BlueLine
INSTRUMENTS

Instruction Manual

Flue gas analysis computer
MAXILYZER NG Plus

UK SALES & SERVICE

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+ Read manual before use!
+ Observe all safety information!
+ Keep manual for future use!

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Contents

1 About 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 Structure of warning

WARNING TERM **The type and source of danger is shown here.**

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

There are three different levels of warning:

Warning term	Meaning
DANGER	Imminent danger! Failure to observe the information will result in death or serious injuries.
WARNING	Possible imminent danger! Failure to observe the information may result in death or serious injuries.
CAUTION	Dangerous situation! Failure to observe the information may result in minor or serious 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 several steps
↳	Result of an activity
•	Bulleted list
`Text`	Indication on a display
Highlighting	Highlighting

2 Safety

2.1 Intended use

The flue gas analysis computer MAXILYZER NG Plus is exclusively suitable for the use in the following application areas:

- Professional settings and control-measurements at all smallfir-ings-facilities (low temperature- and burner-value-boilers and -thermal) for gas and oil applicable.
- With a second CO measuring cell (option) you can also use the instrument for facilities for solid fuels as wood, coal etc.
- Measurements at bivalent and power modulatory communal heating stations.

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

2.2 Predictable incorrect application

The flue gas analysis computer MAXILYZER NG Plus must never be used in the following:

- Hazardous areas (ex)
  If the device is operated in hazardous areas, sparks may cause deflagrations, fires or explosions
- Use as a safety (alarm) unit or continuous measuring device.

2.3 Safe handling

This product represents state-of-the-art technology and is manufactured in accordance with the pertinent safety regulations. Each unit is subjected to a function and safety test prior to despatch.

▶ Operate the product only when it is in perfect condition. Always observe the instruction manual, all pertinent local and national directives and guidelines as well as health and safety regulations and directives regarding the prevention of accidents.

▶ Perform an overall visual inspection of the measuring device (including any accessories) prior to each operation of the MAXILYZER NG Plus in order to ensure proper operation of the device.

Voltage supply

▶ Verify that the device is suitable for your mains. Make sure you have the correct mains voltage when connecting the device.

This is a device of safety class 1, i.e. it has an earth connection. Any interruption of the protective conductor inside or outside the device or disconnecting the protective conductor connection may cause

hazards. Intentional interruptions of the protective conductor are prohibited.

The mains plug may only be plugged into an isolated earth power outlet. Do not disable the protection effect by using an extension cable without a protective conductor.

- ▶ Disconnect the device from all voltage sources before troubleshooting or repairing it or before replacing parts.

WARNING **Severe burns or death due to live parts.**

- ▶ Do not touch parts under voltage with the instrument or sensors.
- ▶ If work must be performed on the device while it is connected to voltage, such work may only be performed by a trained expert who is familiar with the associated hazards!

2.4 Qualification of personnel

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

Electrical work may only be carried out by qualified electricians in accordance with local and national regulations.

2.5 Modifications to the product

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

2.6 Use of spare parts and accessories

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

- ▶ Use only the manufacturer's genuine spare parts and accessories (refer to chapter 17, page 71).

2.7 Liability information

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

The manufacturer and the sales company shall not be liable for costs or damages incurred by the user or by third parties in the use or application of this device, particularly 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 damages resulting from any use other than the use explicitly stated in this instruction manual.

The manufacturer shall not be liable for misprints.

3 Product description

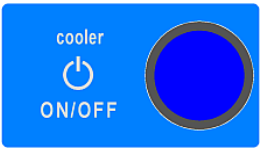
The MULTILYZER NG Plus flue gas analysis computer is a multiple - function analyser with integrated calculating functions. Measurements are in accordance with the general regulations set forth by the German “BIMSchV” at all kinds of combustion plants within the framework of the monitoring of exhaust systems.

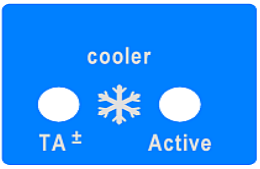
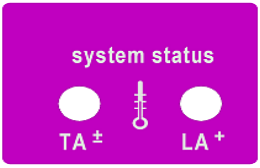
The integrated Peltier gas cooler avoids accumulations of condensate in the gas supply system and incorrect measurements of strongly water-soluble gases such as NO2 and SO2.

3.1 Keyboard function

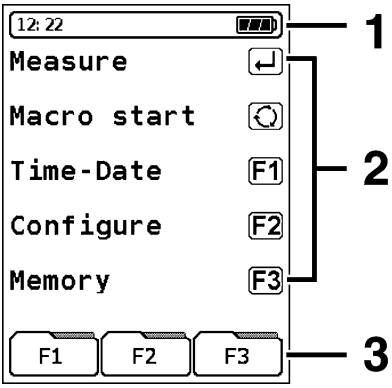
Key	Function
	Register/function key.
	Backlight on/off.
	Change register buttons line.
	Switch to another row./Start macro or waste gas measurement.
	Gas pump on/off.
	Close function or programme, cancel precedure.
	Enter.
	Device on/off

3.2 Status indicators

Status indicator	Function
	Peltier gas cooler on/off.

Status indicator	Function
	"TA±": Cooler control temperature. "Active": Operating state Peltier element. (See page 13 for detailed explanations)
	"TA±": Operating state measured gas line. "LA±": Condensate alarm sensor (See page 13 for detailed explanations)

3.3 Display



1 Status line
2 Programme menu
3 Register key/menu line

Fig. 1: Display using the example of the start menu

Status line

This line continuously shows the status of certain information such as remaining battery power, HOLD-function, sensor-alerts, operation of the pump, chosen fuel, time etc. The priority of the information shown thereby depends on the mode and function-specific criteria respectively.

Programme menu

Programs can be selected or started in the programme selection field.

Register key/menu line

The functions shown on the display can be selected with the register keys. In some menus the keys F1, F2 and F3 have several functions

that can be rotated by pressing the button in the centre of the key-pad.

3.4 Measurement and calculation parameters

Table 1: Readings

Display	Measured medium	Unit
T.Gas	Waste or flue gas temperature	°C, °F
T.Room	Air or ambient temperature	°C, °F
O_2	Oxygen content	% Vol.
CO	Carbon monoxide content	ppm, mg/m³, mg/kWh, mg/MJ
CO_{max}	Maximum carbon monoxide content	ppm, % Vol.
Draft	Draft/Pressure	hPa, mbar, mmWs, mmHg, inWc, inHg, PSI
NO	Nitrogen monoxide content (option)	ppm, mg/m³, mg/kWh, mg/MJ
SO_2	Sulphur dioxide content (option)	ppm, mg/m³, mg/kWh, mg/MJ
NO_2	Nitrogen dioxide content (option)	ppm, mg/m³, mg/kWh, mg/MJ
CO+	Carbon monixide content, high (option)	% Vol.

Table 2: Calculated values

Display	Measured medium	Unit
CO_2	Carbon dioxide	% Vol.
$CO_{unv.}$	Carbon monoxide, undiluted	ppm
Effi.	Combustion efficiency	%
Ex.air	Excess air value	λ
qA	Waste gas losses	%
Dewpnt	Fuel specific dew point	°C, °F
T.Diff	Differential temperature (TG-TA)	°C, °F

Display	Measured medium	Unit
NO_x	Nitric oxides (option)	ppm, mg/m³, mg/kWh, mg/MJ
NO unv.	Nitrogen monoxide, undiluted (option)	ppm
NO_x unv.	Nitric oxides, undiluted (option)	ppm
SO_2 unv.	Sulphur dioxide, undiluted (option)	ppm
NO_2 unv.	Nitrogen dioxide, undiluted (option)	ppm

3.5 Measuring procedure

Table 3: Measuring procedure

Function	Explanation
Temperature Measurement	K-type thermocouple NiCr-Ni
O_2- Measurement	Electrochemical measuring cell
CO- Measurement	Electrochemical measuring cell
NO- Measurement (Option)	Electrochemical measuring cell
SO_2- Measurement (Option)	Electrochemical measuring cell
NO_2- Measurement (Option)	Electrochemical measuring cell
Pressure/Draft Measurement	Piezo-resistive sensor with internal temperature compensation
Measuring Duration	Short-term memory measurements of max. 60 minutes are possible, followed by a new calibration phase with ambient air.
Waste Gas Measurement	Via an external water separator and filter, the waste gas is fed to the sensors by means of a gas feed pump.
Sensor Calibration	After having switched on the instrument there is a calibration phase that takes 60 seconds after a cold start. For repetition measurements it takes 10 seconds (restart).

Function	Explanation
CO-Sensor Protection	The standard equipped CO-Sensor with dynamic H_2-compensation is protected automatically by means of a separate flushing pump when the upper boundary of the measurement range is reached (> 4.000 ppm). By doing so the sensor is supplied with sufficient fresh air from the environment of the device. The measurement starts again automatically as soon as the value falls below 1.600 ppm. During the active flushing phase the other readings aren't influenced.
Waste Gas Sampling	This is done by means of a suitable probe which enables either a "One-Point-Measurement" (combi probe) or a "Multi-Point-Measurement" (multi-hole probe).

3.6 Peltier gas cooler

The integrated Peltier gas cooler is designed for applications at changing sites requiring high-precision gas analyses and involving pollution and condensate in the flue gas.

The analysis of strongly water-soluble gases (NO2 and SO2) makes the use of a Peltier gas cooler indispensable. The reduced dew point of the measured gas avoids the formation of condensate and dirt particles in the analyser and in other system components. At the same time, a stable output dew point prevents vapour cross sensitivity and volumetric errors.

The gas cooler operates with an electronically controlled Peltier element which ensures, together with the flow-optimised heat exchanger, an optimum dew point reduction to a value of approx. 5°C. The condensate is discharged via a hose pump.

The Peltier cooler indicates the operating states of the individual system components by means of status indicators.

Application example

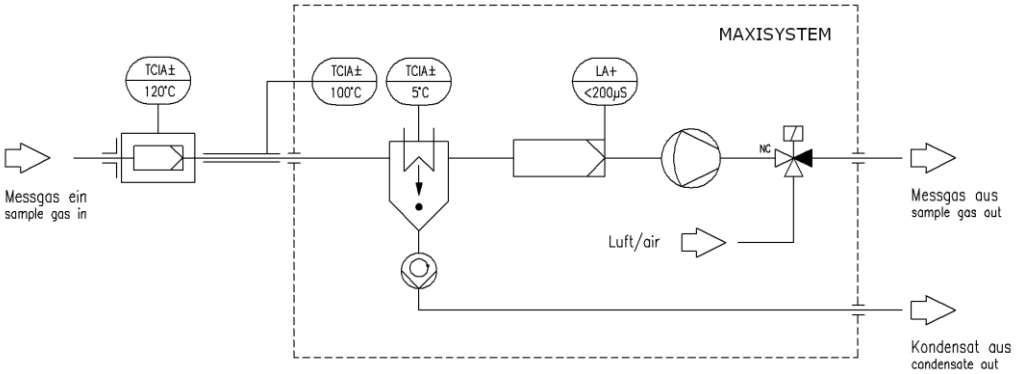


Fig. 2: Application example Peltier cooler

The gas to be measured is drawn in via a gas sampling probe and a heated gas line and supplied to the Peltier cooler. The heating hose is heated to a temperature of 100 °C by a controller in the Peltier gas cooler.

The gas cooler cools down the gas to a dew point of 5 °C; the condensate is discharged via a hose pump. The downstream fine filter removes solid particles that may be contained in the gas.

