SYSTRONIK
Messtechnologie

SYSTRONIK
Elektronik u. Systemtechnik GmbH
Gewerbestrasse 57
D-88636 Illmensee

Tel.: +49 (0) 7558 / 9206-0
Fax: +49 (0) 7558 / 9206-20

E-Mail: info@systronik.de
Internet: www.systronik.com

Operating instructions

Pressure measuring instrument S4600-ST® (BLE)

CAPBs® enabled

Read instructions before using device!

Observe all safety information!

Keep instructions for future use!

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SYSTRONIK part no.: 523538

Table of contents

1 This instruction manual

This instruction manual is part of the product.

- Read this manual before using the product.
- Keep this manual during the entire service life of the product and always have it readily available for reference.
- Always hand this manual over to future owners or users of the product.

1.1 Precautions

WARNING TERMType and source of the danger are shown here.

- Precautions to take in order to avoid the danger are shown here.

There are three different levels of warnings:

Warning term	Meaning
DANGER	Immediately imminent danger! Failure to observe the information will result in death or severe injuries.
WARNING	Possibly imminent danger! Failure to observe the information may result in death or severe injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or severe injuries as well as damage to property.

1.2 Explanation of symbols and typeface

Symbol	Meaning
☑	Prerequisite for an activity
▶	Activity consisting of a single step
1.	Activity consisting of a several steps
↳	Result of an activity
•	Bulleted list
Text	Indication on display
Highlighting	Highlighting

2 Safety

2.1 Intended use

The pressure measuring instrument S4600-ST© may only be used to measure pressure of gaseous media in non-hazardous areas. The measuring instrument S4600-ST® must not be used for pressure measurement at gas lines.

Any use other than the application explicitly permitted in this instruction manual is not permitted.

2.2 Predictable incorrect application

The pressure measuring instrument S4600© must never be used in the following cases:

- Hazardous area (Ex)
  If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.
- Applications involving persons and animals

2.3 Safe handling

This product represents state-of-the-art technology and is made according to the pertinent safety regulations. Each device is subjected to a function and safety test prior to shipping.

▶ Operate the product only when it is in perfect condition. Always observe the operating instructions, all pertinent local and national directives and guidelines as well as the applicable safety regulations and directives concerning the prevention of accidents.

Extreme environmental conditions have negative effects on the function of the product.

▶ Protect the product from shocks.

▶ Only use the product in rooms.

▶ Protect the product from humidity.

2.4 Staff qualification

The product may only be mounted, commissioned, operated, maintained, shut down and disposed of by qualified, specially trained staff.

Electrical work may only be performed by trained electricians and in compliance with all applicable local and national directives.

2.5 Calibration / adjustment

S4600-ST® must be calibrated on an annual basis. Calibration and adjustment may only be performed by the manufacturer or by third parties authorised by the manufacturer.

2.6 Modifications to the product

Changes or modifications made to the product by unauthorised persons may lead to malfunctions and are prohibited for safety reasons.

2.7 Usage of spare parts and accessories

Usage of unsuitable spare parts and accessories may cause damage to the product.

- ▶ Use only genuine spare parts and accessories of the manufacturer.

2.8 Liability information

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe the technical instructions, guidelines and recommendations.

The manufacturer or the sales company shall not be liable for costs or damages incurred by the user or by third parties in the usage or application of this device, in particular in case of improper use of the device, misuse or malfunction of the connection, malfunction of the device or of connected devices. The manufacturer or the sales company shall not be liable for damage whatsoever resulting from any use other than the use explicitly permitted in this instruction manual.

The manufacturer shall not be liable for misprints.

3 Product description

3.1 Scope of delivery

Scope of delivery:

- Measuring instrument S4600-ST®
- USB mains adaptor

3.2 Properties and functions

1	Cancel ("Clear" key) / direct access
2	Up key
3	On/off key
4	Protective sleeve
5	Down key
6	Menu / Enter key
7	Display
8	Pressure connections
9	Sensor
10	Charger/power supply unit connection
11	IR printer connection
12	MicroSD card slot

3.3 Technical specifications

Table 1: Device description

Parameters	Value
General specifications	
Dimensions of housing with protective sleeve (H x W x D)	143 mm x 66 mm x 37 mm (5.6 in x 2.6 in x 1.5 in)
Weight (with protective sleeve)	Approx. 220 g (7.76 oz)
Housing material	Polyamide (PA)
Display	High-resolution graphical 2.8" TFT display (240 x 320).
Data communication	Infrared printer interface. Bluetooth® Smart interface (Bluetooth® low energy).
Printer	External infrared thermal printer (EUROprinter)
Memory	MicroSD card with folder/file structure
Operating temperature range	
Ambient	0 °C to +40 °C (+32 °F to +104 °F)
Medium	0 °C to +40 °C (+32 °F to +104 °F)
Storage	-20 °C to +50 °C (-4 °F to +122 °F)
Atmospheric pressure range	
Ambient	750 hPa to +1100 hPa
Humidity range	
Ambient	20 % rH to 80 % rH
Supply voltage	
Battery operation	Lithium-ion battery 3.6 V / 1800 mAh
Mains operation	Mains adaptor (USB)
Electrical safety	
Degree of protection	IP 40 EN 60529

Parameters	Value
Electromagnetic compatibility (EMC)	
Interference	EN 55022 (VDE 0875-22)
Noise immunity	EN 61000 (VDE 0847-4-2)
ESD	EN 61000-4-2

Table 2: Device specifications (pressure measurement)

	S4602-ST	S4601-ST	S4610-ST	S4650-ST	S4680-ST	S4699 ST
Measuring range [mbar] - nominal - maximum	 ± 20 ± 20	 ± 150 ± 180	 ± 1,000 ± 1,500	 ± 5,000 ± 7,000	 ± 8,000 ± 10,000	 ± 18.000 ± 20.000
Max. overpressure [bar]	0.25	1.35	16.0	16.0	16.0	28.0
Resolution [mbar]	0.001	0.01 (<99.99) 0.1 (>100.0)	0.1 (< 999.9) 1 (> 1000)	0.1 (< 999.9) 1 (> 1000)	0.1 (< 999.9) 1 (> 1000)	1
Accuracy [% of measured value]	0.003 mbar or 0.5 ± 1 digit	0.03 mbar or 0.5 ± 1 digit	0.3 mbar or 0.5 ± 1 digit	0.7 mbar or 0.5 ± 1 digit	1.2 mbar or 0.5 ± 1 digit	3 mbar or 0.5 ± 1 Digit
Mechanical connections	2 x standard (∅ 8 mm)	2 x standard (∅ 8 mm)	2 x standard (∅ 8 mm)	2 x standard (∅ 8 mm)	2 x standard (∅ 8 mm)	2x Festo (∅ 3 mm)

Table 3: Additional device specifications

Parameters	Value
Barometric pressure measurement	
Measuring range	500 – 1150 hPa
Max. deviation	± 1.5 hPa
Resolution	± 10 hPa
Sensor	Semiconductor sensor

3.4 Approvals, tests and conformities

The S4600-ST® pressure measuring instrument is approved as per the German Federal Immission Act (1. BImSchV) and EN 50379-2 and is TÜV-tested. It complies with the EMC Directive (2004/108/EC).

4 Transport and storage

CAUTION

Damage to the device due to improper transport.

- ▶ Do not throw or drop the device.

CAUTION

Damage to the device due to improper storage.

- ▶ Protect the device from shock when storing it.
- ▶ Store the device in a clean and dry environment.
- ▶ Only store the device within the permissible temperature range.

5 Commissioning

5.1 Using the IR printer

For data transmission from the measuring instrument to the corresponding IR printer (EUROprinter), align the bottom of the S4600-ST® and the printer as shown in the following illustration. Switch on the printer. Start the data transmission via the menu of the measuring instrument. The measurement log is printed. Keep a minimum distance of approx. 25 cm! (Max. approx. 70 cm).

Fig. 1: Alignment of the two devices for printing

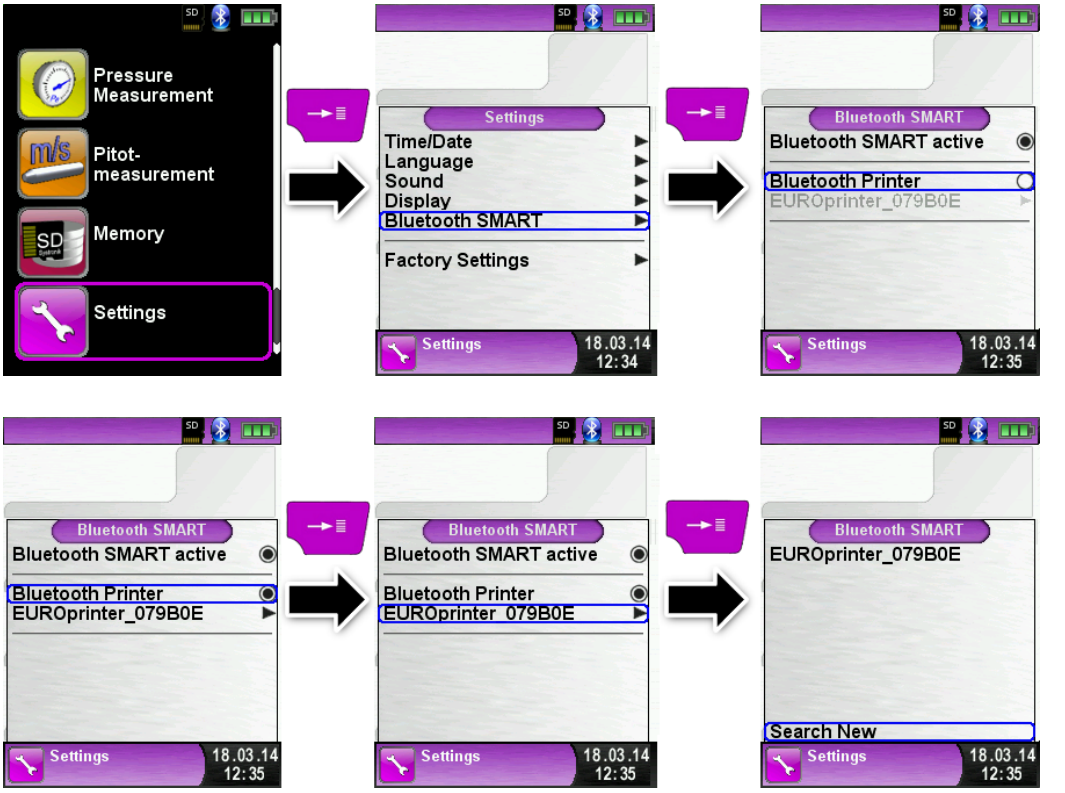
CAUTION

Transmission errors due to incorrect alignment

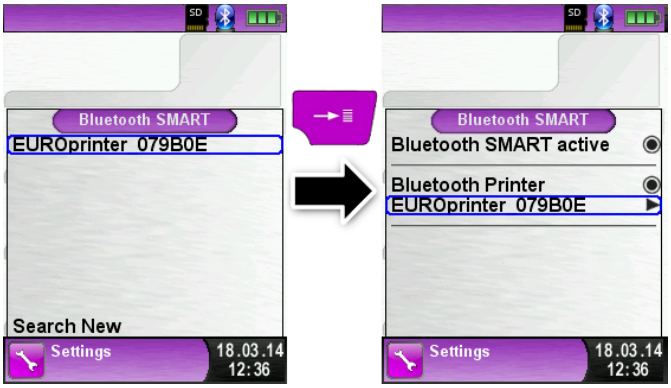
- ▶ The transmission path must be straight and unobstructed.

5.2 Using the Bluetooth Smart printer

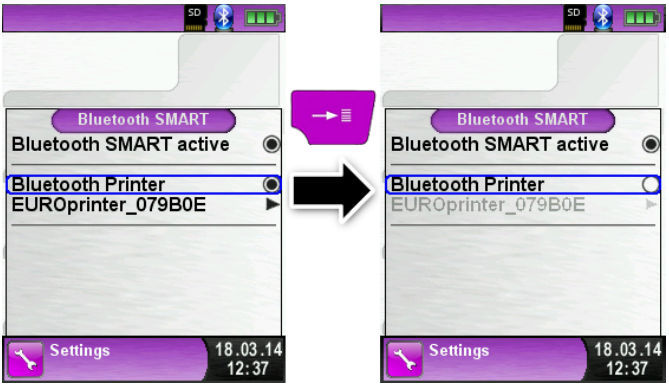
Measuring Data could be also transferred via Bluetooth Smart to the “EUROprinter-BLE”. Activate the Bluetooth Smart in the S4600-ST® Settings and on the printer. To activate the Bluetooth Smart on the printer press the keys “OFF” and “ON” at once. A blue flashing LED means activated Bluetooth Smart otherwise the IR modus is activated. The Bluetooth Smart connection between device and printer is described below:



Select the detected printer to activate the printer.



