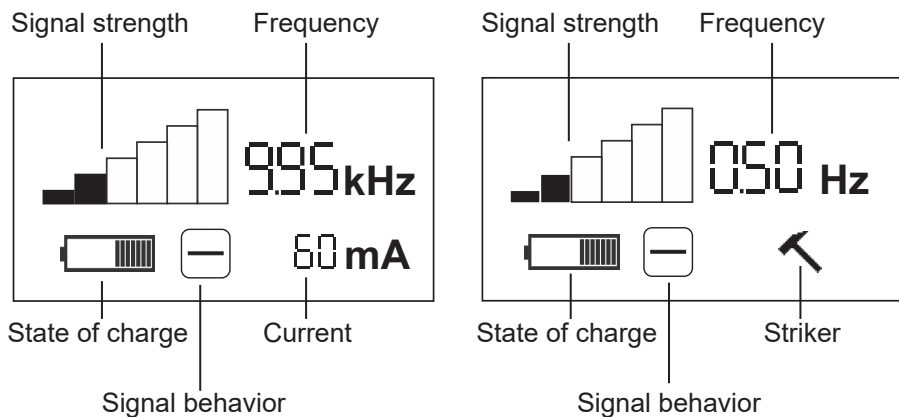


Fig. 4: Display with main view

Left image: Energizing for electromagnetic location

Right image: Energizing for acoustic location (*here*: with striker)

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 health risk.

NOTICE!

Risk of damage to property.

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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.

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Registered trademarks

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1.2 Purpose

The portable **FG 155 C** 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 persons¹:

- Technicians
- Trained persons

1.4 Safety information

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

The product complies with the requirements of part 15 of the FCC regulations, offering sufficient protection for users and the application environment. In certain situations, however, limited interference may be caused (e.g. radio/television reception).

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.

¹ as defined in EN 62368-1

- When you are wearing headphones, you are not fully aware of ambient noise. Be especially vigilant, especially in environments with an increased risk of accident (e.g. traffic).
- 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.

2 Product description

2.1 General

The **FG 155 C** generator is used to energize pipes for electromagnetic or acoustic location. The generator is therefore also often referred to as the transmitter.

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
- Ground spike
- Remote control

The following generator accessories are available to purchase to assist with energizing for acoustic location:

- Stopper
- Striker

Energizing for electromagnetic location

The **FG 155 C** 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.

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.

Energizing for acoustic location

Non-electroconductive pipelines can be made to vibrate by the **FG 155 C** generator with a connected striker or stopper. The acoustic signals generated in this way can be located acoustically using a suitable system (e.g. **AQUAPHON** system).

2.2 FG 155 C generator

Overviews with the names of the generator parts can be found in the front cover (fig. 1 to fig. 3).

2.2.1 Ports

The generator has the following ports:

- Charging socket
for connecting AC/DC adapter **L** or vehicle cable **L**
- Port for accessories
for connecting cable set **FG 150**, a striker or stopper

The **FG 155 C** generator recognizes the intended use based on the connected accessory. If no accessories are connected, the generator energizes indirectly (section 3.2.5).

2.2.2 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.

2.2.3 Remote control

When energizing for acoustic location, the remote control can be used to pause the generator (pause function). When using the striker, the signal strength can also be adjusted. This is not possible when using the stopper.

The remote control has the following keys:

- Pause key
for pausing the generator
- Arrow keys
for setting the signal strength of the striker

2.3 Optional accessories

2.3.1 Striker

The striker has a moving pin, which can be used to generate vibrations on water or gas pipes. These vibrations allow the pipe to be located.

You will find an overview with the names of the parts of the striker inside the back cover (fig. 15).

2.3.2 Stopper

A stopper can generate vibrations on water mains which allow the pipe to be located.

When water is withdrawn from a hydrant, the water column is set in motion. The stopper slows down the water column at intervals. This generates noise that travels along the line and can be acoustically located even at longer distances.