Design

The Peltier gas cooler comprises a gas cooler with automatic condensate discharge as well as an easily accessible gas filter. An au-

tomatic pressure compensation valve ensures fast compensation in the case of changing atmospheric pressures.

All controls, electrical connections as well as gas and condensate connections are located on the front panel of the MAXILYZER NG Plus. In addition, the device features status indicators whose function is described in detail in subsequent chapters.

Gas sampling probe and heated gas line

Heating the gas from the sampling point all the way to the Peltier gas cooler avoids accumulations of condensate in the gas supply system and incorrect measurements of strongly water-soluble gases such as NO2 and SO2. In addition, this function allows for gas sampling at temperatures lower than 0 °C.

The integrated micro filter with a filter rating of 2 µm reliably removes pollution with solid matter and can be easily replaced.

The electrically heated gas line with Pt100 temperature sensors is available in two lengths (3 m or 5 m). MAXILYZER NG Plus controls the temperature and indicates the status "TA±" of the heating hose. The controlled temperature is 100 °C. If the reference temperature is higher or lower by 10 K, the status LED lights red. The device is ready for operation when the status LED switches from red to green.

The following functions are monitored and indicated.

Gas cooler		
Gas cooler temperature	"TA±"	Reference value 5 °C, alarm at ± 3 °C
Function of Peltier element	"Active"	Control and function
System status		
Heating hose temperature	"TA±"	Reference value 100 °C, alarm at ± 10 °C

Colour coding of the individual operating states:

- Status LED flashes or lights solid green: The corresponding system component is ready for operation and works with the specified parameters.
- Status LED flashes or lights solid red: The corresponding system component is either not yet ready for operation or the component is defective.
- System status LED does not light up at all: The corresponding function is of no relevance for the measurement.

Status indicators "Gas Cooler"

- Status LED TA± lights green: The gas cooler is ready for operation. The controlled cooler temperature is within the temperature tolerance range of 5 °C ± 3 °C.
- Status LED TA± lights solid red: The gas cooler is not ready for operation. The controlled cooler temperature is outside the temperature tolerance range of 5 °C ± 3 °C.
  Possible reasons are:
  - The gas cooler has been switched on and is still starting up. The cooler should have reached the controlled temperature after approx. 10 minutes.
  - The cooling capacity is insufficient even though the Peltier element operates in continuous mode. See status LED "Active" for details.
  - The Peltier element is defective. This is indicated by the solid red Active LED.
- Status LED TA± flashes red: The temperature sensor of the gas cooler is defective so that the temperature can no longer be controlled. Contact the manufacturer or the service point in charge in such a case.

The status LED "Active" monitors the function of the Peltier element and provides information on the cooling capacity or degree of utilisation of the gas cooler.

- Status LED lights solid green: The Peltier element operates in continuous mode. When the device starts up, this is a normal condition. During measurement operation, continuous mode of the Peltier element indicates that the maximum cooling capacity has been reached due to a high input dew point or volume flow or an excessively high ambient temperature.
- Status LED "Active" flashes green: The flashing frequency of the status LED indicates the current state of the Peltier element and thus provides information on the degree of utilisation of the gas cooler.
- Status LED "Active" lights solid red: The Peltier element of the cooler is defective. Contact the manufacturer or the service point in charge in such a case.

Status indicators "System Status"

- Status LED TA± lights green: There are no drops of liquid in the gas flow downstream the cooler. Correct measurements can be made.

- Status LED TA± lights solid red: The condensate alarm sensor LA+ has detected drops of liquid in the gas flow.
  Possible reasons are:
  - Cooling or discharge of the condensate do not work properly.
  - Measurements are performed below the specified ambient temperature of 10 °C so that there is condensation downstream the cooler.
  - It was not possible to discharge a gush of water from the sampling point via the condensate pump.

The status LED "TA±" indicates the current operating state of the heated gas line.

- Status LED TA± lights solid green: The heating hose is ready for operation. The controlled temperature is within the temperature tolerance range of 100 °C ± 10 °C.
- Status LED TA± lights solid red: The heating hose is not ready for operation. The controlled temperature is outside the temperature tolerance range of 100 °C ± 10 °C.
  Possible reasons are:
  - The device has been switched on and the heating hose is still starting up. The heating hose should have reached the controlled temperature after approx. 10 minutes.
  - The heating element of the gas line is defective.
- Status LED TA± flashes red: The heating hose is not connected or the Pt100 temperature sensor is defective.

4 Specifications

Table 4: Description of the device

Parameter	Value
General	
Dimensions	410 x 180 x 330 mm (W x H x D)
Weight	Approx. 7000 to 7150 g (depends on equipment with sensors)
Display	Hi-res LCD-Module that can show graphical items. Either 5 or 10 readings plus menu line can be displayed at a time.
Data communication	USB-interface. Option: Bluetooth interface.
Printer	Internal thermal printer

Parameter	Value
Memory	Max. 100 memory blocks including dynamic memory management and directory/file structure
Electrical supply	NiMH-battery 6 V/4,5 Ah, external power adapter and charger
Mains fuse	T 10/250 V (4 x 20 mm)
Operating temperature range	
Ambient	+5 °C to +40 °C
Storage	-20 °C to +50 °C

Table 5: Physical specifications

Parameter	Wert
Waste or flue gas temperature measurement	
Range	-20 °C to +1000 °C
Accuracy	± 2 °C + 1 digit (-20 °C to 0 °C) ± 1 °C (0 °C to +200 °C) ± 0.5 % of reading (above +200 °C)
Resolution	1 °C
Sensor	K-Type thermocouple NiCr-Ni
Combustion air temperature measurement	
Range	-20 °C to +1000 °C
Accuracy	± 2 °C + 1 Digit (-20 °C to 0 °C) ± 0.5 °C + 1 Digit (0 °C to +200 °C) ± 0.5 % of reading (above +200 °C)
Resolution	0.1 °C
Sensor	K-Type thermocouple NiCr-Ni
Pressure measurement	
Range	± 70 hPa (nominal)/± 130 hPa (maximum)
Accuracy	± 0.02 hPa + 1 digit (0 hPa to ±2.00 hPa)

Parameter	Wert
Resolution	±1% of reading (±2.01 hPa to ±70.0 hPa) ±2% of reading (±70.1 hPa to ±130.0 hPa) 0.01 hPa (to 20.99 hPa); 0.1 hPa (above 21.0 hPa)
Sensor	Semiconductor sensor
Oxygen (O_2) measurement	
Range	0-21.0 % Vol.
Accuracy	± 0.2 % Vol. of reading
Resolution	0.1 % Vol.
Sensor	Electro-chemical cell
Response time (T90)	50 seconds
Carbon dioxide (CO_2) calculation	
Range	0 to $CO_{2\ max}$ (fuel-specific)
Accuracy	± 0.2 % Vol. of reading
Resolution	0.1 % Vol.
Sensor	Calculated from O2 measurement
Response time (T90)	50 seconds
Carbon monoxide (CO) measurement (with H_2 compensation)	
Range	0-4000 ppm
Accuracy	3 ppm (up to 20 ppm) 5 % of reading (above 20 ppm)
Resolution	1 ppm
Sensor	Electro-chemical cell
Response time (T90)	60 seconds

Table 6: Physical specifications – options

Parameter	Value
Nitrogen monoxide (NO) measurement	
Range	0-5000 ppm
Accuracy	5 ppm (up to 50 ppm) 5 % of reading
Resolution	1 ppm
Sensor	Electro-chemical cell
Response time (T90)	60 seconds
COhigh measurement (without H_2 compensation)	
Range	0-4.0 % Vol. (40,000 ppm)
Accuracy	5 % of reading (± 1 digit)
Resolution	0.01 % Vol.
Sensor	Electro-chemical cell
Response time (T90)	60 seconds
SO_2-measurement	
Range	0-5000 ppm
Accuracy	10 ppm (up to 200 ppm) 5 % of reading (up to 200 ppm)
Resolution	1 ppm
Sensor	Electro-chemical cell
Response time (T90)	150 seconds
NO_2-measurement	
Range	0-200 ppm
Accuracy	10 ppm (up to 50 ppm) 10 % of reading (up to 50 ppm)
Resolution	1 ppm
Sensor	Electro-chemical cell
Response time (T90)	180 seconds

Table 7: Physical specifications Peltier gas cooler

Parameter	Value
Measurement conditions	
Input dew point	Max. 60°C
Gas pressure (input)	-100 mbar < p < +250mbar
Dust admission	< 200g/m³
Design	
Protection (closed)	IP 65
Protection (open/during operation)	IP 20
Electrical connections	
Voltage supply	AC 230 V/low temperature connector
Heating hose/sampling probe	AC 230 V/round connector CA6
Power input Peltier cooler	50 W
Power input heating hose	Max. 600 W
Fuse	10 A slow-blow (4 x 20 mm)
Electr. device standard	EN 60204-1 (DIN VDE 0113-1/02.86)
Peltier gas cooler	
Cooler type	Peltier cyclone cooler
Output dew point	5 °C (factory-adjusted)
Dead volume (total)	Approx. 50 ml
Wetted parts	PA, PTFE, Viton
Ready to operate	< 15 minutes
Condensate pump	Hose pump
Heating hose	
Sensor type	Temperature sensor Pt100
Heating hose temperature	100 °C (factory-adjusted)
Electrical data	AC 230 V/max. 600 Watt
Electrical connection	7 pin round connector type: CA6xxx
Heating hose length	3 m or 5 m (option)

Parameter	Value
Sampling probe	
(Standard) type	V2A 1.4571 (300 mm)

4.1 Calculation formulae (extract)

Calculation of the CO_2 value

$$CO_2 = CO_{2\,max} * (1 - \frac{O_2}{21}) \text{ in \%}$$

CO_{2max}	Max. CO_2 value (fuel-specific) in % Volume
O_2	Measured oxygen content in % Volume
21	Measured oxygen content in % Volume

Calculation of the waste gas loss

$$qA = (T.Gas - T.Air) * (\frac{A_2}{21 - O_2} + B) \text{ in \%}$$

T.Gas	Waste/flue gas temperature in °F or °C
T.Air	Combustion/ambient temperature in °F or °C
A2, B	Fuel-specific factors

Calculation of the excess air value Lambda

$$Lambda = \frac{CO_{2\,max}}{CO_2} = \frac{21}{21 - O_2}$$

Calculation of the combustion efficiency value (Eta)

Eta = 100 - qA in %

Calculation of CO 0% (undiluted)

$CO_{unv.} = CO * Lambda$

$CO_{unv.}$	Content of carbon monoxide, undiluted
CO	Reading for CO

4.2 Approvals, tests and conformities

Maxilyzer NG Plus is approved as per 1st German Federal Immission Act (Bundesimmissionsschutzverordnung) and EN 50379-2. It is TÜV-tested and complies with the applicable directives 2004/108/EC (EMC) and 2006/95/EC (low voltage).

5 Transportation and storage

CAUTION **Damage to the device due to improper transportation.**

- ▶ Do not throw or drop the device.

CAUTION **Damage to the device due to improper storage.**

- ▶ Protect the device against shock when storing it.
- ▶ Store device in a clean and dry environment.
- ▶ Store device only within the admissible temperature range.
- ▶ Store device away from paint, solvent and glue.

6 Commissioning

Commissioning the Peltier cooler

1. Connect MAXILYZER NG Plus to mains.
2. Actuate the "ON/OFF" switch (Peltier cooler and hose heating controller).

↳ The connected system components are heated up to operating temperature. This may take up to 15 minutes.

↳ When the green status LEDs light up, the device is ready for operation.