The IR modus could be set by deactivating the „Bluetooth Printer“ in the settings menu. Set the printer to IR modus as well. Press the keys „OFF“ and „ON“ at once and the blue flashing LED goes out.



6 Operation

Switch on the device: Briefly press the "On/Off" key  .

6.1 Menu structure V2.0

From the firmware V2.0 a new main menu structure is available. The menu is divided in different lists: Favourites, Internal, Wireless and System. Switch with the “back arrow” key between the different menu lists.

Menu Favourites: On new devices a default favourites list is available. Measuring programs from the lists Internal, Wireless and System can be activated for the Favourites list. New Favourites programs will occur at the end of the list. Set of factory settings won’t change the favourites list. Set of factory setting with an empty favourites list, will set the default favourites list.

Menu Internal: In this list are all measuring programs which access to the internal sensors.

Menu Wireless: In this list are all measuring programs which connect to the CAPBs.

Menu System: In this list are all System information.

Edit Favourites list

In every measuring program in the settings menu is the menu item “In favourites”. If this item is activated the program will occur in the favourites list. Otherwise this program isn’t available in the favourites list.

CAPBs product description

CAPBs are measuring instruments for different applications. CAPBs can be used to extend BlueLine measuring instruments by the measured variables provided by the CAPBs. The BlueLine measuring instrument or an app on a smartphone or tablet display, evaluate and log the measured values. The measured values are transferred via Bluetooth Smart technology.

The following BlueLine measuring instruments can be paired with the CAPBs: BLUELYZER ST, EUROLYZER STx, MULTILYZER STe, S4600 ST series and TMD9.

The various CAPBs allow you to measure pressure, differential pressure, flow, temperature and humidity. There are CAPBs for detecting gas leaks and CAPBs to measure air quality.

CAPBs are modular. This way, various sensor modules can be connected via different connection types. This results in numerous application solutions.

Overview

1	LED
2	Multi-purpose key
3	Magnets
4	Unlocking mechanism for removing CAPBs sens
5	Battery compartment
6	Snap-in mechanism for CAPBs sens

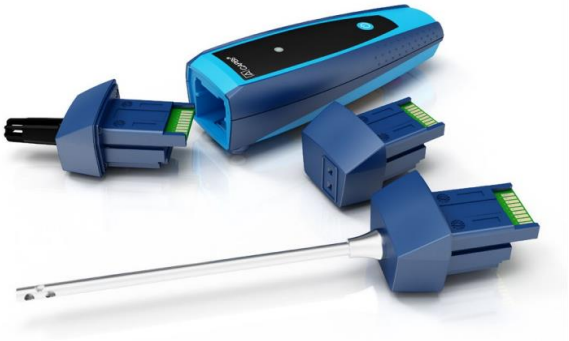
LED display

LED status	Meaning
Flashing blue	CAPBs is searching for a Bluetooth Smart connection
Flashing green	CAPBs is connected
Flashing yellow	Measuring mode
Flashing white	Measurement finished – measured data available
Flashing magenta	Data logger active
Flashing red	Sensor error
Flashing red, fast	CAPBs connected, no CAPBs sens plugged in
Flashing magenta, fast	CAPBs not connected and no CAPBs sens plugged in

Modular system with base handle STm

The CAPBs constitute a modular system consisting of the universal base handle CAPBs STm and an application-specific sensor module CAPBs sens for a wide variety of measured variables.

The base handle CAPBs STm holds the various sensor modules CAPBs sens. The base handle can be combined with any sensor module to form a complete CAPBs measuring unit. A multi-purpose key is located at the front; it is used for switching the unit on and off, for zero adjustment, for activating the Hold mode or for starting the data logger function. The multi-colour LED displays the status of the CAPBs measuring unit by means of different colours and flashing frequencies.



Operation with BlueLine devices

Initial commissioning

1. For switching on, press and hold down for two seconds the multi-purpose key of the CAPBs device.
2. Start the required CAPBs program on the measuring instrument, designated by the Bluetooth symbol .
3. Press the "Enter" key to open the main menu in the measurement program.
4. Select the Bluetooth Smart search for CAPBs under "Settings → Bluetooth SMART".

The Bluetooth Smart search takes approximately 30 seconds. The CAPBs must be on while the search is running. The CAPBs devices found are displayed with serial number of the base handle and the designation of the CAPBs sens.

5. Select the required CAPBs and press the "Enter" key to establish the connection.

When the connection is established, the colour of the LED at the CAPBs LED changes from blue to green. The selected CAPBs is now paired with the BlueLine device. In the future, it will connect automatically. It is sufficient to switch on the CAPBs before you start the required measurement program on the BlueLine device.

CAPBs settings

You can assign a function to the key of the multi-purpose key of the CAPBs via the menu item "Settings → Bluetooth SMART → CAPBs Key". The following functions are available (depending on the measurement program): Start/Stop, Hold, Zero, Reset Max/Min and Data Logger (option).

In the Direct Access menu, you can switch between different CAPBs devices via the menu item "CAPB".

6.2 Measuring mode

Program selection

The program selection section displays the available programs as symbols. Programs can be selected and started.

Fig. 2: Program selection in the start menu
(example: S4600-ST® Pressure Measurement)

Main display

1 Status line
2 Measured values
3 Information line
4 Optional information line
5 Individual measured value

Fig. 3: Display when measuring program is running

Status line

The status line provides information on the status of relevant parameters data such as battery, Hold function, Pressure function, Bluetooth® Smart function, MicroSD card, etc. The type of

information displayed depends on the operating mode and function-specific criteria.

Symbol	Bedeutung
	MicroSD card in the device
	Status battery
	Active Bluetooth Smart connection
	Inactive Bluetooth Smart connection
	„Auto-off“ in one minute
	Measuring data sending to the EUROprinter
	Status CAPBs battery
	CAPBs searching

Information line

The information line provides information on the current measuring program, time, date, etc.

Main menu

▶ Display the main menu with the "Menu/Enter" key.

The main menu provides access to the main functions of the device. All other functions and settings are accessed via submenus.

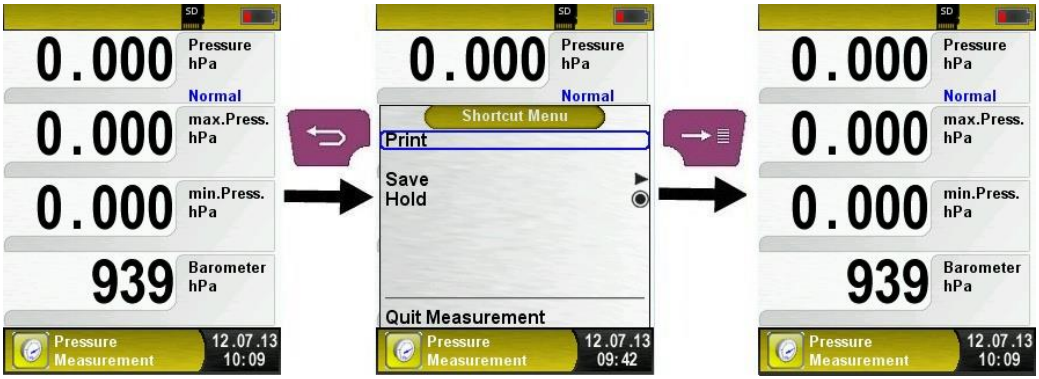
Optional information line

The optional information line provides additional information on the corresponding measured value such as measuring velocity of the pressure sensor, barometric pressure sensor during Pitot measurement, etc.

Direct Access menu

▶ Print measured value / terminate measurement.

Press the "Clear" key to display the Direct Access menu. In the Direct Access Menu, you can print the measured values via the "Menu/Enter" key or terminate the measurement and return to the Start menu.



As soon as the print command is chosen, the measurement log is printed in parallel with the measuring task (→ multitasking function), i.e. the measurement mode remains active without limitations.

Edit mode

The Edit mode is activated if you select certain submenus so that you can edit the appropriate values, such as the interval time for the data logger function.

▶ Editing the interval time of the data logger function

For example, if you want to change the interval time for the Data Logger function, you must first select the appropriate line using the arrow keys and then confirm with the "Menu/Enter" key. Once the background colour of the line changes to blue, you are in Edit mode and can change the corresponding value using the arrow keys. The change must be confirmed with the "Menu/Enter" key. The Edit mode is activated for the next number. Once you have changed and confirmed all numbers, the Edit mode is disabled and the blue background disappears.

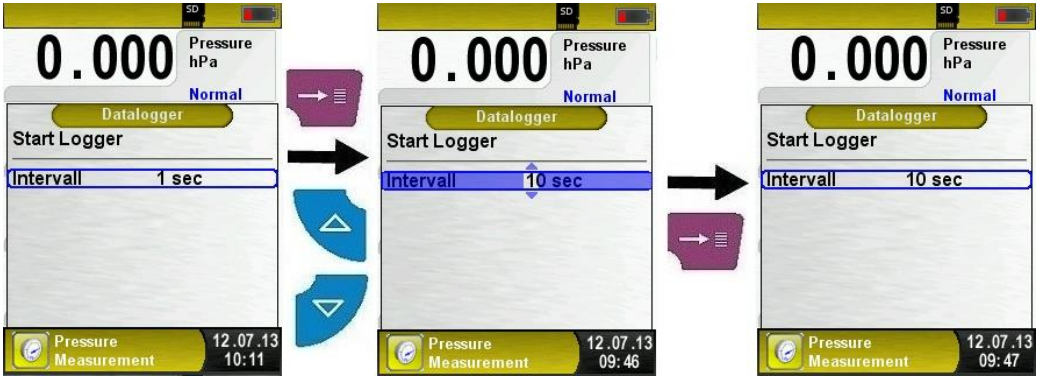
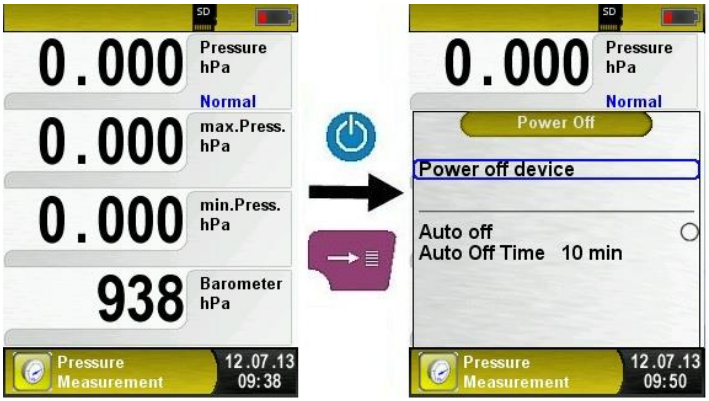


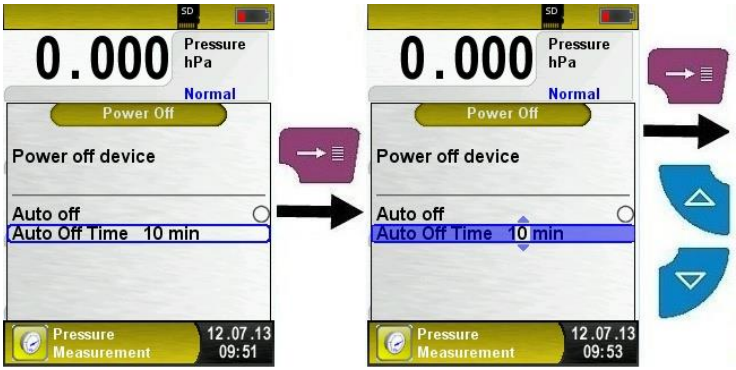
Fig. 4: Edit mode, example: changing the interval time

▶ Switching off the device, automatic Off function

Switching off the device: Briefly press the "On/Off" key and confirm with the "Menu/Enter" key. The S4600-ST® measuring instrument also features a time-dependent automatic Off function; this function can be enabled or disabled.

