MiniLec® 4

Operating Instructions

SEWERIN

GB

103999

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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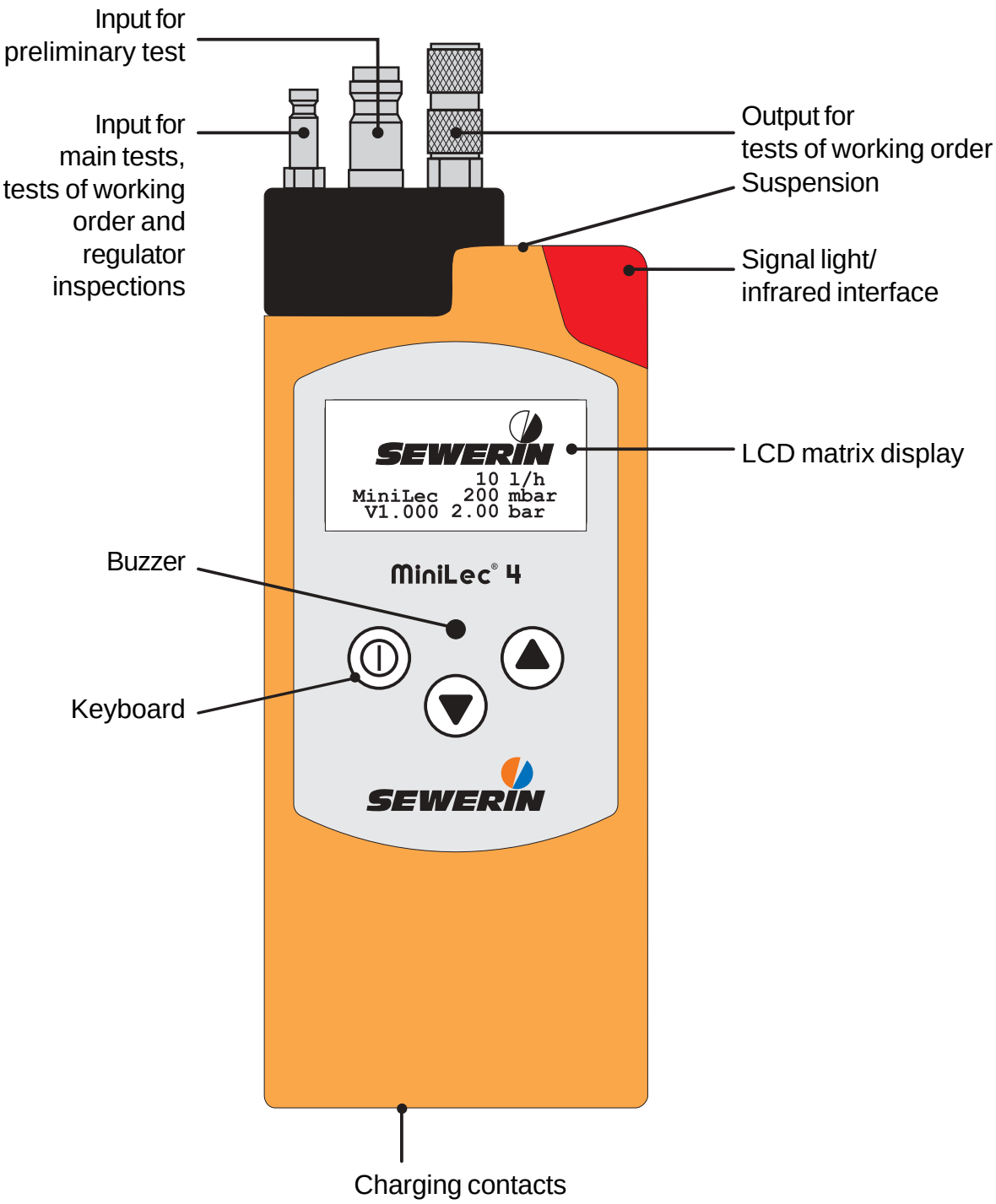

Input for preliminary test
Input for main tests, tests of working order and regulator inspections
Output for tests of working order
Suspension
Signal light/ infrared interface
LCD matrix display
Buzzer
Keyboard
Charging contacts
SEWERIN
10 l/h
MiniLec 200 mbar
V1.000 2.00 bar
MiniLec® 4
SEWERIN

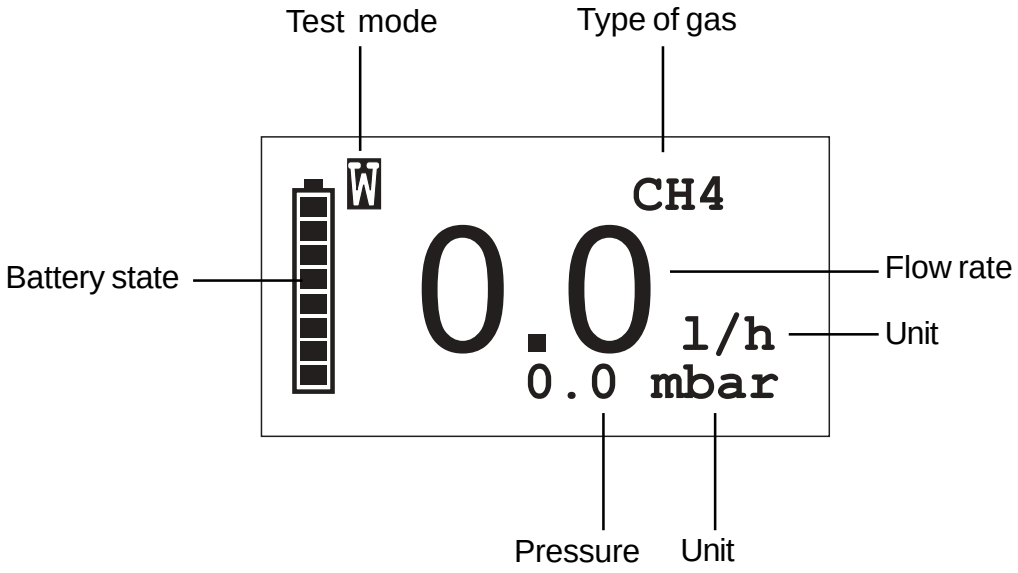
Operating keys

For switching the device on/off
(keep pressed for approx. 3 seconds)

For entries / confirming a selection
(short pressing)

For changing between the operating menus / selection of menu items

LCD display



Operating Instructions

MiniLec® 4

GB 103999 – 22.02.2005 – V1.XXX

CAUTION! Danger of injuries!
This symbol refers to important safety instructions. Adhere strictly to these instructions to avoid injuries!

CAUTION! Danger of damages!
This symbol refers to important safety instructions. Adhere strictly to these instructions to avoid material damages!

Note:
This symbol refers to information and useful tips which are exceeding the basic operating procedures.

1 General information

1.1 Warranty

To ensure proper functioning and safety, it is required to observe the following notes.

Hermann Sewerin GmbH is not liable for damage caused by failure to comply with these notes. The guarantee and liability conditions of the sales and delivery conditions of Hermann Sewerin GmbH are not extended by the following notes.

- This product may only be taken into operation after reading thoroughly the accompanying operating instructions.
- This product may only be taken into operation by sufficiently qualified staff who is familiar with the legal requirements (in Germany: TRGI).
- This product may only be used as set forth in these operating instructions.
- This product is exclusively destined for industrial and commercial applications.
- Repairs may only be performed by qualified experts or appropriately trained staff.
- Modifications and conversions may only be carried out with prior written consent of Hermann Sewerin GmbH. The manufacturer is not liable for damage resulting from arbitrary modifications of the product.
- Only accessories manufactured by Hermann Sewerin GmbH may be used in conjunction with the product.
- Only spare parts which are approved by Hermann Sewerin GmbH may be used for repairs.
- Only approved or recommended battery types may be used.
- Technical changes within the scope of further development reserved.

Apart from the notes and instructions included in these operating instructions, adhere also strictly to all generally valid safety and accident prevention rules!

1.2 Application purpose

MiniLec 4 is an electronic device for measuring the pressure and the flow rate of low-pressure gas installations.

Apart from performing measurements, the device also permits to store and record measurement data.

Note:
These operating instructions describe the functionalities of software version 1.XXX.
Other versions are subject to changes!
The descriptions always refer to the default settings of the device.