3. You can start measurements once all system components are ready for operation.

If gas cooling is not required, it is possible to operate MAXILYZER NG Plus with the gas cooler switched off.

6.1 Connecting scheme

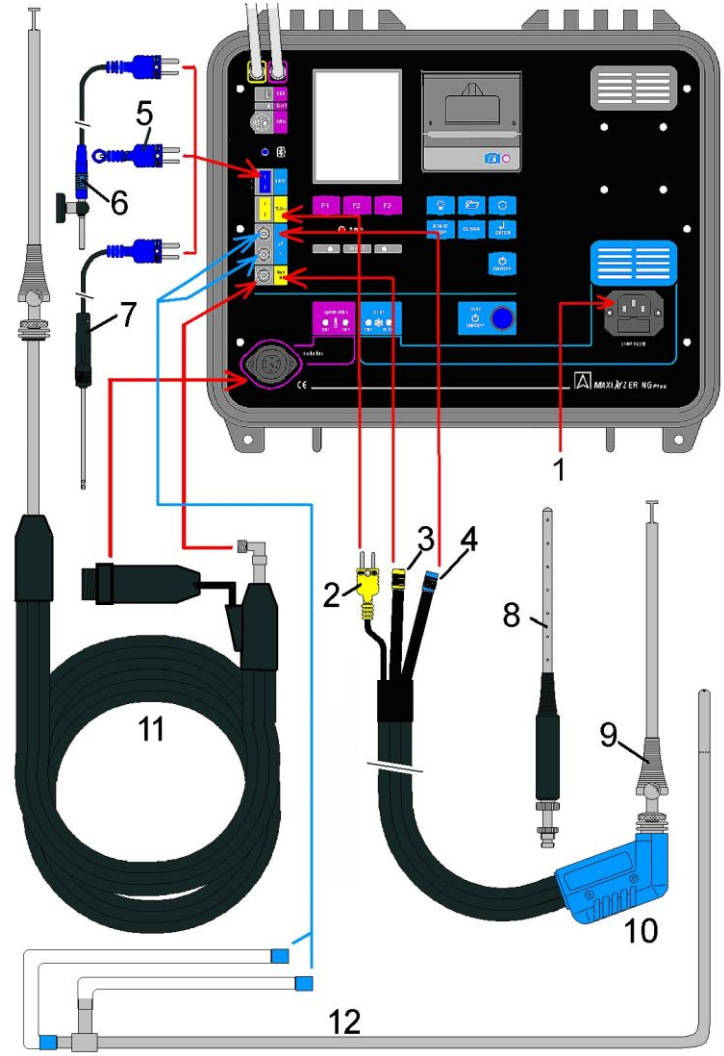


Fig. 3: Connecting scheme

1 Mains connection socket AC 230 V

2 Plug for flue gas temperature (yellow)

3 Tube for measurement gas

4 Draft tube

5 Air temperature sensor (blue)

6 Air temperature sensor with 2.5 m conduction and magnet retainer

7 External air sensor

8 Multi hole probe

9 Adjustable measuring cone

10 Flue gas probe with draft for measurements without the Peltier cooler

11 Gas sampling probe with heated line

12 Pitot tube

13 Condensate outlet piece

6.2 Mounting and installation

- ▶ MAXILYZER NG Plus is a portable device. To ensure proper separation and discharge of the condensate in the cooler, MAXILYZER NG Plus must be placed on an even, horizontal surface.
- ▶ Use MAXILYZER NG Plus only away from heat sources and when free ventilation is ensured to avoid heat accumulation in the device. The fan openings must not be covered.

CAUTION

Damage to the device due to excessively high or low ambient temperatures.

- ▶ Operate MAXILYZER NG Plus only in the admissible ambient temperature range from +5°C to +40°C.

6.3 Electrical connections

☑ The correct mains voltage is available.

MAXILYZER NG Plus is shipped with a low temperature cable (1.5 m long).

- ▶ Connect the low temperature cable to the main socket on the front plate.

Heating hose and sampling probe

☑ The electrical power of the heating hose and the sampling probe does not exceed 600 W each.

Use the round connector with the designation "Heating Hose" to supply the gas sampling probe and the heating hose.

The sampling probe can also be connected directly to MAXILYZER NG Plus without the heating hose.

6.4 Hose connections

CAUTION

Damage to the device due to improper use.

- ▶ If you measure corrosive gases, make sure there are no components damaging the gas transport parts.

Unheated gas sampling lines should have a gradient to the cooler in order to avoid condensate accumulations in the gas supply line.

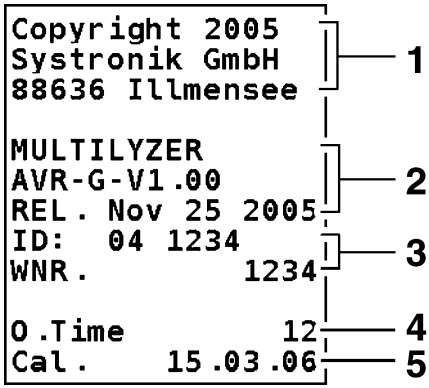
If you use a heated gas line, it must be supported in such a way as to prevent bends in the gas supply line.

The condensate is discharged by the customer, for example into a condensate collector with manual drain. Dispose of the collected condensate in compliance with all applicable directives and standards.

7 Start menu

1. Switch on device: ON/OFF

↳ Initialisation screen is shown:



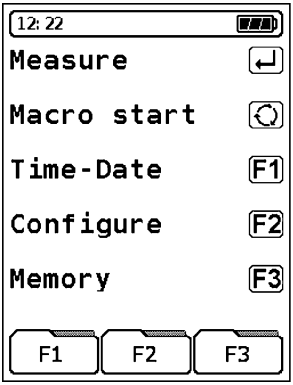
1 Producer information
2 Version of software
3 Part No.
4 Hours in use
5 Date of next calibration

Fig. 4: Initialisation screen

Key	Function
ENTER	Hold initialisation screen.
	Switch the backlight on/off.
CLEAR	Continue.

↳ The implemented company symbol appears on the display.

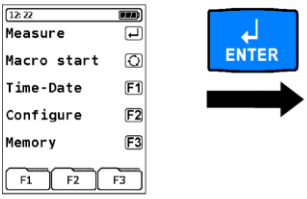
↳ The programme starting screen appears on the display:

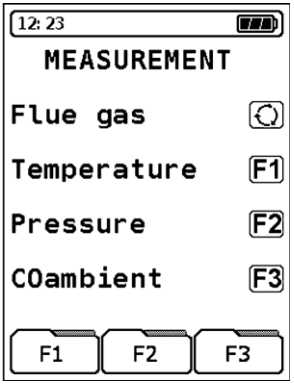


Taste	Funktion
ENTER	Start the “Measure” menu, refer to chapter 8, page 26.
	Start the “Macro Start” menu, refert to chapter 9, page 49.
F1	Start the “Time-Date” menu, refer to chapter 10, page 50.
F2	Start the “Configure” menu, refer to chapter 11, page 52.
F3	Start the “Memory” menu, refer to chapter 12, page 64.

8 Menu “Measure”

▶ Open the “Measure” menu.

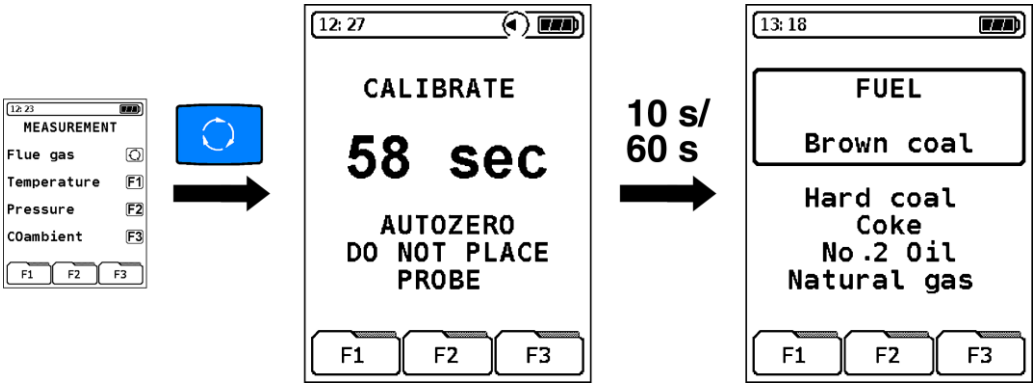




Key	Function
	Start the “Flue gas” programme, refer to chapter 8.1, page 27.
	Start the “Temperature” programme, refer to chapter 8.2, page 45.
	Start the “Pressure” programme, refer to chapter 8.3, page 46.
	Start the “CO ambient Measurement” programme, refer to chapter 8.4, page 47.
	Start the "Pitot Measurement" programme, refer to chapter 8.5, page 48.
	Close menu and back to the start menu.

8.1 Programme “Flue gas”

▶ Start the “Flue gas” programme.

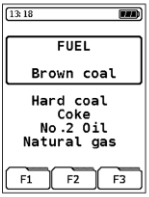


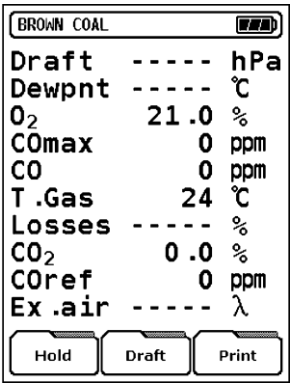
After a cold start the calibration phase takes 60 seconds. If a restart is done out of the measuring programme the calibration phase takes only 10 seconds.

After the calibration the last used fuel appears on the screen.

Key	Function
	Change fuel.
	Confirm the selected fuel (fuel in the framed box).

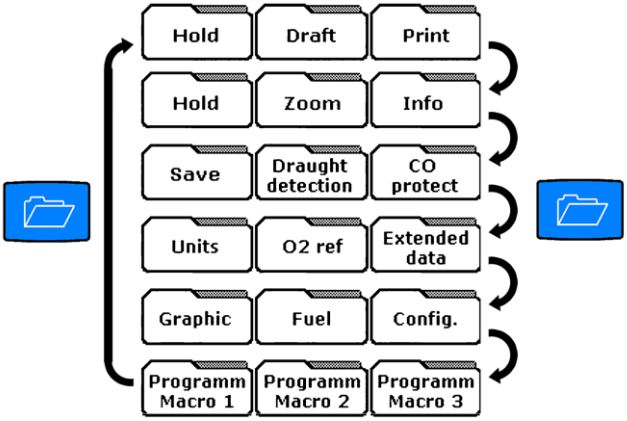
▶ Open the “Flue gas” measuring menu.





Key	Function
	Backlight on/off.
	Change the register buttons line (new function buttons), see below.
	Change the way in which the readings are shown line by line (uni directional line change).
	Gas pump on/off.
	Reset CO_{max} value.

▶ Change the register buttons line.

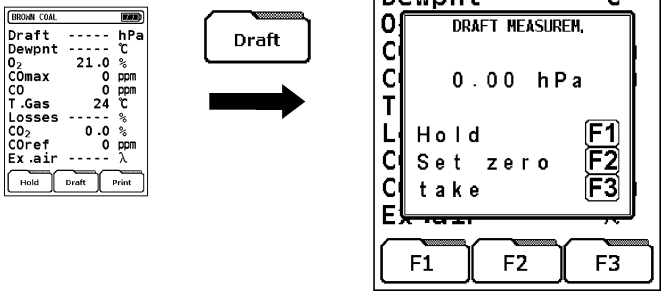


Register	Function
Hold	Function „Hold“: Hold readings. Refer to page 43.
Draft	Measuring menu “Draft”: Flue-measurement. Refer to page 30.
Print	Function “Print”: Print readings. Refer to page 44.
Zoom	Function “Zoom”: Change layout of readings (5 or 10 lines). Refer to page 43.
Info	Extra menu “Info”: Start information menu (shows data about fuels and condition of sensors). Refer to page 31.
Save	Menu “Memory”. Refer to chapter 12, page 63.
Draught detection	Extra menu “Draught detection”. Refer to page 32.
CO protect	Function “CO protect”: Manual CO-Sensor protection). Refer to page 44.
Units	Extra menu “Units”: Change units of readings. Refer to page 34.
O2 ref	Extra menu “O_2-reference”. Refer to page 35.