The switch off time can be changed in Edit mode. The Edit mode is described in chapter 6.1, page 21.


0.000
Pressure
hPa
Normal
0.000
max.Press.
hPa
0.000
min.Press.
hPa
938
Barometer
hPa
Pressure
Measurement
12.07.13
09:38
Power Off
Power off device
Auto off
Auto Off Time 10 min
09:50

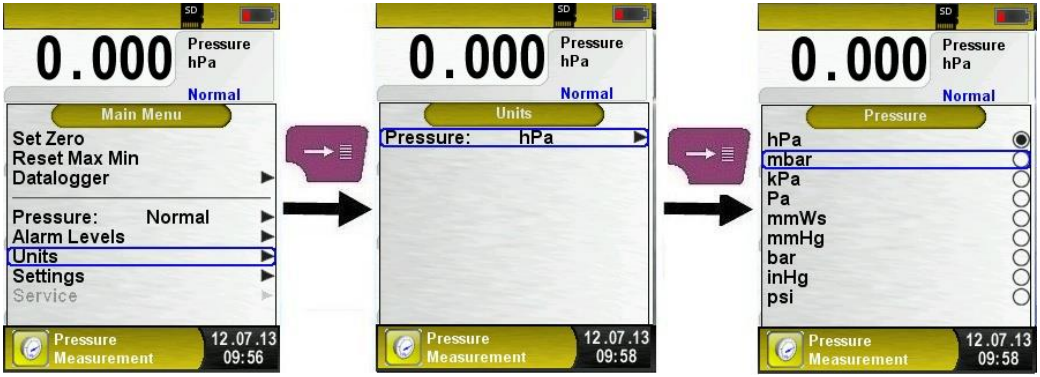

0.000
Pressure
hPa
Normal
Power Off
Power off device
Auto off
Auto Off Time 10 min
Pressure
Measurement
12.07.13
09:51
09:53


0.000
Pressure
hPa
Normal
Power Off
Power off device
Auto off
Auto Off Time 10 min
Pressure
Measurement
12.07.13
09:53
09:51
09:54

6.3 Changing the units

▶ Displaying the main menu.

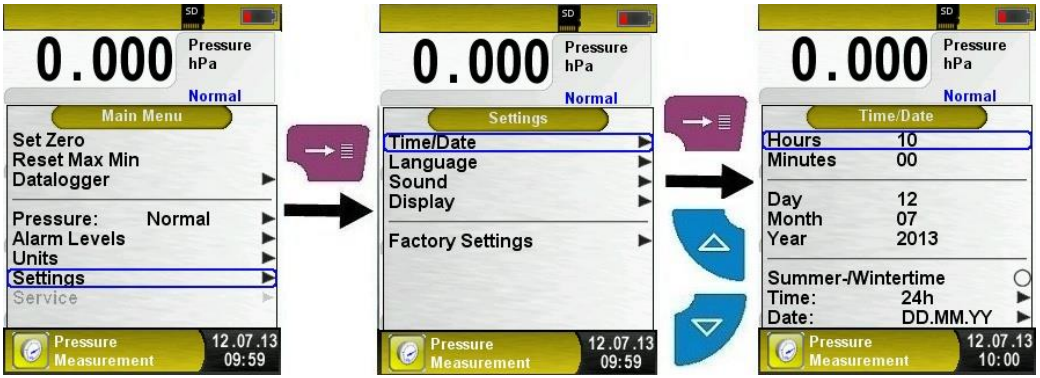
Various units are available for pressure measurements.



6.4 Setting time and date

▶ Changing time and date

Time and date can be changed in Edit mode. The Edit mode is described in chapter 6.1, page 21. The device automatically considers leap years and daylight-saving time/wintertime; the time and date formats are adjustable.

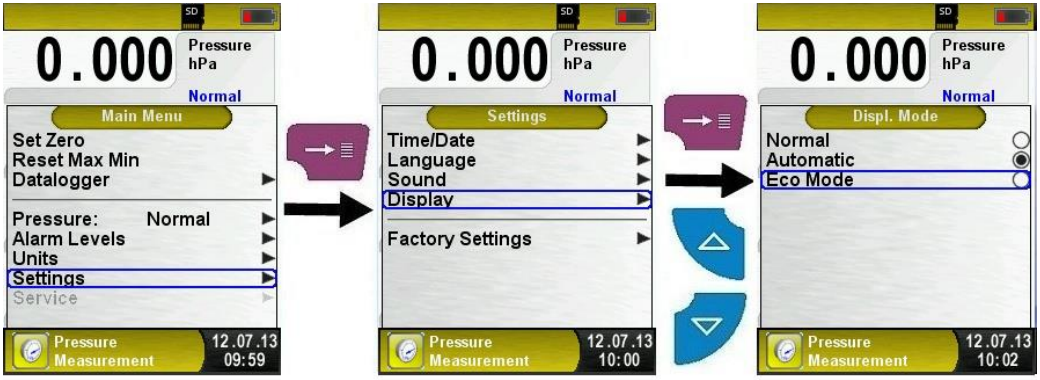


6.5 Setting the display

The intelligent power management of S4600-ST© allows for optimisation of the battery life.

Three display settings are available: "Normal", "Automatic" and "Eco Mode". The selected setting influences the battery life, see chapter 8.1, page 53.

▶ Change the display setting.

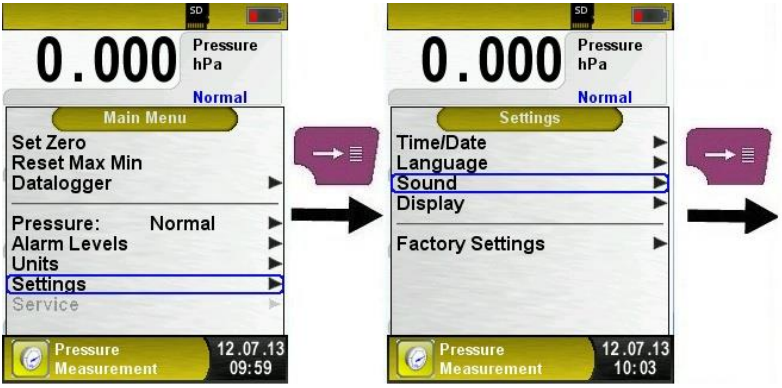


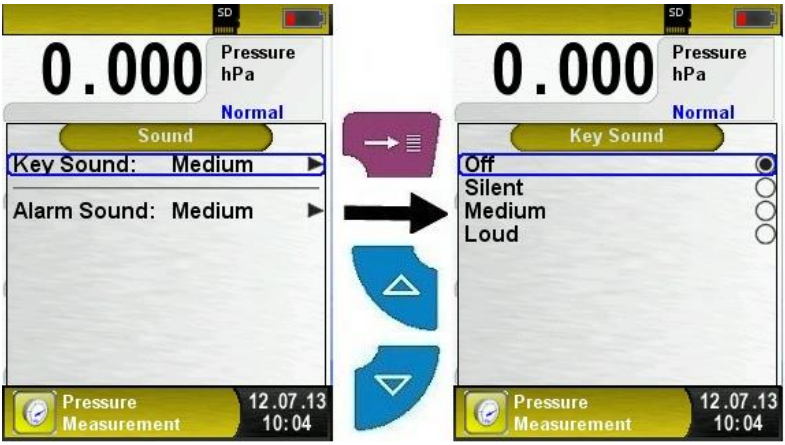
6.6 Setting the key tone and the alarm tone

▶ Setting the key tone and the alarm tone.

There are four sound levels for the key tone and the alarm tone:

- Off
- Low
- Medium
- Loud

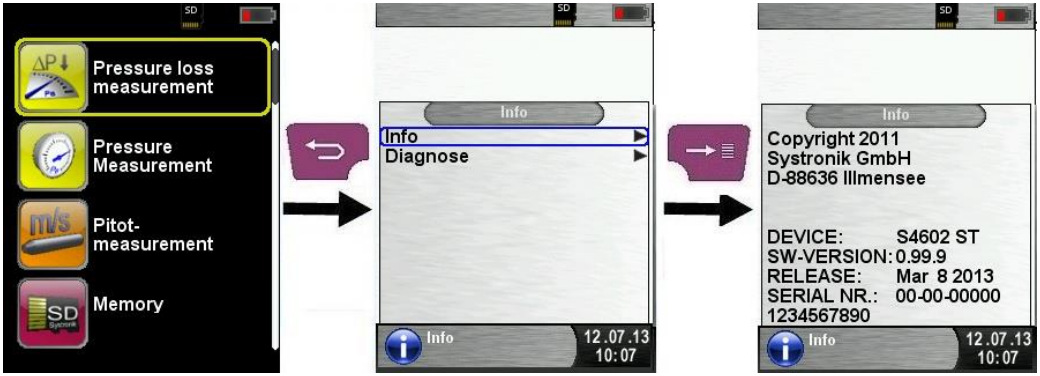




6.7 Displaying device information

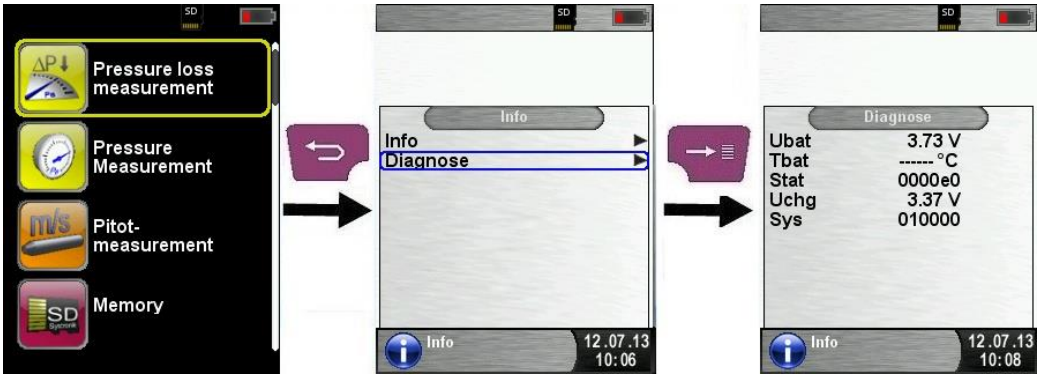
▶ Displaying device information

Press the "Clear" key in the program selection area to display the device data. The Info menu displays, among other things, the firmware version, the release date and the serial number.



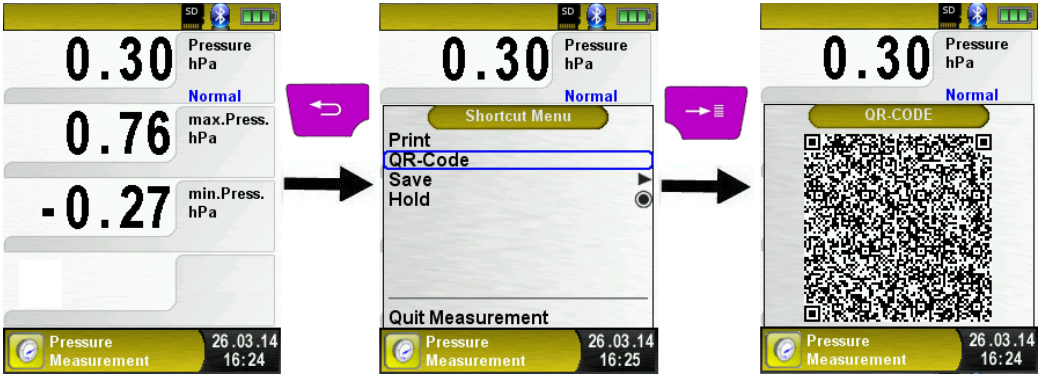
▶ Displaying diagnostics data

Press the "Clear" key in the program selection area to display the diagnostics data. The Diagnostics menu displays, among other things, the firmware version, the release date and the serial number.



6.8 Generating QR-CODE

With the QR-Code the measured values could be transferred to a Tablet or Smartphone.