You will find an overview with the names of the parts of the stopper inside the back cover (fig. 16).

2.4 Settings and adjustments for energizing

2.4.1 Electromagnetic location

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

- Frequency
- Signal strength
- Signal behavior

When switching off, the frequency¹ is saved; signal strength and signal behavior are not saved.

The following settings are saved permanently:

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

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

2.4.1.1 Frequencies

The frequency measures how quickly the pulses acting on a pipe follow each other.

Various preset frequencies are available for energizing (section 5.2.1). 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, pictured left) the number of selectable frequencies becomes smaller by deactivation. A desired frequency can thus be selected more quickly.

The list of frequencies (fig. 5) 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

1. 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).

Frequency list 1	
x	512 Hz <
x	640 Hz
x	1100 Hz
x	8192 Hz
X	9950 Hz

Frequency list 3	
o	200 Hz <
o	200 Hz
o	200 Hz
o	200 Hz
o	200 Hz

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

A PIN code protects the list of frequencies from being inadvertently changed.

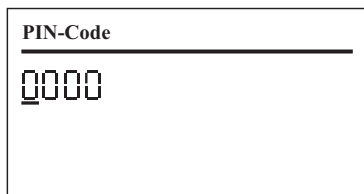


Fig. 6: **PIN code** view

2.4.1.2 Signal strength

The signal strength is the intensity with which pulses affect a pipe.

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

- Frequency <45 kHz: max. 10 W
- Frequency ≥45 kHz: max. 1 W

Whether or not 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. 7, pictured left), the generator operates in the safe-to-touch range ES1². When the **Notice** symbol appears (fig. 7, pictured right), the generator operates in the ES2 range³.

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

³ analog ES1

NOTICE!

In the ES2 range, contact between metal parts (clamps, ground spike etc.) and body parts 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 3.2.2).

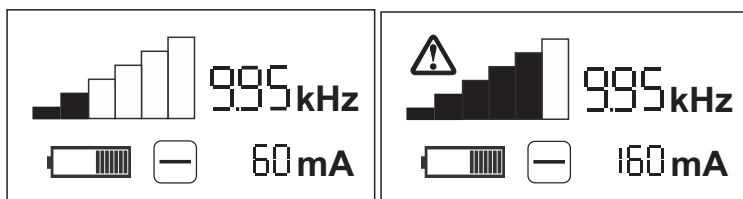


Fig. 7: Energizing for electromagnetic location – main view
Left image: Signal strength in ES1 range (safe-to-touch range)
Right image: Signal strength in ES2 range (**Notice** symbol)

2.4.1.3 Signal behavior

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

- Continuous signal
- Pulsed signal

With pulsed signal, the signal cycle is 1 to 2 (pulse to pause).

Signal	Signal curve
continuous signal	
pulsed	

Note:

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

The signal behavior determines the maximum output power of the generator as well as the maximum current in the energized pipeline (section 2.4.1.2).

2.4.2 Acoustic location

Temporary adjustments can be made to the generator (when it is switched on) or the stopper.

- Frequency
- Signal strength
- Signal behavior (striker only)

Temporary changes to the generator are not saved when it is switched off.

At switch-on, the generator always starts with the lowest frequency and, if the striker is being used, also with the lowest signal strength.

2.4.2.1 Frequencies

The frequency measures how quickly the pulses acting on a pipe follow each other.

Both the striker and the stopper can be operated at different frequencies.

Various preset frequencies are available for energizing (section 5.2.2).

2.4.2.2 Signal strength

The signal strength is the intensity with which pulses affect a pipe.

A high signal strength means high energy which helps with location e.g. across long distances or of thicker pipes.

A low signal strength is often required if location has to take place close to the striker. This is because e.g. noise can be transmitted through the ground close to the striker.

Striker

When using the striker, the signal strength is adjusted on the generator.

