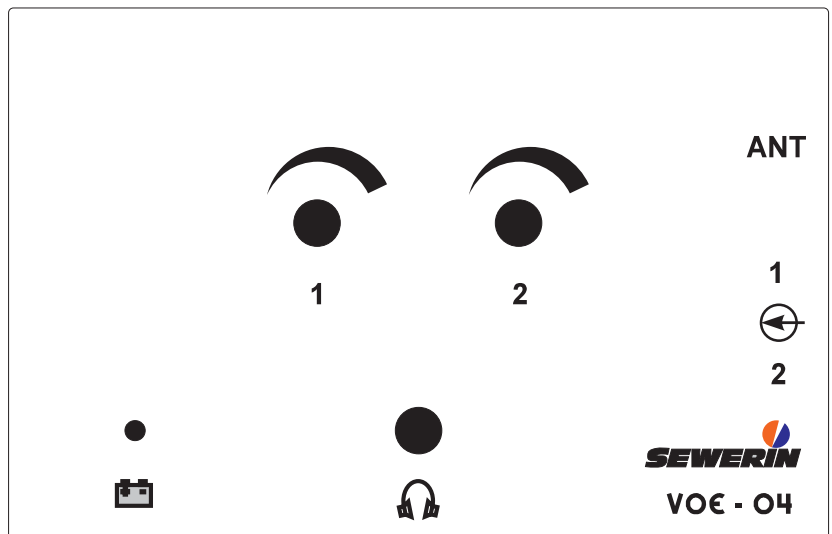


VOE of SeCorr® 05

Operating- Instructions




SEWERIN
Wir sichern Lebensqualität.

GB

102688

Measurable success by Sewerin equipment

You settled on a precision instrument.
A good choice!

Our equipment stands out for guaranteed safety, optimal output and efficiency.

They correspond with the national and international guide-lines.


These operating instructions will help you to handle the instrument quickly and competently.

Please pay close attention to our operating instructions before usage.

In case of further queries our staff is at your disposal at any time.

Yours

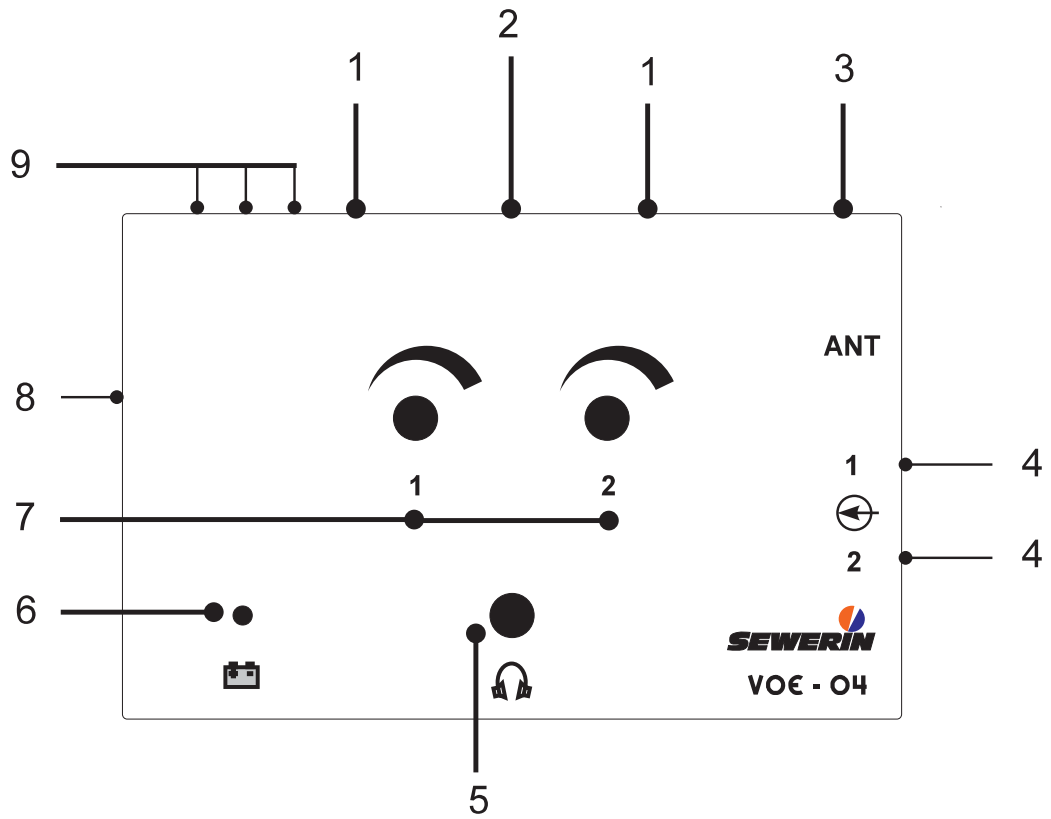
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Design of : **VOE-O4** (see page 12!)