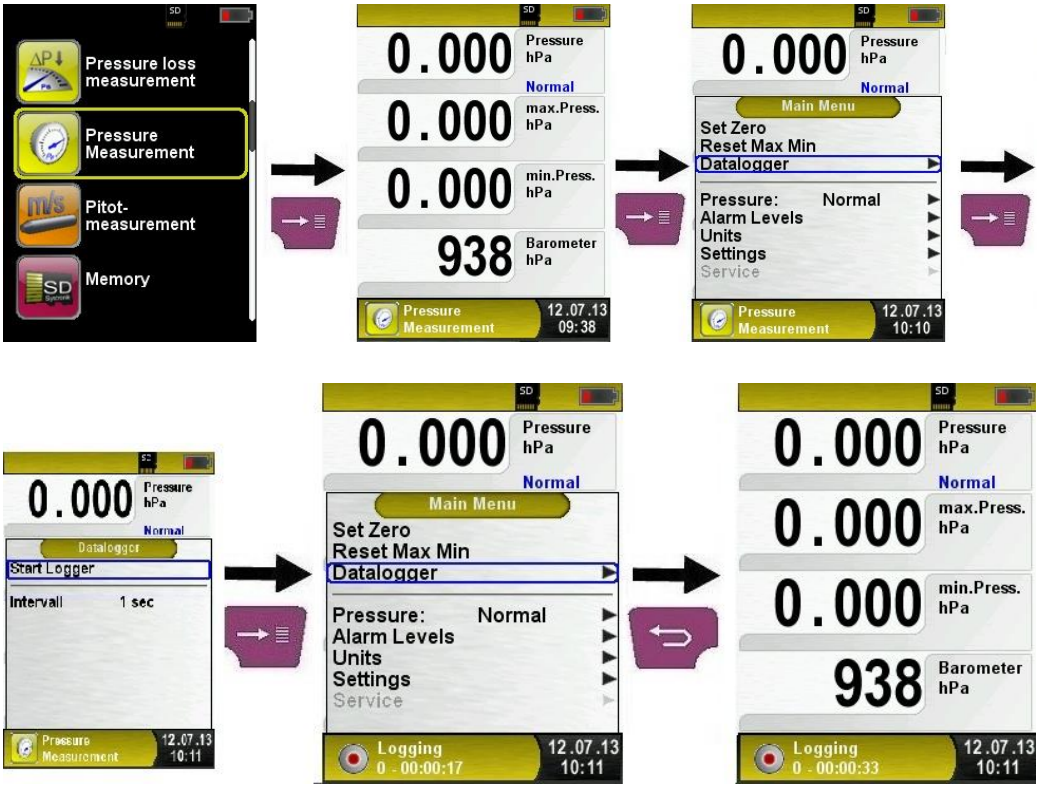


6.9 Data Logger function (option)

▶ Starting the Data Logger function

The "Datalogger" function can be operated via the main menu. The MicroSD card must have been inserted and sufficient memory must be available.

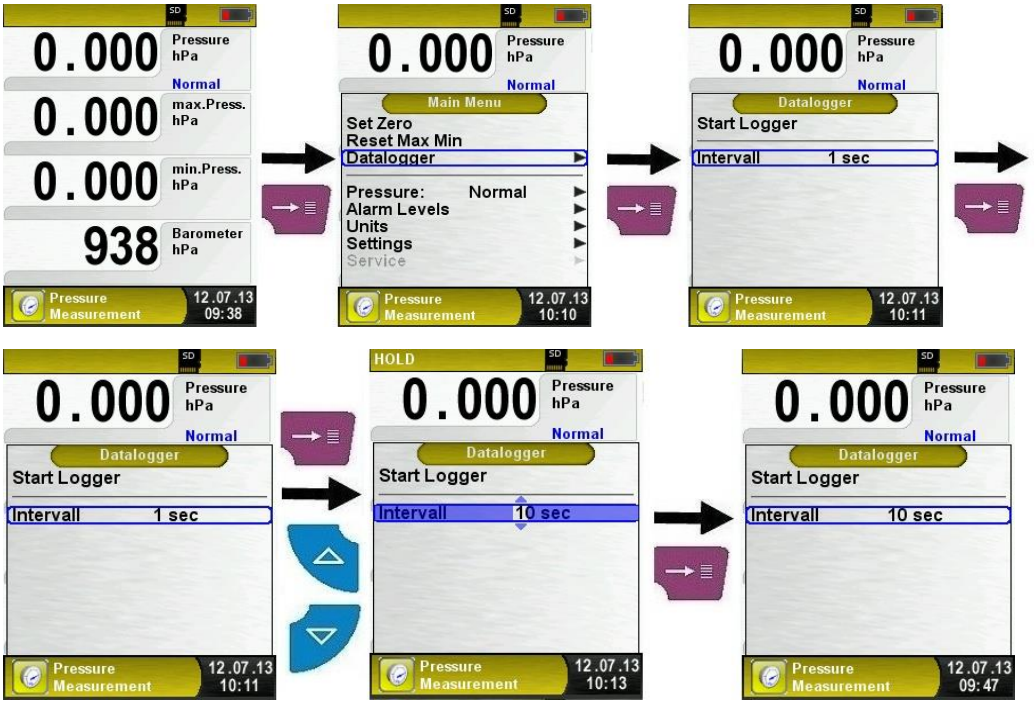
The following screenshots use the "Pressure Measurement" program as an example; the Datalogger function is also available in the "Pitot Measurement" program (option).



The logging time that has already passed is shown in the Information line.

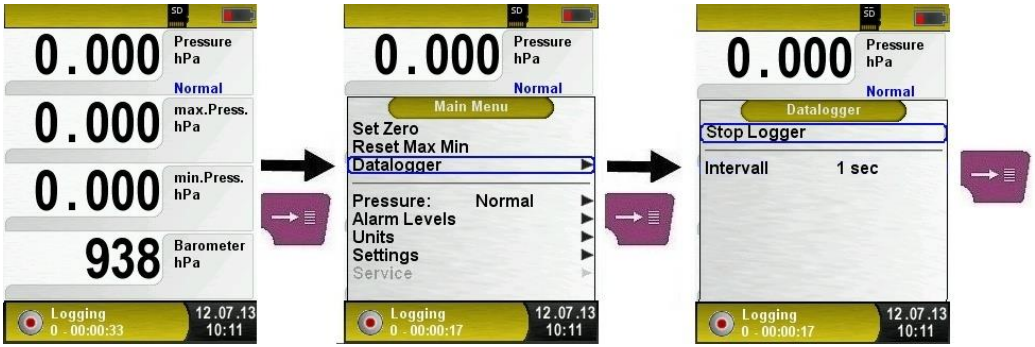
▶ Changing the data logger interval.

The sampling rate can be changed in Edit mode. The Edit mode is described in chapter 6.1, page 21. The sampling rate (interval time) can be set between 1 and 999 seconds.



▶ Stopping the Data Logger function

The Data Logger function can be stopped via the main menu at any time. The data stored on the MicroSD card in XML format can be read and further processed via an Internet browser or other XML tools.



6.10 "Pressure Measurement" program

▶ Starting the "Pressure Measurement" program

When you start the "Pressure Measurement" program, the pressure sensor is first zero-balanced; this takes a few seconds.

The colour of the pressure value then changes from grey to black. The black colour indicates that the device is ready for measurements. Zero balancing can also be performed manually via the main menu.

The optional Data Logger function is also available; it allows you to save a series of measured values to the MicroSD card. The Data Logger function is described in chapter 6.8, page 26.

Key	Function
	Quitting the program "Pressure Measurement" / displaying the Direct Access menu.
	Changing selection in the menu.
	Displaying the main menu.
	Switch off the device.

6.11 "Pressure Loss Measurement" program

▶ Starting the "Pressure Loss Measurement" program

When you start the "Pressure Loss Measurement" program, the pressure sensor is first zero-balanced; this takes a few seconds.

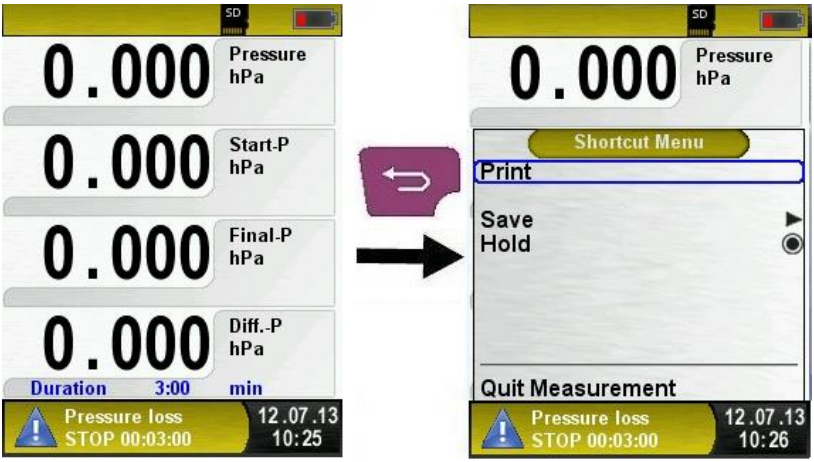
The colour of the pressure value then changes from grey to black. The black colour indicates that the device is ready for measurements. Zero balancing can also be performed manually via the main menu.

▶ Connecting the system to S4600-ST®.

The system to be measured must be connected to S4600-ST®. The pump is then used to apply the test pressure to the system as per instruction.

"START" starts the pressure loss measurement. A counter in the main display shows the duration of the running pressure loss measurement in seconds and minutes.

After the pressure loss measurement, a sound is triggered and the information line displays the message "Pressure Loss STOP" along with the duration of the measurement duration. The measured values are held in the main display; you can save or print the measurement log.



Key	Function
	Quitting the program "Pressure Loss Measurement" / displaying the Direct Access menu.
	Changing selection in the menu.
	Displaying the main menu.
	Switch off the device.

6.12 "Pitot Measurement" program (option)

▶ Starting the "Pitot Measurement" program

When you start the "Pitot Measurement" program, the pressure sensor is first zero-balanced; this takes a few seconds.

The colour of the pressure value then changes from grey to black. The black colour indicates that the device is ready for measurements. Zero balancing can also be performed manually via the main menu.

The main display shows the following measured values with adjustable units:

- Flow (m/s, km/h)
- Volume (m³/h, l/s, m³/s)
- Pressure (hPa)
- Barometric pressure (hPa)

The optional Data Logger function is also available; it allows you to save a series of measured values to the MicroSD card. The Data Logger function is described in chapter 6.8, page 26.

Key	Function
	Quitting the program "Pitot Measurement".
	Changing selection in the menu.
	Displaying submenu.
	Switch off the device.

- Entering measurement data (units, K factor of the Pitot tube, chimney shape, chimney size)

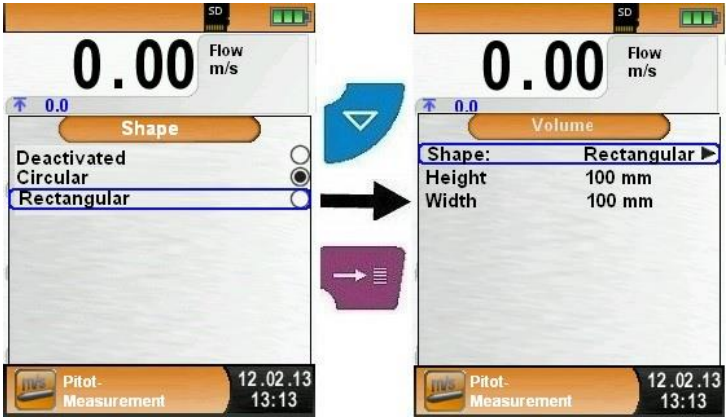
The values entered are used for flow measurement /volume measurement.

The menu "Units" allows you to set the units for the flow measurement / volume measurement.

The K factor of the Pitot tube can be set via the main menu; the default value is 1.00.

The submenu "Volume" lets you select the chimney shapes "Round" and "Rectangular. If you select the chimney shape "Round", you can set the diameter in mm; if you select the chimney shape "Rectangular, you can set the height and width in mm. The Edit mode is described in chapter 6.1, page 21.

If you select the menu item "Deactivated" in the submenu "Shape", volume measurement is hidden in the main display.