Register	Function
Extended data	Extra menu “Enter data”: Enter additional data: Enlarge measurement protocol. Refer to page 36.
Graphic	Extra menu “Graphic”: Start analysis software: Graphic representation of values. Refer to page 40.
Fuel	Menu “Fuel”. Refer to page 41.
Config.	Menu “Configuration”. Refer to chapter 11, page 52.
Programm Macro 1 Programm Macro 2 Programm Macro 3	Function “Programme macros“: Save measurement combinations as macros. Refer to page 42.

Measuring menu “Draft”

1. To determine the zero point in relation to the surrounding air pressure unplug the air tube (with the blue connector) before every draft measurement.
2. Press the F2 key.
3. Connect the air tube again.
4. Open the “Draft” measuring menu.

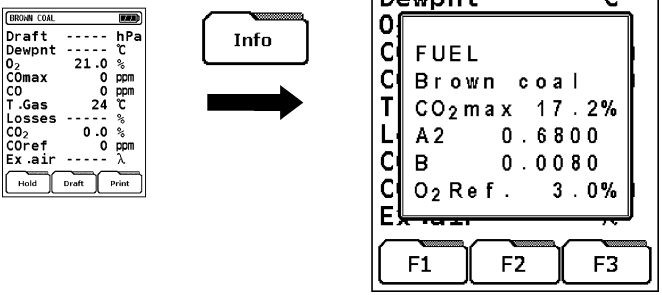


Key	Function
F1	Hold reading for draft (function “Hold”).
F2	Carry out zero point calibration.
F3	Transfer draft value to the flue gas menu.
○	Change representation of readings in the main menu line by line (multi-tasking-function).

Extra menu “Info”

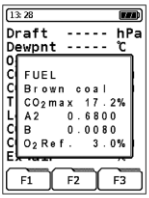
The most important fuel parameters and the O_2-reference value are shown.

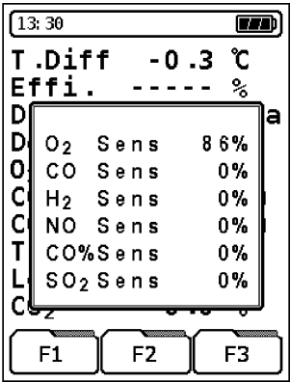
▶ Open the “Info” extra menu.



Key	Function
○	Change representation of readings in the main menu line by line (multi-tasking-function).
🗁	Start the sensor quick-diagnosis, see below.
CLEAR	Close “Info” extra menu.

▶ Open the sensor quick-diagnosis.





Sensor value	Diagnosis
O_2 > 50 %	Oxygen cell OK
CO and H_2: 0 to 1 %	CO-sensor with H2-compensation OK*)
CO%: 0 to 1 %	CO-sensor for upper range OK*)
NO and SO_2: 0 to 1%	NO- and/or SO2-value OK*)

*) resp. sensor option disabled

Are other values found the corresponding sensor is either strongly impaired or used up.

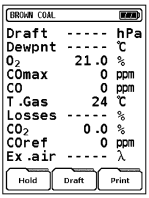
▶ If so please contact the service point.

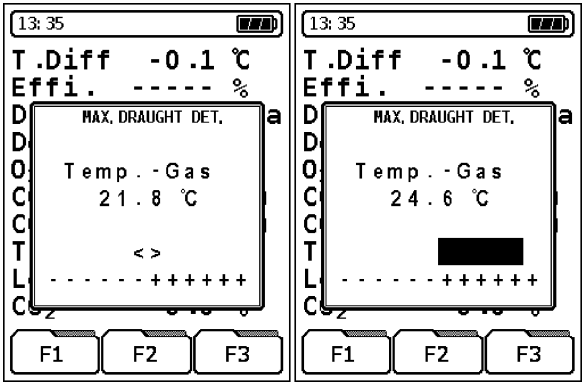
Extra menu “Draught detection”

The function “Draught detection” shows tendencies in a graphical way. Slightest changes in the temperature of the flue gas are shown with a black bar. If temperature is constant no bar appears.

The „Draught detection“ extra menu is only available for the measurement of the flue gas temperature in the “Flue gas” programme.

▶ Open the “Draught detection” extra menu.

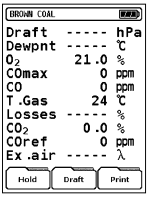


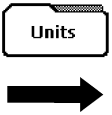


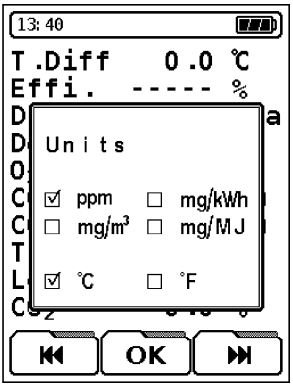
Key	Function
	Change representation of readings in the main menu line by line (multi-tasking-function).
	Close extra menu.

Extra menu “Units”

▶ Open the “Units” extra menu.





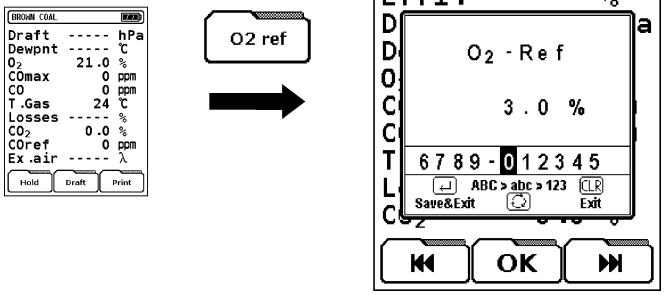


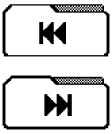
Register	Key	Function
⏮ ⏭	F1 F3	Move the flashing cursor: Units ☑ ppm ☐ mg/kWh ☐ mg/m³ ☐ mg/MJ ☐ °C ☑ °F
OK	F2	Confirm new “O_2 reference value”.
-	◯	Change representation of readings in the main menu line by line (multi-tasking-function).
-	CLEAR	Cancel procedure and close menu. The “O_2 reference value” used before will be kept.
-	↵ ENTER	Accept procedure and close menu. After the selected units have been confirmed they are available in the “Flue gas” menu from now on. This configuration is kept until new units are selected, no matter whether the device is switched off and on.

Extra menu “O_2-reference”

In order to convert the measured gas values the so called O_2 reference value can be modified in accordance with the current regulations and the chosen fuel respectively. For gas and oil fuels a value of 3 % is preset. For solid fuels a value of 13 % is preset.

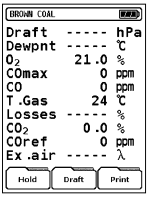
▶ Open the “O_2-reference” extra menu.

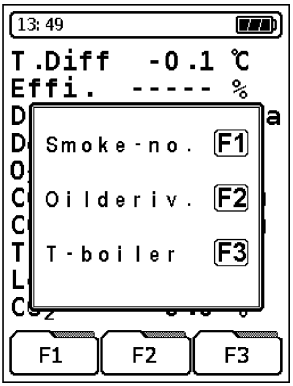


Register	Key	Function
	F1 F3	Select figure.
	F2	Confirm.
-		You cannot switch between characters (uppercase letters, lowercase letters, numbers). Only numerical values are available.
-	CLEAR	Cancel procedure and close menu. The “O_2 reference value” used before will be kept.

Extra menu “Enter data”

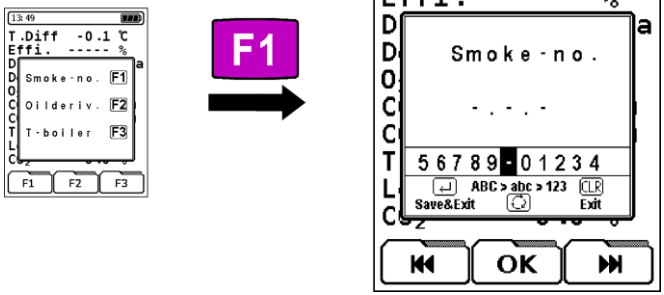
▶ Open the “Enter data” extra menu.





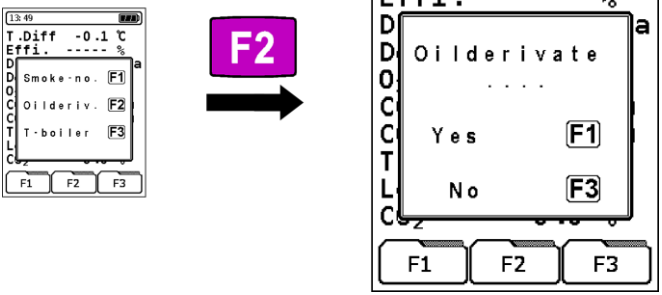
Key	Function
F1	Enter the found out Smoke-no. (soot content according to the Bacharach scale), see below.
F2	Enter the found out oil derivatives, see below.
F3	Enter temperature of boiler and heat carrier, see below.
◯	Change representation of readings in the main menu line by line (multi-tasking-function).
CLEAR	Close menu. All data that has been confirmed with ↵ ENTER so far will be stored in the measurement protocol. Inputs of data that have been cancelled will not be taken account of.

▶ Open the “Smoke-no.“ input menu.



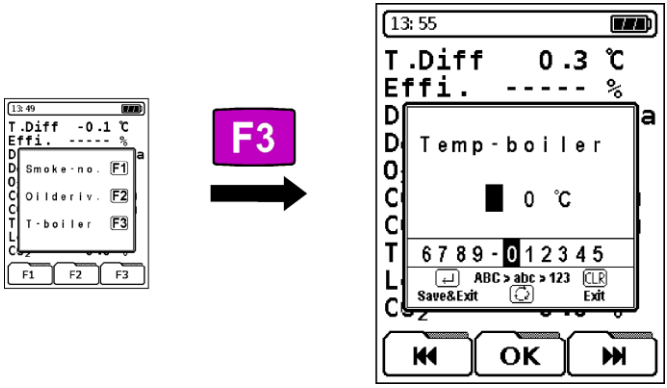
Register	Key	Function
⏮ ⏭	F1 F3	Select figure.
OK	F2	Confirm selection.
-	CLEAR	Cancel procedure and close menu without keeping new data.
-	↵ ENTER	Confirm input and transfer data to the measurement protocol.

▶ Open the “Oil derivatives“ input menu.



Key	Function
F1	Yes, oil derivatives existent.
F3	No, no oil derivatives existent.
CLEAR	Cancel procedure and close menu without keeping new data.
ENTER	Confirm input and transfer data to the measurement protocol.

▶ Open the “Temperature and heat carrier” input menu.