Stopper

When using the stopper, the signal strength is adjusted directly on the stopper (signal strength controller).

2.4.2.3 Signal behavior

The signal behavior indicates the rate at which the pulses act on the pipe.

Striker

When using the striker, the generator can optionally be operated with the following signal behavior:

- Steady signal
- Discontinuous signal

Signal	Signal curve
steady	
discontinuous	

Stopper

When using the stopper, the generator always emits a steady signal.

3 Energizing pipelines



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, ground 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. The main view then appears (fig. 4).

Switching off

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

The generator switches off.

3.2 Energizing for electromagnetic location

3.2.1 Setting the frequency

3.2.1.1 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. Either the cable set or no accessory is connected.

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

3.2.1.2 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, pictured left) appears.

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

3.2.1.3 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.

Frequency list 3	
o	<u>1359</u> Hz < Edit
o	200 Hz
o	200 Hz
o	200 Hz
o	200 Hz

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

The generator is switched off.

- Open the **PIN-Code** view (fig. 6).
 - Simultaneously press both frequency keys and the On/Off key until the **PIN code** view appears.
- 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, pictured left) appears.

3. Press the Down key until the **Frequency list 3** view appears (Fig 5, pictured right).
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. 8).
6. Set the desired frequency.

The frequency can be between 200 and 16000 Hz.

- 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.

3.2.2 Adjusting signal strength

The signal strength can be changed in steps.

The generator is switched on. Either the cable set or no accessory is connected.

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

The signal strength display 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 safe-to-touch range in section 2.4.1.2.

3.2.3 Selecting the signal behavior

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

The generator is switched on. Either the cable set or no accessory is connected.

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

The symbol of the selected signal behavior is displayed.

3.2.4 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 least one exposed part of the pipeline.

The following options are available for direct energizing:

- Connection via conductor loop
- Connection with ground spike

3.2.4.1 Connecting 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.

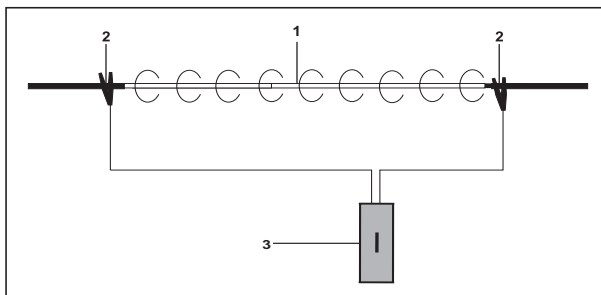


Fig. 9: Energizing via conductor loop
1 Energized section of pipeline
2 Terminals of the cable set
3 Generator

The generator is switched off.

1. Connect the cable set to the generator.
 2. Attach one terminal of the cable set to an exposed part of the pipeline to be energized.
 3. 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.
 4. Switch on the generator.
 5. Select the frequency.
 6. Adjust the signal strength.
 7. 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.

3.2.4.2 Connecting with ground spike

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



CAUTION! Risk of injury from tip

The ground spike has a tip.

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

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

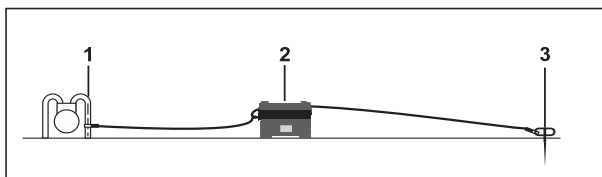


Fig. 10: Energizing with ground spike

- 1 Electrical connection to the pipeline to be located
- 2 Generator
- 3 Ground spike

The generator is switched off.

1. Connect the cable set to the generator.
2. Insert the ground spike firmly into the ground.
3. Attach a clamp to the ground spike.
4. Attach the second clamp of the cable set to the exposed part of the pipeline to be energized.
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 clamps from the pipeline and from the ground spike.

3.2.5 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. 11).