6.13 "Leakage measurement" program (option)

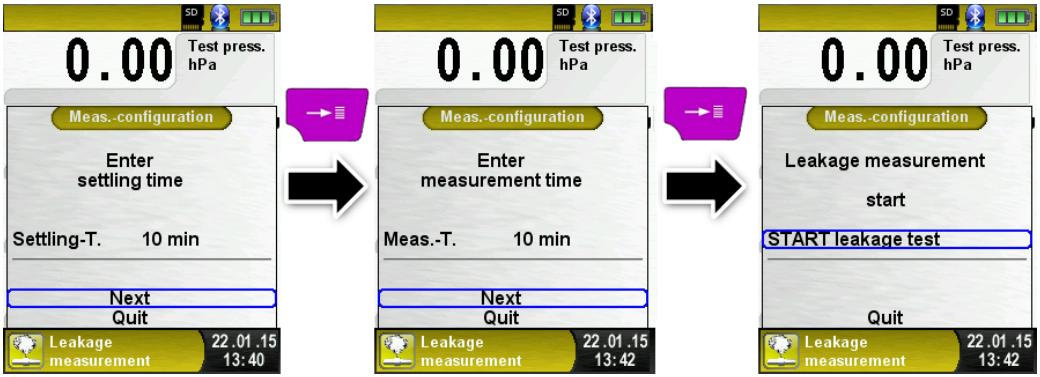
▶ Starting the "Leakage mesurement" program

When you start the "Leakage measurement" program, the pressure sensor is first zero-balanced; this takes a few seconds.

The colour of the pressure value then changes from grey to black. The black colour indicates that the device is ready for measurements. Zero balancing can also be performed manually via the main menu.

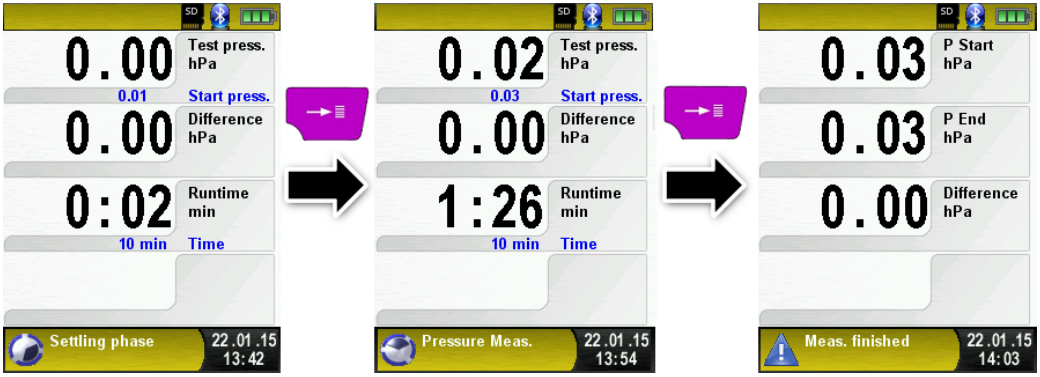
First set the settling time with the arrow keys.

Confirm the settling time with “Next” and set the measurement time. Then start the measurement with “START leakage test”.



The leakage measurement starts with the settling phase and after the set time the pressure measurement will start. A counter in the main display shows the duration of the running measurement in seconds and minutes.

The start and the end of the pressure measurent is signalled acoustically.



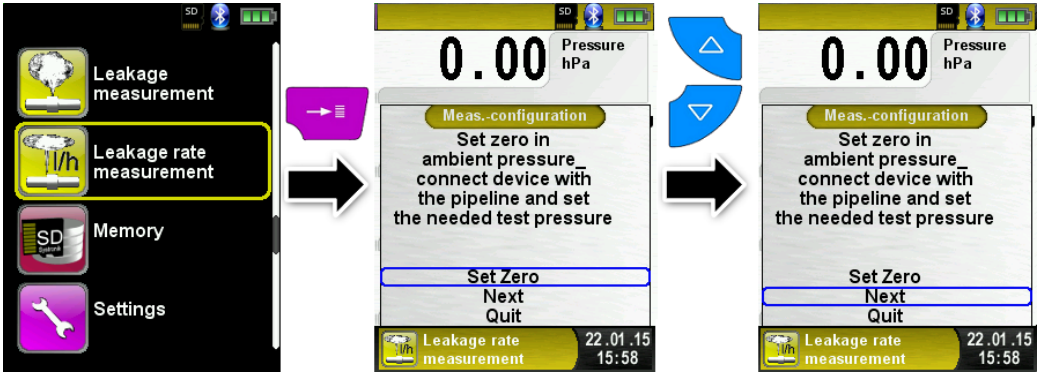
The measured values are held in the main display; you can save or print the measurement log.

6.14 "Leakage rate measurement" program (option)

▶ Starting the "Leakage mesurement" program

When you start the "Leakage measurement" program, the pressure sensor is first zero-balanced; this takes a few seconds.

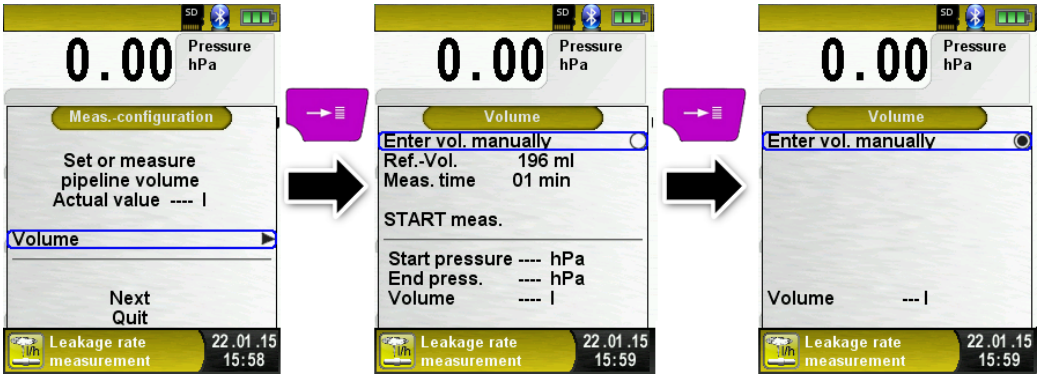
The colour of the pressure value then changes from grey to black. The black colour indicates that the device is ready for measurements. Zero balancing can also be performed manually via the main menu.



It is possible to enter the system (tube) volume manually. If the system volume is unknown the device can calculate the volume automatically.

Manually:

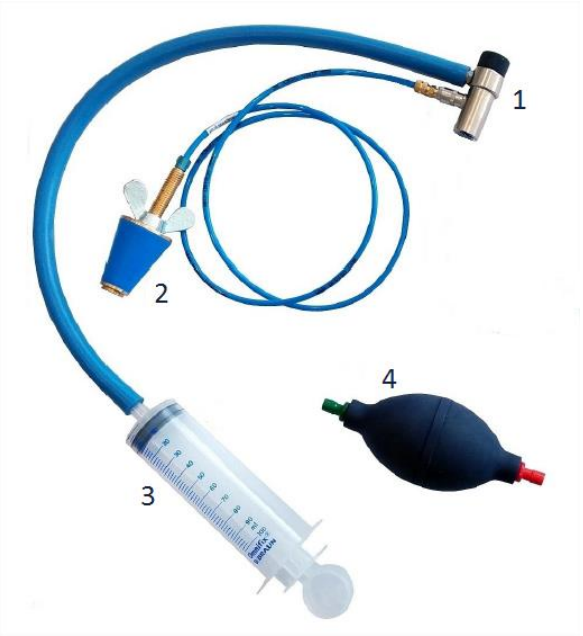
If the system volume is known select “Enter vol. manually” and use the editor to set the volume.



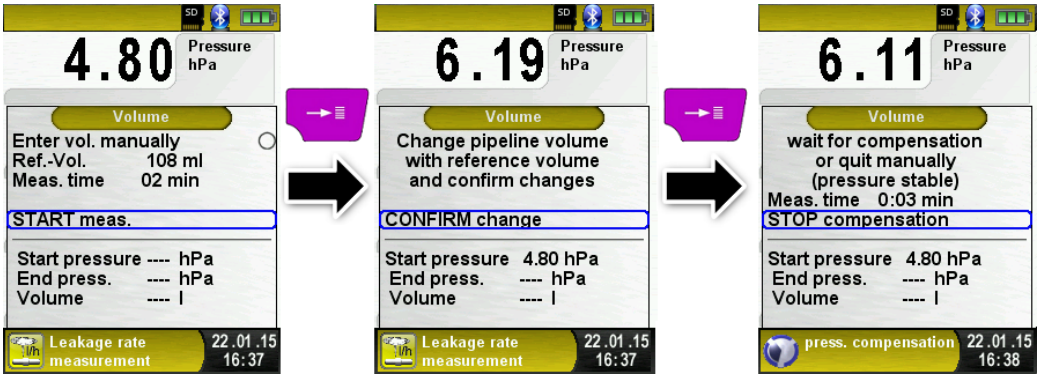
Automatically:

To identify the system volume connect the candidate system with the device: First connect the shut-off valve (1) with the measurement device. Then connect the plug (2) with the candidate system. Open the shut-off valve (1) and with the pumpball (1) give a pressure (working pressure) to the candidate system. In this example 4.80 hPa.

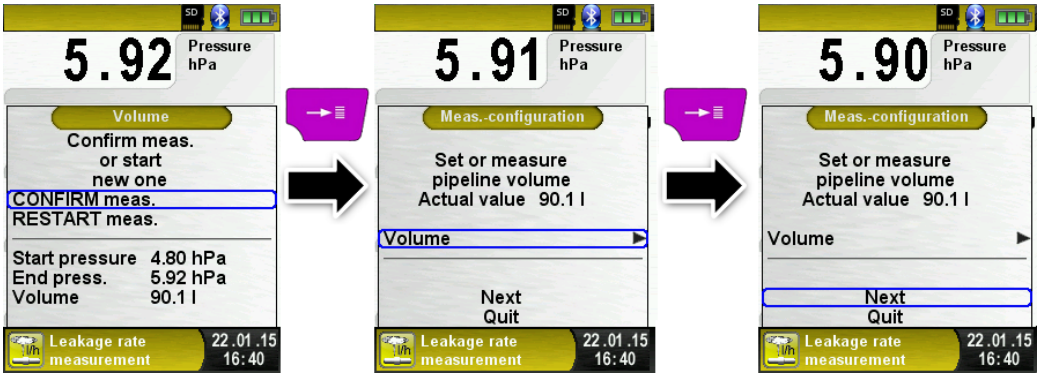
Then close the shut-off valve (1) and connect the syringe (3) to the shut-off valve (1). Best case is to connect the already air filled syringe.



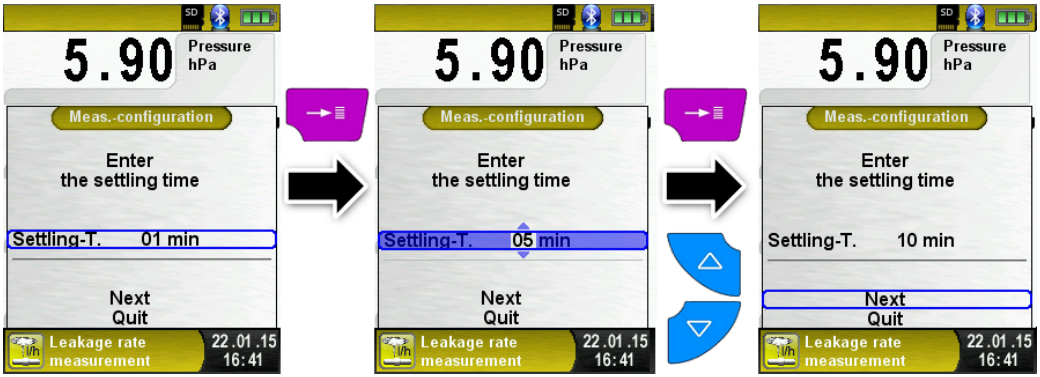
With “START meas.” start the measurement. Then open the shut-off valve (1) and add (or minus) the syringe (3) volume. The volume of the SYSTRONIK syringe (3) is 108 ml. Close the shut-off valve (1) and confirm the volume change with “CONFIRM change”. The calculation will start and stop at the entered measuring time automatically.



The device shows the calculated volume in the last line. Confirm the volume and exit the calculation menu with the “Back” key.