Notes

For your safety *

The law governing technical equipment (the Law on the Safety of Appliances) of 24.06.1968 (BGBl.I, page 717) as amended by the Amendment Law of 13.08.1979 (BGBl.I, page 1432) requires the following matters to be drawn to your attention:

Comply with the Operating Instructions.

Before operating or adjusting the appliance you must be thoroughly familiar with this operating manual. You must comply with it in every respect.

The appliance is designed only for the application described and for industrial (commercial) use.

Liability for Function and/or Damage

Liability for the functioning of the appliance passes to the owner or operator in all cases in which the appliance has been improperly maintained or repaired by persons not associated with SEWERIN Service or if it has been used for a purpose not in accordance with its designated application.

You should therefore always use original SEWERIN accessories with the **SeCorr® O5**.

Hermann Sewerin GmbH accepts no responsibility for damage due to a failure to comply with the foregoing instructions. The guarantee and liability terms of the Hermann Sewerin GmbH terms of sale and supply are not extended by the foregoing.

We reserve the right to make technical changes in the course of continued development.

HERMANN SEWERIN GMBH

* All references to laws, statutes and norms relate to the legislation of the Federal Republic of Germany.

For your safety	4
1.0 Important notes	6
2.0 Designated purpose/principles	7
2.1 The underlying principle	7
2.2 Preconditions for a measurement	8
2.3 The measurement section	8
3.0 "Notebook" version	9
3.1 System components	9
3.2 Charging equipment / power supply	10
3.2.1 External power supply	10
3.2.2 Power supply from the removable battery	10
3.3 VOE-O4 control device	11
4.0 "Desktop" version	13
4.1 System components / Operation	13
4.2 Power supply	13
5.0 Accessories	14
6.0 Technical data and characteristics	15
7.0 Setting up	16
7.1 Making the connections	16
7.2 Switching the system on and off	16
Declaration of Conformity	17

1.0 Important notes

The system includes components not manufactured by Hermann Sewerin GmbH. Please familiarise yourself with the operation, care and maintenance of these components by studying the manuals and operating instructions supplied.

The hard disk of your PC (notebook or desktop) is sensitive to impact, particularly when in use. The machine should therefore not be moved or knocked when it is in operation.

The notebook and the control device or PC must be protected from external influences (moisture and dirt).

The interface between the control device and the notebook should not be plugged in and unplugged more often than is absolutely necessary.

It is recommended that the equipment should be used in a vehicle.

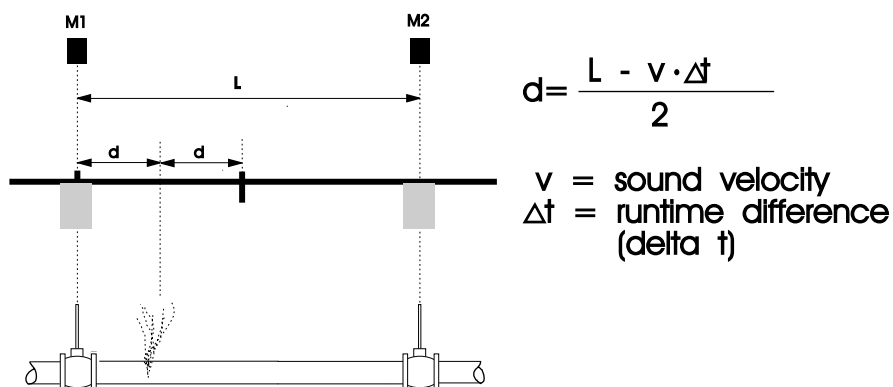
2.0 Designated purpose/principles

2.1 The underlying principle

The purpose of the **SeCorr® O5** correlator is to determine the location of a leak in underground pressurised lines such as water mains. Microphones are placed on contact points (e.g. valve rods) at both ends of a section of pipe which is believed to contain a leak. These two microphones, which mark the limits of the measurement section, transmit the signals they receive to the correlator by radio.