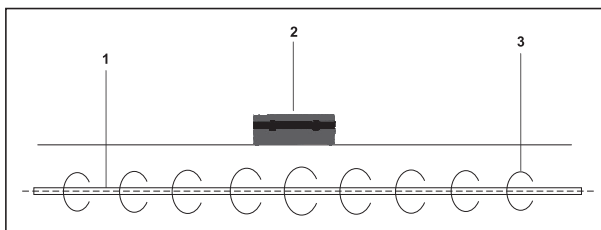


Fig. 11: Indirect energizing - alignment of the generator to the pipeline

- 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.
5. Choose between continuous signal or pulsed signal.

The pipeline is energized with the selected settings.

Ending indirect energizing

- Switch off the generator.

3.3 Energizing for acoustic location

3.3.1 Selecting the frequency

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

The generator is switched on. A striker or stopper is connected.

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

3.3.2 Adjusting signal strength

3.3.2.1 Signal strength of the striker

The signal strength of the striker can be changed in steps.

The generator is switched on. The striker is connected.

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

The signal strength display changes with each keystroke.

Note:

Even if no segment is filled in the **signal strength** display, the generator still supplies pulses.

3.3.2.2 Signal strength of the stopper

The signal strength of the stopper can be changed in steps.

- Turn the signal strength controller on the stopper clockwise to reduce the signal strength.
- Turn the signal strength controller on the stopper counterclockwise to increase the signal strength.

3.3.3 Selecting the signal behavior (striker only)

You can choose between steady and discontinuous signal on the generator for energizing using a striker.

Note:

The signal behavior can only be selected for the striker, not for the stopper.

The generator is switched on. The striker is connected.

- Press the pulse key to switch between steady and discontinuous signal.

The symbol of the selected signal behavior is displayed.

3.3.4 Energizing using a striker

The striker can be used for gas and water pipes with an outer diameter of up to 4¾ inches.

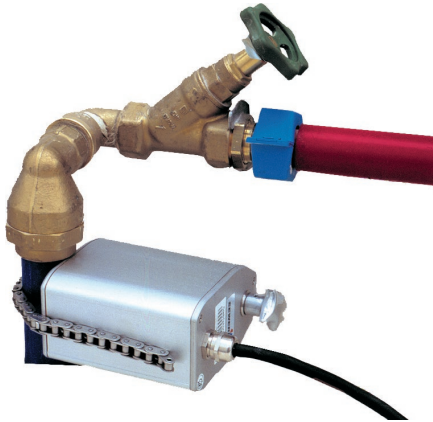


Fig. 12: Striker, attached to a house service connection

1. Attach the striker to the line.
 - a) Place the fastening chain around the pipeline.
 - b) Hook the fastening chain onto the striker.
 - c) Clamp the fastening chain using the star knob until the striker is adequately secured to the pipe.
2. Connect the connection cable of the striker to the generator.
3. Switch on the generator.
4. Adjust the frequency, signal strength and if necessary the signal behavior to the local conditions.

The pipeline is energized with the selected settings.

Ending energizing with a striker

1. Switch off the generator.
2. Disconnect the connection cable of the striker from the generator.
3. Remove the striker from the pipe.

3.3.5 Energizing using a stopper

The stopper can be connected to:

- Above-ground hydrants
- Underground hydrants in conjunction with a standpipe

Note:

The section below explains how to use the stopper on an underground hydrant with standpipe. The stopper is connected directly to above-ground hydrants.

1. Connect the standpipe with flushing adapter to the hydrant.
2. Rinse the hydrant/pipeline to remove any dirt.
 - a) Open the shut-off valves on the hydrant and the standpipe.
 - b) Wait until the water runs totally clear:
 - c) Close the shut-off valves on the hydrant and the standpipe.
3. Take the flushing adapter off the standpipe.
4. Connect the stopper to the standpipe.
5. Turn the signal strength controller on the stopper clockwise as far as the stop (lowest signal strength).
6. Connect the connection cable of the stopper to the generator.
7. Open the shut-off valves on the hydrant and the standpipe.
8. Switch on the generator.
9. Adjust the frequency and signal strength to the local conditions.

