SEWERIN
Technologies for leak detection.

COMBIPHON®

Operating Instructions

12.09.2017 a – 107543 – en

Fig. 1: **CG 50** generator in case with accessories

Fig. 2: Ports on case

CG 50 generator

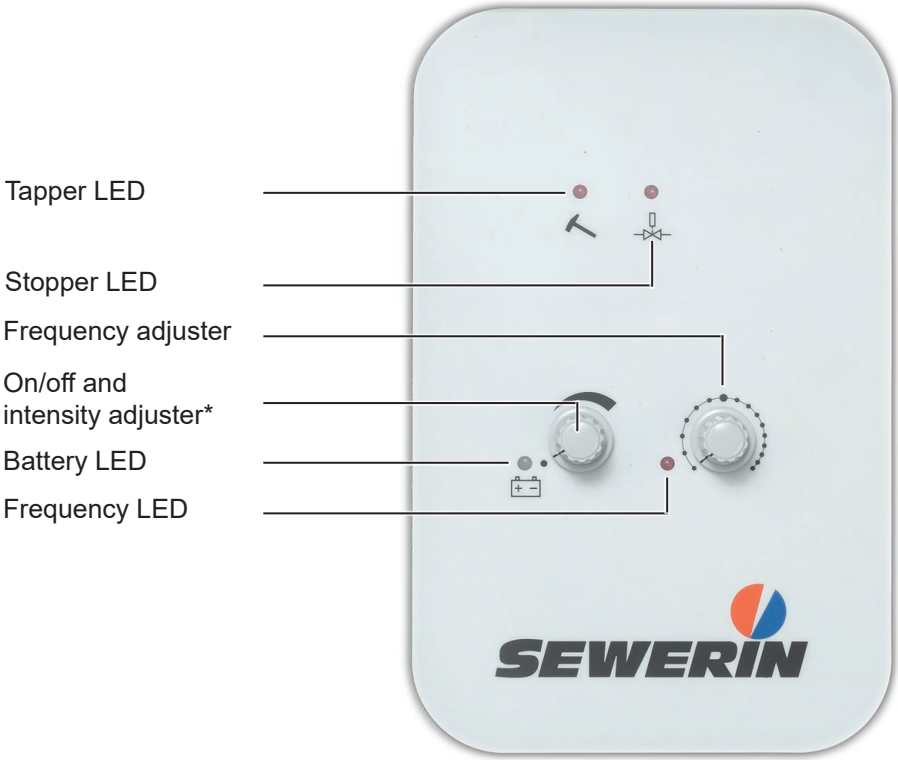

Fig. 3: **CG 50** generator – displays and controls

* Intensity setting for tapper only.

Information about this document

Warnings and notes in this document mean the following:

NOTICE!
Risk of damage to property.

Note:
Tips and important information.

Enumerated lists (numbers, letters) are used for:

- Instructions that must be followed in a certain order

Lists with bullet points (point, dash) are used for:

- Lists
- Instructions that only involve one step

1 Introduction

1.1 Warranty

The instructions below must be complied with in order for any warranty to be applicable regarding functionality and safe operation of this equipment. This product must only be commissioned by qualified professionals.

- Read these operating instructions prior to operating the product.
- Use the product only as intended (Section 1.3).
- Repairs and maintenance must only be carried out by specialist technicians or other suitably trained personnel. Only spare parts approved by Hermann Sewerin GmbH may be used when performing repairs.
- Changes or modifications to this product may only be carried out with the approval of Hermann Sewerin GmbH.
- Use only Hermann Sewerin GmbH accessories for the product.

Hermann Sewerin GmbH shall not be liable for damages resulting from the non-observance of this information. The warranty conditions of the General Terms and Conditions (AGB) of Hermann Sewerin GmbH are not broadened by this information.

In addition to the warnings and other information in these Operating Instructions, always observe the generally applicable safety and accident prevention regulations.

The manufacturer reserves the right to make technical changes.

1.2 Purpose

COMBIPHON is a system used to mechanically cause pipelines to vibrate. The vibrations generate noises which can be located acoustically (e.g. using the **AQUAPHON** or **AquaTest T10** system).