The noise signals ("noise patterns") received by the correlator are evaluated by the device and the noise source determined. This takes place as follows:

The sound "runs" along the pipe in both directions from the noise source to the microphones. This takes the sound a certain period of time, the period depending on the speed of sound in the pipe. The correlator determines which of the microphones picks up the noise first. It obtains the so-called run-time difference, or skew - from which the position of the leak can be derived - by the formula:



2.2 Preconditions for a measurement

The following preconditions must be satisfied in order to work with the correlator:

- a) The leak must produce a noise loud enough to reach the microphones via the pipe. The main way to verify this is by using the headphones. Can a "typical" leak noise be heard?
The quality of the noise transmission in the pipe is largely a function of its material and dimensions. With metallic pipes the so-called structure-borne noise, the noise produced at valves, hydrants or the tube itself, is measured. Non-metallic pipes can often only be examined with the water noise and special microphones (hydrophones).
- b) The exact position of the line, and thus the length of line between the microphones, must be known - as should the path of the measurement section. It is also advantageous if any special characteristics (e.g. bends, building connections, pressure reducers etc.) are known prior to measurement.

2.3 The measurement section

The first stage in setting up a measurement section is to look for suitable valves to connect the microphones to. Main valves should be used if possible, as they generally produce superior noise transmission.

Procedure:

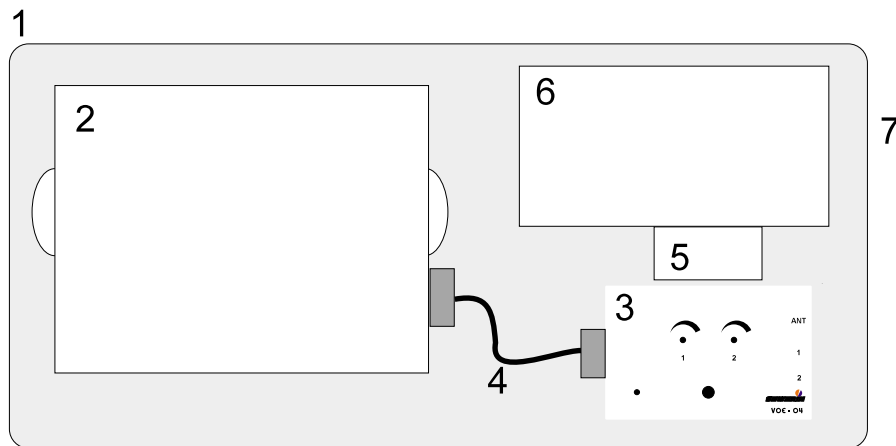
1. The two microphones are connected in the region of the suspected leak (see Operating instructions for the **RT 03** radio transmitter).
2. The radio link between the radio transmitter and the control device is established and the correlator started up.
3. Approximate values may initially be entered for the length of the measurement section and the speed of sound, but the length entered should not be less than the actual length of the measurement section, nor should the speed of sound entered be greater than the actual value.

3.0 "Notebook" version

3.1 System components

This system is designed for portable use in a vehicle, as it uses a 12V vehicle battery as its power supply. The equipment is accommodated in foam-lined cases for protection during transport. It is not permanently installed.


The system consists of the following components:



- 1 foam-lined case
- 2 notebook for the calculation and display of the result
- 3 **VOE-O4** control device
- 4 connection cable
- 5 battery for the control-device internal power supply
- 6 headphones compartment
- 7 12V= power-supply connection

- 12 V= / 12 V= vehicle connection cable
- Magnetic antenna to be placed on the roof of the vehicle during operation. The antenna is not designed for use while the vehicle is in motion. It must be removed before the vehicle is moved.

Caution!