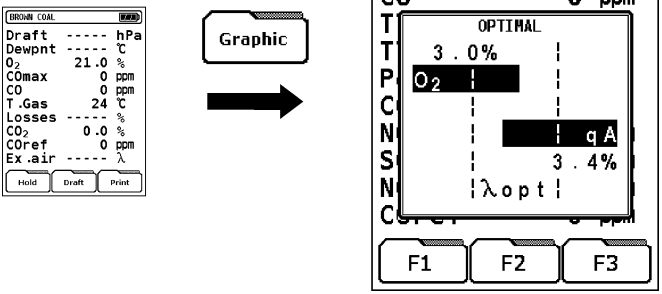
Register	Key	Function
⏮ ⏭	F1 F3	Select figure. If you have to edit temperature values < 100 °C, so set in front of the two last figures a „0“ (zero). E.g.: 090 (= 90 °C).
OK	F2	Confirm selection.
-	CLEAR	Cancel procedure and close menu without keeping new data.
-	ENTER	Confirm input and transfer data to the measurement protocol.
-		Change representation of readings in the main menu line by line (multi-tasking-function).

Extra menu “Graphic”

This functions uses graphs to show the numerical values according to the chosen fuel. The remaining content of oxygen (O_2) and the calculated waste gas losses (qA) are thereby set in a relation to the excess air value (λ) and to the classical combustion diagram.

If both bars extend to the optimal fuel-air relation (the gap indicated by “λopt”) the firing facility in question is set in the correct way.

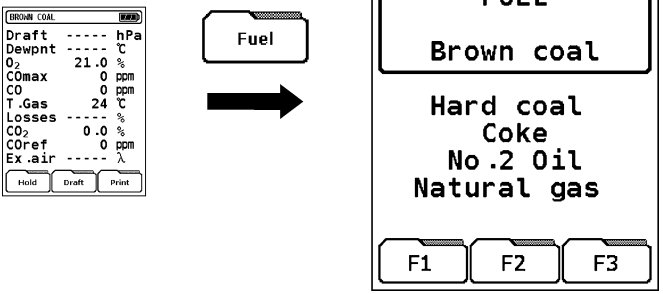
▶ Open the “Graphic” extra menu.



Key	Function
	Change representation of readings in the main menu line by line (multi-tasking-function).
	Close menu.

Menu “Fuel”

▶ Open the “Fuel” menu.



Key	Function
	Select new fuel.
	Confirm the selected fuel (fuel in the framed box).
	Cancel procedure without selecting new fuel.

Function “Programme macros“

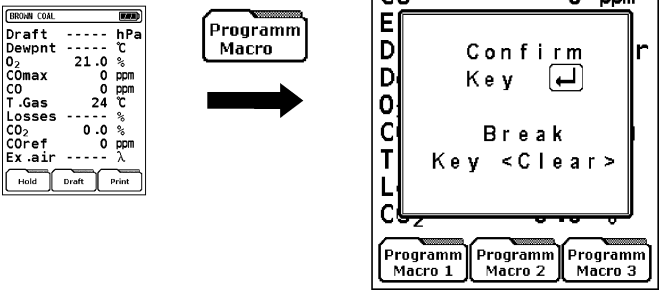
Up to three customised measuring configurations can be created. They can be started directly out of the starting menu. The procedure of these macros can be reduced to a few key inputs only.

Programme macros can have configurations as shown below:

- Order of the readings that are shown on the screen
- Font size of the readings (5 or 10 characters)
- Predefined fuel
- Preset measuring units

The list of available fuels is not shown after the calibration phase.

▶ Open the function “Programme macros”.

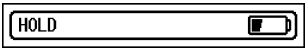


Register	Key	Function
Programm Macro 1 Programm Macro 2 Programm Macro 3	F1 F2 F3	Save preset measurement configuration as programme macro.
-	CLEAR	Cancel procedure without saving data.
-	↵ ENTER	Save macro.

Function „Hold“

Register	Key	Function
Hold	F1	Keep measured data. Press the key again to stop the HOLD-Function.

If the HOLD-Function is activated all displayed measured data at the time the key was pressed will be kept. If the HOLD-Function is activated the alert “HOLD” appears in the top left corner of the status line in exchange with the name of the fuel.



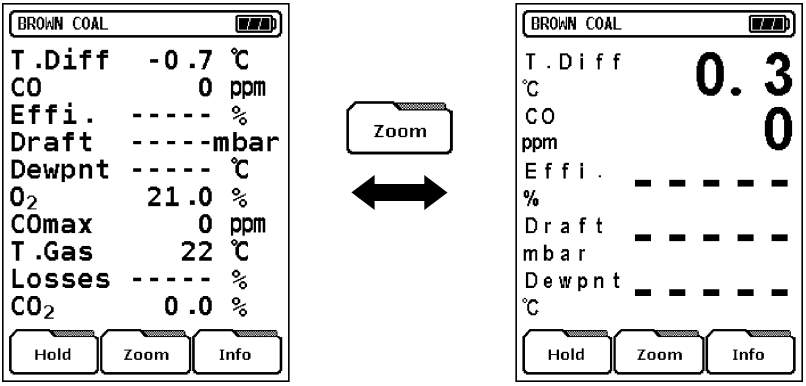
Function “Zoom”

There are two fonts and therefore types of layout available:

- **10 lines layout:** The 10 lines layout is the standard layout set by the producer. Measured parameters are shown on the left whereas readings and units are shown on the right.
- **5 lines layout:** This layout reduces the number of displayed lines but it facilitates the reading of the display from a bigger distance. Measured parameters and units are on the left whereas readings are on the right.

After the device is switched off and on again the display resets to the 10 lines layout automatically unless the 5 lines layout was a measurement configuration activated by a macro.

▶ Operate the function “Zoom”.



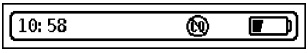
Function “CO protect”

Every device is equipped with a second pump (CO-flushing-pump) in order to protect the quite sensitive CO-sensors from CO-overload.

The CO-flushing-pump can either be started manually or it switches on automatically when necessary, i.e. when the admitted CO-range is exceeded.

Register	Key	Function
CO protect	F3	Switch CO-flushing-pump on/off. If the CO-flushing-pump starts automatically due to an excess concentration of CO it can’t be switched off manually until the high CO-concentration is no danger for the CO-Sensor anymore. If the CO-concentration has reached the lower range again the CO-flushing-pump will shut off.

When the CO-flushing-pump is activated a scored out CO-symbol appears in the status line:



If the device is equipped with two CO-sensors the result of the higher range sensor will be displayed when the lower range sensor is flushed.

The active CO-flushing-pump doesn’t influence any other sensors within the device.

Function “Print”

Register	Key	Function
Print	F3	Print measured data.

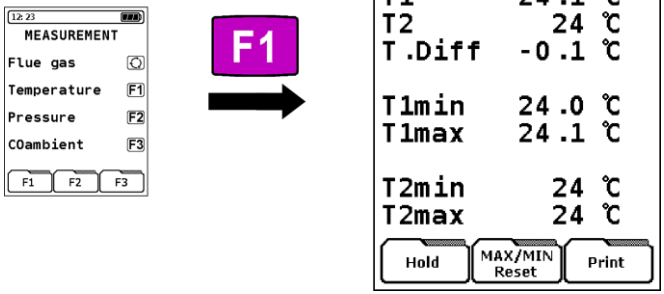
The printer in use can be selected from the configuration menu, refer to chapter 11.3, page 58. The rate of printing depends mostly on the type of printer selected.

Because of the modern multi-tasking-operating the device can be used without restrictions during the printing procedure. Printing takes place simultaneously to the other procedures in order to avoid delays.

8.2 Programme “Temperature”

For temperature measurement there are two measurement channels (T1 and T2) available. Measurement channel T1 is displayed with a resolution of 0.1 °C whereas channel T2 has a resolution of 1 °C.

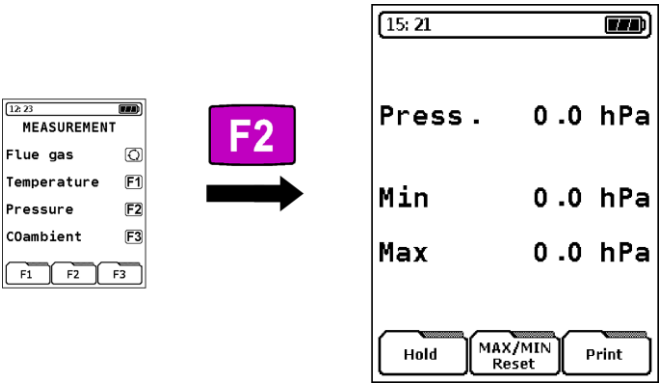
▶ Start the “Temperature” programme.



Register	Key	Function
Hold	F1	Keep all temperature readings.
MAX/MIN Reset	F2	Reset readings.
Print	F3	Print measurement protocol.
-	◯	Change units: °C, °F.
-	CLEAR	Close programme and back to the “Measure“ menu.

8.3 Programme “Pressure”

▶ Start the “Pressure” programme.

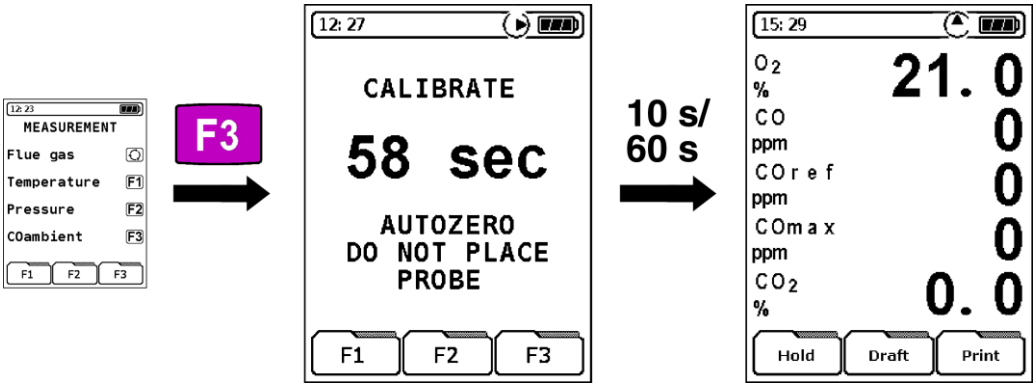


Register	Key	Function
Hold	F1	Keep all readings for pressure.
MAX/MIN Reset	F2	Reset readings.
Print	F3	Print measurement protocol.
-	◯	Change units while the active measurement programme and in the HOLD-mode: hPa, mbar, mmWC (millimeter water column), mmHg, (Millimeter Mercury Column), inWC (Inch Water Column), inHg (Inch Mercury Column), Psi (Pounds Per Square Inch).
-	↵ ENTER	Reset to zero.
-	CLEAR	Close programm and back to the “Measure“ menu.

The conversion takes place in the active measurement programme as well as in the HOLD-mode.

8.4 Programme “CO(O_2) Measurement”

▶ Start the “CO(O_2) Measurement“ programm.



This is a reduced measurement (without temperature measurement) that can be carried out in the environment of the heating facility especially in the area of the flue gas channels.

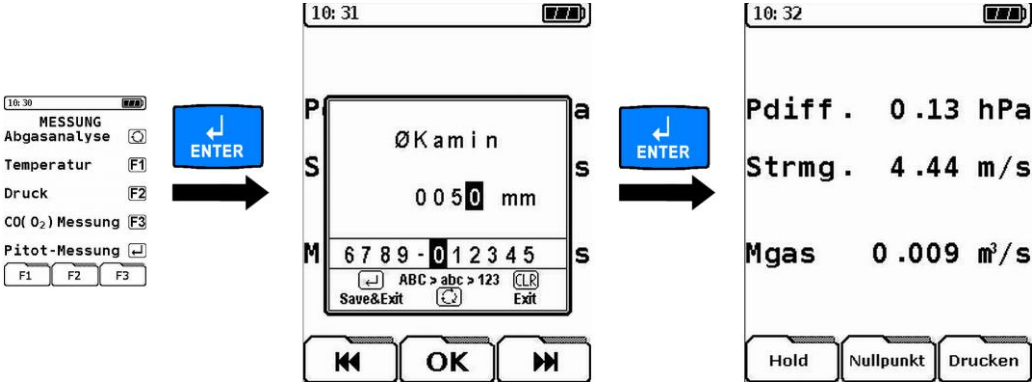
For this programme the same keypad functions apply as described on page 29.