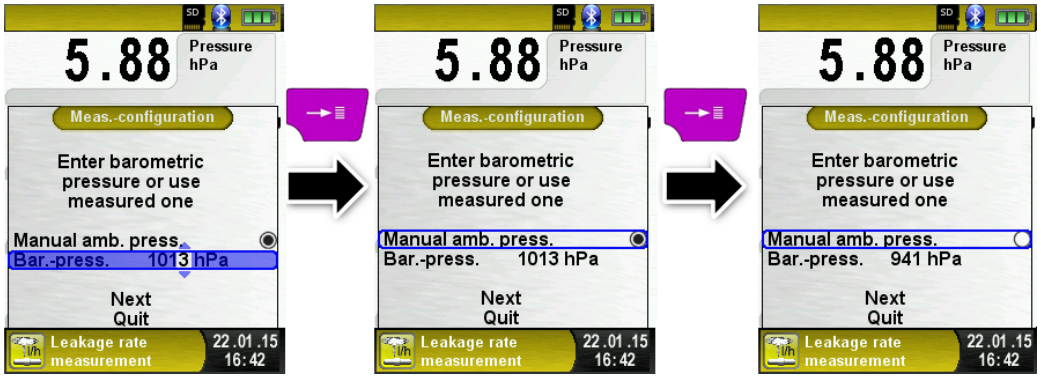


Set the settling time with the arrow keys, and confirm with “Next”.



Set the measuring time with the arrow keys, and confirm with “Next”. Then set the working pressure according to the current pressure. A rough eastimation of the current value is sufficient. In the next step the measured media must be selceted. Available media are air and methane.

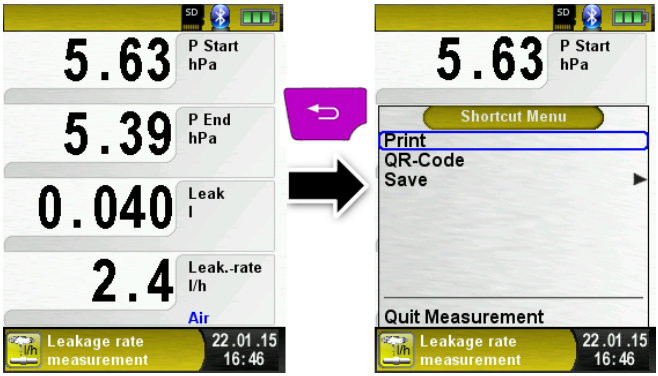
It is possible either to set the barometric pressure manually or measure by the device. Disselect the item “Manual amb. press.” To activate the automatic measurement by the device.



“START meas.” will start the leakage rate measurement with the settling phase and after the set time the pressure measurement will start. A counter in the main display shows the duration of the running measurement in seconds and minutes.

The start and the end of the pressure measurent is signalled acoustically.

The measured values are held in the main display; you can print save, or show the measurement log as QR code.



7 Memory mode and memory structure

7.1 How to save

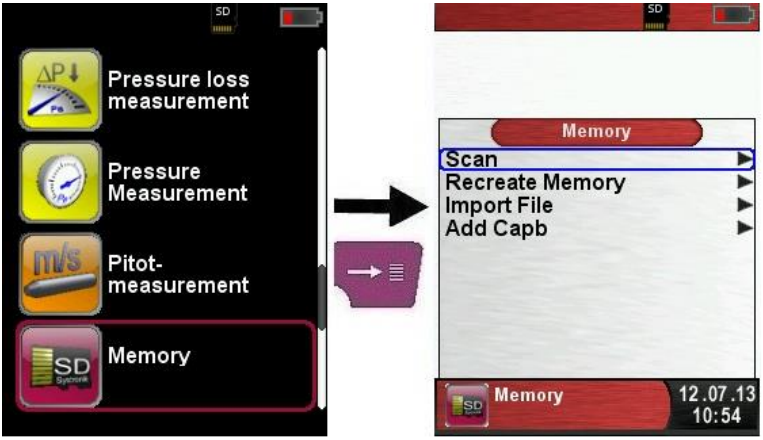
The use of MicroSD memory cards as system-independent storage media ensures maximum flexibility in terms of storing and managing the measured data. MicroSD cards with a memory of up to 16 GB can be used. The card can be read without any additional software by all SD-card-enabled data processing systems (PCs, laptops, notebooks, etc.) using a web browser. More than 1,000,000 measured values can be saved with the recommended memory capacity of 1 GB.

CAUTION

Damage to the memory card slot due to improper plugging in

- Always insert the MicroSD straight and with the contacts pointing up as shown above.

- Displaying the "Memory" menu.



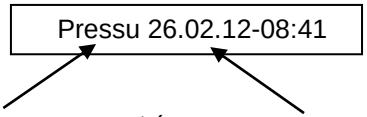
▶ Before you use a MicroSD card for the first time, you should create the folder structure.

The function "Create Memory" creates 10 folders with 10 files each on the MicroSD card; this represents the memory structure of S4600-ST®. The function takes a few seconds to finish.

Note: This function deletes a memory structure that may already be available on the card. However, private user data (such as pictures, documents, etc.) are not deleted by this function.

▶ The memory structure of S4600-ST® consists of 100 memory blocks; one measurement log can be written to each of these blocks.

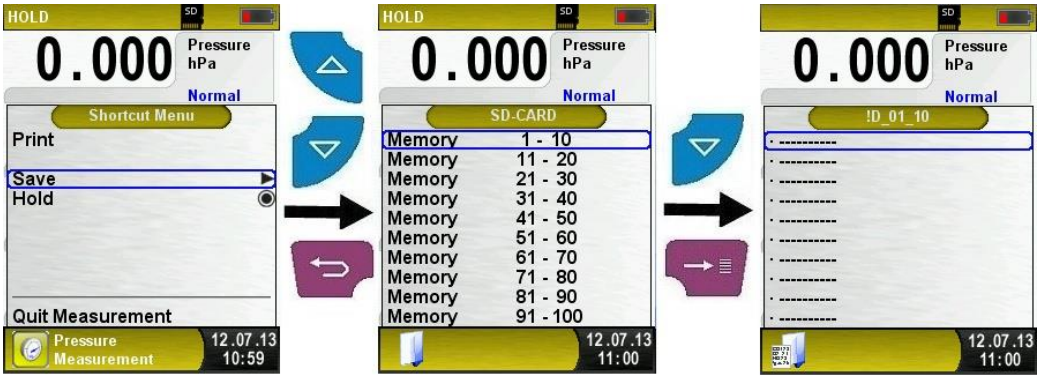
At the end of a measurement, the measurement log can be saved to a free memory block. A total of 10 x 10 memory blocks are available. The file name is automatically generated by the device according to the following structure:



Type of measurement (e.g. pressure measurement) date (day.month.year) and time

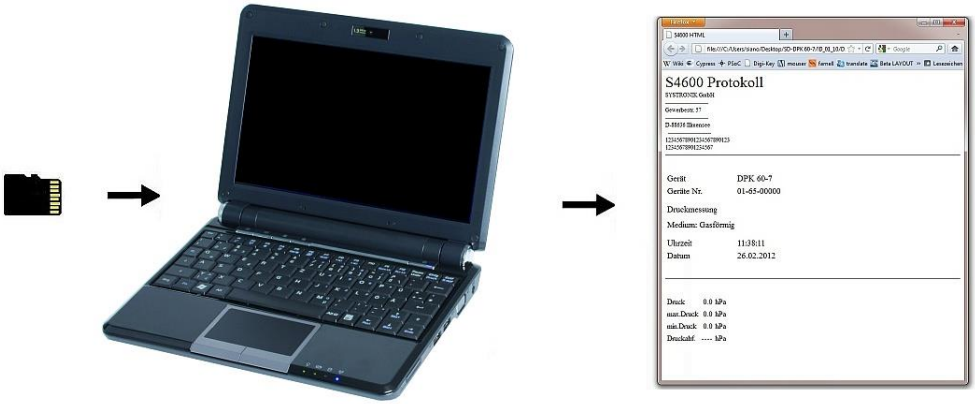
Note:

A file which has been created and saved on the card is protected against manipulation and, if manipulated, can neither be displayed by the device nor printed!



A saved file may there be displayed, printed or overwritten by a new measurement.

The saved file can also be displayed via a browser (such as Mozilla Firefox).



7.2 Database Memory (option)

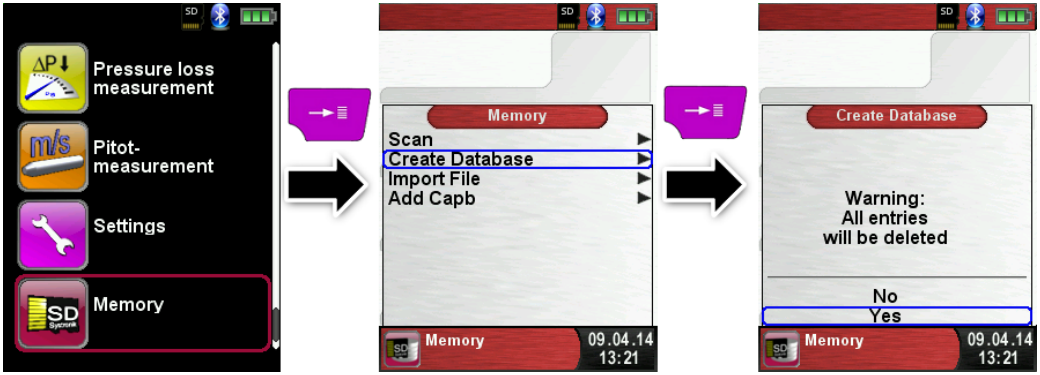
▶ Create a customer database

Measurements can be saved direct in the customer folder. Every folder has 8 entry lines with 20 characters. The first entry is the key word for the search function in the device. The further lines are for detailed customer information like: Street, City, Email, Phone No… The customer information will be print out with every measurement print and shown in the protocol.

It is possible to create or modify the customer database either on the S4600-ST® or on a PC.

▶ For first use of the MicroSD card the database should be generated

For new database open menu „Memory“ and choose “Create Database”. Confirm the warning “All entries will be deleted” with yes.

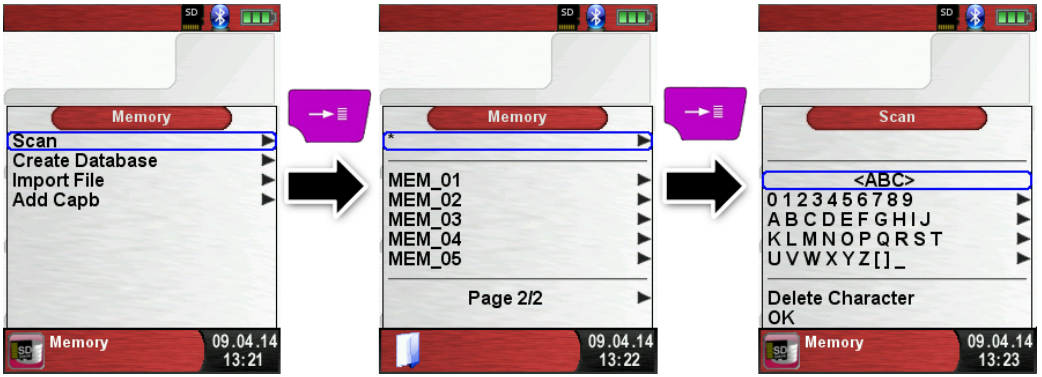


With this procedure a file named DATABASE.CSV will be generated on the MicroSD card. This file will show the database entries of the S4600-ST®. This process needs a few seconds.