The **COMBIPHON** system is ideal for locating pipelines made of plastic, fibre cement and metal.

1.3 Intended use

The **COMBIPHON** system is intended for professional industrial and commercial use. The appropriate specialist knowledge is required to operate the system.

Only use the **COMBIPHON** system for the application specified in section 1.2.

1.4 General safety information

The **COMBIPHON** system was manufactured in accordance with all binding legal and safety regulations. It corresponds to the state of the art and complies with conformity requirements. The product is safe to operate when used in accordance with the instructions provided.

If you handle the product improperly or not as intended, the product may present a risk to persons and property. For this reason, always observe the following safety information.

Risk of personal injury (health risk)

- Proceed with extreme caution in the vicinity of electrical lines.
- Do not use the **COMBIPHON** system in the case of damage or faults.

Hazards for the product and other property

- Avoid damage, strong shocks, constant moisture and dirt.
- Before using the device, always check that the system components are in good working order. Never use damaged or defective components.
- Dirty contacts and moisture can result in functional disturbances. Clean and dry the electrical connections if necessary.
- Handle the system carefully and safely both during transport and when working.
- Observe the permitted operating and storage temperatures (page 18).

2 COMBIPHON system

2.1 System components (overview)

COMBIPHON is a modular system. The main system components are as follows:

- **CG 50** generator (permanently installed in case)
- Tapper

  Oscillator for use with water or gas pipes
- Stopper (optional)

  Oscillator for use with water mains
- AC/DC adapter **L**

  for operating and charging the **CG 50** generator

2.2 Power supply to the system

There are various power supply options available for the **CG 50** generator:

- external power source (100 – 240 V)
  - AC/DC adapter **L**
  - 12 V battery via vehicle cable **L** (accessory)
- Pb battery (rechargeable lead acid battery), built-in and sealed

The **CG 50** generator automatically starts charging / trickle charging when it is connected to an external power source. In trickle charge mode, the battery is constantly monitored and recharged when necessary.

Note:
SEWERIN recommends always connecting the **CG 50** generator to an external power source, even when it is not in use. This will prevent harmful deep discharge of the battery and also means that the **CG 50** generator is always ready for use.

If the battery voltage drops below 10 V and there is no external power supply, the **CG 50** generator will switch to standby mode. In standby mode the current is less than 7 mA, and all the LEDs will go out.

3 CG 50 generator

The **CG 50** generator is permanently integrated in the case and cannot be removed (fig. 1).

There is an optional remote control available for the **CG 50** generator.

3.1 Controls and displays

For an overview including the names of all the controls and displays, see the front cover flap (fig. 3). The frequency and intensity of the signal used for the location process are set using the knobs on the **CG 50** generator.

The LEDs on the control panel indicate the following operating statuses:

LED	Colours	Signal	Operating status
Tapper	red	constant	tapper connected
Stopper	red	constant	stopper connected
Disposable battery	green	constant	generator switched on
		flashing	battery charging
		double flashing	trickle charge
	red	flashing	undervoltage
Frequency	red	flashing	generator generating pulse

3.2 Switching the generator on and off

The **CG 50** generator is switched on and off using the on/off knob.

- Turn the on/off knob to the right until you overcome the slight resistance. The generator is switched on.
- Turn the on/off knob to the far left until you overcome the slight resistance. The generator is switched off.

4 Locating with the tapper

The tapper causes pipelines to vibrate, which enables the line to be located.

For the location process itself an appropriate system for acoustic leak detection must be used (e.g. **AQUAPHON** system).

The tapper can be used with gas and water pipes up to 120 mm in diameter.

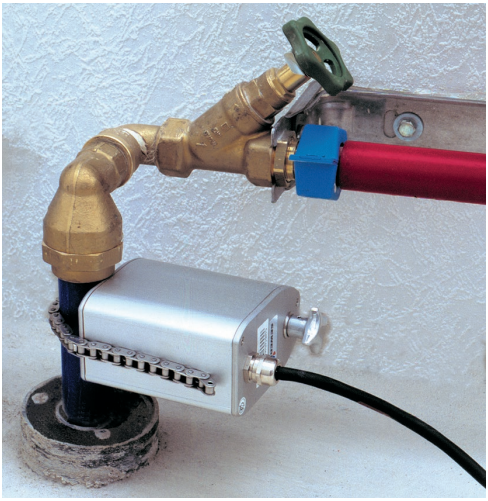

Fig. 4: Tapper, attached to a house service connection

4.1 Using the tapper to locate pipes

Proceed as follows to use the tapper to locate pipes:

1. Attach the tapper to the line.
   a) To do this, place the fastening chain around the pipeline.
   b) Hook the fastening chain onto the tapper.
   c) Using the knob on the tapper, tighten the fastening chain until the tapper is securely positioned.
2. Connect the connection cable of the tapper to the **CG 50** generator.
3. Switch on the **CG 50** generator.
4. Start up the system to be used for acoustic leak detection.

5. To optimally adjust the pulses to the individual conditions, initially turn the intensity adjuster and frequency adjuster towards the centre.
6. Start locating the pipeline.
   - While doing so, gradually adjust the intensity and frequency of the emitted pulses on the **CG 50** generator until they suit the local conditions.
     - Take into account the type of ground surface, the soil density and possible background noise.
     - Do not set the intensity and frequency too high if you are locating a pipeline close to the tapper. Vibrations can, for example, travel along the walls of buildings and make location difficult.
7. Mark the course of the located line.

4.2 After location

Once you have finished your location work:

1. Switch off the **CG 50** generator.
2. Disconnect the connection cable of the tapper from the **CG 50** generator.
3. Disconnect the tapper from the pipeline.
4. Clean and dry the tapper before storing it in the case.

NOTICE! Equipment damage possible

Moisture in the case can eventually lead to equipment damage:

- Leave the case open in a dry environment until it has fully dried out.

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5 Locating pipelines with the stopper

The stopper is an optional accessory for the **COMBIPHON** system. The stopper is designed for use on water mains.

The stopper can be connected to:

- DIN above-ground hydrants
- DIN underground hydrants in conjunction with a standpipe

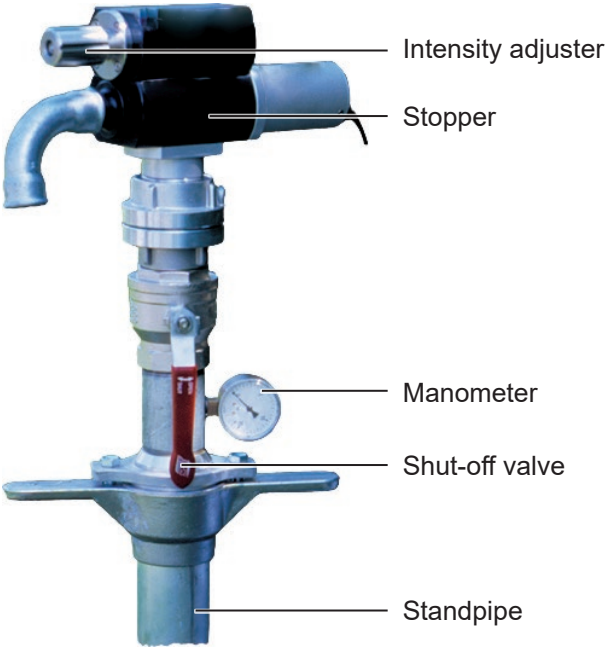

Fig. 5: Stopper on standpipe

5.1 Functional principle

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 noises that travel along the line and can be located even at long distances.

For the location process itself, an appropriate system for acoustic water leak detection must be used (e.g. **AQUAPHON** system).

5.2 Using the stopper to locate pipes

Note:
This section explains how to use the stopper at an underground hydrant with a standpipe. If the hydrant is above ground, connect the stopper directly.