The pipeline is energized with the selected settings.

Ending energizing using a stopper

1. Switch off the generator.
2. Close the shut-off valve on the hydrant.
3. Disconnect the connection cable of the stopper from the generator.

4. Remove the stopper from the hydrant in the following order:
 - a) Remove the stopper from the standpipe.
 - b) Remove the standpipe from the hydrant.
5. Clean the stopper (section 4.2.2).

3.3.6 Using the remote control

Note:

The keys of the remote control are located below the black dots beside the symbols, not below the symbols.

3.3.6.1 Commissioning

The remote control comes with a film strip to save the battery, which must be removed before first use.

- Pull the battery saver strip until it comes undone.

3.3.6.2 Pause function

The pause function can be used to pause operation of the generator without switching the generator off. While paused, the generator does not send any pulses. The pause function can be used for both the striker and the stopper.

Note:

A pause can only be started using the remote control. A pause can be ended, however, both using the remote control and on the generator.



Fig. 13: Energizing for acoustic location – main view when using the remote control (Symbol **Pause**)

Starting a pause

- Press the pause key on the remote control.

The **Pause** symbol appears on the display.

Ending a pause

- Press the pause key on the remote control again.

OR

- Press one of the arrow keys on the remote control or on the generator.

The **Pause** symbol disappears from the display.

3.3.6.3 Setting the signal strength (striker only)

Note:

The remote control can only be used to adjust the signal strength for the striker, not for the stopper.

The signal strength is adjusted using the remote control in the same way as on the generator itself (section 3.3.1).

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

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.

The following is required for charging:

- AC/DC adapter **L**

OR

- Vehicle cable **L**

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

NOTICE! Danger due to moisture

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

- Only charge the battery in dry rooms.
-

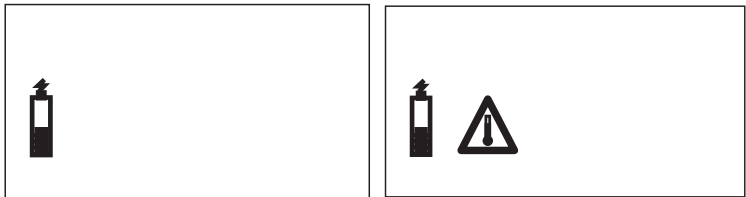


Fig. 14: Display when charging

Left image: Battery is being charged

Right image: Charging interrupted due to impermissible charging temperature

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 (fig. 14, pictured right).

- Connect the generator using the AC/DC adapter or vehicle cable to the power supply (110 V~ or 12 V=).

The display shows that charging is in progress (fig. 14, pictured left).

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

NOTICE!

Shortened battery life due to deep discharge

The battery in 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

4.2.1 Cleaning the generator and striker

All that is necessary to care for the generator and striker is to wipe them 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 constituents (e.g. acidic or abrasive constituents) to clean the display surface.
-

SEWERIN recommends: Always remove significant contamination immediately.

4.2.2 Cleaning the stopper

The stopper must be thoroughly cleaned and dried after every use.