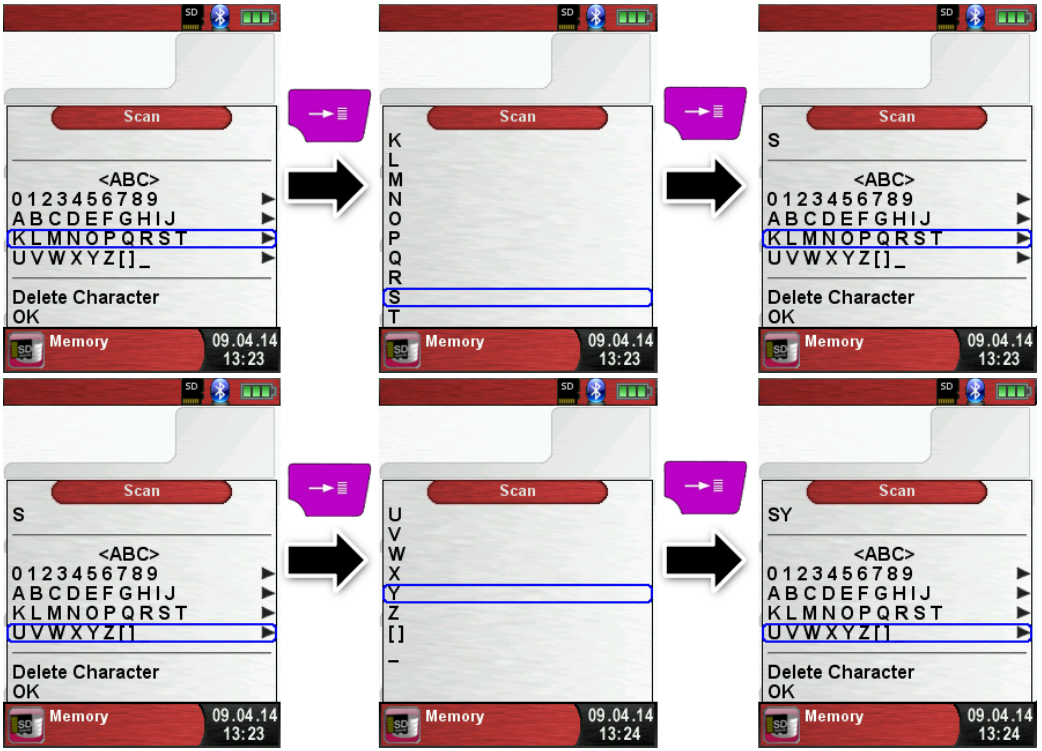
HINWEIS

▶ Existing Database will be deleted! Private files (images, documents etc.) won’t be deleted!

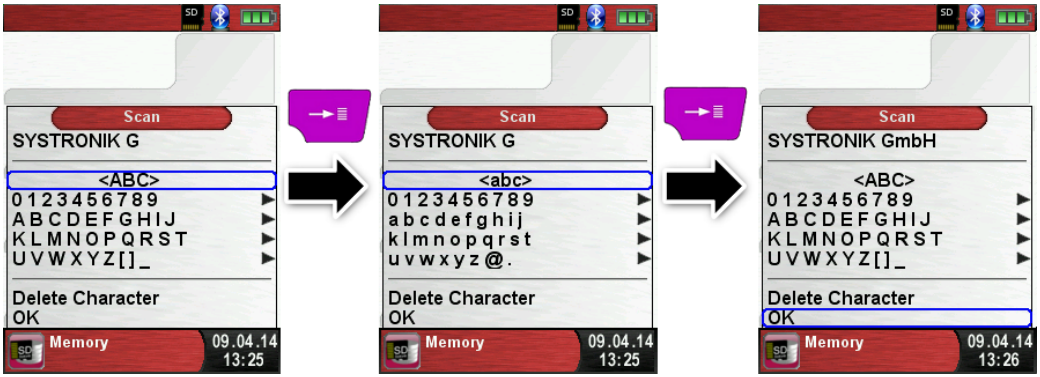
▶ Create / modify customer database on the S4600-ST®
Select „Scan“ in the menu „Memory“ and type the customer name:



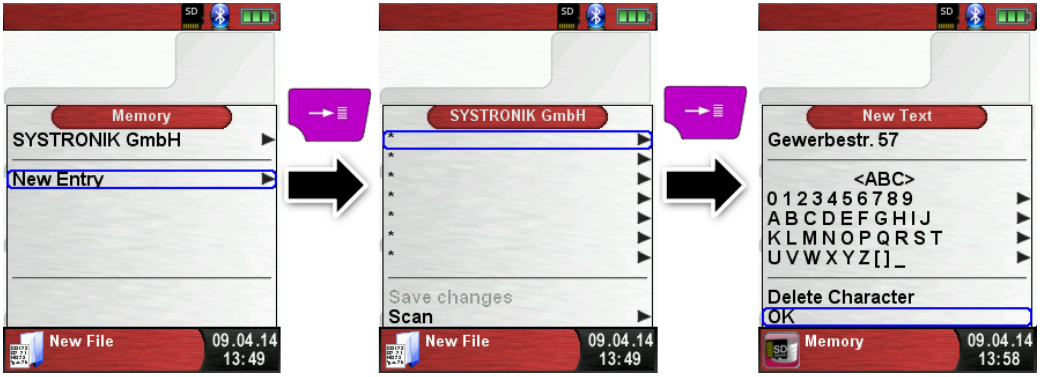
Select with the arrow keys the row with the desired character. Open the row with the „enter key“ and select the desired character using the arrow keys. Select letter by letter in this way:



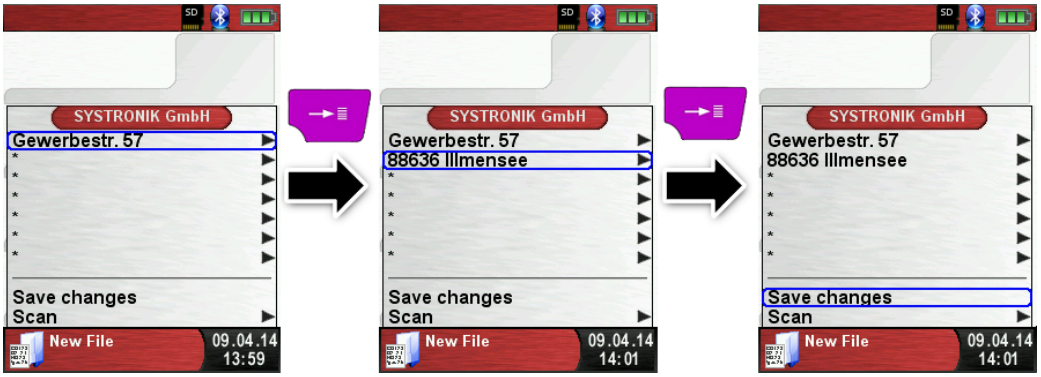
Switch between upper and lower case letters and special characters with „<ABC>“. “Delete character“ will delete the last character. With „OK“ save the customer name. Already existing name will be shown. If the name doesn’t exist it is possible to save the customer name with „New entry“.



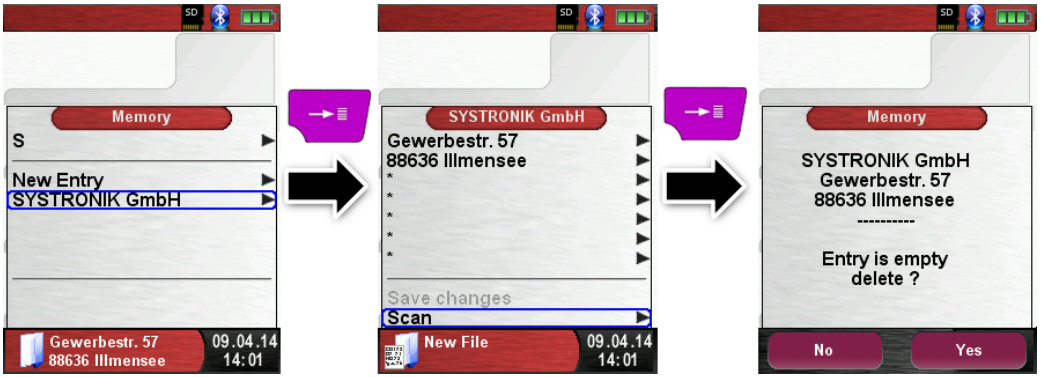
Now additional information could be saved. (Street, City, Email, and Phone No.):



Select „OK“ to save the individual lines. Finally select “Save changes” to save all customer information.



To delete customers in the database there mustn’t be any measurements stored. Select the customer and choose „Scan“, if there are no measurements stored the request „Entry is empty delete?“ will occur. Confirm the request with “Yes“.



▶ Create / modify customer database on PC

The customer database can be create / modify on the PC as well. Open the file “DATABASE.CSV” on the MicroSD card with the PC. Now type customer information in the table of the “DATABASE.CSV“ file. Column A is the customer name and column B – H are for additional customer information. Don’t use special characters only „@“, „_“ and „.“. Maximum 20 characters per field.

CAUTION

▶ Incorrect editing of the „DATABASE.CSV“ could generate errors in the S4600-ST®.

A1 SYSTRONIK GmbH

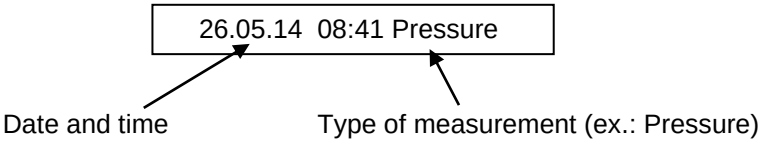
	A	B	C	D	E
1	SYSTRONIK GmbH	Gewerbestr. 57	88636	IIImensee	
2	Essie	Vaill	Litronic Industries	14225 Hancock Dr	Anchorage
3	Cruz	Roudabush	Meridian Products	2202 S Central Ave	Phoenix
4	Billie	Tinnes	D M Plywood Inc	28 W 27th St	New York
5	Zackary	Mockus	Metropolitan Elevator Co	286 State St	Perth Amboy
6	Rosemarie	Fifield	Technology Services	3131 N Nimitz Hwy -105	Honolulu
7	Bernard	Laboy	Century 21 Keewaydin Prop	22661 S Frontage Rd	Channahon
8	Sue	Haakinson	Kim Peacock Beringhause	9617 N Metro Pky W	Phoenix
9	Valerie	Pou	Sea Port Record One Stop Inc	7475 Hamilton Blvd	Trexlertown
10	Lashawn	Hasty	Kpff Consulting Engineers	815 S Glendora Ave	West Covina
11	Marianne	Farman	Albers Technologies Corp	6220 S Orange Blossom Trl	Orlando

Finally save the „DATABASE.CSV“ and restart the S4600-ST® before import the MicroSD card. In this way the database will be newly read.

▶ Use of the memory

The memory structure consists of 1,000 memory entries (customer or location), within every entry 10 measurements protocols can be stored. In total 10,000 measurements can be stored.

At the end of a measurement you can take the measurement protocol in a free space. The file name is automatically assigned by the device and is structured as follows:

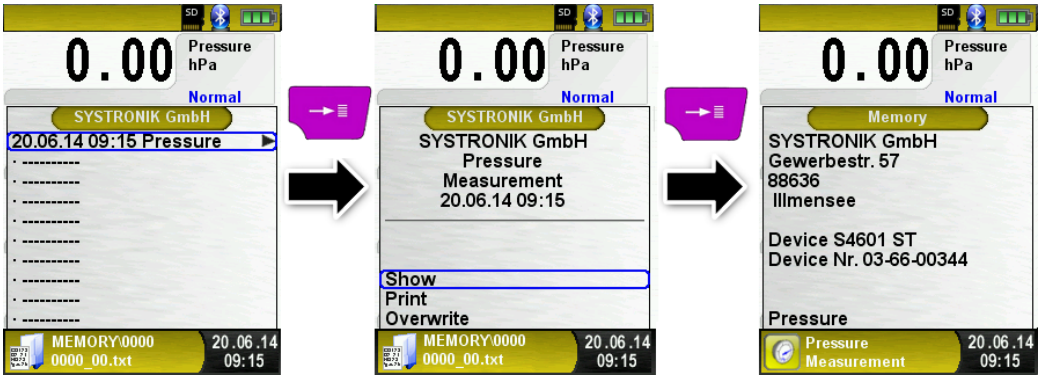


CAUTION

A file which has been created and saved on the card is protected against manipulation and, if manipulated, can neither be displayed by the device nor printed!

, print or override it with a new measurement.

The file name and the storage location is shown in the lower bar. In this example: Storage folder: MEMORY/0000 and file name 0000_00.txt:



The customer information will be shown in the header of the measurement report.

The saved file can be opened with a web browser (e.g.: Chrome, Firefox, Explorer, Opera, etc.)