Proceed as follows to use the stopper to locate pipes:

1. Connect the standpipe with flushing adapter to the hydrant.
2. Rinse the hydrant/pipeline to remove any dirt from the stopper. To do this, open the shut-off valves on the hydrant and the standpipe. As soon as the water runs totally clear, close the shut-off valves. The hydrant/pipeline is now rinsed.
3. Take the flushing adapter off the standpipe.
4. Connect the stopper to the standpipe.
5. Always turn the intensity adjuster on the stopper (fig. 5) all the way to the right initially (lowest intensity).
6. Connect the connection cable of the stopper to the **CG 50** generator.
7. Open the shut-off valves on the hydrant and the standpipe.
8. Switch on the **CG 50** generator.
9. Start up the system to be used for acoustic leak detection and start the locating process.
10. Carefully adjust the pulse to the local conditions. Take into account, for example, the ground surface, soil density and background noise.
    - To strengthen the pulse, gradually turn the intensity adjuster on the stopper to the left.
    - Use the frequency adjuster on the **CG 50** generator to change the frequency of the pulse.
11. Mark the course of the located line.

5.3 After location

Once you have completed the location process:

1. Switch off the **CG 50** generator.
2. Close the shut-off valve on the hydrant.
3. Disconnect the connection cable of the stopper from the **CG 50** generator.
4. Remove the stopper from the hydrant.

   If using on an underground hydrant:

   a) Remove the stopper from the standpipe.

   b) Remove the standpipe from the hydrant.
5. Thoroughly clean the components of the stopper (section 5.4 on page 12).
6. Dry all parts or let them dry naturally.
7. Clean and dry the stopper before storing it.

NOTICE!

Functional disturbances possible as a result of corrosion

To prevent the corrosion of surfaces:

- Make sure the system is as dry as possible when storing it.
- Only reassemble the stopper when it is dry or immediately before next use.

5.4 Cleaning the stopper

To ensure the functionality of the stopper, thoroughly clean and dry the stopper after every use.

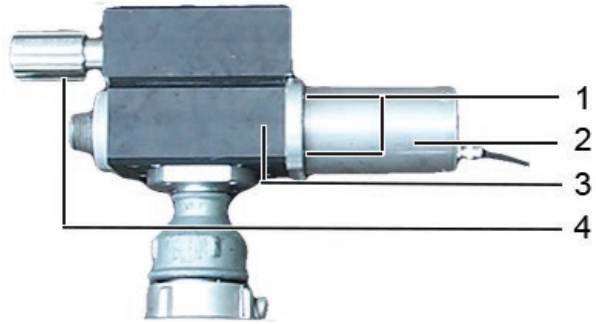

Fig. 6: Components of the stopper
1 Front with screws, 2 Cylinder with piston,
3 Housing, 4 Intensity adjuster

Proceed as follows:

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) 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 intensity adjuster.
   a) Undo the screws beside the intensity adjuster using the Allen key provided.
   b) Carefully pull out the intensity adjuster.
   c) Pull out the slide gate.

d) Thoroughly rinse the intensity adjuster, slide gate and housing with low-lime or distilled water.

e) Thoroughly dry the intensity adjuster and slide gate. Allow the housing to air-dry.

f) Re-insert the slide gate and intensity adjuster.

g) Secure the screws with lock washers again so that they are equally tight.

The stopper is now clean.

6 CG 50 generator with remote control (optional)

The CG 50 generator can also be operated with a remote control. The remote control is available as an optional accessory.

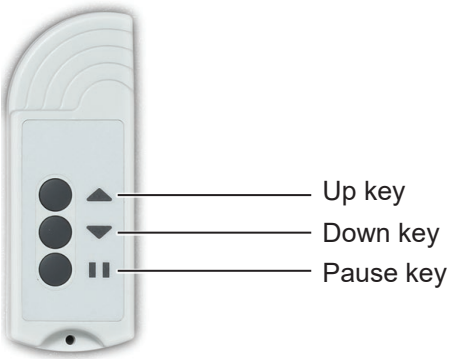

Fig. 7: Remote control

6.1 Operating the tapper with the remote control

Use the remote control to adjust the intensity of the pulses on the tapper to the requirements as follows:

- Up key: increases the intensity of the tapper.
- Down key: reduces the intensity of the tapper.
- Pause key: pauses pulses.
- Pause key again: resumes pulse after pause.

Note:

The intensity on the tapper cannot be adjusted with the remote control to a higher value than that specified by the intensity adjuster on the **CG 50** generator.

- To be able to set the maximum intensity on the tapper using the remote control, turn the intensity adjuster on the **CG 50** generator all the way to the right.

6.2 Operating the stopper with the remote control

Only the pause key on the remote control works when operating the stopper.