The number of readings is reduced to five significant flue gas values.

8.5 Programme "Pitot Tube Measurement" (option)

This programme is only available if the device-specific L Pitot tube is used.

▶ Start the "Pitot Measurement" programme.



First, enter the chimney diameter in mm. After you have confirmed the entry, you can perform the Pitot tube measurement.

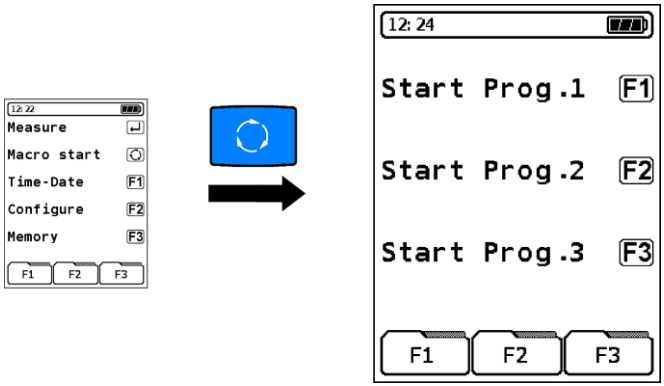
Tab	Key	Function
⏮ ⏭	F1 F3	Enter the chimney diameter. If the diameter is < 1000, use two leading "0" (zeros), e.g. 0050 (= 50 mm).
OK	F2	Confirm.
-	CLEAR	Cancel without storing.
-	ENTER	Store entries.

9 Menu “Macro Start”

The handling of the device can be facilitated enormously by means of customised measuring programme configurations that can be saved as programme-macros (refer to chapter Function “Programme macros“, page 42). Up to three different and customised macros can be used.

Requirement for the use of macros are customised sets of measurement programme settings that can be started in an efficient way refer to chapter Function “Programme macros“, page 42.

▶ Open the “Macro Start” menu.



Key	Function
F1 F2 F3	Start required macro. After having started the macro the settings it is based on will be activated automatically after the calibration phase and without showing the list of fuels.

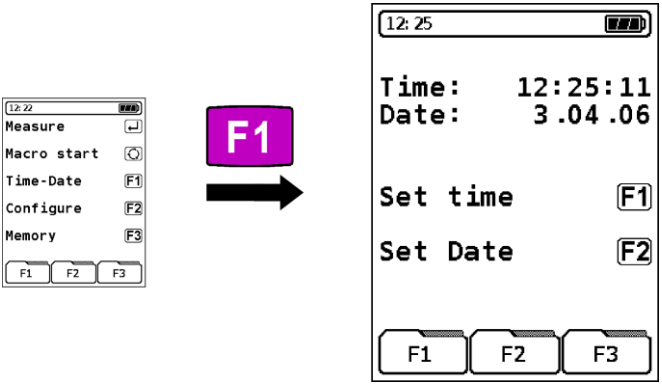
If a „Confi.-reset“, refer to chapter 11.4, page 62, is carried out all macro-settings will be lost. Without customised settings the settings for the fuel gas analysis will be used.

10 Menu “Time-Date”

The time will be displayed in the top left corner of the status line if not replaced by superior information. Time and date will be saved together with the corresponding data and therefore appear on the print-outs of measured data protocols as well.

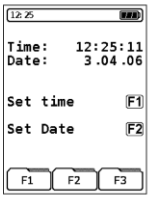
In contrast to changes between winter and summer time and vice versa leap years will be considered automatically.

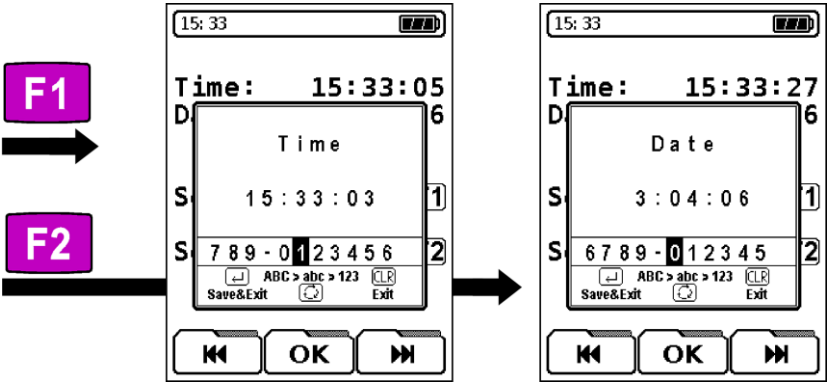
1. Open the “Time-Date” menu.



Key	Function
CLEAR	Close menu.

2. Open the input menu for Time/Date.



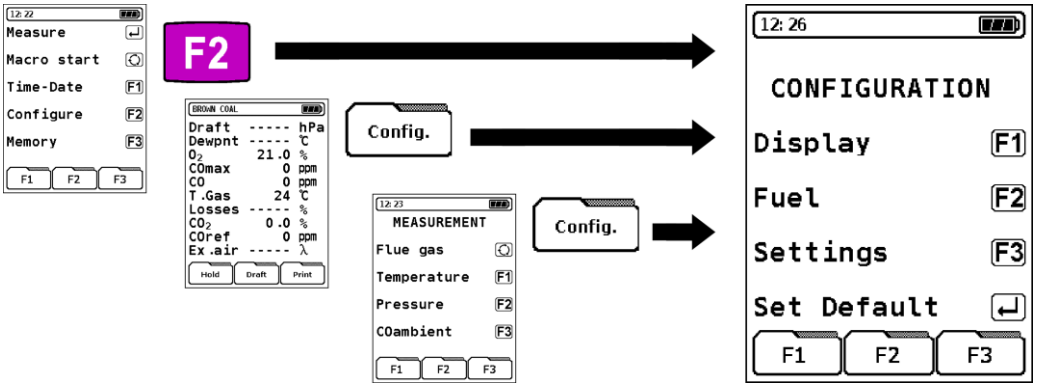


During time setting the clock in the editor will be stopped and not re-started until the new time is confirmed.

Register	Key	Function
⏮ ⏭	F1 F3	Change data.
OK	F2	Confirm input.
-	CLEAR	Cancel procedure without saving data.
-	↵ ENTER	Save input.

11 Menu “Configuration”

▶ Open the “Configuration” menu.



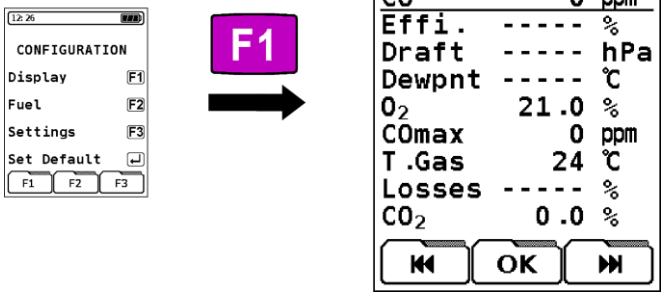
In this menu customised measuring programme settings can be set. After being transferred into the active measurement programme these settings will be saved lastingly and are therefore producer-independent i.e. customised settings.

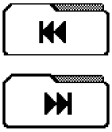
Key	Function
F1	Change order of measured values on the display, refer to chapter 11.1, page 53.
F2	Reduce/expand list of fuels, refer to chapter 11.2, page 55.
F3	Change general settings, refer to chapter 11.3, page 59.
ENTER	Restore factory settings, refer to chapter 11.4, page 63.
CLEAR	Close configuration menu.

11.1 Change order of measured values on the display

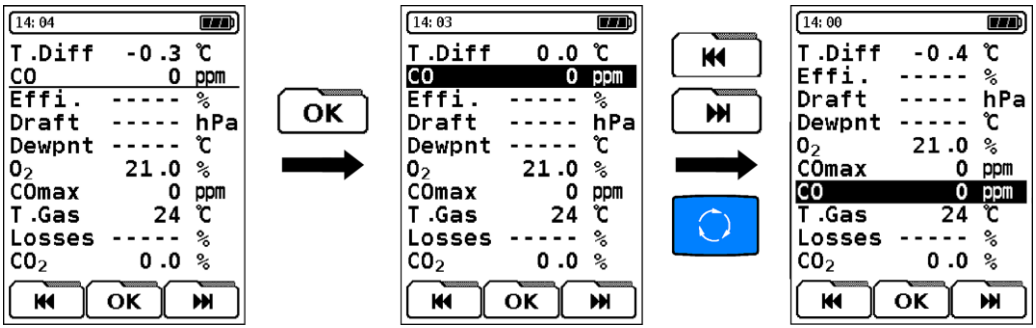
The sequencing of the measured parameters can be altered in an arbitrary way. The same line can’t be displayed more than once.

1. Open the “Display” configuration menu.



Register	Key	Function
		Move line cursor (underline) upwards or downwards.
-		Move line cursor (underline) in one direction.
-		Cancel procedure and back to the start menu.

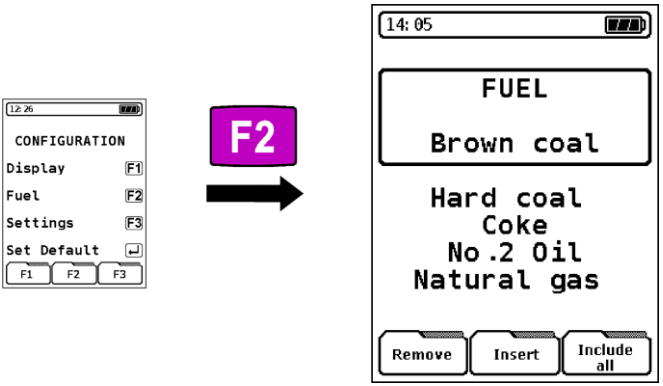
2. Change order of measured values on the display.



Key	Function
CLEAR	Cancel procedure without saving data.
ENTER	Confirm setting.

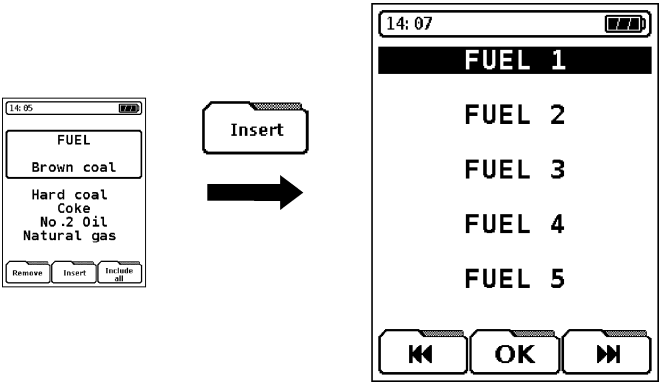
11.2 Configure list of fuels

1. Start the “fuel” configuration menu.



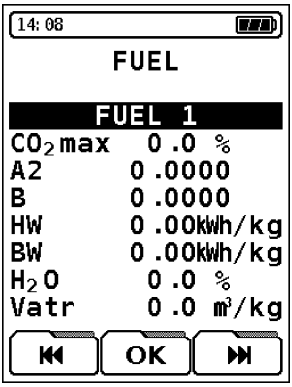
Register	Key	Function
Remove	F1	Remove framed fuel from list. The removed fuel can be reactivated later on by opening the complete list of available fuels again („Include all“).
Gesamt-liste	F3	Include all available fuels again.
Insert	F2	Insert new fuel. The available list of fuels will be expanded by a new fuel. There is a maximum of 5 more slots for fuels available that can be parame-terised accordingly.

