SYSTRONIK
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Description and
User Manual for

MAXILYZER NG

New Generation

Gas Analysis Computer

- ☞ Read the instructions before using the instrument!
- ☞ Consider security advice!
- ☞ Keep instructions for further questions!

Version: 03.2007
Part-No.: 22636

Subject to availability and technical changes!

DIN EN ISO 9001:2000
Zertifikat: 01 100 050394


MAXILYZER NG
TÜV
MAXILYZER NG

Contents

1. General instructions

Note!

Please read this user's manual carefully and make sure to know how the instrument works before using it. Keep the user's manual to read up on details when required.

2. Safety instructions

Avoid danger due to electricity

- Do not touch parts under voltage with the instrument or the sensor!

Protection of the measuring instrument

- Keep the instrument away from paint, solvent and glue and store it in a dry place.

Safety measures in order to maintain product warranty

- The instrument can only be used within the specified data.
- Treat the instrument according to its purpose.
- Do not use force!

- Only authorised staff is allowed to repair the instrument, otherwise the manufacturer is not responsible for functioning. This is the same for the validity of licence.

3. Battery and device disposal

Empty or damaged batteries are to deliver to authorised collection points.

After removal from service, the instrument has to be disposed of eco-friendly.

4. Application area

This high-quality instrument is only suitable for the use in the following application areas:

The instrument is for professional settings and for control-measurements at all small-firings-facilities (low temperature- and burner-value-boilers and -thermal) for gas and oil applicable. If you have the appropriate option you can also use the instrument for facilities for solid fuels (wood, coal etc.).

Furthermore the MAXILYZER NG is best suitable for measurements at bivalent and power modulatory communal heating stations.

This instrument is for measurement appropriate the German "1. BundesImmissionsSchutzVerordnung" (1. BImSchV) and the European Norm DIN EN 50379-2.

5. Product description

The 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” and the European “EN 50379” at all kinds of combustion plants within the framework of the monitoring of exhaust systems.

5.1 Measurement and calculation parameters

Readings	T.Gas	Waste or flue gas temperature	°F or °C
	T.Room	Air or ambient temperature	°F or °C
	O2	Oxygen content	% Volume
	CO	Carbon monoxide	ppm - mg/m³ - mg/kWh
	NO	Nitrogen monoxide (option)	ppm - mg/m³ - mg/kWh
	SO2	Sulphur dioxide (option)	ppm - mg/m³ - mg/kWh
	Draft	Draft or Pressure	inches of H2O (iWC)
Calculated values	CO2	Carbon dioxide	% Volume
	CO 0%	Carbon monoxide, undiluted	ppm
	Effi.	Combustion efficiency	%
	Ex.air	Excess air value	λ
	qA	Waste gas losses	%
	Dewpnt	Fuel specific dew point	°C or °F
	T.Diff	Differential temperature (TG-TA)	°C or °F
	NOx	Nitride oxides (option)	ppm - mg/m³ - mg/kWh - mg/MJ

NO ref.	Nitrogen monoxide, undiluted (*option*)	ppm
NOx ref.	Nitric oxides, undiluted (*option*)	ppm
SO2 ref.	Sulphur dioxide, undiluted (*option*)	ppm
NO2 ref.	Nitrogen dioxide, undiluted (*option*)	ppm

5.2 Measuring procedure

Temperature Measurem.:	K-type thermocouple *NiCr-Ni*
O2-Measurem.:	*Electrochemical measuring cell.*
CO-Measurem.:	*Electrochemical measuring cell.*
NO-Measurem. (option):	*Electrochemical measuring cell.*
SO2-Measurem. (option):	*Electrochemical measuring cell.*
NO2-Measurem. (option):	*Electrochemical measuring cell.*
Pressure/Draft Measurem.:	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 Measurem.:	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 (re-start).*
CO-Sensor Protection	The standard equipped CO-Sensor with dynamic H2-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).

5.3 Description of the device – technical data

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 optional: radio-interface (*Bluetooth-Interface*)
Printer	internal infrared-thermo printer
Memory	max. 100 memory blocks including dynamic memory management and directory/file structure
Electrical Supply	*NiCd-battery 6V/4Ah, external power adapter and charger*
Adm. Operating Temp.:	*+ 5 °C to + 40 °C (+40 °F to +104 °F)*
Adm. Storage Temp.:	*- 20 °C to + 50 °C (-4 °F to 140 °F)*
Mech. Dimensions	*275 x 250 x 115 mm (L x W x D)*
Weight	*approx. 2950 g to 3100 g (115 oz.-120 oz.) (depends on equipment with sensors)*

6. Physical specifications

Waste or flue gas temperature measurement

Range	*-20 °C ... +1.000 °C (-4 °F to 1,832 °F)*
Accuracy	*± 2 °C + 1 digit (-20 °C to 0 °C / -4 °F to 32 °F)*
	± 1 °C (0 °C to 200 °C / 32 °F to 392 °F)
	± 0.5 % of reading (above 200 °C / 392 °F)
Resolution	*1 °C*
Sensor	K-Type thermocouple *NiCr-Ni*

Combustion air temperature measurement

Range	*- 20 °C ... + 1.000 °C (-4 °F to 1,832 °F)*
Accuracy	*± 2 °C + 1 digit (-20.0 °C to 0.0 °C / -4 °F to 32 °F)*
	± 0.5 °C + 1 digit (0.0 °C to 200.0 °C / 32 °F to 392 °F)
	± 0.5 % of reading (above 200 °C / 392 °F)
Resolution	*0.1 °C*
Sensor	K-Type *thermocouple NiCr-Ni*

Pressure measurement

Range	*± 70 hPa (nominal) / ± 130 hPa (maximal)*
Accuracy	*± 0.02 hPa + 1 digit (0 to ± 2.00 hPa)*
	± 1 % of reading (± 2.01 to ± 70.0 hPa)
	± 2 % of reading (± 70.1 to ± 130.0 hPa)
Resolution	*0.01 hPa (up to 20.99 hPa); 0.1 hPa (above 21.0 hPa)*
Sensor	*semiconductor sensor*

Oxygen (O2) measurement

Range	*0 ... 21.0 vol.-%*
Accuracy	*± 0.2 vol.-% of reading*
Resolution	*0.1 vol.-%*
Sensor	*electro-chemical cell*
Response time (T90)	*≤ 50 sec*

Carbon dioxide (CO2) calculation

Range	*0 ... CO2 max (fuel-specific)*
Accuracy	*± 0.2 vol.-% of reading*
Resolution	*0.1 vol.-%*
Sensor	*calculated from O2 measurement*
Response time (T90)	*≤ 50 sec*

Carbon monoxide (CO) measurement (with H2 compensation)

Range	*0 ... 4.000 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 sec*

Options:

Nitrogen monoxide (NO) measurement

Range	*0 ... 2.000 ppm*
Accuracy	*5 ppm (up to 50 ppm)*

	5% of reading (above 50 ppm)
Resolution	*1 ppm*
Sensor	*electro-chemical cell*
Response time (T90)	*≤ 60 sec*

COhigh measurement (without H2 compensation)

Range	*0 ... 2.0 vol.-% (20.000 ppm)*
Accuracy	*5 % of reading (± 1 digit)*
Resolution	*0.001 vol.-%*
Sensor	*electro-chemical cell*
Response time (T90)	*≤ 60 sec*

SO2-measurement

Range	*0 ... 2.000 ppm*
Accuracy	*10 ppm (up to 200 ppm)*
	5 % of reading (above 200 ppm)
Resolution	*1 ppm*
Sensor	*electro-chemical cell*
Response time (T90)	*≤ 120 sec*

NO2-measurement

Range	*0 ... 200 ppm*
Accuracy	*10 ppm (up to 50 ppm)*
	10 % of reading (above 50 ppm)
Resolution	*1 ppm*
Sensor	*electro-chemical cell*
Response time (T90)	*≤ 120 sec*

7. Calculation formulae (extract)

Calculation of the CO2 value:

$$CO2 = CO2max. * \left(1 - \frac{O2}{21}\right) \text{ in \% Volume}$$

CO2max: Max. CO2-value (fuel-specific) in % Volume.
O2: Measured oxygen content in % Volume.
21: Measured oxygen content in % Volume.