1.3 Intended usage

The device can be used for the following purposes:

- Serviceability determinations (i. e. tests of working order) according to DVGW worksheets G 600 (TRGI ’86/’96) and G 624 [DGWV: German Technical and Scientific Association for Gas and Water].
- Main tests according to DVGW worksheets G 600 (TRGI ’86/ ’96) and G 624.
- Preliminary tests according to DVGW worksheets G 600 (TRGI ’86/’96) and G 624.
- Regulator inspections according to DVGW worksheets G 459-2 and G 495.

1.4 General safety instructions

- The **MiniLec 4** device is constructed in accordance with the European Ex protection standards CENELEC and ATEX 100a.
- The device may only be used with the following gasses:
  - Air
  - Natural gas
  - Methane (CH_4)
  - Propane (C_3H_8)
  - Butane (C_4H_{10})
  - Town gas (TGas)
  - Hydrogen (H_2)

Note:
The device is prepared ex works for detecting methane (CH_4) as test gas. Measurements with air or natural gas are also carried out with this setting. It is not required to change the type of gas.

- It is required to use supply tubes with hydrophobic filters to protect the flow sensor (applies to tests of working order [i. e. serviceability determinations] and main tests).
- The maximum operating pressure must not be exceeded **:**
  - Test mode test of working order: max. 200 mbar
  - Test mode main test: max. 200 mbar
  - Test mode preliminary test: max. 2 bar
  - Test mode regulator inspection max. 200 mbar
- The permissible operating temperature is - 10 °C to + 40 °C.
- The permissible storage temperature is - 20 °C to + 70 °C.
- The permissible humidity is 0% RH to 90% RH, non-condensing.
- The permissible ambient pressure is 860 hPa to 1100 hPa.

2 Equipment

The device can be delivered in two versions:

- Version HP (full equipment),
  suitable for preliminary tests, main tests, tests of working order (serviceability determinations) and regulator inspections
- Version LP (basic equipment),
  suitable for main tests, tests of working order and regulator inspections

2.1 Connections

CAUTION!
Only members of staff who are familiar with the legal requirements (in Germany: TRGI) are permitted to connect and operate the device.

The device can be connected to the gas installation with the help of three quick-release connections (see illustration in the appendix):

- Inlet for main tests, tests of working order and regulator inspections
- Inlet for preliminary tests (not available for the LP version)
- Outlet for tests of working order

Note:
The quick-release connections allow only are designed in such a way that they allow only to connect tubes which are suitable for the appropriate test mode.

2.2 Visual and audible signals

MiniLec 4 is equipped with two signalling devices:

- red signal light on top of the device
- buzzer at the front panel of the device

Note:
These signalling devices cannot be switched off.

Every touch of a button or key is confirmed by an audible signal:

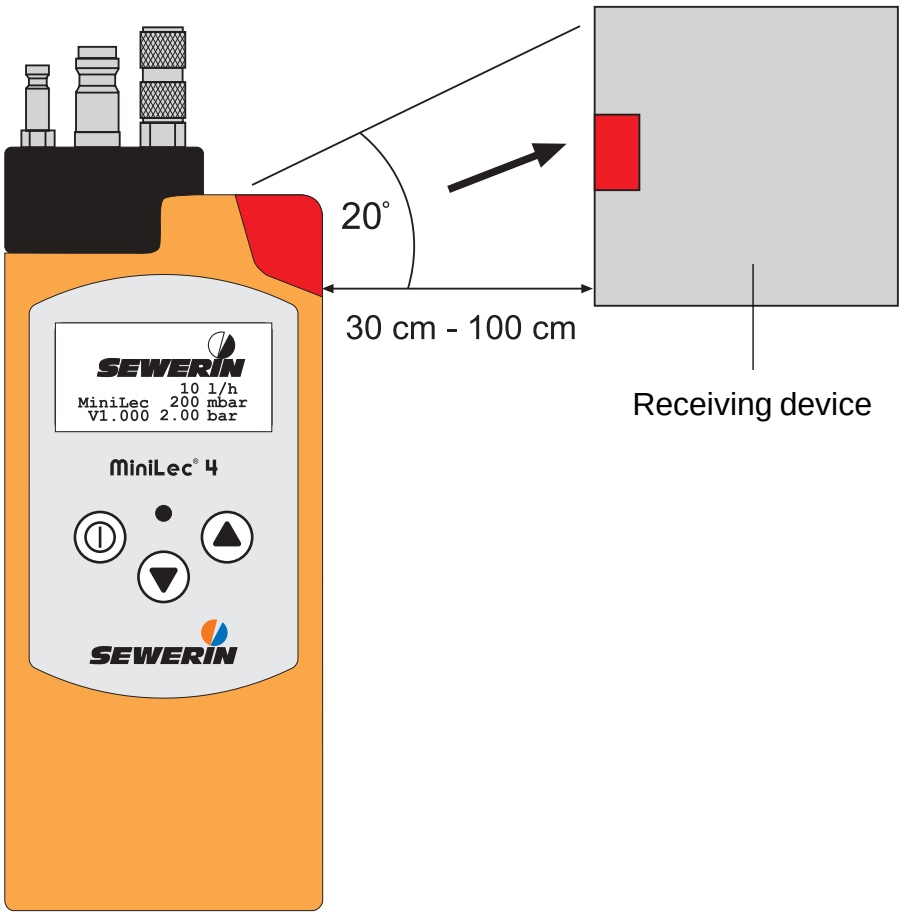
- very long tone — indicates an error message
- long tone: — switching off, menu change
- short tone: — switchingon, confirming the selection, navigation within a menu

2.3 Infrared interface

The device is provided with an infrared interface (IrDA 1.0) which can be used to transmit the readings to a PC or other devices (e. g. printer, pocket PC, organizer). It is located on the outer surface of the device, below the red signal light.

To ensure an optimum data transmission, you need to align the **MiniLec 4** device with the relevant interface of the PC, printer, etc.

The following illustration shows how the devices are properly aligned:



3 Operation

The operation of the device is divided into two sections:

- **Measurement mode (see chapter 3.1)**

  Measurements are carried out in the measurement mode. The User menu can be used to change the test mode, to store measurement data and to call up protocols.

- **Extended settings (see chapter 3.2)**

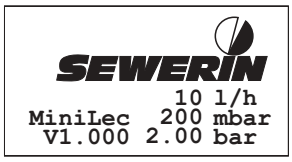
  The extended settings permit to change default measurement settings and further device settings (such as “Adjustment”, “System”, “Hardware”, etc.). It is not possible to carry out a measurement when the extended settings are opened.

3.1 Measurement mode

The device is switched off.

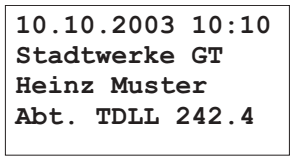
- Press the ⏻ key for approx. three seconds.

The device is switched on. The two following start displays appear:



Start display

Indication of:
- Device type (MiniLec)
- Software version (V1.000)
- Installed sensors (10 l/h, 200 mbar, 2.00 bar)



Date/time

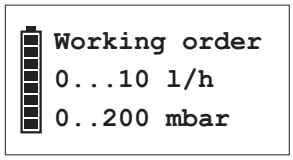
Indication of:
- Date (10/10/2003)
- Time (10:10)
- User data (example)

The device enters the pre-set test mode .
Three further displays are automatically indicated.

> **Note:**
> The test mode to be enabled immediately after the start-up can be changed in the extended settings (chapter 3.2). As default, the mode Test of working order is set.

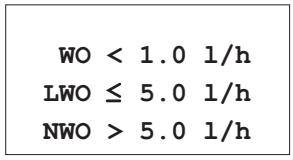
Appearance of displays in various test modes:

- **Test of working order**



Measuring range

Indication of the test mode, including information on the sensors' measurement range



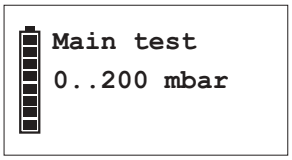
Parameters

Indication of the measuring specifications, corresponding to the selected test mode

Measurement data

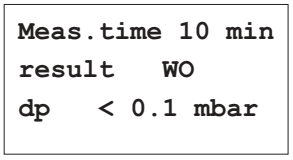
Indication of measurement data

● Main test



Measuring range

Indication of the test mode, including information on the sensors' measurement range



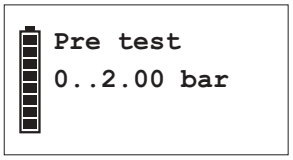
Parameters

Indication of the measuring specifications, corresponding to the selected test mode

Measurement data

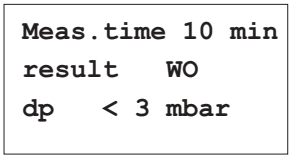
Indication of measurement data

● Preliminary test



Measuring range

Indication of the test mode, including information on the sensors' measurement range



Parameters

Indication of the measuring specifications, corresponding to the selected test mode

Measurement data

Indication of measurement values

While these displays are indicated, no entry is possible. If the display **Measuring data** appears, the device has entered the **Measuring mode**.