 **The magnetic antenna is fitted with a strong magnet. Never place the base of the magnetic antenna on or near the notebooks or diskettes, as this may destroy all the data and programs which they contain.**

- Two **RT O3** radio transmitters

3.2 Charging equipment / power supply

3.2.1 External power supply

The power supply is connected to the socket on the outside of the case. The power source is the vehicle's 12V battery. Use the 12 V= / 12 V= vehicle connection cable.

The control device consumes about 200 mA (12V=) in operation. No general information can be given about the notebook, as power consumption varies from type to type. A car adapter (notebook accessory) should be used.

For the notebook's power consumption, see its manual.

If the correlator system is not used the power supply should be disconnected, since otherwise no-load losses may deplete battery capacity.

3.2.2 Power supply from the removable battery

The control device can be operated with the removable battery. Operating time is about 10 hours.

The battery is charged by placing it in the **LDG1 charger**. The charger is powered by the vehicle battery via the 12V=/12V= vehicle connection cable or by the 230V/12V= plug-in power pack.

The maximum charging time of the time and temperature-controlled charging equipment is 12 hours.

While charging is in progress the LED on the **LDG1** flashes regularly, in buffer operation it flashes twice in quick succession. "Buffer operation", which is started automatically when charging is complete, avoids both overcharging the battery and allowing it to discharge owing to extended storage.

Notes on charging

Even if the battery is not used, it spontaneously discharges almost completely within one month. If it is to be maintained in a state of readiness for use, it may remain permanently in buffer operation.

The battery's storage capacity will be maximised if it is only recharged after being fully discharged. Repeatedly recharging a battery which has not been fully discharged gradually reduces its storage capacity.

3.3 VOE-O4 control device

The **VOE-O4** control device receives the (noise) signals from the microphones via the radio transmitter and processes them. They are passed to the notebook via the connection cable. The notebook calculates and displays the results.

The microphones can also be connected directly to the control device, i.e. without using the radio transmitter. It is up to you whether only one or both microphones are connected.

As this bypasses the radio transmitter's automatic amplification adjustment, the correct amplification must be set manually (correlation software: channel 1 or channel 2 amplification, control in "time-signal display").

Even while correlation is in progress you are recommended to monitor the noise signals with the headphones so that extraneous noises, for example, can be recognised and properly evaluated.

For illustration see inside cover !

- 1 Banana jacks for removable battery, any polarity.
Double plugs are used between the removable battery and the connection sockets.
- 2 12 V= connection socket, external power supply
- 3 antenna input
- 4 direct input for microphone 1 or 2
- 5 headphones output
- 6 LED, yellow = power supply OK,
red = power supply inadequate
- 7 volume control for channel 1 and channel 2

If **(1)** and **(2)** are turned fully to the left: both outputs are switched off.

If only **(1)** is turned up: the signal from channel 1 is on both channels ("mono operation 1").

If only **(2)** is turned up: the signal from channel 2 is on both channels ("mono operation 2").

If **(1)** and **(2)** are turned up: the signals are on both channels in stereo at the volumes set.

The volume controls have no effect on the amplification of the microphone signals when calculating the correlation result.

- 8 output to notebook
- 9 3 analog inputs, channels for inflow analysis,
optional. From left to right: channel 1, 2, 3.

4.0 "Desktop" version

This system is designed for permanent installation in a vehicle. An additional transformer is required for the power supply (230 V).

4.1 System components / operation

Desktop PC, with the control-device components accommodated in the computer case.

Controls:

2 volume-control knobs for channel 1 and channel 2.

Connections:

stereo headphones output

230 V power-supply input

antenna input (BNC socket)

Vehicle antenna to be installed permanently on the roof of the vehicle.

Two **RT O3** radio transmitters

4.2 Power supply

The power source for the desktop version is the vehicle's battery. Power at 230V / 50Hz must be supplied to the PC and the monitor via a transformer. Power consumption in operation is about 150 VA .