Calculation of the waste gas loss:

$$qA = (T.Gas - T.Air) * \left(\frac{A2}{21 - O2} + B\right) \text{ in \%}$$

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):

$$\text{Lambda} = \frac{CO2max.}{CO2} = \frac{21}{21-O2}$$

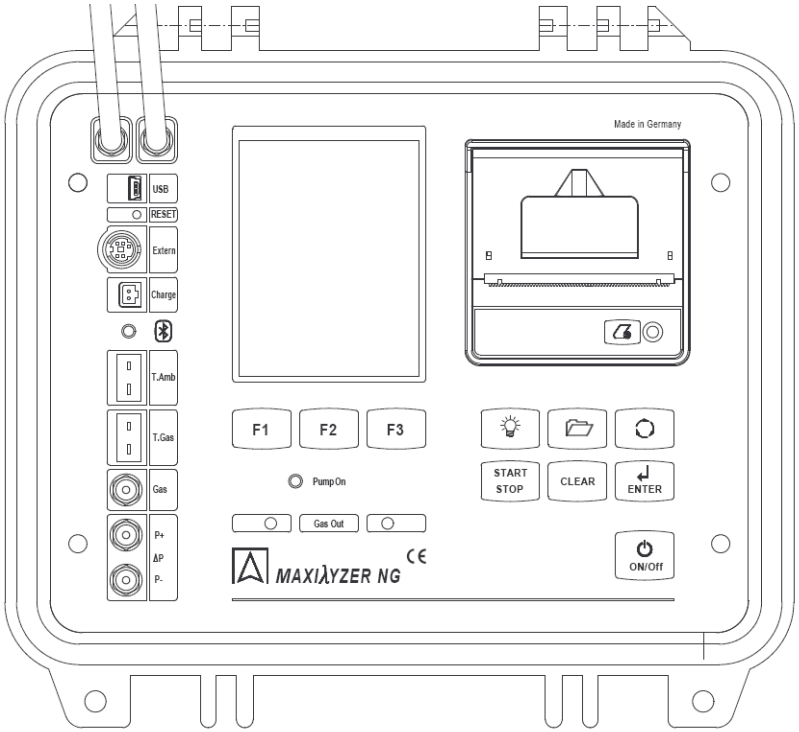
Calculation of the combustion efficiency value (Eta): Eta = 100 - qA in %

Calculation of CO 0% (undiluted): CO und. = CO * Lambda

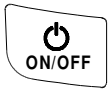
CO und.: content of carbon monoxide, undiluted

CO: reading for CO

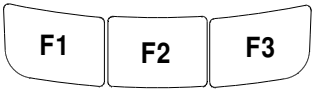
8. Button arrangement



9. Keyboard function

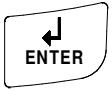


ON/OFF (Shift button)



Function buttons
(register buttons)

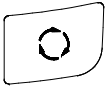
Gas pump ON/OFF



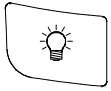
Confirmation button

Change function line

Close/cancel function or programme



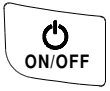
Change alignment of lines
with reading



Backlight ON/OFF

10. User guide

10.1 Programme start menu

Switch on device _____ 

The picture that appears on the screen in the beginning includes information about version, part-no., hours in use, etc.

To keep this picture on the display press the ENTER-button during the starting routine.

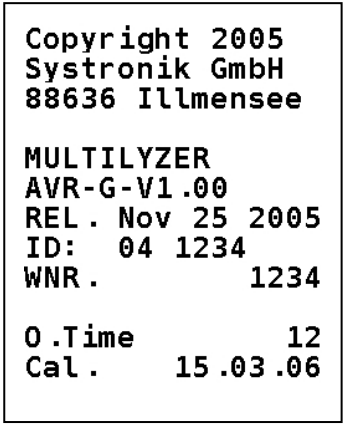
Press the CLEAR-button to close it.

Then the implemented company symbol appears on the display and afterwards the programme starting screen appears.

It is already possible to switch the backlight on/off (press backlight button).

The other buttons have no function at this stage.

Pict 1



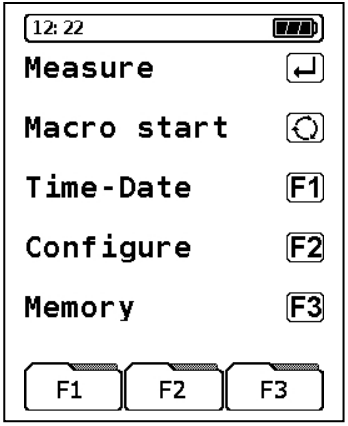
10.1.1 Starting screen

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.

Pict 2



(see p. 16 for explanation)

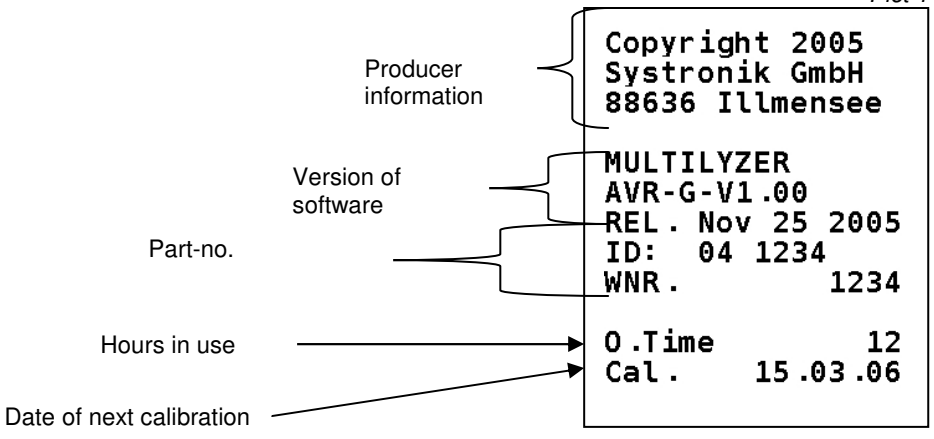
Programme Menu

Out of this menu programmes can be chosen and started.

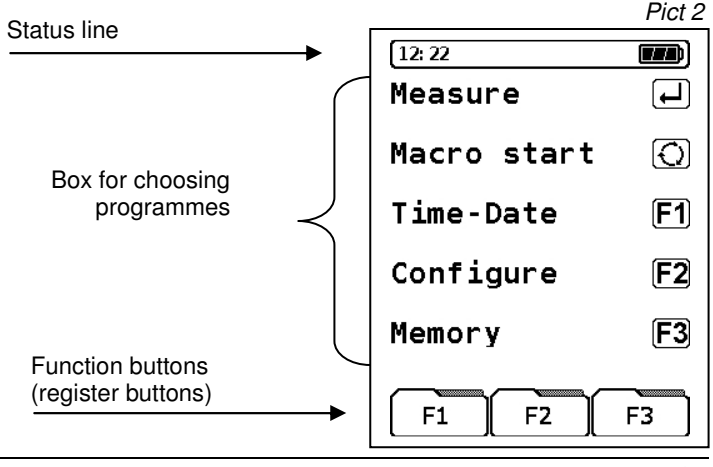
Menu Line

The functions shown on the display can be selected with the register buttons (F-buttons). In some menus the F-buttons have several functions that can be rotated by pressing the button in the centre of the keypad.