The measurement mode permits to use the following functions:

- zero-point correction,
- selection of the test mode,
- carrying out measurements,
- protocols.

These functions can be called up via the **User** menu:

- Press the ▲ or ▼ key for approx. two seconds.

The **User menu** appears:

zero point
Working order
Main test
Pre test
regulator ins
start meas.
protocols

Note:
The menu item **Start meas.** appears if a particular measurement time is pre-set.
For tests of the working order, the measurement time is pre-set ex works to zero. The menu item **Store** is indicated in the **User** menu instead of **Start meas.**

To change between the menu items:

- You can move up or down in the menu by pressing the appropriate arrow key ▲ or ▼.
- Confirm the selection by pressing the ⓘ key.

If the selection is not confirmed, the display returns to the measurement mode after a couple of seconds.

The functions of the User menu are described in the chapters 3.1.1 to 3.1.7.

3.1.1 Setting the zero point

Before the measurements are started, the device can be adjusted to the ambient conditions by setting the zero point. At that time, no tubes should be attached to the device. If the zero point is incorrectly set, other values than zero are indicated on the display after switching on the device.

Note:
The zero point must be set for every individual test mode.

Perform the following steps to set the zero point of the device:

- Press the ▲ or ▼ key for approx. two seconds.
- Use the keys ▲ and ▼ to select the menu item Zero point**.**
- Confirm the selection with the ⓘ key.

The device returns to the **Measurement mode**.
The display shows **zero**.

Note:
If the indicated value is not **0.0** or **0.000**, the device was not able to set the zero point because the measured value lies outside the defined limits (see chapter 3.2.3.1).

3.1.2 Test of working order

CAUTION!
Tests of working order (i. e. serviceability determinations) may only be carried out by sufficiently qualified members of staff who are familiar with the prevailing national regulations (in Germany, for example: TRGI). All relevant safety procedures and accident prevention regulations have to be taken into account.

Tests of working order are carried out to determine and evaluate the operational safety of low-pressure gas installations. A built-in flow sensor is used to measure the amount of gas which is streaming into the gas installation over a defined period of time (leakage rate).

Preparations:

- There are different ways to install the device in the supply system (see illustration in the appendix):
  - Flow measuring principle (at the location of the gas meter)
  - Measuring principle of the return flow (at an arbitrary place of the pipe)
  - Check of non-metered pipes
  - etc.
- Switch the device on.
- Connect the device to the supply system. Use the corresponding quick-release connections for this which are installed on the device.
- Apply the required testing pressure.

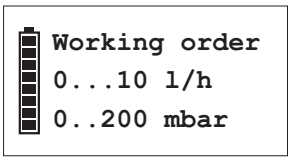
Execution:

- Press the key ▲ or ▼ for approx. two seconds to open the User menu.

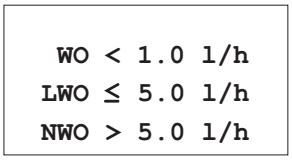
If the test mode **Test of working order** is not pre-set:

- Use the keys ▲ and ▼ to select the menu item T**est of working order.**
- Confirm with ⓘ.

After confirming the selection, two displays appear indicating further details of the test of working order:

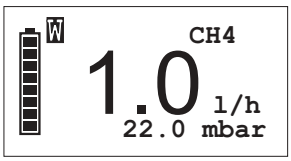


Measuring range



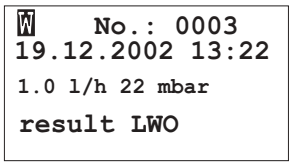
Parameters

The device then changes to the measurement mode. The measured values are displayed:



Measurement data

- Press the key ▲ or ▼ for approx. two seconds to access the User menu.
- Use the ▲ or ▼ key to select the menu item Store.
- Confirm with ⓘ.



The appropriate protocol is indicatedon the display for approx. 30 seconds.

The measurement is stored.

The appropriate protocol can be called up in the User menu via the menu item **Protocols** (see chapter 3.1.7).

Depending on the relevant country, there may be different national regulations for determining the serviceability. According to TRGI, the degree of serviceability is categorized as follows:

Leakage rate of gas < 1.0 l/h

unrestricted serviceability (result WO)

=> The pipes can be operated without any restrictions

Leakage rate of gas ≥ 1.0 l/h and ≤ 5.0 l/h

reduced serviceability (result LWO)

=> Full serviceability must be established within 4 weeks

Leakage rate of gas > 5.0 l/h

no serviceability (result NWO)

=> The pipes have to be immediately taken out of service

3.1.3 Main test

CAUTION!
Main tests may only be carried out by sufficiently qualified members of staff who are familiar with the prevailing national regulations (in Germany, for example: TRGI). All relevant safety procedures and accident prevention regulations have to be taken into account.

Main tests are leak tests which are used to detect even the smallest leaks. For this, the pipes are checked with all fittings – but without gas equipment and corresponding controllers and safety devices. The gas meter can be included in the test.

Preparations:

- Switch the device on.
- Connect the device to the supply system. Use the corresponding quick-release connection for this which is installed on the device.
- Apply the required testing pressure.

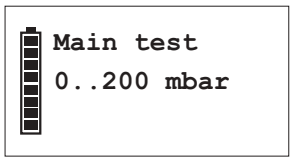
Execution:

- Press the key ▲ or ▼ for approx. two seconds to access the User menu.

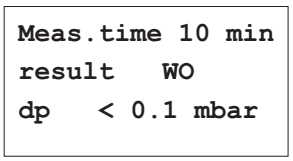
If the test mode **Main test** is not pre-set:

- Use the key ▲ or ▼ to select the menu item **Main test**.
- Confirm with ⓘ.

After confirming, two displays appear indicating further details of the main test:



Measuring range



Parameters

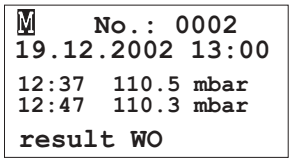
The device then changes to the measurement mode. The measured values are displayed:

Measurement data

- Press the key ▲ or ▼ for approx. two seconds to access the User menu.
- Use the key ▲ or ▼ to select the menu item **Start meas**.
- Confirm with ⓘ.

The measurement is started. The measured values and the remaining measurement time are indicated.

The end of measurement is indicated by an audible signal.



The appropriate protocol is indicatedon the display for approx. 30 seconds.

The measurement is stored.

The appropriate protocol can be called up in the User menu via the menu item **Protocols** (see chapter 3.1.7).

Note:
If a key is pressed during the measurement, the test is cancelled. In this case, the result is not stored.

Depending on the relevant country, there may be different national regulations with respect to main tests. According to TRGI, the following requirements have to be met:

- The minimum test duration is 10 minutes.
- During the test, the pressure must not decrease.

Note:
The minimum test duration is sufficient for standard housing constructions. For installations/constructions with a larger volume, the test time may be correspondingly longer.

3.1.4 Preliminary test

CAUTION!
Preliminary tests may only be carried out by sufficiently qualified members of staff who are familiar with the prevailing national regulations (in Germany, for example: TRGI). All relevant safety procedures and accident prevention regulations have to be taken into account.

Preliminary tests are used to test the endurance of the relevant material. Newly installed pipes are checked without fittings.

Note:
Fittings whose nominal pressure stage is at least equal to the testing pressure, may be subjected to preliminary tests.

Preparations:

- Switch the device on.
- Connect the device to the supply system. Use the corresponding quick-release connection for this which is installed on the device.
- Apply the required testing pressure.

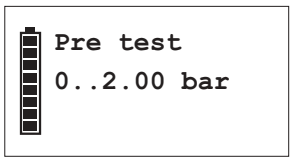
Execution:

- Press the key ▲ or ▼ for approx. two seconds to open the User menu.