5.0 Accessories

<i>HYDROPHONES</i>	to pick up water-borne sound; type HA for building-connection lines; type HY for hydrants
<i>ACTIVE FILTER</i>	Filtering to eliminate extraneous noise; particularly recommended for use with hydrophones
<i>ADAPTER</i>	Stand-pipe extension for hydrophones (for DN 50 shaft hydrants); extension rod for piezomicrophones
<i>GAS OR AIR-NOISE MICROPHONES</i>	to locate leaks in lines with gaseous media; for drained waterpipes
<i>EXTENSION CABLE</i>	to extend the microphone cable
<i>SELF-TUITION CASSETTE</i>	C-60 audio-cassette with leakage noises and cable; playable with any stereo apparatus with a jack socket
<i>PRINTER</i>	to document results
<i>REMOVABLE BATTERY</i>	to operate the VOE-04 with no external power supply
<i>LDG1 CHARGERS</i>	to charge the removable battery

6.0 Technical data and characteristics

Notebook version

VOE-O4 control device

serial number: 03311...

Operation :

- radio reception of 2 signals
- direct input of 2 signals
- 12-bit A/D conversion of signals
- transfer to PCMCIA interface or type II PC card
- signal amplification
- headphones connection
- adjustable headphones amplification, mono or stereo

Power supply :

- 12 V= external (200 mA) or removable battery 12 V / 2.4 Ah, with 10 hours of operating time
- notebook power consumption ca. 1 to 3 A / 12 V=, depending on the type

Dimensions of carrying case (WxHxD) : 710 x 175 x 490 mm

Weight :

control device ca. 6.5 kg

- case with lining and **VOE-O4**
- battery ca. 0.75 kg
- notebook ca. 2.5 kg

Temperature ranges (VOE-O4)

- **operating temperature** : - 10° to + 40°C

- **storage temperature** : - 10° to + 50°C

Desktop version

- 2-channel radio receiver built into the desktop PC
- listen-in facility via headphones
- 12-bit analog-digital converter with transfer to PC card or PC BUS interface.

7.0 Setting up

7.1 Making the connections

The notebook version of the system is supplied in the case ready for use. The following connections must be made:

- the power supply from the vehicle
- the antenna connection to receive the signals from the radio transmitters (ideally the antenna should be mounted on the roof of the vehicle, as this improves reception quality - antennas inside the vehicle do not always pick up signals successfully)
- the cable connection between the **VOE-O4** control device and the notebook
- headphones (if required)
- printer (if required).

7.2 Switching the system on and off

First switch on the notebook. When the **SeCorr® O5** program is run the **VOE-O4** control device is switched on by the PC. When the program is terminated the **VOE-O4** is switched off.

Declaration of Conformity

Konformitätserklärung / Declaration of Conformity

Gerätebezeichnung: Type of Product:	Korrelatorsystem/Zuflußanalyse mit PC correlator system/flow analysis with PC
Geräte-Typ: Product Name:	SeCorr 05
Fabrikations-Nr.: Fabr.No.:	KR 06-14xxx

Hiermit erklären wir, daß oben genanntes Produkt mit der / den folgenden Norm(en) oder normativen Dokument(en) übereinstimmt. Bei einer mit uns nicht abgestimmten Änderung des Produkts verliert diese Erklärung ihre Gültigkeit.

We hereby declare that the above product complies with the following norms or standardized directives. In case of any modification of this product which has not been authorized by us, this declaration becomes invalid.

Norm(en) / Norm(s):

DIN EN 50 081-1	EMV - Fachgrundnorm Störaussendung Generic Emission Standard
DIN EN 50 082-1	EMV - Fachgrundnorm Störfestigkeit Generic Immunity Standard

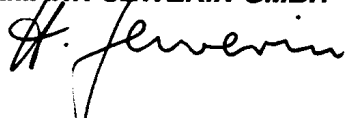
Fundstellen bzgl. EN 50 081/82 sind Amtsblätter der EG Nr. C 44/12 bzw. Nr. C 90/2
The Norms EN 50 081/82 are recorded in the Gazette of the EG No. C 44/12 and no. C90/2 resp.

Gemäß den Bestimmungen der Richtlinie(n) / The unit is in accordance with:

89/336/EWG	EG-Richtlinie : Elektromagnetische Verträglichkeit EG-Directive: Electromagnetic Compatibility
92/31/EWG	Änderung dazu /amendment to above
93/68/EWG	Änderung dazu /amendment to above

Gütersloh, den 6.01.1999

HERMANN SEWERIN GMBH



(Geschäftsführer / Managing Director)

Notes

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