Pict 1


Producer information
Version of software
Part-no.
Hours in use
Date of next calibration
Copyright 2005
Systronik GmbH
88636 Illmensee
MULTILYZER
AVR-G-V1.00
REL. Nov 25 2005
ID: 04 1234
WNR. 1234
O.Time 12
Cal. 15.03.06

Pict 2


Status line
Box for choosing programmes
Function buttons (register buttons)
12:22
Measure
Macro start
Time-Date
Configure
Memory
F1
F2
F3
F1
F2
F3

10.1.2 Selecting a programme

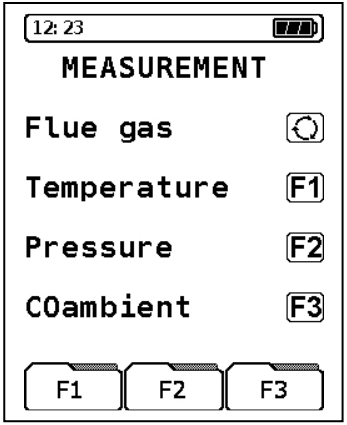
The starting screen enables to select the programmes shown in the following:

Available programmes

Programme „Measure“ _____
(see chapt. 10.2)

ENTER

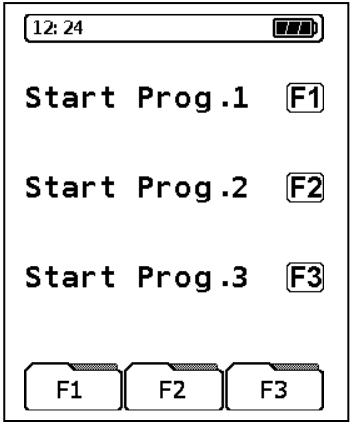
Pict 3



Pict 4

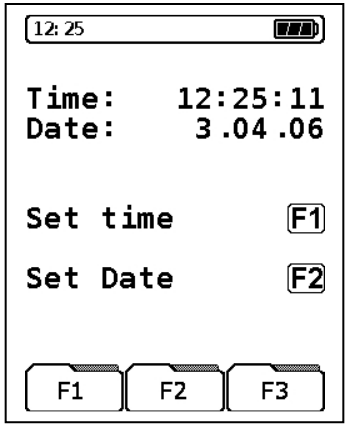
Individual measuring programmes
(programme-macros)

Programme „Macro Start“ _____
(see chapt. 10.3)



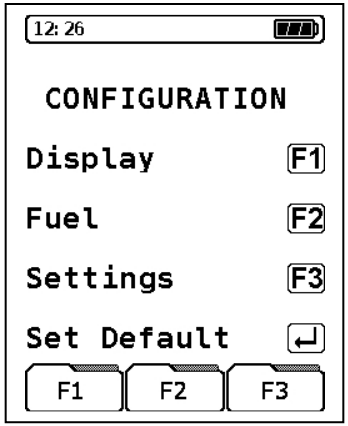
Programme „Time-Date“ _____ F1
(see chapt. 10.4)

Pict 5

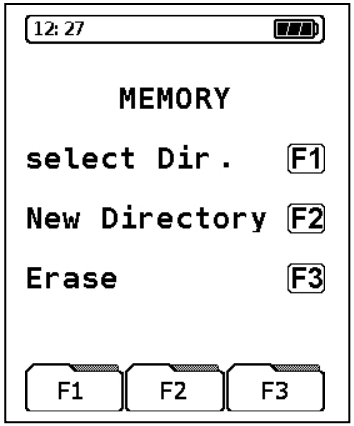


Programme „Configure“ _____ F2
(see chapt. 10.5)

Pict 6



Pict 7



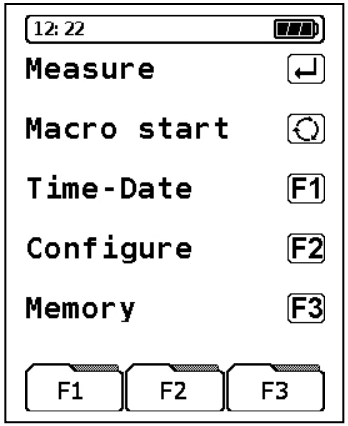
Programme „Memory“ _____ F3
(see chapt. 10.6)

10.2 Programme group „Measure“

The programme „Measure” can be selected out of the starting screen (10.1.1):

Measure _____ ENTER

Pict 2



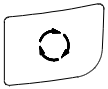
Out of the programme-menu „Measure“ the programmes shown below can be selected:

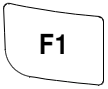
Flue gas _____
(start flue gas programme)

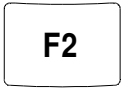
Temperature _____
(start temperature measurement programme)

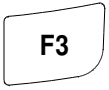
Pressure _____
(start measurement of pressure difference)

CO ambient Measurement _____

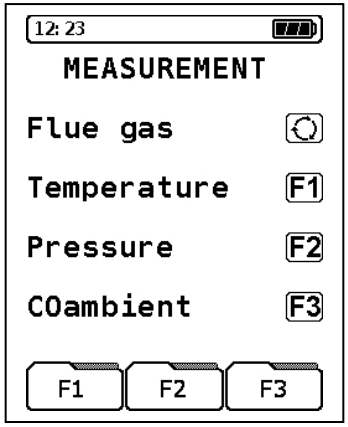






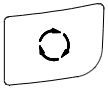


Pict 3



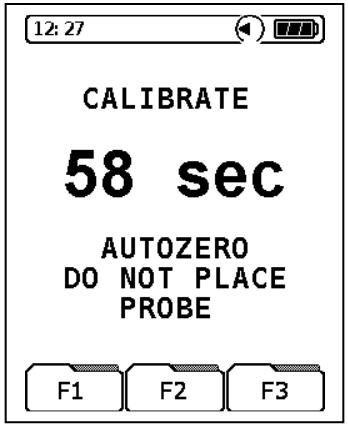
10.2.1 Programme „Flue gas“

Flue gas _____

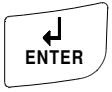


After the calibration the last used fuel appears on the screen. Now either the fuel in the framed box can be chosen or any other fuel. The selected fuel has to be in the framed box.

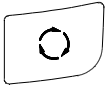
Pict 8



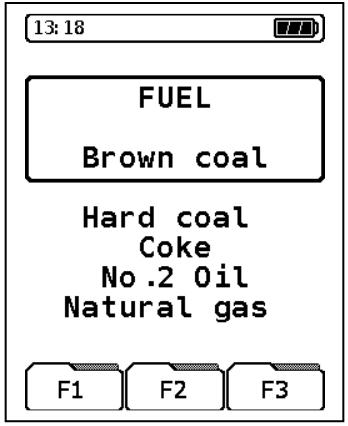
Confirm fuel _____



Select new fuel _____



Pict 9



Note!

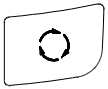
After a cold start the calibration phase takes 60 seconds. If a restart is done out of the measuring programme the calibration phase takes only 10 seconds.