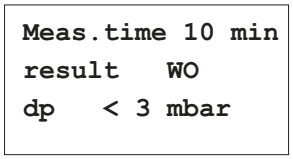
If the test mode **Preliminary test** is not pre-set:

- Use the keys ▲ or ▼ to select the menu item **Preliminary test.**
- Confirm the selection with the ⓘ key.

After confirming, two displays appear indicating further details of the preliminary test:



Measuring range

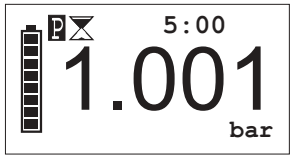


Parameters

The device then changes to the measurement mode. The measured values are displayed:

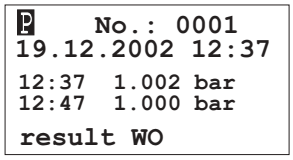
Measurement data

- Press the key ▲ or ▼ for approx. two seconds to access the User menu.
- Use the key ▲ or ▼ to select the menu item **Start meas**.
- Confirm with ⓘ.



The measurement is started. The measured values and the remaining measurement time are indicated.

The end of measurement is indicated by an audible signal.



The appropriate protocol is indicated on the display for approx. 30 seconds.

The measurement is stored.

The appropriate protocol can be called up in the User menu via the menu item **Protocols** (see chapter 3.1.7).

Note:
If a key is pressed during the measurement, the test is cancelled. In this case, the result is not stored.

Depending on the relevant country, there may be different national regulations with respect to preliminary tests. According to TRGI, the following requirements have to be met:

- The minimum test duration is 10 minutes.
- During the test, the pressure must not decrease.

Note:
The minimum test duration is sufficient for standard housing constructions. For installations/constructions with a larger volume, the test time may be correspondingly longer.

3.1.5 Regulator inspection

CAUTION!
Regulator inspections may only be carried out by sufficiently qualified members of staff who are familiar with the prevailing national regulations (in Germany, for example: TRGI). All relevant safety procedures and accident prevention regulations have to be taken into account.

Regulator inspections are used to check controllers and safety devices. For this, five individual tests can be performed with the device.

Note:
It is not possible to select regulator inspections as default start mode.

Preparations:

- Switch the device on.
- Connect the device to the supply system. Use the corresponding quick-release connection for this which is installed on the device.
- Apply the required testing pressure.

Execution:

- Press the button ▲ or ▼ for approx. two seconds to open the **User** menu.
- Use the buttons ▲ or ▼ to select the menu item **Regulator inspection**.
- Confirm with ⓘ.

After confirming the display changes to the **Regulator inspection** menu:

dynamic pr.
static pr.
reaction pr.
zero shut-off
low flow safe
exit

Regulator inspections comprise five individual tests.

- Use the ▲ or ▼ button to select the desired test.
- Confirm with ⓘ.

The selected test and the measured value appear on the display.

- Use the buttons ▲ or ▼ to select the desired option (see chapter 3.1.5.1 – 3.1.5.5).
- Confirm with ⓘ.

  The device returns to the **Regulator inspection** menu. The relevant values and entries are stored for the protocol.

Note:
If the test is repeated, the stored values are overwritten. If you select **Back** in the dialogues of the individual tests, no values will be stored for the protocol.

A protocol is generated after selecting **Back** in the **Regulator inspection** menu. The protocol always includes the most recently stored value.

The stored protocols can be called up in the **User** menu via the menu item **Protocols** (see chapter 3.1.7).

3.1.5.1 Dynamic pressure

This test is used to check the regulation function of the gas regulator with the consumers being **switched on**.

store
exit

After the dynamic pressure has settled:

- Select **store**.

The value is stored for the protocol.

3.1.5.2 Static pressure

This test is used to check the regulation function of the gas regulator with the consumers being **switched off**.

store
exit

After the static pressure has settled:

- Select **store**.

The value is stored for the protocol.

3.1.5.3 Reaction pressure inspection

This test is used to determine the **upper** switching-off point of the safety shut-off valve.

store
exit

After the safety shut-off valve is triggered (distinctly audible):

- Confirm the value **immediately** with **store**.

The value is stored for the protocol.

3.1.5.4 Zero shut-off

This test is used to check the safety shut-off valve for leaks.

WO
not OK
none
exit

If you want to skip the zero shut-off test:

- Select the option **none**.

An appropriate entry is generated in the protocol.

3.1.5.5 Low-pressure cut-off valve

This test is used to check the function of the low-pressure cut-off valve.

WO
not OK
missing
exit

If you want to skip the test of the low-pressure cut-off valve (e. g., because the valve is not installed at all):

- Select the option **missing**.

An appropriate entry is generated in the protocol.

3.1.6 Starting or storing a measurement

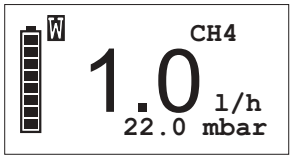
To start or store a measurement:

- Press the key ▲ or ▼ for approx. two seconds to access the **User** menu.
- Use the ▲ or ▼ key to select the following item:

  - **Start meas.** (measurement time > 0)

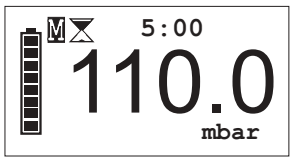
  or

  - **Store** (measurement time = 0)
- Confirm the selection with the ⓘ key.



Test mode –
Test of working order:

The indicated measurement data is immediately stored.



Test mode –
Main test or preliminary test:

The measurement is started. The remaining time of the measurement is indicated by a countdown. After the measurement, an audible signal sounds. The measurement data is stored.

After storing the measurement data, the protocol of the relevant measurement is indicated on the display.

If a key is pressed, the display returns to the measurement mode. If no key is pressed, the display returns automatically to the measurement mode after approx. 20 seconds.

The measurement is stored.

The appropriate protocol can be called up in the **User** menu via the menu item **Protocols** (see chapter 3.1.7).

A consecutively increasing number is assigned to every measurement. It is possible to store max. 122 measurements. If all memory locations are assigned, the device starts to overwrite the oldest measurements (FIFO memory [“First In, First Out”]).

To cancel a measurement:

- Press the key ▲ or ▼ for approx. two seconds to access the User menu.
- Use the key ▲ or ▼ to select the menu item **Stop meas.**

  The measurement is stopped. In this case, the result is not stored.

3.1.7 Protocols

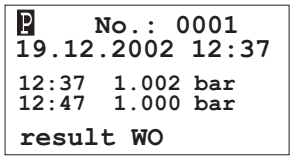
The measurement results are stored to permit documenting the measurements. Stored measurements can be viewed, printed, transmitted or deleted in the **Protocols** menu.

To access the **Protocols** menu:

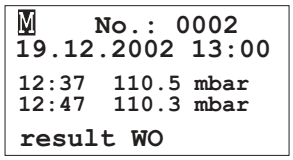
- Press the key ▲ or ▼ for approx. two seconds to access the User menu.
- Use the key ▲ or ▼ to select the menu item **Protocols**.
- Confirm the selection with the ⓘ key.

  A brief message appears indicating the number of stored protocols. Then, the last stored protocol is displayed.

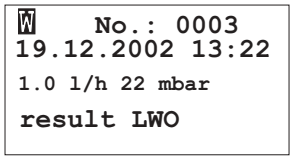
Examples:



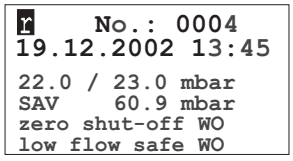
- Preliminary Test



- Main test



- Test of working order



- Regulator inspection

- Press the ▲ or ▼ key to select a specific protocol.
- Confirm the selection with the ⓘ key.

The **Protocols menu** appears.

print
send
send all
clear
clear all
exit

- Press the ▲ or ▼ key to select a specific command.
- Confirm the selection with the ⓘ key.The command is executed. The display returns to the Measurement mode.

Note:
To permit execution of the commands **Print**, **Send** and **Send all**, it is required to align the **MiniLec 4** with the receiving device (see chapter 2.3).
If no receiving device is detected, the search run is interrupted after two minutes. The device returns to the Protocols menu.
The search run can be cancelled any time by pressing the ⓘ key.

3.2 Extended settings

The extended settings permit to adjust the following functionalities of the device:

- Adjustment
- System
- Hardware
- Parameters
- Memory

It is not possible to carry out a measurement when the extended settings are opened.

