



COMBIPHON® CG 155

Generator
Striker and stopper



CG 155 generator



Fig. 1: CG 155 generator with an opened case



Fig. 2: Control panel

CG 155 generator

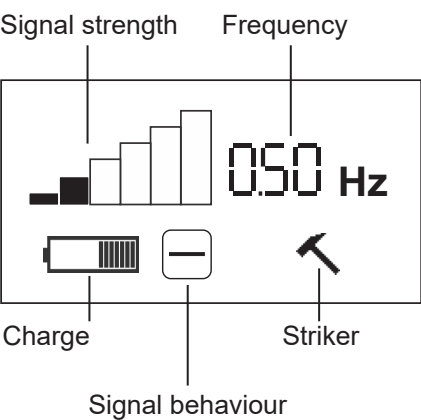


Fig. 3: Display (*here*: during energising with striker)

Illustration of warnings in this document

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

Registered trademarks are generally not indicated in this document.

1.2 Purpose

The portable **CG 155** generator is part of the **COMBIPHON** system.

The generator is suitable for the acoustic energising of pipes 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 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.

¹ as defined in EN 62368-1

- Always adequately cordon off the work area.
- 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 **CG 155** generator is used to energise pipes for acoustic location. The generator is therefore also often referred to as the transmitter.

Pipes that are not electrically conductive can be made to vibrate by the 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).

A remote control is included in the generator delivery

Energising requires a striker or a stopper. A striker and stopper can be purchased as accessories.

2.2 CG 155 generator

The generator is permanently installed in a case. An overview with the names of the generator parts can be found on the front cover (fig. 1 and fig. 2).

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 a striker or stopper

The **CG 155** generator recognises the intended use based on the connected accessory.

2.2.2 Power supply

The generator is powered by a special, permanently installed Pb rechargeable battery. Information about charging the rechargeable battery can be found in section 4.2.2.

2.2.3 Remote control

The remote control can be used to pause the generator (pause function).

The signal strength can also be adjusted when using the striker. This is not possible when using the stopper.

The remote control has the following keys:

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

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.

An overview with the names of the striker parts can be found on the back cover (fig. 7).

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 pipe and can be acoustically located even at greater distances.

An overview with the names of the stopper parts can be found on the back cover (fig. 8).

2.4 Settings for energising

The following adjustments can be made to the generator when it is switched on or to the stopper:

- Frequency
- Signal strength

The following settings for the striker can be adjusted on the generator:

- Signal behaviour

Generator settings are not saved when it is switched off.

When the generator is switched on, it always starts with the lowest frequency. If the striker is being used, the generator starts with the lowest signal strength.

2.4.1 Frequencies

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

Various frequencies are available for energising.

2.4.2 Signal strength

The signal strength is the intensity with which pulses act on 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 sound, for example, 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).

2.4.3 Signal behaviour

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

Striker

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

- Steady signal
- Discontinuous signal

Signal	Signal curve
Steady	
Discontinuous	

Stopper

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

3 Energising pipes

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. After that, the generator is operational (fig. 3).

Switching off

- Press the ON/OFF key for approx. 2 seconds.

The generator switches off.

3.2 Selecting a frequency

The frequency for energising 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 Setting the signal strength

3.3.1 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 when no signal strength is displayed, the generator will still send pulses.

3.3.2 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 anti-clockwise to increase the signal strength.

3.4 Selecting the signal behaviour of the striker

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

Note:

The signal behaviour 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 behaviour is displayed.

3.5 Energising using a striker

The striker can be used for gas and water pipes with an outer diameter of up to 120 mm.

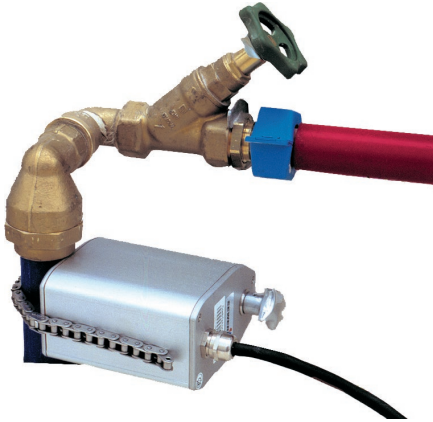


Fig. 4: Striker, attached to a house service connection

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 behaviour to the local conditions.

The pipe is energised with the selected settings.