10.2.1.1 Measuring menu “Flue gas”

In the measuring menu the following button combinations are available:

Main buttons

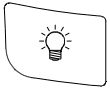
Change the way in which the readings are shown line by line _
(uni directional line change)



Change the layout of the register buttons _____
(new function buttons)

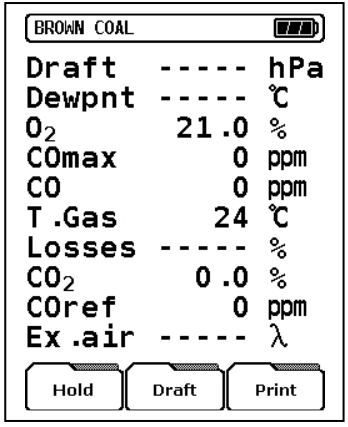
Gas pump (ON/OFF) _____

Backlight (ON/OFF) _____



Reset COmax-value_____

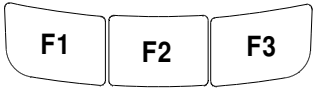
Pict 11

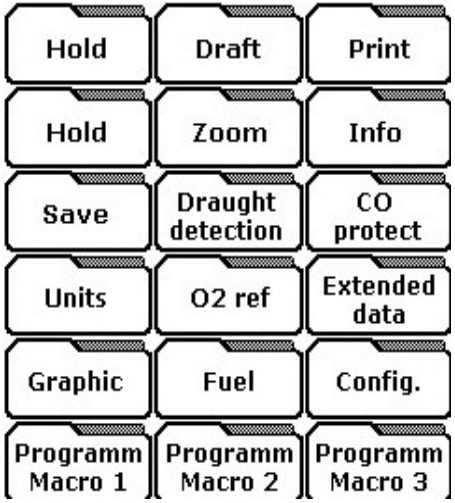


Function buttons

With this keypad additional functions can be activated. In addition to the fixed main buttons there are now three more functions available (depends on the selected function line).

Choose programme function with the register buttons





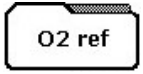
Available function buttons within the measurement menu „Flue gas“.

Button functions and programmes that are linked with the register buttons:

	Hold readings
	Start draft measurement programme (flue-measurement)
	Print readings
	Change layout of readings (5 or 10 lines)
	Start information menu (shows data about fuels and condition of sensors)
	Go to the memory section
	Start main gas flow detection programme

Activate flushing function (manual CO-Sensor protection)

Change units of readings



Change reference value for O2

Enter additional data (enlarge measurement protocol)

Start analysis software (graphic representation of values)

Change fuel (selection of fuels)

Start settings menu (set programme data)

Save measurement combinations as macros

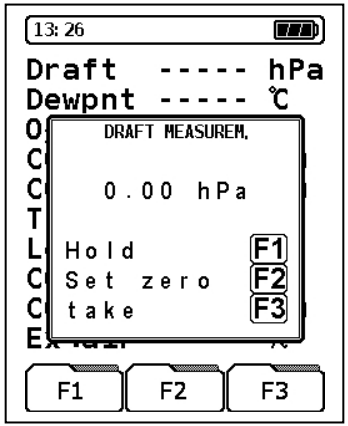
(customised measurement programmes)

10.2.1.2 Extra menu “Draft”

From the flue gas menu:

Draft _____ Start draft measurement

Pict 30



From the draft measurement menu the following functions are available:

Hold reading for draft_____

Carry out zero point calibration _____ F2

Transfer draft value to the_____ F3
flue gas menu

Note!

To determine the zero point in relation to the surrounding air pressure unplug the air tube (with the blue connector) before every draft measurement. Then press the F2 button and connect the air tube again.

Change representation of readings in the main menu _____
line by line (multi-tasking-function)

10.2.1.3 Extra menu „Info“

Out of the flue gas menu:

Info ____ Start Info-Menu

After having started the Info-Menu the most important fuel parameters and the O2-reference value are shown.

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

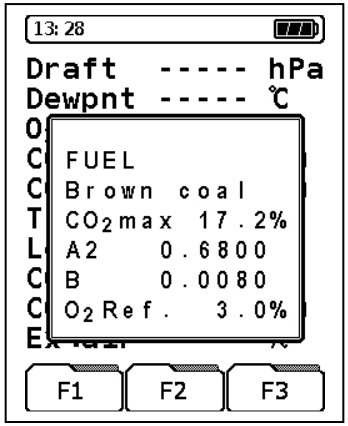
Show current status of the gas sensors

Sensor quick-diagnosis:

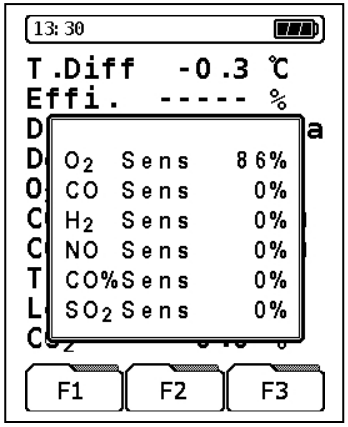
O2-value > 50 %
Oxygen cell OK
CO- and H2-value: 0 to 1 %
CO-sensor with H2-compensation OK)*
CO%-value: 0 to 1 %
CO-sensor for upper range OK)*
NO- and/or SO2-value: 0 to 1%
NO- and/or SO2-value OK)*

**) resp. sensor option disabled*

Pict 27



Pict 28



Note!

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

If so please contact the service point.

Close Info menu _____ CLEAR

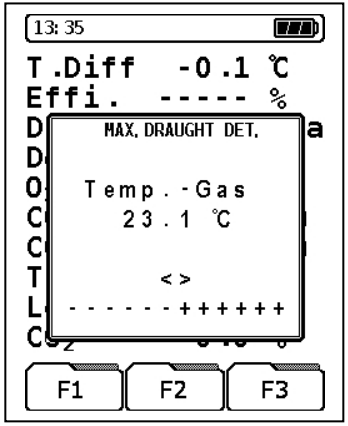
10.2.1.4 Extra menu „Draught detection“

From the flue gas menu:

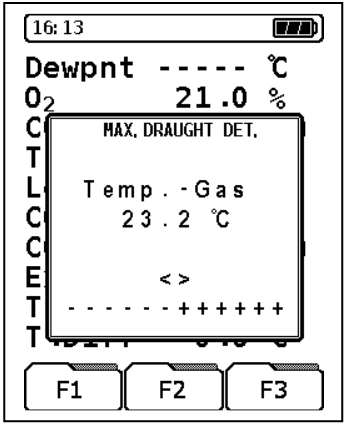
Draught detection _____ Start function „Draught detection“

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.

Pict 31



Pict 32



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

Note!

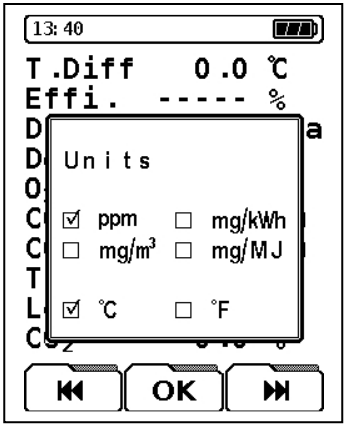
Change representation of readings in the main menu line by line (multi-tasking-function)

10.2.1.5 Extra menu „Units“

Out of the menu „flue gas“:

Units — Start menu „Units“

Pict 35



The required conversion of the units of the gas and temperature sensors can be selected by the function buttons (F1 to F3)

⏮ and/or ⏭ — Move cursor

OK — Confirm selected unit

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

Close menu „units“ _____ CLEAR
and/or cancel operation

Note!

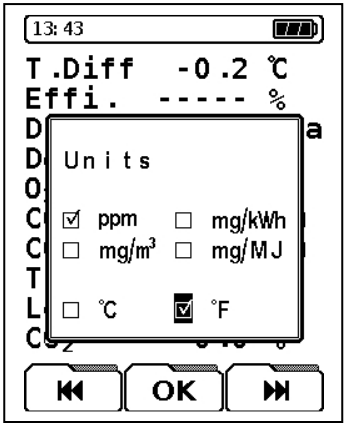
If the unit selection gets cancelled the units used before will be kept.