3.2.1 Access

There are two ways to call up the **extended settings**:

The device is switched off:

- Press simultaneously the keys ⓘ, ▲ and ▼ for approx. 2 seconds.

The device is in the measurement mode:

- Press simultaneously the keys ▲ and ▼ for approx. 2 seconds.

The following display appears:

```
PIN  0000
```

The access is protected by a PIN code. As default, PIN CODE 0001 is always pre-set.

A specific setting is available for the **MiniLec 4** device determining that only authorised members of staff have access to the **Info** menu.

It is recommended to set another PIN code after taking the device into service.

Note:
If the PIN code is set to 0000, no PIN code query is carried out. The extended settings will then be freely accessible.

If you cannot call up the extended settings (e. g., you have forgotten the PIN code), it is required to contact the SEWERIN service.

The PIN code has to be entered from left to right. The currently active digit is always indicated on a black background:

- Select the desired digit with the help of the ▲ or ▼ key.
- Confirm the selection with the ⓘ key.
- Enter all digits of your code.

If the pin code was entered correctly, the **Info** menu will appear after confirming the last digit:

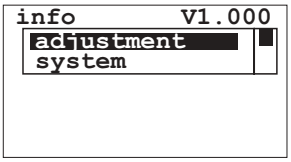
adjustment
system
hardware
parameter
memory
exit

Otherwise the device returns to the measurement mode.

3.2.2 Procedure

The extended settings are divided into three levels.

- The two first levels are used to subdivide and categorise the setting options.
- The third level is used for the actual selection or entry.



The name of the current menu is always indicated in the top left corner.

The selection options appear in a frame below it.

In addition, the software version number (e. g. V1.000) is indicated in the **Info** menu (top level).

Use the ▲ **or** ▼ key to navigate within a menu.

Use the ⓘ key to confirm the selected menu item.

On the two first menu levels, the **Exit** button is always indicated at the end of a menu.

If this button is selected, the display returns to the preceding menu.

Exception: From the top level, the device returns to the measurement mode.

On the third menu level, you can select settings or enter values:

- **Selection of settings**

  Use the ▲ or ▼ key to navigate within a selection list.

  Use the ⓘ key to confirm the selected setting.

  After confirming the setting the display returns to the preceding menu.

● Entering values

The position at which the entry is to be inserted is always indicated on a black background:

Use the ▲ or ▼ key to increase or decrease the value.

Use the ⓘ key to confirm the selected value.

> **Note:**
> It is always required to confirm all values. Values can only be specified in forward direction. It is not possible to cancel the entry of values.

After confirming the last value, the display returns to the preceding menu.

3.2.3 Info menu

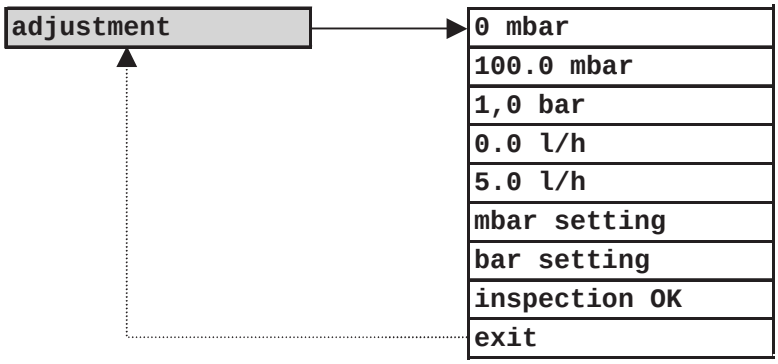
The **Info** menu can be found on the top level of the extended settings:

adjustment
system
hardware
parameter
memory
exit

Note:
If you select **Exit** in the **Info** menu, to device returns to the measurement mode.

3.2.3.1 Adjustment menu

The **Adjustment** menu is used for setting the sensors.

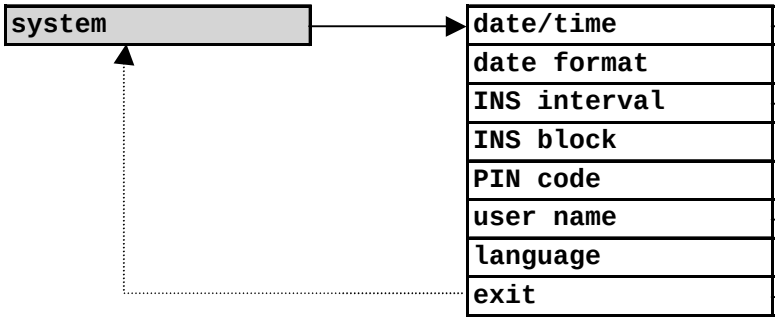


CAUTION!
The device may only be adjusted by sufficiently qualified members of staff. Incorrect adjustments may result in wrong evaluations of the measurement results.

Note:
Adhere absolutely to the instructions given in chapter 5!

3.2.3.2 System menu

The **System** menu is used to set general details and specifications for operation, inspection and documentation.



01.10.2003 09:00

Date/time

Entry of date and time. This setting is important to document the measurements.

DD.MM.YYYY
YYYY-MM-DD

Date format

You can select between two date formats.

weeks 00

INS interval

The inspection interval reminds you of regular inspections/adjustments of the device.

yes
no

INS block

If the inspection lock is enabled, an inspection must be carried out at the next due date. Only after the due inspection has been performed and confirmed, the device can be re-used for measurements.

PIN 0000

PIN code

Entry of a user-defined PIN code.

Stadtwerke GT
Heinz Muster
Abt. TDLL 242.4

User name

Entry of the user name. This setting is important to document the measurements.

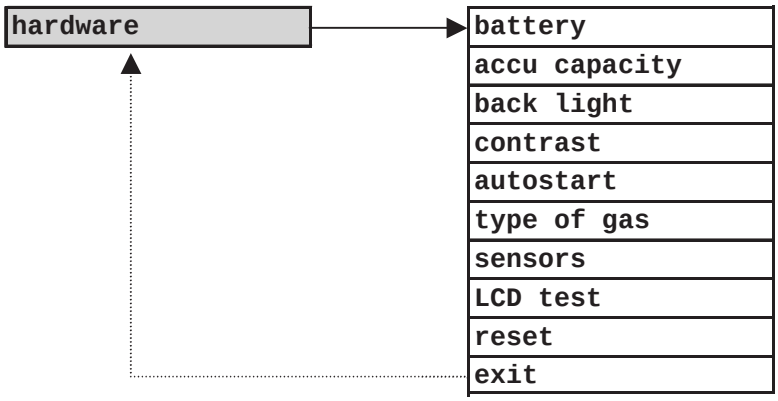
Deutsch
English
Español
Italiano
Cesky
Dutch
Polski
Francais

Language

Eight different languages are available for operating the device.

3.2.3.3 Hardware menu

The **Hardware** menu includes settings which can be used to operate the device.



accu Ni-MH
Alkaline

Battery

Selection of the used battery type. This setting is important for calculating the service life.

mAh 1850

Accu capacity

Entry of the accumulator capacity. This setting is important for calculating the service life.

sec 010

Back light

Entry of the time how long the LC display remains illuminated after receiving a signal.

0 - 100%

Contrast

Contrast settings to permit better legibility of the LC display.

Working order
Main test
Pre test

Autostart

Selection of the test type which is enabled after switching on the device.

CH4
C3H8
C4H10
TGAS
H2

Type of gas

Selection of the used operating medium.

sensors

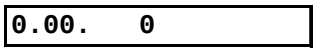
Sensors

CAUTION!
The sensor settings may only be set or modified by the SEWERIN customer service!

LCD test

LCD test

For checking the functionality of the LC display.

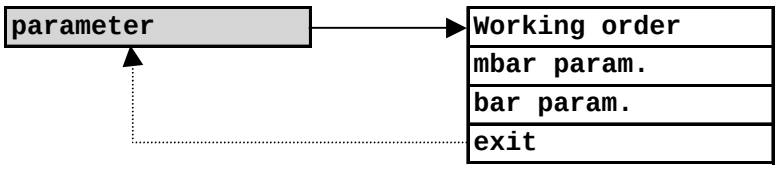


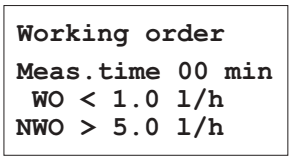
Reset

All customized settings are reset to the default settings.