NOTICE! Functional disturbances possible as a result of corrosion

To prevent the corrosion of surfaces:

- Only reassemble the stopper when it is dry or immediately before next use.
-

1. Undo the screws on the front of the stopper using the Allen key provided.
2. Clean the piston and cylinder.
 - a) Remove the cylinder.
 - b) Carefully pull the piston out of the cylinder, making sure you keep it straight.
 - c) Thoroughly rinse the piston and cylinder with low-lime or distilled water.
 - d) Thoroughly dry the cylinder and piston, e.g. with a cloth.
 - e) Carefully insert the piston back into the cylinder. Make sure that the components do not get jammed.
 - f) Screw the cylinder back onto the housing.
3. Clean the signal strength controller.
 - a) Undo the screws beside the signal strength controller using the Allen key provided.
 - b) Carefully pull out the signal strength controller.
 - c) Pull out the slide gate.
 - d) Thoroughly rinse the slide gate, signal strength controller and housing with low-lime or distilled water.
 - e) Carefully dry the slide gate, signal strength controller and housing, e.g. with a cloth. Re-insert the slide gate and signal strength controller.
 - f) Secure the screws with lock washers again so that they are equally tight.

4.2.3 Water in the case

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.

4.2.4 Storage

If the generator, striker and stopper are not stored properly, e.g. damp can cause corrosion resulting in malfunctions.

- Store the generator in a dry place.
- Always make sure the striker and stopper are clean and dry before storing.
- Store the striker in the case.

4.3 Servicing

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

4.4 Troubleshooting

4.4.1 Generator

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 for electromagnetic location is not working	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

4.4.2 Striker

Problem	Possible cause	Corrective action
Striker not generating a signal	Generator not switched on	Switch on the generator
	Striker is not correctly connected to generator	Check electrical connection (connection cable)
Striker signal cannot be detected	Generator pulse too weak	Increase signal strength
	Striker fastening to pipeline has come loose	Tighten fastening chain

4.4.3 Stopper

Problem	Possible cause	Corrective action
Stopper not generating a signal	Generator not switched on	Switch on the generator
	Stopper not correctly connected to generator	Check electrical connection (connection cable)
Stopper signal cannot be detected	Generator pulse too weak	Increase signal strength
Stopper piston not moving	Piston is blocked	See below “Loosening the blocked piston”.
Water leaking out of the venting hole on the bottom of the housing	Bellows leaking	Send the stopper to SEWERIN Service for repair.

Loosening the blocked piston

If the piston of the stopper blocks during energizing, you will need to clean the stopper.

1. Switch off the generator.
2. Close the shut-off valve on the hydrant.
3. Disconnect the connection cable of the stopper from the generator.
4. Remove the stopper from the hydrant.
5. Clean the stopper (section 4.2.2).
6. Reassemble the stopper.
7. Reconnect the stopper.
8. Start up the stopper.

Note:

If you cannot loosen the piston or if the problem recurs:

- Send the stopper to SEWERIN Service.
-

5 Appendix

5.1 Technical data

Device data

Dimensions (W × D × H)	19.7 × 10.3 × 7.5 inches
Weight	18 lbs. 5 ounces
Material	ABS (housing)

Certificates

Certificates	FCC
Marking	Contains: FCC ID: OJM900MCA / IC: 5840A-900MCA

Features

Display	FSTN, 2", 240 × 128 pixels, LED backlight
Processor	DSP 16 bit
Operation	• membrane keypad with 6 keys • remote control

Operating conditions

Operating temperature	5 – 122 °F
Storage temperature	5 – 122 °F
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 at 77°F
Operating time, maximum	50 h at 77°F
Battery power	180 Wh
Battery voltage	12 V
Charging time	≤ 7 h
Charging temperature	5 – 104 °F
Charging voltage	12 V
Charging current	3.5 A
Charging socket	4-pin (binder)

Data transmission (remote control)

Transmission frequency	902 – 928 MHz
Radio range	330 ft
Communication	radio
Power	9.5 dBm

Location

Transmitting frequency	electromagnetic location: • 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 acoustic location: • striker: 0.4 – 1.6 s • stopper: 1.0 – 1.6 s
transmitting power	• 10 W • 1 W starting at 45 kHz
transmitting current	• with continuous signal: 0.5 A • with pulsed signal: 1 A
transmission voltage, effective	max. 120 V
Signal strength	length of a pulse striker: 14 – 80 ms stopper: 160 ms

Remote control	power supply: CR2032
----------------	----------------------

5.2 Preset frequencies

5.2.1 Electromagnetic location

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.