Accept selected units _____ ENTER

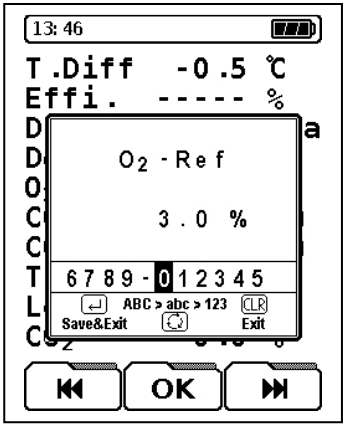
Note!

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.

Pict 36



Pict 38



10.2.1.6 Extra menu „O2-reference“

From the menu „flue gas“:

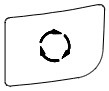
O2 ref _____ Change O2 reference

In order to convert the measured gas values the so called O2 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.

The values are entered by means of an editor that can be used with the buttons F1 to F3.

 and/or  Select figure

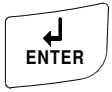
 Confirm

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

Close/cancel input menu „O2 reference“ 

Note!

If the input gets cancelled the “O2 reference value” used before will be kept.

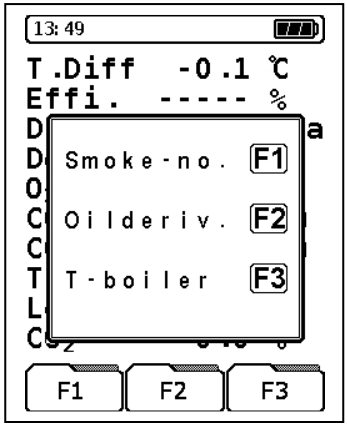
Confirm new „O2 reference value“ 

10.2.1.7 Extra menu „Enter Data“

From the menu „Flue gas“

Extended data ____ Enter extra data

Pict 39



The following data can be entered and transferred to the measurement protocol:

Found out Smoke-no. _____ F1
(soot content according to the Bacharach scale)

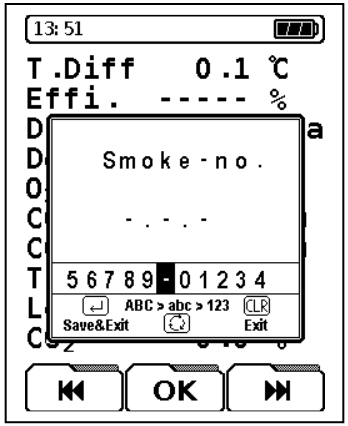
Found out oil derivatives _____ F2

Temperature of boiler and heat carrier_____ F3

Change representation of readings in the main menu _____
line by line (multi-tasking-function)

Smoke-no. input menu

Pict 40



The value that was determined through the mechanical soot pump can be entered by the function buttons F1 to F3.

⏮ and/or ⏭ _____ Select figure

OK _____ Confirm Smoke-no.

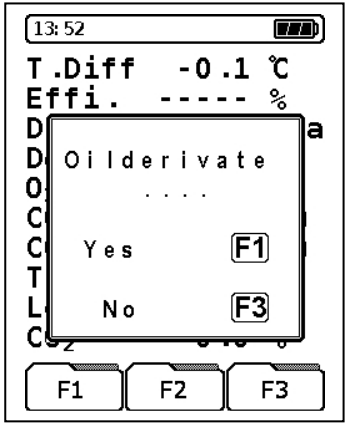
Close input menu_____ CLEAR
without keeping new data

Confirm Smoke-no. input _____ ↵ ENTER
(without transferring data to the measurement protocol)

Oil derivatives input menu

In this menu there is a choice between “Yes” (oil derivatives existent) and “No” (no oil derivatives existent).

Pict 42



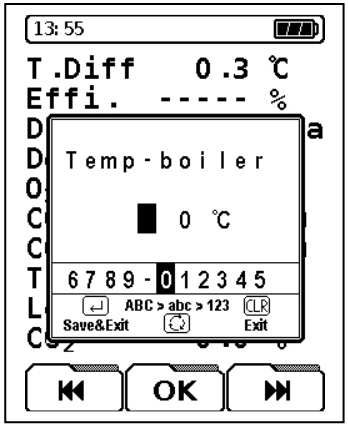
Oil derivatives existent _____ F1

No oil derivatives existent _____ F3

Cancel input _____ CLEAR

Confirm input _____ ENTER

Pict 43



Temperature and heat carrier

The read temperature can be entered through the editor (buttons F1 to F3).

⏮ and/or ⏭ _____ Select figure

OK _____ Confirm input of temperature

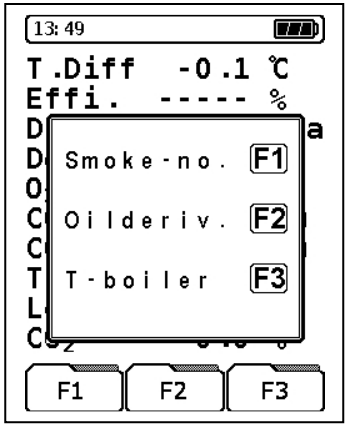
Close input menu _____ CLEAR
without keeping data

Confirm input _____ ENTER
(Transfer data to the measurement protocol)

Change representation of readings in the main menu _____
line by line (multi-tasking-function)

Close input menu for additional data _____ CLEAR

Pict 39

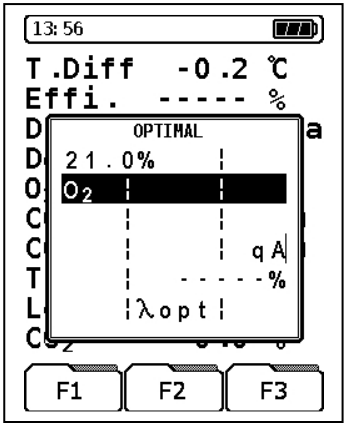


Note!

When the input menu for the additional data (Smoke-no., oil derivatives and boiler temperature) is closed all data that has been confirmed with the ENTER-button so far will be stored in the measurement protocol. Inputs of data that have been cancelled will not be taken account of.

10.2.1.8 Additional menu „Graphic“

Pict 45



From the menu „Flue gas“

Graphic _____ Start combustion graphic menu

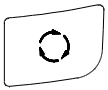
This functions uses graphs to show the numerical values according to the chosen fuel. The remaining content of oxygen (O2) and the calculated waste gas losses (qA) are thereby set in a relation to the excess air value (λ) and to the classical combustion diagram.

Note!

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.

Close graphic menu _____

Change representation of readings in the main menu _____ line by line (multi-tasking-function)



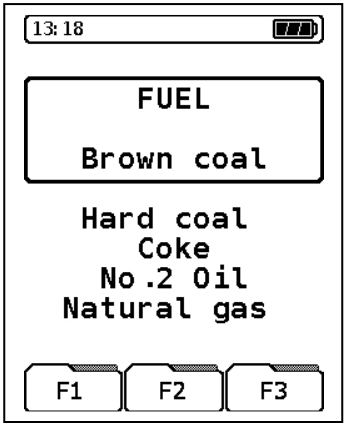
10.2.1.9 „Fuel“ Menu

From the menu “Flue gas”:

Fuel _____ Start menu „Fuel“

Select new fuel _____

Pict 9



Note!

In this menu the required fuel can be selected out of the list of available fuels.
In order to select the new fuel it must appear in the framed box.

Confirm selected fuel_____ ENTER

Cancel_____ CLEAR
(without selecting new fuel)

10.2.1.10 Configurations menu „Config.“

From the menu „Flue gas“:

Config. — Start 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.

The settings shown below can be transferred:

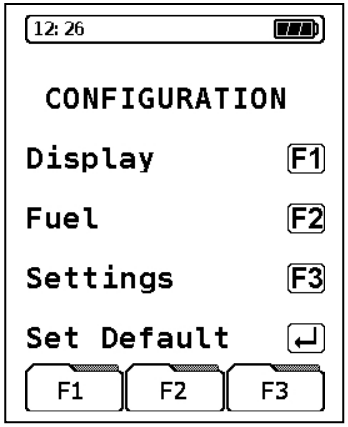
Change order of measured values on the screen — F1

Reduce/expand list of fuels — F2

Change general settings — F3

Restore factory settings — ENTER

Pict 6



10.2.1.10.1 Configuration „Readings“

From the configuration menu:

Start menu „Display" _____ F1

The underline that appears on the screen can be regarded as a “line cursor” that highlights the line to be changed on the display.