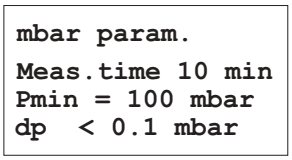
3.2.3.4 Parameters menu

The **Parameters** menu is used to modify the default settings of the measurements.

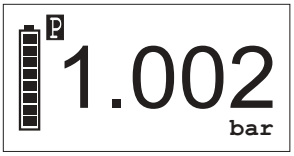




Test of working order (W)



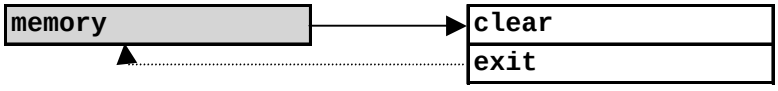
Main test



Preliminary Test

3.2.3.5 Memory menu

The **Memory** menu is used to delete the recorded measurements. No other settings are affected by this.



4 Charging and battery operation

The device can be operated with two different types of batteries:

- Nickel metal hydride accumulators (rechargeable)
- Alkaline batteries (non-rechargeable)

Prescribed type:	AA cells
Recommended manufacturers:	Sanyo, Varta or Duracell

To ensure that the time required for recharging and of the remaining operating time is indicated correctly, the following settings need to be modified in the extended settings:

- Accu type (Info menu – Hardware – Battery)
- Capacity of the used accumulator types (Info menu – Hardware – Accu capacity).

As default, the device is delivered with nickel metal hydride accumulators. The corresponding settings are stored.

4.1 Operation with rechargeable nickel metal hydride accumulators (Ni-MH)

The accumulators are recharged by the HG4 charging station which is included in the scope of delivery.

This station can either be used in the workshop or in the company car.

CAUTION!
To ensure trouble-free operation, the following instructions have to be taken into account:

- The charging station must not be connected directly to the 24 V onboard power supply of the vehicle. This voltage is too high for charging.
- The accumulator should roughly have ambient temperature for recharging.
- Short usage times and long periods without using the device can reduce the available accumulator capacity (memory effect).

Optional connections of the charging station:

- Power supply unit for 100 – 240 V~
- Car charging cable, for permanent connection, 12 V=
- Car charging cable, for mobile connection, 12 V=
- Car charging cable, for mobile connection, 24 V=

Note:
You can connect up to three charging stations to a single 100 – 240 V ~ power supply unit. If four or more charging stations are connected, the charging voltage is too low. In this case, an error message appears on the display.

Charging procedure:

- **Switch off** the device and put it into the charging station.

  The time required for a complete recharging cycle is indicated.

If the accumulators are completely recharged, the device switches automatically to charge retention.

It can remain in the charging station until the next use.

After recharging the device for min. 12 hours (depending on the accumulator capacity), it is ready to be used for at least 20 hours.

Note:
If the device is switched off and kept outside the charging station, the nickel metal hydride accumulators start to discharge. After max. 30 days the accumulators are completely discharged.
To retain the accumulator capacity, it is required to completely discharge the device regularly (e. g. once a month) before recharging it.

Discharging procedure:

- **Switch on** the device and put it into the charging station.

  The accumulators are completely discharged. After the discharging procedure, the device automatically changes to recharging.

A complete recharge/discharge cycle takes approx. 32 hours (20 hours for discharging + 12 hours for recharging).

Note:
If you replace alkaline batteries by nickel metal hydride accumulators, the indicated operating hours may not be correct. In this case, the device must be switched on and put into the charging station so that it can automatically perform a discharge/recharge cycle. After that, the correct number of operating hours will be indicated.

4.2 Operation with non-rechargeable alkaline batteries

CAUTION!
A device operated with alkaline batteries **cannot** be recharged in the charging station. If this device is put into the charging station, a corresponding message appears on display.

The **MiniLec 4** device can be operated with new alkaline batteries for at least 20 hours.

Proceed as follows to replace batteries or accumulators:

- Loosen the two lower screws on the back panel of the device using the supplied screwdriver.
- Open the battery compartment.
- Insert the new cells. Ensure that the batteries are properly inserted to maintain correct polarity.
- Close the battery compartment.
- Retighten the two lower screws on the back panel of the device.

Note:
If it takes more than 120 seconds to replace the batteries, you need to re-enter date and time the next time you switch on the device. All other data remains stored.

5 Maintenance

The tests used for the device maintenance are divided as follows:

- Functional test or inspection
- Adjustment
- Maintenance and repairs

5.1 Functional test or inspection

The functional test is carried out by the user before starting to work with the device.

The following items need to be checked:

- condition of the outer surface of the device
- function of the operating elements
- charging state of the battery/accumulator
- zero point

5.2 Adjustment

Only the SEWERIN customer service or an authorized qualified member of staff / specialized company is permitted to set or modify the adjustment of the device. The adjustment procedure comprises a check of the display tolerance, setting the sensors and a complete functional test.

Devices which are blocked due to a triggered inspection lock can be released for operation after carrying out the required adjustment procedure. The corresponding setting is entered in the **Adjustment** menu.

Note:
The adjustment settings can be reset in the **Hardware** menu under the item **Reset**.

5.3 Service and repairs

Maintenance and repairs of the device may only be carried out by the SEWERIN customer service.

- Return the device to SEWERIN to have repairs and the annual maintenance done.

Note:
If you have purchased a service contract, the device maintenance can be performed by our mobile equipment service.

6 Errors

If errors occur during regular operation, a corresponding message appears on the display. The appropriate error number and name are indicated.

Overview of possible error messages

Error no.	LCD indication (error name)	Cause	Corrective measure
10	W ZERO POINT ADJUSTMENT	An error occurred during adjusting the zero point	Check the flow. Repeat adjustment. See chapter 3.1.1.
11	M ZERO POINT ADJUSTMENT	An error occurred during adjusting the zero point	Check pressure 0.0 mbar. Repeat adjustment. See chapter 3.1.1.
12	P ZERO POINT ADJUSTMENT	An error occurred during adjusting the zero point	Check pressure 0.000 bar. Repeat adjustment. See chapter 3.1.1.
13	W SPAN ADJUSTMENT	An error occurred during adjusting the flow	Check the flow. Repeat adjustment. See chapter 5.
14	M SPAN ADJUSTMENT	An error occurred during adjusting the pressure	Check the flow. Repeat adjustment. See chapter 5.
15	P SPAN ADJUSTMENT	An error occurred during adjusting the pressure	Check the flow. Repeat adjustment. See chapter 5.
51	int. RAM SERVICE	An error occurred in the internal RAM	Only the SEWERIN customer service may perform troubleshooting.
52	XFLASH SERVICE	An error occurred in the program / data memory	Only the SEWERIN customer service may perform troubleshooting.
53	AD Con. SERVICE	An error occurred in the analogue converter	Only the SEWERIN customer service may perform troubleshooting.
54	DISPLAY SERVICE	A display error occurred	Only the SEWERIN customer service may perform troubleshooting.

7 Technical data

7.1 Equipment

● **Gas databases**	Methane (CH4) /air / natural gas Propane (C_3H_8) Butane (C_4H_{10}) Town gas (TGas) Hydrogen (H_2)
● **Timer**	Pressure test Countdown mode (hh:mm) Service schedule Calibration interval
● **LC display**	Graphic display, 65 x 132 pixels
● **Foil key pad**	3 keys
● **Buzzer**	Frequency 2.4 kHz Volume = 70 dB (A) / 1 m
● **Signal light**	red
● **Infrared interface**	IrDA 1.0 Printing: IrCOMM 3-Wire Raw Transmitting: Multi-Transport OBEX
● **PC interface**	via HG4 charging station with interface
● **Memory**	Capacity: 122 memory locations

7.2 Measuring ranges

- **Test of working order (W)**

  0 to 200 mbar

  - Resolution: 0.1 mbar
  - Accuracy: +/- 0,5 % of end of measuring range
  - Temperature related error: 0,12 mbar/K

  0 to 10 l/h

  - Resolution: 0.1 l/h
  - Accuracy: 0.1 l/h or 5 % of the measured value

- **Main test (M)**

  0 to 200 mbar

  - Resolution: 0.1 mbar
  - Accuracy: +/- 0,5 % of end of measuring range
  - Temperature related error: 0,12 mbar/K