2. Insert new fuel.



Register	Key	Function
⏮ ⏭	F1 F3	Move bar cursor upwards or downwards.
OK	F2	Confirm selected location of fuel.
-	CLEAR	Cancel procedure without saving data.

3. Edit new fuel.



HW Heating value without condensation content

BW Heating value with condensation content

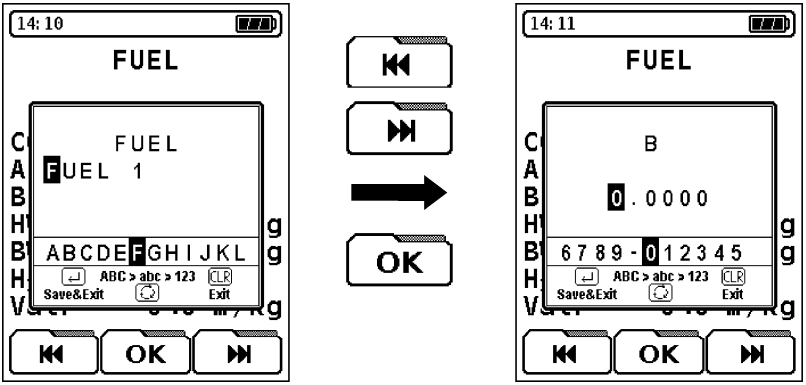
H_2O Content of water

Vatr Quantity of flue gas (dry)

In order to create a new fuel the first three fuel-specific factors (CO_2max, A2 and B) have to be entered. If other units than ppm or % are used the other factors should be entered as well as otherwise a conversion to mg/m³, mg/kWh or MJ/m³ is not possible.

Register	Key	Function
⏮ ⏭	F1 F3	Select row: Name of fuel or attribute of fuel.
OK	F2	Open selected row.
-	CLEAR	Cancel procedure.

4. Edit row.

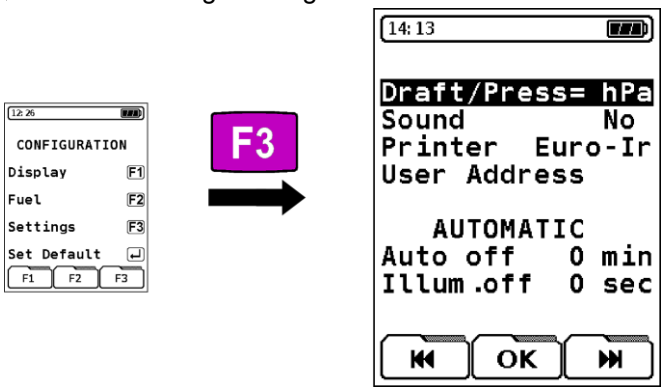


Register	Key	Function
⏮ / ⏭	F1 / F3	Select required character.
OK	F2	Confirm selected character.
-	CLEAR	Cancel procedure without saving data.
-	ENTER	Save input and close.

11.3 Change settings

This menu is for general settings that represent programme independent functions.

▶ Start “Settings” configuration menu.



Key	Function
	Select row. The bar cursor can only be moved in one direction.
	Cancel procedure.

Pressure/Draft

▶ Change the preselected unit for the pressure and draft measurement within the flue gas measurement programme.

Register	Key	Function
		Change unit: hPa, mbar, mmWC, mmHg, inWC, inHg, PSi.
		

Sound

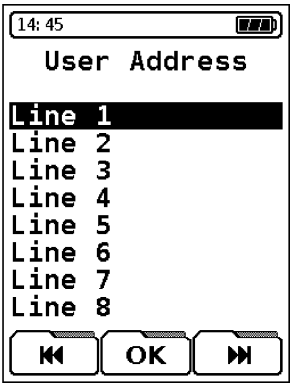
▶ Switch on/off the sound when a key on the keypad is pressed.

Register	Key	Function
⏮	F1	Sound yes/no.
⏭	F3	

Company address

In this menu the address of the user/company can be entered. There are 8 lines available with 16 characters each (minuscules and capital letters, numbers and symbols).

1. Open the input menu for the address of the user.

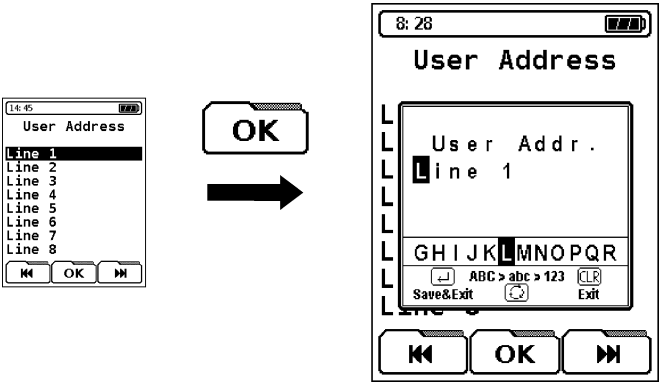


Register	Key	Function
⏮	F1	Select row.
⏭	F3	
OK	F2	Activate selected row.
-	CLEAR	Cancel procedure and back to the “Settings” configuration menu.

2. Change selected row.

In the input mask (editor) only one line can be edited at a time. This entry mask is comparable to common mobile phone editors.

Unless indicated by a „dot“-character empty lines aren’t printed.



Register	Key	Function
 	 	Select type of character.
		Confirm character.
-		Change type of character: Minuscules and capital letters, numbers and symbols
-		Cancel procedure without saving data.
-		Accept input and close editor.

Automatic

- **Auto off:** Time after which the device switches off automatically if no key is pressed. The auto off time can be set in intervals of 5 minutes. Maximum: 60 minutes.
  If set to „0 min“ the auto off function is disabled and the device has to be switched off by hand via the ON/OFF key.
- **Illum. off:** Time interval for the backlight. This can be set in intervals of one second. Maximum: 30 seconds.

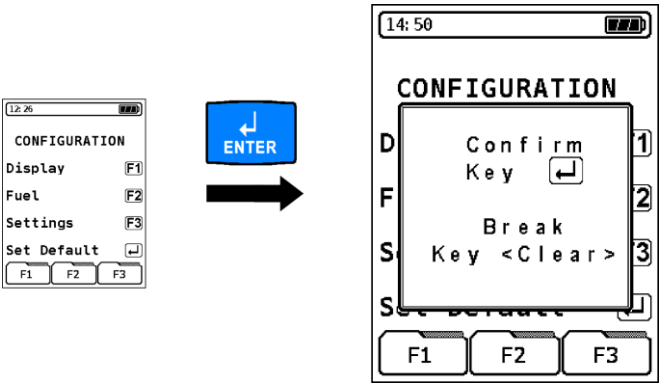
Register	Key	Function
		Decrease time interval.
		Increase time interval.
-		Cancel procedure without saving data.
-		Save input and close menu.

11.4 Set default settings

This function restores factory settings.

Attention: The restoration of the factory settings will cause a lost of all individual settings and can’t be undone. The data memory is not affected.

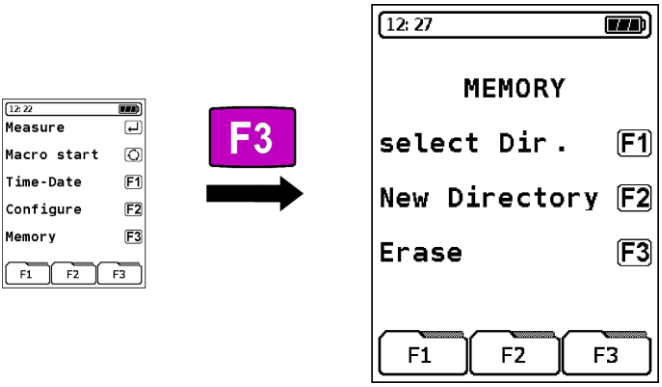
▶ Open the “Set default” function.



Key	Function
CLEAR	Cancel procedure.
ENTER	Confirm the restoration of the factory settings.

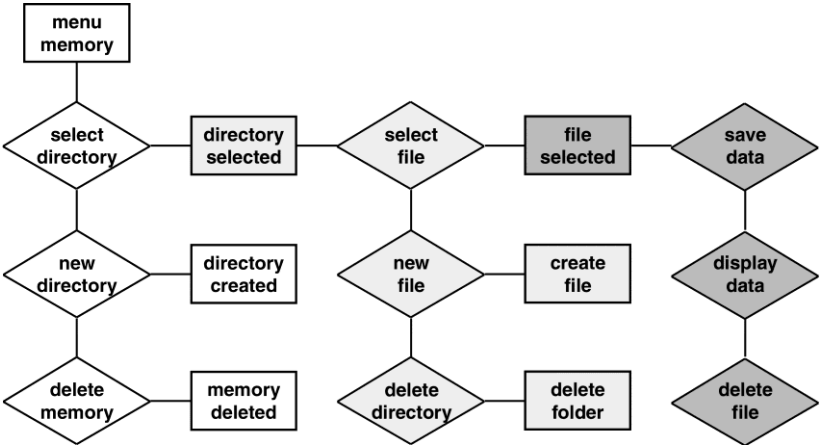
12 Menu “Memory”

▶ Start the “Memory” menu.



Key	Function
CLEAR	Close memory and back to the start menu.

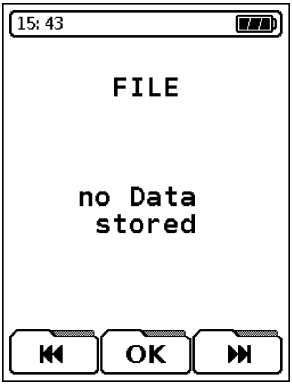
The data memory is structured as follows:



The organisation of the memory is dynamic, i.e. only already existing directories and files are available for saving data. Additional directories and files can be created at any time. Names of both directories and files can be defined by the user. Directories could for instance be used for the names of clients or facilities (or client numbers).

Files could be named after the types of measurement.

New devices are delivered without preset directories and files:



13 Operation

13.1 Notice concerning measurement of SO2 and NO2 (option)

SO_2 and NO_2 gases have a high solubility in water. For measurement of SO_2 and NO_2 concentrations it is therefore necessary to remove the condensate residues form the gas filtration and drying system. These residues can absorb SO_2 and NO_2 which could cause measurement deviations.

Furthermore, when carrying out SO_2 and NO_2 relevant measurements no additional desiccant should be used. Even when it is dry this filter material can absorb significant parts of the SO_2 and NO_2 content.

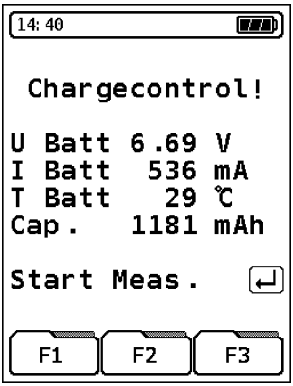
13.2 Battery/line voltage operation (only for the measurement module)

- Battery mode: Battery operation: Up to 36 hours of continuous operation with the display backlight switched on.
- Charging: Intelligent charging by means of an integrated charger management system.
- Battery operation is limited to the measurement module MAXILYZER NG Plus. The Peltier gas cooler (with the heating controller) can only be operated via mains.