⏮ and/or ⏭ _____ Move line cursor upwards or downwards

Move line cursor in one direction _____ ○

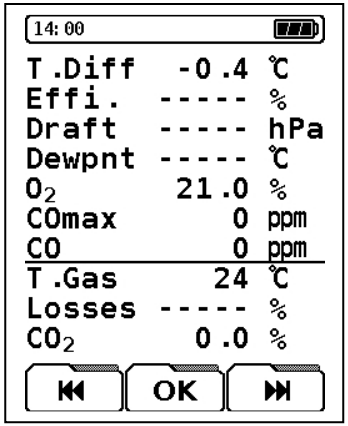
After the required display line is highlighted it has to be activated in order to move it on the display.

OK _____ Activate highlighted display line

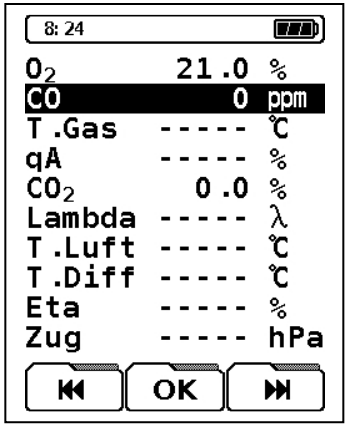
Now the activated line can be moved to the required position.

⏮ and/or ⏭ _____ Move activated line

Pict 48



Pict 49



Move activated line in one direction only _____

OK _____ Confirm position of line

Confirm setting _____ ENTER

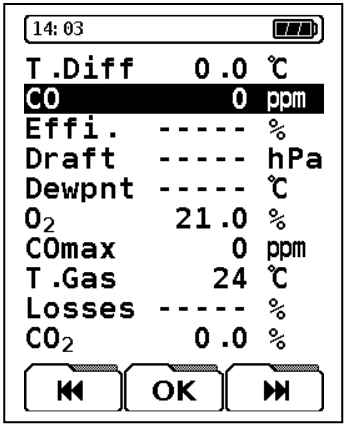
Cancel procedure _____ CLEAR

Note!

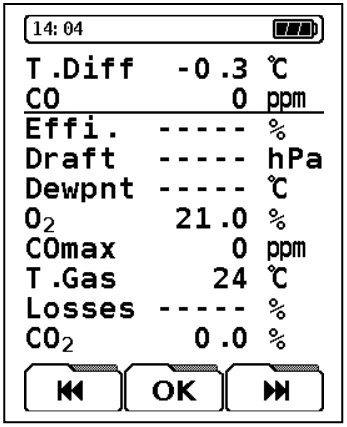
The sequencing of the measured parameters can be altered in an arbitrary way.

The same line can't be displayed more than once.

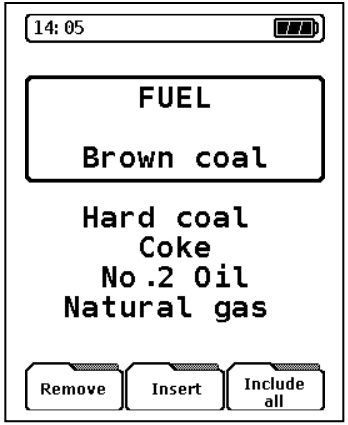
Pict 50



Pict 51



Pict 53



10.2.1.10.2 Configuration „Fuel “

From the configuration menu:

Open list of fuels _____ **F2**

Remove _____ Remove framed fuel from list

Note! The removed fuel can be reactivated later on by opening the complete list of available fuels again.

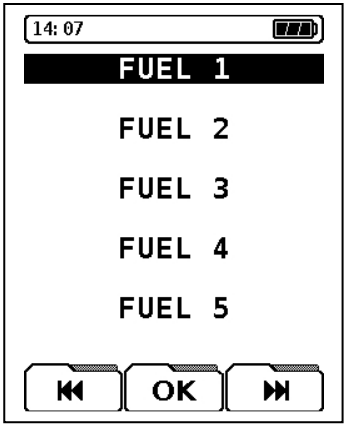
Include all _____ Include all available fuels again

The available list of fuels can be expanded as shown below:

Insert _____ Insert new fuel

Note! There is a maximum of 5 more slots for fuels available that can be parameterised accordingly.

Pict 54



⏮ and/or ⏭ — Move bar cursor upwards or downwards

OK — Confirm selected location of fuel

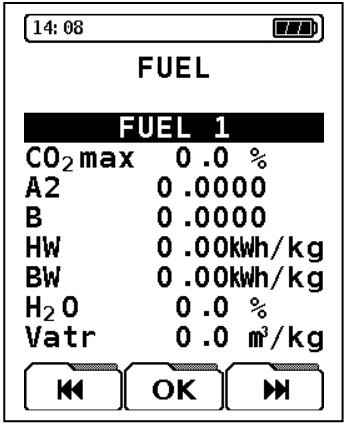
Cancel procedure — CLEAR

Note!

In order to create a new fuel the first three fuel-specific factors (CO2max, 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.

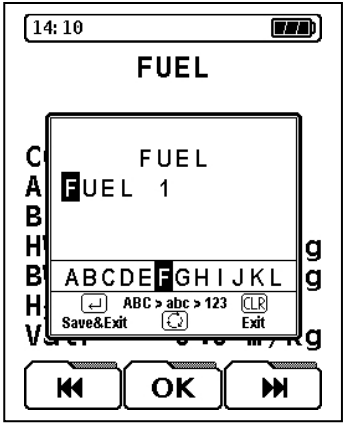
OK — Edit/change name of fuel

Pict 55



HW = heating value without condensation content
BW = heating value with condensation content
H_2O = content of water
Vatr = quantity of flue gas (dry)

Pict 56

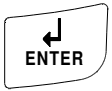


The name of the new fuel can be entered via the editor.

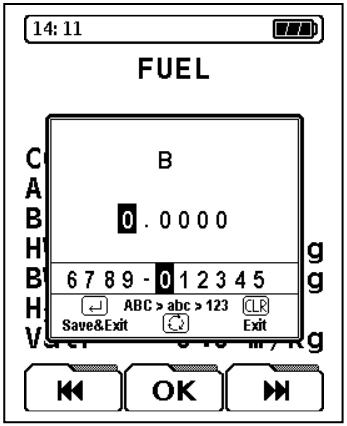
 and/or  Select required character

 Confirm selected character

Pict 58

Finish input 

Cancel input procedure 



Use the same procedure for the input of the fuel specific factors.

Pict 59

10.2.1.10.3 Configuration „Settings“

From the configuration menu:

Start menu „Settings“ _____ F3

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

Select line _____

Note!

The bar cursor can only be moved in one direction.

Pressure / Draft

Here the unit for the pressure and draft measurement within the flue gas measurement programme can be preselected.

 and/or  Select unit

Pict 60

Sound

Switches on/off the sound when a button on the keypad is pressed.

 and/or  Sound Yes/No

Printer

The infrared printer that is used for the proceedings of the readings (print-out) can be selected at this point.
Available printers:
EUROprinter (Euro-Ir) and HP84420B (HP-Ir)

 and/or  Select printer

Pict 67

User address

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

Note!