- **Preliminary test (P)**

  0 to 2 bar

  - Resolution: 0.001 bar
  - Accuracy: +/- 0,5 % of end of measuring range
  - Temperature related error: 0,12 mbar/K

- **Regulator inspection (R)**

  0 to 200 mbar

  - Resolution: 0.1 mbar
  - Accuracy: +/- 0,5 % of end of measuring range
  - Temperature related error: 0,12 mbar/K

7.3 Sensors

- Flow sensor (S): l/h
- Low-pressure sensor (M, R): mbar
- High-pressure sensor (P): bar

7.4 Fields of application

- Operating temperature: - 10 °C to + 40 °C
- Storage temperature: - 20 °C to + 70 °C
- Humidity: 0 % RH to 90 % RH, non-condensing
- Pressure: 860 hPa to 1100 hPa

7.5 Power supply

- Operation with: Ni-MH accumulators or alkaline batteries
- Operation time: 20 h
- Recharge of Ni-MH accumulators: via charging station HG4 and plug-in power supply with 12 V interface
- Charging time: 14 h (complete recharge)

7.6 Dimensions and weight

- Dimensions (W x H x D): approx. 60 x 160 x 40 mm
- Weight: approx. 300 g

8 Delivery variants and accessories

8.1 Delivery variants

MiniLec 4 – HD variant

Part No.: LH04-10100

- Preliminary test
  (Connection: Rectus 21 nipple)
- Main test
  (Connection: Rectus 20 nipple)
- Regulator inspection
  (Connection: Rectus 20 nipple)
- Test of working order
  (serviceability)
  (Connection
  input: Rectus 20 nipple
  Output Rectus 20 coupling)
- Data memory
- Infrared interface

MiniLec 4 – LD variant

Part No.: LH04-10001

- Main test
  (Connection: Rectus 20 nipple)
- Regulator inspection
  (Connection: Rectus 20 nipple)
- Test of working order
  (serviceability)
  (Connection
  input: Rectus 20 nipple
  Output Rectus 20 coupling)
- Data memory
- Infrared interface

8.2 Accessories

Hardsided luggage, orange

Part No.: ZD22-10000

- Size SR/VT
- With foam insert and compartments for multi-purposes
- For holding:
  - MiniLec 4
  - Charging equipment
  - Printer
  - Testing tubes
  - Testing connections
  - Testing caps
  - Y piece
  - High-performance pump

Charging station HG 4

Part No.: LP10-10001

Charging station HG 4 with interface

Part No.: LP10-10101

Power supply unit M4

Part No.: LD10-10001

Thermal printer and power supply

Part No.: 3001-0018

- Belt printer with infrared interface for printing via MiniLec 4 or palmtop computer
- For printing out the measurement results without graphics

Inlet tube

Part No.: LH04-Z0100

- On the device:
  Rectus 20 coupling
- On the installation:
  Rectus 21 coupling
- Length 1.5 m
- Hydrophobic filter
- For main tests and tests of working order (serviceability)

Outlet tube

Part No.: LH04-Z0200

- On the device:
  Rectus 20 nipple
- On the installation:
  Rectus 21 coupling
- Length 1.5 m
- Hydrophobic filter
- For tests of working order (serviceability)

Connection tube

Part No.: LH04-Z0300

- On the device:
  Rectus 21 coupling
- On the installation:
  Rectus 21 coupling
- Length 2 m
- For preliminary tests or other tests, if required.

Testing nozzle Duo

Part No.: LH04-Z0400

- with two threads G 1 and G 1¼, ball valve and Rectus 21 nipple
- For all tests with internal thread connection
- Not suitable for connections with swivel nut

Testing nozzle for twin-pipe gas meters, e. g. DN 25 G 1¼

Part No.: LH04-Z1900

- With ball valve and Rectus 21 nipple
- For connections with swivel nuts
- Other dimensions available

Overflow cap DN 25 with ball valve and Rectus 21 nipple

Part No.: LH04-Z0500

- For one-pipe meter connections
- For checking the supply line and consumption line at the same time
- Preliminary tests and main tests

Overflow cap DN 25 with two ball valves and Rectus 21 nipple

Part No.: LH04-Z0600

- For one-pipe meter connections
- For checking the supply line (non-metered) and consumption line apart from each other
- All test types

Y piece with two ball valves

Part No.: LH04-Z0700

- 1 x coupling Rectus 21, 2 x nipple Rectus 21
- For preliminary tests or other test types, if required.

High-pressure pump with manometer

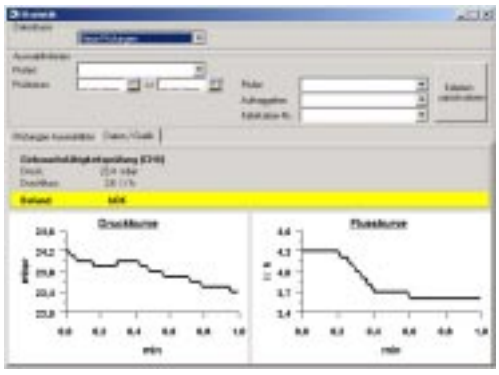
Part No.: LH04-Z0800

- For preliminary tests

SPL-AUTO

Part No.: ZZ23-10100

- Automatic filling of the gas bubble with the help of a built-in electrical pump
- For serviceability determinations of **non-metered** pipes and for checks at an arbitrary place of the pipe



MiniLec 4 Desktop

Part No.: LH04-82000

- Software for the central recording, processing and managing of measurement data on the PC

Konformitätserklärung / Declaration of Conformity

Gerätebezeichnung: Type of Product:	batteriebetriebenes Leckmengenmeßgerät battery operated Gas Leakage Rate Meter
Geräte-Typ: Product Name	MiniLec 4 l/h 0-200mbar / MiniLec 4 l/h 0-200mbar/0-2bar
Fabrikations-Nr.: Fabr.No.	063 00 xxxx / 063 01 xxxx

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 61000-6 - 2	EMV – Fachgrundnorm Störfestigkeit Generic Immunity Standard
DIN EN 61000-6 - 4	EMV – Fachgrundnorm Störaussendung Generic Emission Standard

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

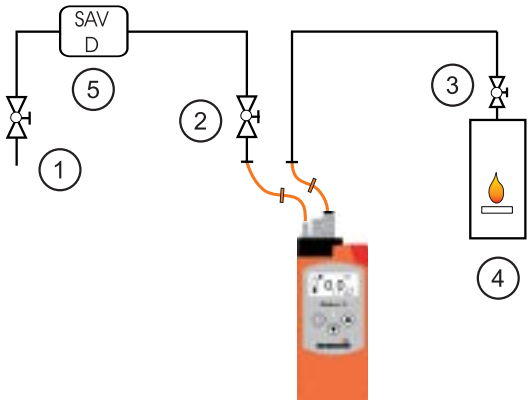
Gütersloh, den 26.05.03

HERMANN SEWERIN GMBH

(Geschäftsführer / Managing Director)

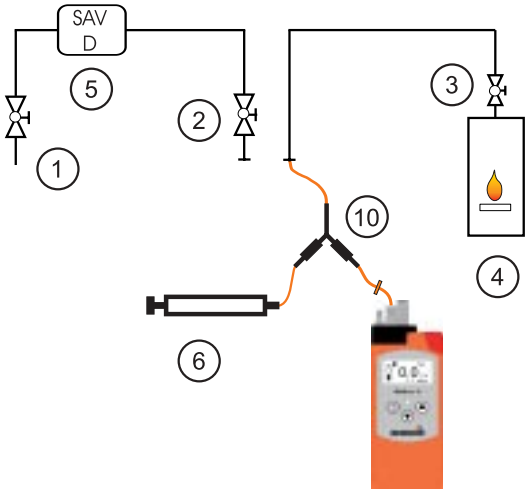
Connection and application options

Replacement of a meter, test of working order (W)



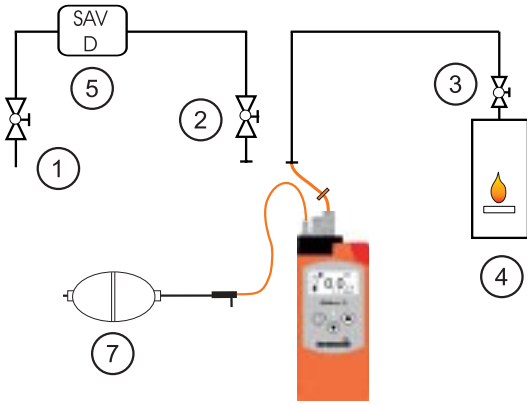
Gas:	Natural gas
Flow:	0 ... 5 l/h
Operating pressure:	approx. 20 … 30 mbar