Ending energising using 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.

3.6 Energising using a stopper

The stopper can be connected to:

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

The hydrants must meet the standards of DIN¹.

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 pipe is energised 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 stopper's connection cable 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).

¹ Deutsches Institut für Normung e. V.

3.7 Using the remote control

3.7.1 Using the remote control for the first time

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

- Pull the battery protection strip until it comes off.

3.7.2 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. 5: Display when using the remote control (**Pause** symbol)

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.

3.7.3 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 3.2).

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

4 Maintenance

4.1 Charging the rechargeable 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.
-

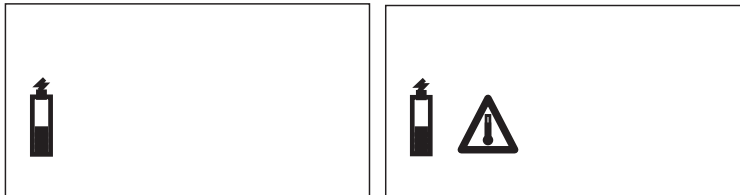


Fig. 6: Display when charging

Left image: Rechargeable battery is being charged

Right image: Charging interrupted because of 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. 6, 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. 6, 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 authorised 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	Charging the rechargeable battery
	ON/OFF key not pressed long enough	Press the ON/OFF key for at least 1 s
Generator shuts down during the energising process	Power supply insufficient	– Reduce power at generator – Charging the rechargeable 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 stopper's connection cable 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)	500 × 260 × 190 mm
Weight	8.3 kg
Material	ABS (housing)

Certificates

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

Features

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

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	14 h (at 25 °C)
Operating time, maximum	40 h (at 25 °C)
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
Charging socket	4-pin (binder)

Data transmission (remote control)

Transmission frequency	902 – 928 MHz
Radio range	100 m
Communication	radio
Power	9.5 dBm

Location

Transmitting frequency	- striker: 0.5 Hz 1.0 Hz 1.5 Hz 2.0 Hz 2.5 Hz	- stopper: 0.6 Hz 0.7 Hz 0.8 Hz 0.9 Hz 1.0 Hz
Signal strength	length of a pulse - striker: 16 – 80 ms - stopper: 160 ms	

Additional data

remote control	power supply: CR 2032
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5.2 Symbols on the display



Charge



Discontinuous signal



Steady signal



Striker



Stopper



Pause



Rechargeable battery is being charged



Charging interrupted because of impermissible charging temperature

5.3 Accessories

Part	Order number
COMBIPHON striker	SA02-10000
COMBIPHON stopper	SA03-10001
AC/DC adapter L	LD26-10100
Vehicle cable L	ZL05-10200

Other accessories are available for the **CG 155** generator. Please contact the SEWERIN Sales Department for further information.

5.4 Declaration of conformity

Hermann Sewerin GmbH hereby declares that the **CG 155** generator fulfils the requirements of the following guidelines:

- 2014/30/EU
- 2014/53/EU

The complete declaration of conformity can be found online.

5.5 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.

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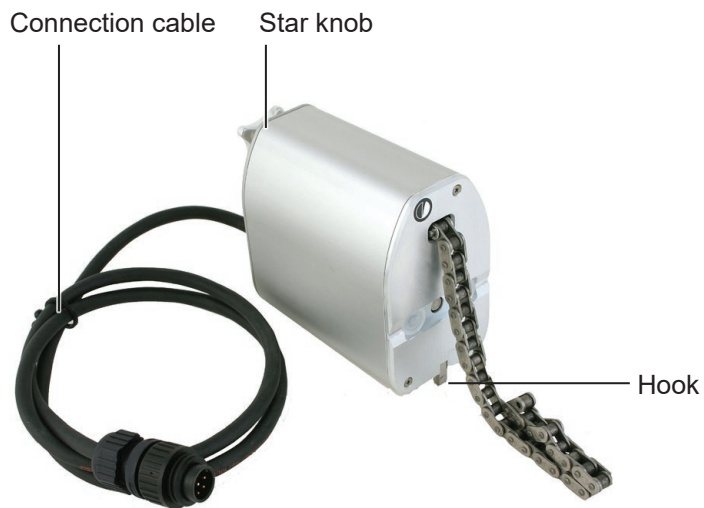


Fig. 7: Striker



Fig. 8: Stopper

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