Unless indicated by a „dot"-character empty lines aren't printed.

and/or _____ Select line for input

OK _____ Activate input

Available editing functions:

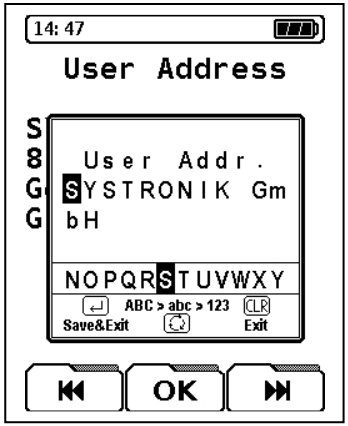
Accept input and close input mask _____ ENTER

Select type of character (minuscules and capital letters, numbers and symbols) _____

Cancel procedure (CLR) (without saving data) _____ CLEAR

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

Pict 68



Automatic

In this configuration menu two time values can be set.

„Auto off“ Time after which the device switches off automatically if no button is pressed.
The auto off time can be set in intervals of 5 minutes.
Maximum: 60 minutes

Note! 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 button.

Attention! This function can cause irritations if the „Auto off“ is forgotten and the device switches off automatically as configured.
Please check the “Auto off” setting.

„Illum. off“ Time interval for the backlight. This can be set in intervals of one second with a maximum length of 30 seconds.

Pict 60

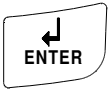
Functions of the buttons in the submenu „AUTOMATIC“:

Decrease time interval

Increase time interval

Cancel input
(without saving settings)

Finish input
and save settings



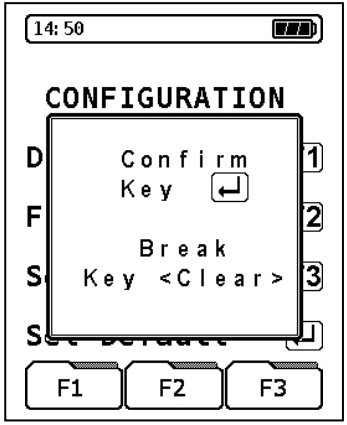
10.2.1.10.4 Configuration „Set Default“

From the configuration menu

Activate „Set Default“ _____ ENTER

This function restores factory settings.

Pict 75



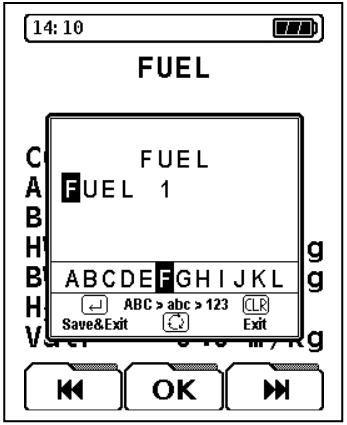
The restoration of the factory settings will cause a lost of all individual settings and can’t be undone!
The data memory is not affected!

Attention!

Confirm „Set Default“ _____ ENTER

Cancel procedure _____ CLEAR

Pict 61



10.2.1.11 Register buttons „Programme Macros“

From the menu „Flue gas“:

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

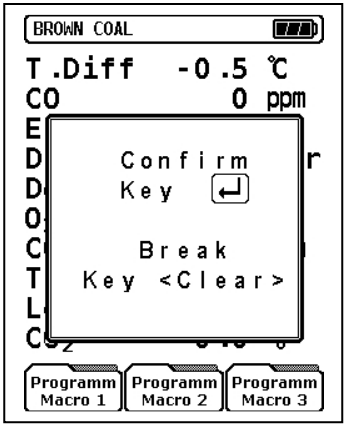
Note!

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

Apart from that the list of available fuels is not shown after the calibration phase.

Pict 62



Programm Macro 1 | Programm Macro 2 | Programm Macro 3 — Save preset measurement configuration as programme macro

Cancel saving procedure — CLEAR

Save macro — ENTER

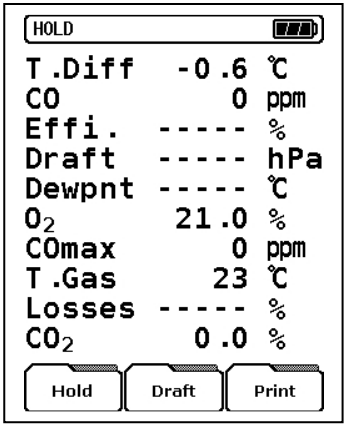
10.2.1.12 Function „HOLD“

The “Hold”-function is used to keep measured data.

If the HOLD-Function is activated all displayed measured data at the time the button was pressed will be kept.

Hold — Keep readings

Pict 11_1



Note!

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).

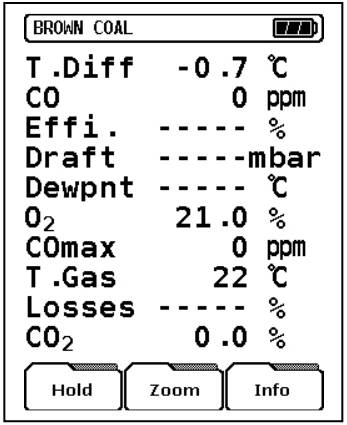
10.2.1.13 Function „Zoom“

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.

Pict 21

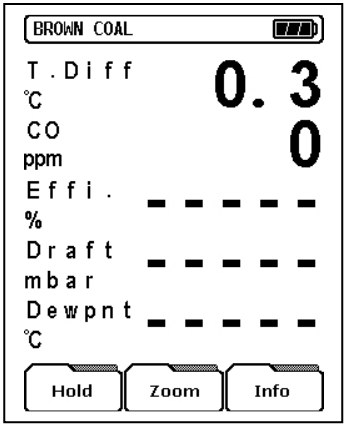


Change layout (5 or 10 lines)

5-lines layout

This layout reduces the number of displayed lines but it facilitates the reading of the display from a bigger distance.
This time measured parameters and units are on the left whereas readings are on the right.

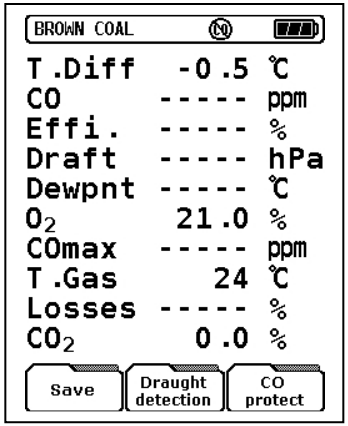
Pict 22



Note!

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.

Pict 33



10.2.1.14 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.

CO protect — Switch ON/OFF CO-flushing-pump

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

Note!

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.

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.

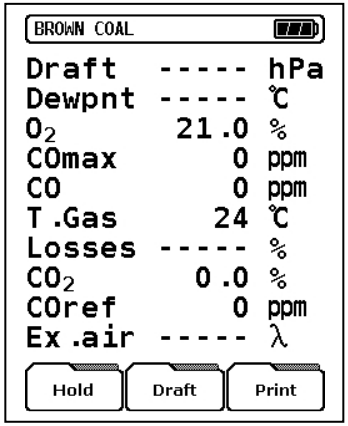
Note!

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

10.2.1.15 Function „Print“

The measured data can be printed out by means of a wireless infrared printer.

Pict 11



Print — Print measured data

The printer in use can be selected from the configuration menu.

Note!

The rate of printing depends mostly on the type of printer selected.
Please activate the correct type to avoid possible failures while printing.

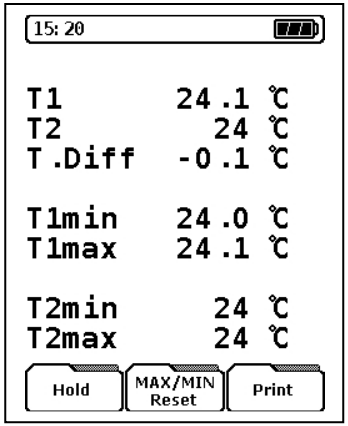
Because of the modern multi-tasking-operating the device can be used without restrictions during the printing procedure. Printing takes place simultaneously to the other operations in order to avoid delays.