Preliminary test



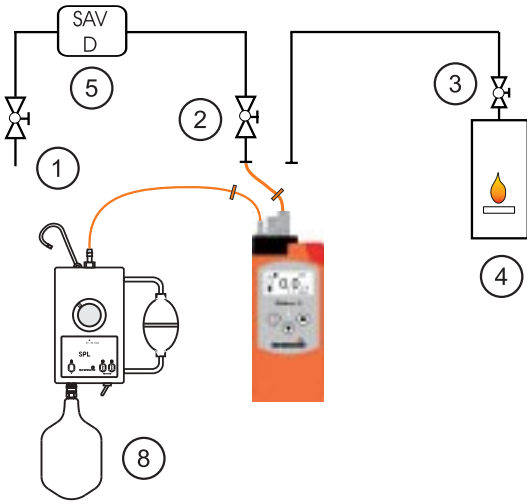
Gas:	Air
Pressure:	approx. 1.0 bar

Main test



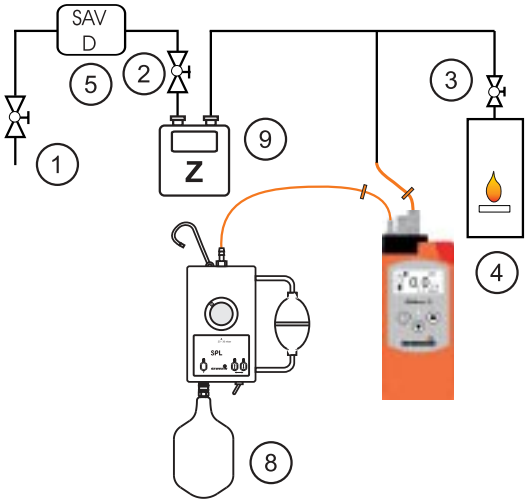
Gas:	Air
Pressure:	approx. 110.0 mbar

Check of non-metered pipes



Gas:	Natural gas
Flow:	0 ... 5 l/h
Operating pressure:	approx. 20 … 30 mbar

Test of working order at an arbitrary place of the pipe

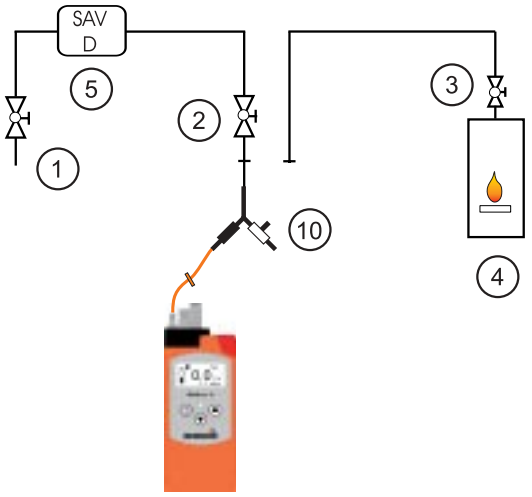


Gas:	Natural gas
Flow:	0 ... 5 l/h
Operating pressure:	approx. 20 … 30 mbar

Legend:

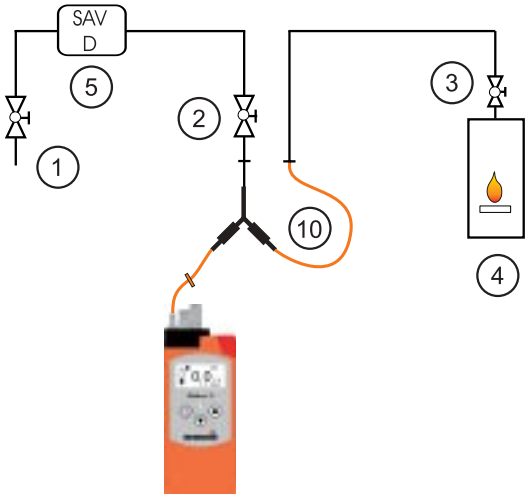
1	Main stop device
2	Meter-locking device
3	Equipment-locking device
4	Consumer
5	Controller + safety shut-off valve
6	High-pressure pump
7	Manually operated pump
8	Testing device SPL
9	Meter
10	Y piece with two ball valves

Regulator inspection / static pressure



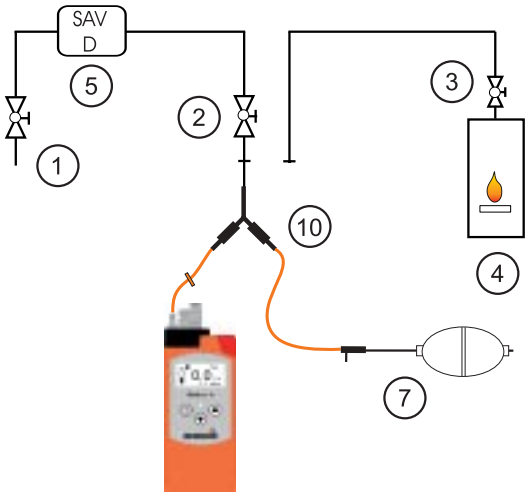
Main stop device:	Open
Gas:	Natural gas
Operating pressure:	approx. 20 … 30 mbar

Regulator inspection / dynamic pressure



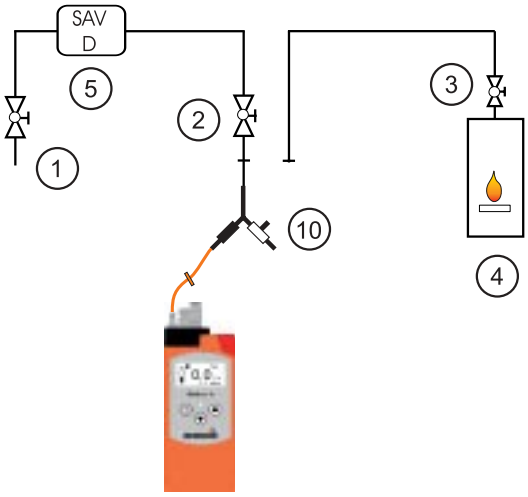
Main stop device:	Open
Gas:	Natural gas
Operating pressure:	approx. 20 … 30 mbar

Regulator inspection / reaction pressure inspection



Main stop device:	Closed
Gas:	Air
Pressure:	depending on the upper switching-off point of the safety shut-off valve (typical: 50 ... 100 mbar)

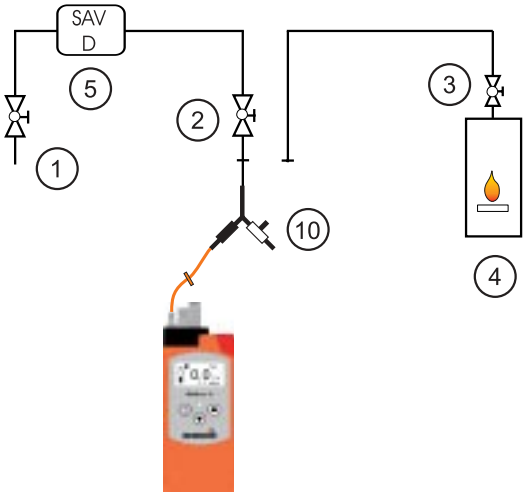
Regulator inspection / zero shut-off



Main stop device: Open

Operating pressure: 0 mbar

Regulator inspection / low-pressure cut-off valve



Main stop device: Open

Gas: Natural gas

Operating pressure: Slowly increasing to approx. 20 ... 30 mbar

Legend:

1	Main stop device
2	Meter-locking device
3	Equipment-locking device
4	Consumer
5	Controller + safety shut-off valve
6	High-pressure pump
7	Manually operated pump
8	Testing device SPL
9	Meter
10	Y piece with two ball valves

List of abbreviations

DVGW	Deutscher Verein des Gas- und Wasserfaches e.V. [German Technical and Scientific Association for Gas and Water]
IrDA	Infrared Data Association, interface standard used for communication
LCD	Liquid Crystal Display
Ni-MH	Nickel metal hydride
SSV	Safety shut-off valve
TRGI	Technical rules for gas installations

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