- Press the pause key to pause the pulses on the stopper.
- Press the pause key again to resume the pulses on the stopper.

7 Troubleshooting

7.1 Problems with the CG 50 generator

Problem	Cause > Solution
CG 50 switched on, but LEDs do not light up	Battery capacity too low ● recharge battery ● use external power supply

7.2 Problems with the tapper

Problem	Cause > Solution
Tapper not generating a signal	**CG 50** not switched on ● switch on **CG 50** Tapper not connected to**CG 50** ● check electrical connection (connection cable)
Tapper signal cannot be detected	**CG 50** pulse too weak ● increase intensity on **CG 50** Tapper fastening to pipeline has come loose ● tighten fastening chain

7.3 Problems with the stopper

Problem	Cause > Solution
Stopper not generating a signal	**CG 50** not switched on ● switch on **CG 50** Stopper not connected to **CG 50** ● check electrical connection (connection cable)
Stopper signal cannot be detected	Intensity on stopper too weak ● increase intensity on stopper
Stopper piston not moving	Piston is blocked: ● follow the instructions set out below this table to unblock the piston. ● should problems persist, please send the stopper to SEWERIN Service.

Problem	Cause > Solution
Water leaking out of the venting hole on the bottom of the housing	The bellows are leaking: ● send the stopper to SEWERIN Service for repair.

If the piston is blocked carry out the following steps:

1. Cut off the water supply and switch off the **CG 50** generator.
2. Disconnect the connecting cable between the **CG 50** generator and the stopper.
3. Remove the stopper from the standpipe.
4. Thoroughly clean the stopper.
5. Reassemble the stopper and fit it to the standpipe.
6. Start up the stopper again.

8 Appendix

8.1 Technical data

8.1.1 CG 50 generator

Device data

Dimensions (W x D x H)	500 x 260 x 190 mm
Weight	5.2 kg

Device elements

Signal lights	4 LEDs
Processor	Microcontroller 8 bit
Controls	2 knobs optional: COMBIPHON remote control (433 MHz, 10 mW)

Operating conditions

Operating temperature	-10 – 50 °C
Storage temperature	-15 – 60 °C
Protection rating	IP54 (when cover closed)
Permitted operating environments	outdoors indoors
Non-permitted operating environments	in explosive areas

Power supply

Power supply	Pb battery, built-in and sealed alternatively directly with 12 V=
Operating time, typical	10 h
Operating performance	86.4 Wh
Operating voltage	12 V
Nominal capacity	7.2 Ah
Charging time	9 h
Charging temperature	0 – 40°C
Charging voltage	12 V
Charging current	1.3 A
Charger	AC/DC adapter L optional: Vehicle cable L

8.1.2 Tapper

Max. operating time	80 h
Min. operating time	4.5 h

Control pulses

Knock period	16 ms to 80 ms (power)
Knock frequency	0.4 s – 1.6 s (centre position = 1 s)

8.1.3 Stopper (optional)

Max. operating time	11 h
Min. operating time	7.5 h

Control pulses

Pulse duration	120 ms (non-adjustable)
Pulse frequency	1 s – 1.6 s

8.1.4 AC/DC adapter L

Input	100 – 240 V~ / 50 Hz / 1 A
Output	12 V= / 5 A

8.1.5 Remote control (optional)

Range	30 m – 300 m

8.2 Accessories

Part	**Order number**
Standpipe DN 80 / Storz-C	SA03-Z1000
Vehicle cable **L** 12 V =	ZL05-10200

8.3 Declaration of conformity

Hermann Sewerin GmbH hereby declares that the **CG 50** generator fulfils the requirements of the following guidelines:

- **2011/65/EU**
- **2014/30/EU**

The complete declaration of conformity can be found online.

8.4 Advice on disposal

The European Waste Catalog (EWC) governs the disposal of appliances and accessories.

Description of waste	Allocated EWC waste code
Device	16 02 13
Disposable battery, rechargeable battery	16 06 05 / 20 01 34

End-of-life equipment

Used equipment can be returned to Hermann Sewerin GmbH. We will arrange for the equipment to be disposed of appropriately by certified specialist contractors free of charge.

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