13.3 Charging the batteries

1. Connect MAXILYZER NG Plus to mains.
2. Switch the device on and off.

↳ The charging of the batteries starts automatically:



Uakku	Current voltage
Iakku	Current amperage
Takku	Measured battery temperature
Kap.	Current battery capacity

Key	Function
ENTER	Start measurement while charging the battery.

↳ During measuring the battery will be recharged continuously and monitored by the system.

As soon as the battery is full the device switches to the passive recharging mode (trickle charging) automatically.

↳ The charge control screen disappears.

↳ When recharging is finished MAXILYZER NG Plus can remain connected to mains for any period of time without the battery being damaged.

Lebensdauer und Kapazität des Akkus

MAXILYZER NG Plus is equipped with an NiMH storage battery. The service life and capacity of the battery are considerably affected by the way the instrument is charged and used. In order to make the handling safer, the instrument has an efficient and battery saving load management unit for all purposes.

The graphic charge-level indicator of the MAXILYZER NG Plus consisting of three elements of a battery symbol helps the user to estimate correctly the capacity of the battery. There will be five different states of capacity displayed.

▶ During normal use it is recommended not to recharge the battery until it is run down completely.

The battery can be recharged at any time given the load management unit recognises the need of recharging the battery. If the battery is too full already the load management unit can deny a further recharging of it.

The service life of the NiMH battery can be significantly reduced when the instrument is operated at temperatures below 5 °C (40 °F).

Reconditioning cycle

If the device is used outside the permitted temperature range, if the battery is quite old or if incomplete charging cycles (charging/discharging) are carried out the charge-level indicator can possibly not show the true charge-level anymore. In this case the indicator can be corrected as explained in the following:

1. Discharge batteries by switching on the device until it runs out of battery power and switches off automatically.
2. Connect MAXILYZER NG Plus to mains.
3. Switch the device on and off.

↳ The charging of the batteries starts automatically.
Recharging completely takes approx. 4 to 6 hours, depending on surrounding temperature.

↳ After having finished active recharging the MAXILYZER NG Plus switches off automatically.

4. Repeat the reconditioning cycle if necessary.

14 Maintenance

Waste Gas Cleaning System

Refer to fig. 6, page 71.

- ▶ Empty the condensate reservoir completely after each measuring operation. Water residues within the measuring instrument will destroy the pumps and sensors.
- ▶ Check the micro filter for contaminations and replace as necessary.
- ▶ If the pump capacity is reduced, exchange the diaphragm filter. Damage of the filter and/or improperly fitted filter will greatly decrease or eliminate the filter function and will eventually destroy pumps and sensors.
- ▶ Make sure that threaded parts are straight when placed on and tighten them moderately. Ensure sufficient sealing by means of O-rings.
- ▶ Plug-type elements and flanges: Remove any gas residues. Grease with Vaseline.

Replacing the battery

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

- ▶ Do not short-circuit connection terminals.

- ▶ Batteries may **not** be disposed together with unsorted household waste. Return empty batteries to a collection point or to your dealer for environmentally compatible disposal.

Replacing the mains fuse

☑ The mains cable has been disconnected.

The spare fuse is located in the fuse holder of the mains input socket.

15 Troubleshooting

Repair work may only be performed by qualified, specially trained staff.

Table 8: Troubleshooting

Problem	Possible reason	Remedy
Device automatically switches off.	Battery empty.	▶ Charge battery.
	Automatic Off activated	▶ Set Automatic Off to 0, see chapter „" – Auto Off", page 61.
O_2 error message.	Service life of O_2 sensor expired.	▶ Run device without accessories in fresh air.
	Temporary signal error.	▶ Take device to service centre.
"CO value too high"/“CO sensor defective“ message.	CO sensor malfunction.	▶ Run device without accessories in fresh air.
	CO measuring range exceeded.	
	End of service life of sensor.	▶ Take device in for servicing.
Incorrect measured gas values (e.g. measured O_2 value too high, CO_2 value too low, no CO values displayed, etc.).	Leak in measuring system.	▶ Check gas treatment system for cracks and other damage. ▶ Check hose system for cracks and other damage. ▶ Check O rings of gas treatment unit. ▶ Check O ring of external probe pipe.
Service message.	Device has not been inspected for a longer period.	▶ Take device in for servicing.
Measured gas values are displayed slowly.	Filter in the gas treatment system is used up.	▶ Check filter and replace, if necessary.
	Hose system bent.	▶ Check hose system.

Problem	Possible reason	Remedy
	Gas pump polluted.	▶ Take device to service centre.
Flue gas temperature unstable.	Humidity in the probe pipe.	▶ Clean probe.
Device does not switch on.	Battery empty.	▶ Charge battery, refer to chapter 13.3, page 66. ▶ Take device to service centre.
Sonstige Störungen	–	▶ Gerät an den Hersteller schicken.

16 Shutting down and disposal

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

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 dispose of it or to return it.

17 Spare parts and accessories

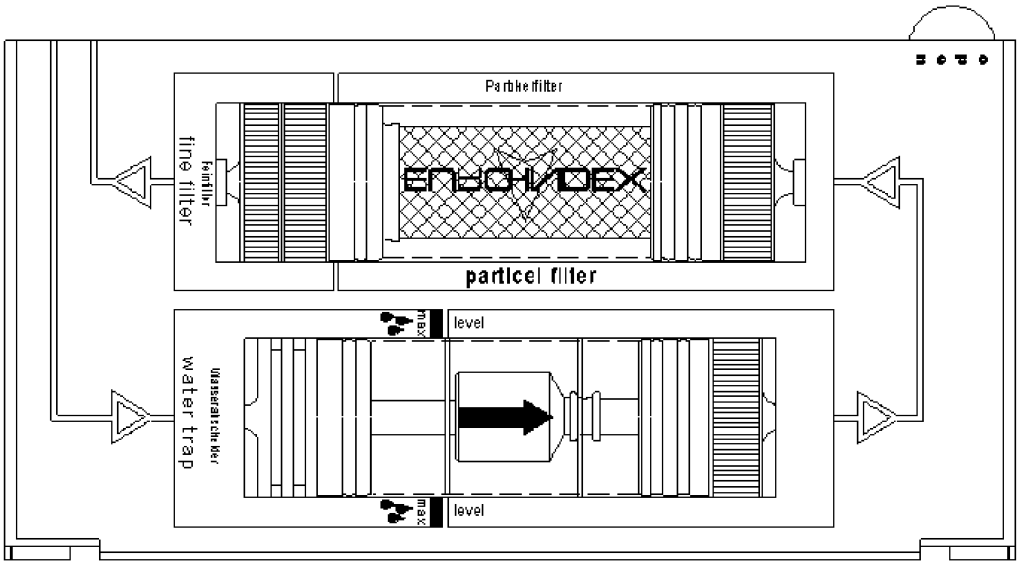


Fig. 5: Waste Gas Cleaning System

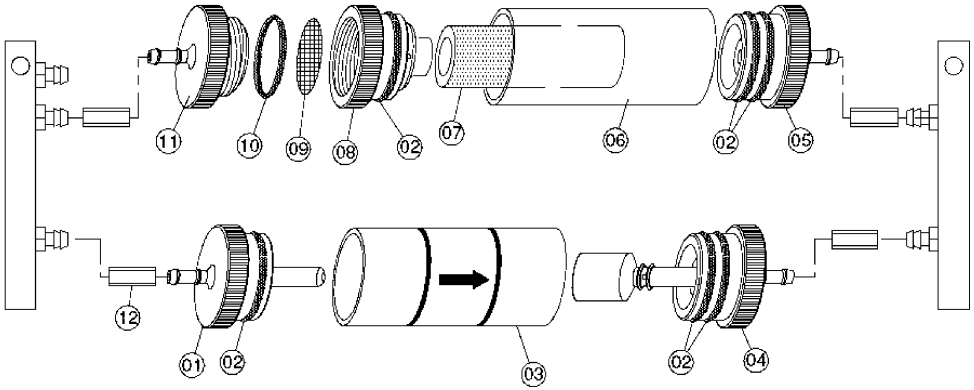


Fig. 6: Waste Gas Cleaning System – spare parts

Spare parts for Waste Gas Cleaning System:	**Part No.**
(**1**) Inlet piece	695 000 94
(**2**)+(**10**) Set of O-rings, assorted set	69 427
(**3**) Glass piston with arrow mark	695 00 95

(**4**) Outlet piece with cylinder	695 000 91
(**5)** Outlet piece - centre	695 00 093
(**6**) Glass piston with logo „Euro-Index“	695 00 099
(**7**) Infiltec micro filter, 5 each	69 412
(**8**) Zwischenstück	695 00 097
(**9**) Filter disc 23.5 mm, 10 each	69 206
(**11**) Outlet piece	695 000 098
(**12**) Silicon hose 3 x 2 mm	

18 Warranty

The manufacturer’s warranty for this product is 24 months from date of purchase. This warranty applies to all countries in which this product is sold by the manufacturer or its authorised representatives.

19 Copyright

20 Customer satisfaction

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

21 Addresses

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

22 Appendix

22.1 Declaration of conformity

Report No.: EF/2006/20015
Issue Date: Feb. 27, 2006
Page: 2

VERIFICATION OF COMPLIANCE

Applicant:	Bluegiga Technologies Sinikalliontie 11, 02630 ESPOO, FINLAND
Equipment Under Test:	Bluetooth Class 1 EDR Module
Brand Name:	Bluegiga
Model No.:	WT11#
Model Difference:	N/A
File Number:	EF/2006/20015
Date of test:	Feb. 17, 2006 ~ Feb. 24, 2006
Date of EUT Received:	Feb. 17, 2006

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
ETSI EN 300 328 V1.6.1: 2004	Complied

The above equipment was tested by SGS Taiwan Ltd. for compliance with the requirements set forth in the European Standard ETSI EN 300 328 V1.6.1: 2004 under R&TTE Directive 1999/5/EC. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Test By:	Alex Hsieh	***Date***	Feb. 27, 2006
	Alex Hsieh		
Prepared By:	Elisa Chen	***Date***	Feb. 27, 2006
	Elisa Chen		
Approved By:	Vincent Su	***Date***	Feb. 27, 2006
	Vincent Su		

SGS Taiwan Ltd. 台灣檢驗科技股份有限公司 | No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. / 台北縣五股工業區五工路134號
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The Netherlands
Chamber of Commerce
09076358
www.telefication.com

telefication

TCB

TCB

GRANT OF EQUIPMENT AUTHORIZATION

Certification
Issued Under the Authority of the
Federal Communications Commission
By:

Telefication BV
Edisonstraat 12a
NL-6902 PK Zevenaar
The Netherlands

Date of Grant: 05/08/2006

Application Dated: 05/08/2006

BlueGiga Technologies Inc.
Sinikalliontie 11
Espoo, FI-02630
Finland

Attention: Mikael Bjorkas , Director of Production

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: QOQWT11

Name of Grantee: BlueGiga Technologies Inc.

Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Bluetooth Class I EDR Module

Grant Notes	FCC Rule Parts	Frequency Range (MHz)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.023		

Modular Approval. Power output listed is conducted. This grant is valid only when the module is sold to OEM integrators and must be installed by OEM integrators. The device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter in the same host. OEM integrators and End-users must be provided with transmitter operating conditions for satisfying RF exposure compliance. End-users may not be provided with the module installation instructions.

Certificate N°:	M.H. Koop	
06218037/AA/00	Manager Certification	

laboratory *certification* *approvals*