5.2.2 Acoustic location

Frequency when using	
striker	stopper
0.50 Hz	0.60 Hz
1.00 Hz	0.70 Hz
1.50 Hz	0.80 Hz
2.00 Hz	0.90 Hz
2.50 Hz	1.00 Hz

5.3 Symbols on the display

	State of charge
	Continuous signal / steady signal
	Pulsed / discontinuous signal
	Indirect energizing
	Notice!
	Striker
	Stopper
	Pause
	Battery is being charged
	Charging interrupted due to impermissible charging temperature

5.4 Accessories

Part	Order number
COMBIPHON striker	SA02-10000
COMBIPHON stopper	SA03-10022
AC/DC adapter L	LD26-10100
Vehicle cable L	ZL05-10200

Other accessories are available for the **FG 155 C** generator. Please contact the SEWERIN sales department for further information.

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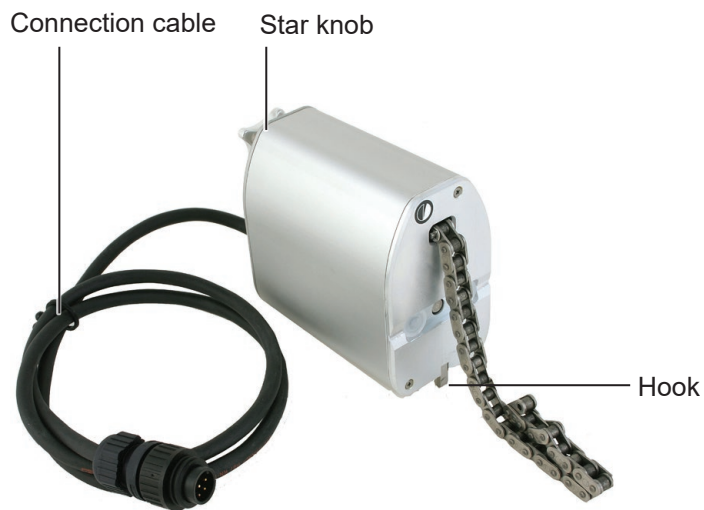


Fig. 15: Striker

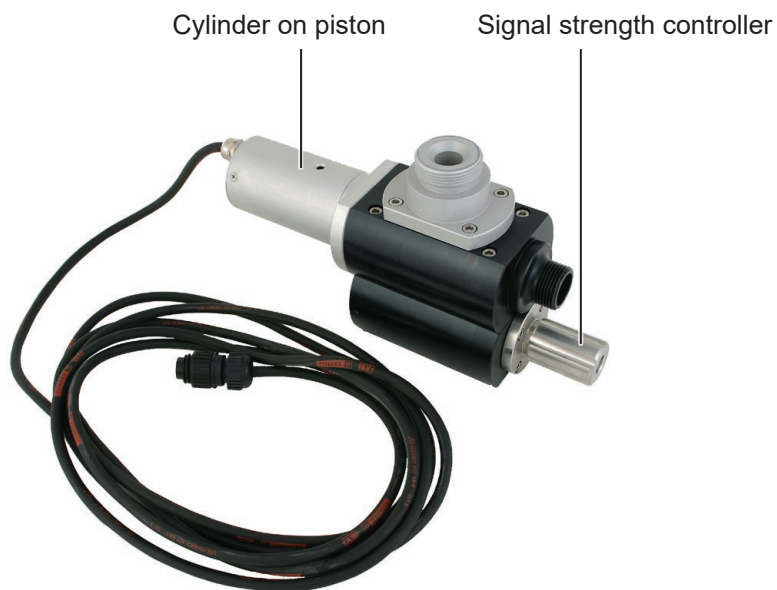


Fig. 16: Stopper

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