S4600 ST Protocol

SYSTRONIK GmbH Gewerbestrasse 57 D-88636 Illmensee
Tel. +49(0)7558 9206-0 Email info@systronik.de Web www.systronik.com

SYSTRONIK GmbH
Gewerbestr. 57
88636
Illmensee

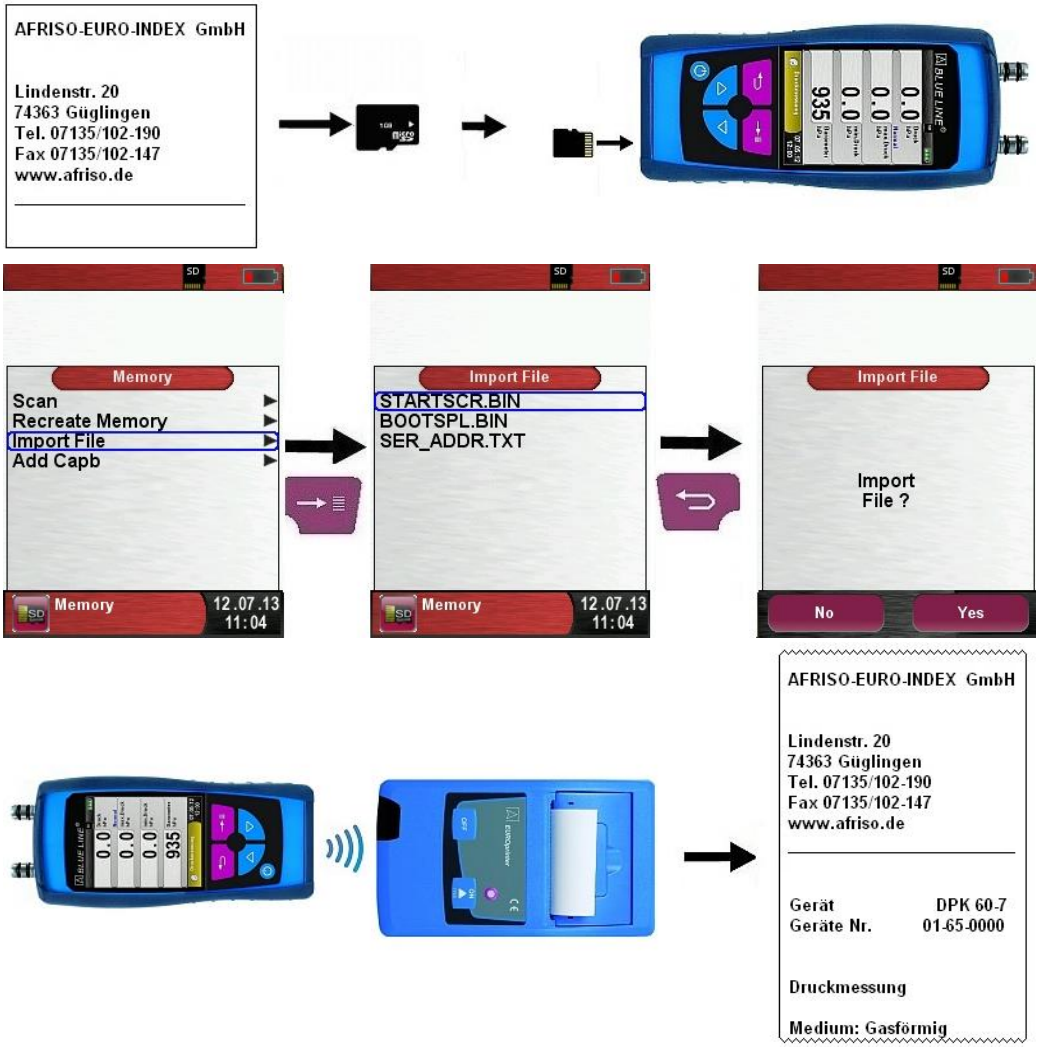
Device	S4601 ST
Device Nr.	03-66-00344
Pressure Measurement	
Time	09:14:31
Date	20.06.2014

Pressure	0.00 hPa
max.Press.	0.00 hPa
min.Press.	0.00 hPa
Barometer	930 hPa

7.3 Entering the user address

For importing the user address, you must first create s special file "Address.txt" on the MicroSD card. This is a plain text file with the extension .txt. The text file can be created on the PC using any text editor (such as Notepad). The maximum length is 8 lines with 22 characters each.

Note: A new user address overwrites an existing user address.



8 Battery management

8.1 Battery operation / charging mode

- Battery operation: The battery life in continuous measurement mode depends on the selected display mode. With display setting "Normal", continuous measuring is possible for up to 18 hours, with display setting "Automatic" for up to 25 hours and with display setting "Eco Mode" of up to 38 hours.
- Charging mode: External power supply unit 100-240 V~/50-60 Hz. Intelligent charging by means of an integrated charging management system.

8.2 Charging the batteries

CAUTION

Damage to the battery or the device caused by power supply units that are not device-specific.

▶ Use only the power supply unit delivered with the device for charging the batteries.

▶ Connect the device-specific power supply unit to mains and then to the S4600-ST®.

↳ The charging process of the batteries starts automatically:

Green area	Current battery capacity

Key	Function
	Close battery menu.

- During measurements, the battery is also charged continuously and monitored by the system.
- When the battery is fully charged and if the Battery menu is active, the device automatically switched off; if it is not active, the device switches to passive recharging mode (trickle charging).
- When recharging is finished, the charger can remain connected to S4600-ST© without the battery being damaged.

Service life and capacity of the battery

S4600-ST© is equipped with a high-performance lithium ion battery. The service life and capacity of the battery are primarily determined by the way the device is charged and used. In order to make handling safer, the device features efficient and battery-saving charge management suitable for all application situations.

The graphical charge level indicator of S4600-ST© consists of three elements of a battery symbol and helps the user to correctly estimate the capacity of the battery. Five different battery states are detected.

The battery can be recharged at any time given that the charge management system recognises the need to recharge the battery. Otherwise, the charge management system will not release the battery for charging.

Operating the device at temperatures below +5 °C will considerably reduce the service life of the lithium ion battery.

9 Maintenance

Table 4: Maintenance times

When	Activity
If required	▶ Clean the device.

Replacing the battery

For technical reasons, old battery blocks may only be replaced by the manufacturer or an authorised service partner.

▶ To protect the environment, batteries must not be disposed of together with normal household waste. Return old batteries to the point of purchase or to a collecting point.

10 Troubleshooting

Repairs may only be performed by specially trained, qualified staff.

Table 5: Troubleshooting

Problem	Possible reason	Repair
Device switches off automatically.	Battery empty.	▶ Charge battery.
	Battery defective.	▶ Take device to service centre.
Device cannot be switched on.	Battery empty.	▶ Charge battery.
No indication of pressure.	Sensor defective.	▶ Send the device to the manufacturer.
Display frozen / device does not respond to key presses.	–	▶ Hold down "On/Off" key for six seconds,
Other malfunctions	–	▶ Send the device to the manufacturer.

11 Disposal

▶ To protect the environment, this device must not be disposed of together with the normal household waste. Dispose of the device according to according to local directives and guidelines.

This device consists of materials that can be reused by recycling firms. The electronic inserts can be easily separated and the device consists of recyclable materials.

If you do not have the opportunity to dispose of the used device in accordance with environmental regulations, please contact us for possibilities to return it.

12 Warranty

The manufacturer's warranty for this product is 12 months after the date of purchase. This warranty shall be good in all countries in which this device is sold by the manufacturer or its authorised dealers.

13 Copyright

14 Customer satisfaction

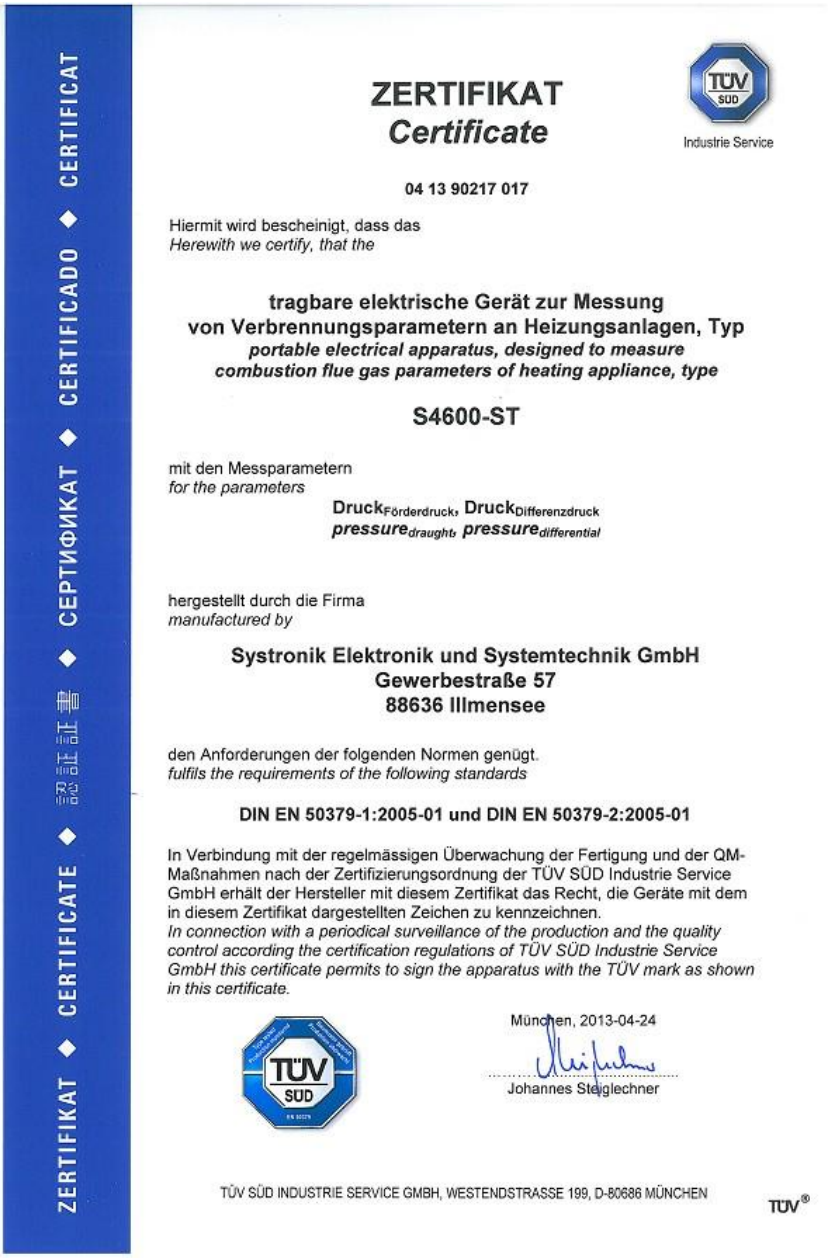
Customer satisfaction is our prime objective. Please get in touch with us if you have any questions, suggestions or problems concerning your product.

15 Addresses

The addresses of our worldwide representations and offices can be found on the Internet at www.afriso.de.

16 Appendix

16.1 DIN EN 50379 certificate



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

ZERTIFIKAT
Certificate

TÜV SÜD Industrie Service

04 13 90217 017

Hiermit wird bescheinigt, dass das
Herewith we certify, that the

tragbare elektrische Gerät zur Messung von Verbrennungsparametern an Heizungsanlagen, Typ
portable electrical apparatus, designed to measure combustion flue gas parameters of heating appliance, type

S4600-ST

mit den Messparametern
for the parameters

Druck$_{Förderdruck}$, Druck$_{Differenzdruck}$
pressure$_{draught}$, pressure$_{differential}$

hergestellt durch die Firma
manufactured by

Systronik Elektronik und Systemtechnik GmbH
Gewerbestraße 57
88636 Illmensee

den Anforderungen der folgenden Normen genügt.
fulfils the requirements of the following standards

DIN EN 50379-1:2005-01 und DIN EN 50379-2:2005-01

In Verbindung mit der regelmässigen Überwachung der Fertigung und der QM-Maßnahmen nach der Zertifizierungsordnung der TÜV SÜD Industrie Service GmbH erhält der Hersteller mit diesem Zertifikat das Recht, die Geräte mit dem in diesem Zertifikat dargestellten Zeichen zu kennzeichnen.
In connection with a periodical surveillance of the production and the quality control according the certification regulations of TÜV SÜD Industrie Service GmbH this certificate permits to sign the apparatus with the TÜV mark as shown in this certificate.

TÜV SÜD

München, 2013-04-24

Johannes Steiglechner

TÜV SÜD INDUSTRIE SERVICE GMBH, WESTENDSTRASSE 199, D-80686 MÜNCHEN

TÜV®