10.2.2 Programme „Temperature“

The programme „Temperature“ can be started out of the programme group “Measure” *(see chapt. 10.2)*

Temperature Measurement Programme _____ F1

Pict 69



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.

Hold _____ Keep all temperature readings

MAX/MIN Reset _____ Reset readings

Print _____ Print measurement protocol

Change units (°C or °F) _____

10.2.3 Programme „Pressure“

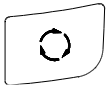
The programme „Pressure“ can be started out of the programme group “Measure” *(see chapt. 10.2)*.

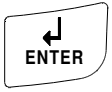
Start pressure measurement programme_____

Hold _____ Keep all readings for pressure

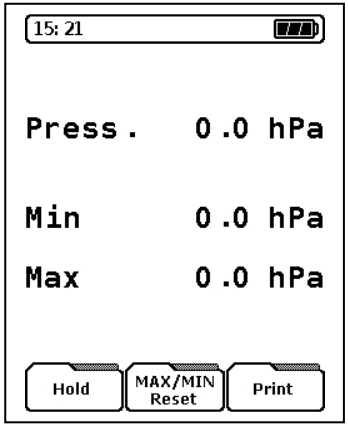
MAX/MIN Reset _____ Reset readings

Print _____ Print measurement protocol

Change units _____ 

Reset to zero _____ 

Pict 72



The units shown below can be selected:

hPa, mbar, mmWC (millimeter water column), mmHg (Millimeter Mercury Column), inWC (Inch Water Column), inHg (Inch Mercury Column), Psi (Pounds Per Square Inch).

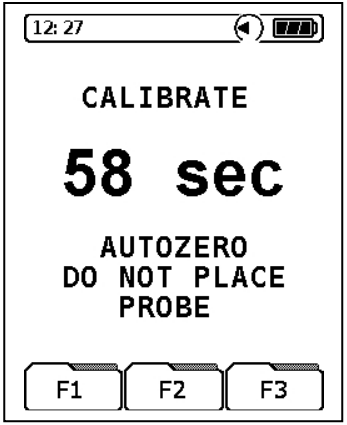
Note!

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

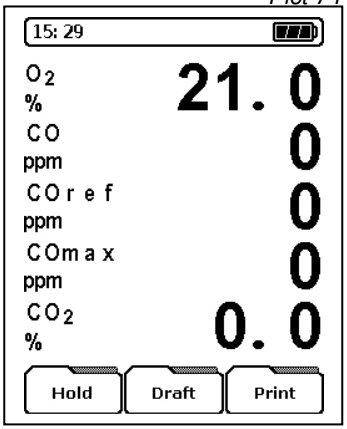
10.2.4 Programme „CO (O2) Measurement“

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.

Pict 8



Pict 74



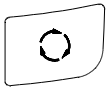
For this measurement programme the same keypad functions apply as described in chapter 10.2.1.1.

Apart from that the number of readings is reduced to five significant flue gas values.
The font size of the readings can be changed with the register buttons (function: “Zoom”).

10.3 Programme Group „Macro Start“

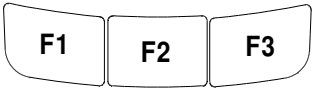
The programme „Macro Start“ can be selected from the starting screen (10.1.1):

The handling of the device can be facilitated enormously by means of customised measuring programme configurations that can be saved as programme-macros. *(see chapt. 10.2.1.11)*
Up to three different and customised macros can be used.

Macro Start _____ 

Note!

Requirement for the use of macros are customised sets of measurement programme settings that can be started in an efficient way (see chapt. 10.2.1.11).

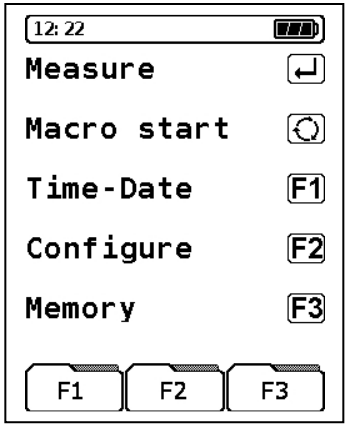
Start required macro _____ 

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 (see chapt. 10.2.1.11 for macro settings).

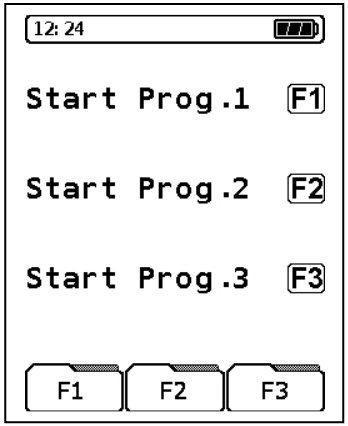
Note!

If a „Confi.-reset“ *(see chapt. 10.2.1.10.4)* is carried out all macro-settings will be lost. Without customised settings the settings for the fuel gas analysis will be used.

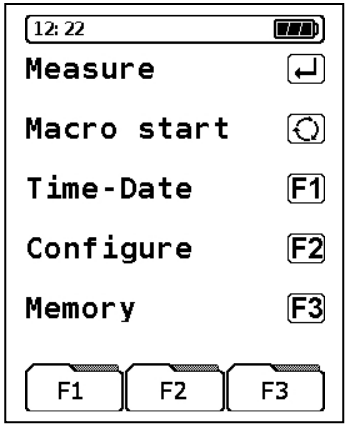
Pict 2

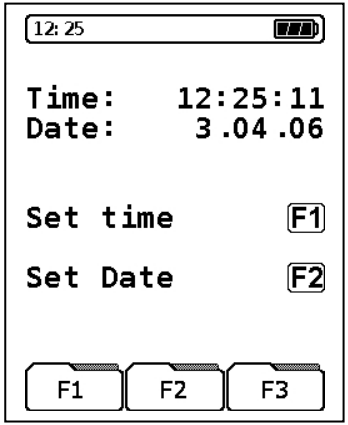


Pict 4



Pict 2





10.4 Programme group „Time-Date“

Choose the programme „Time-Date“ from the starting screen (10.1.1):

The integrated clock (time and date) can be set at every time as shown below:

Time-Date _____ F1

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.

Change/set time _____ F1

Change date _____ F2

Note!

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

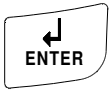
Change time

 and/or  Set new time

 Confirm

Close menu _____
(without setting time)

Confirm time-change _____



Note!

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

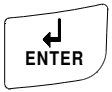
Change date

 and/or  Change date

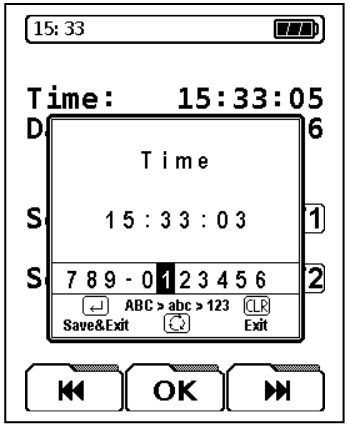
 Confirm input

Close menu _____
(without correcting time)

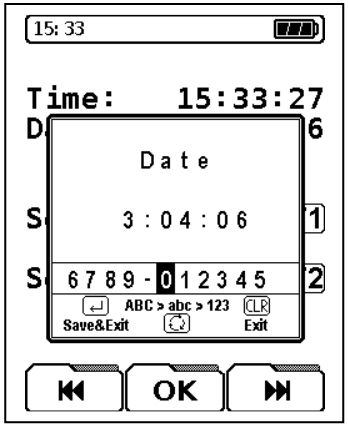
Confirm time _____



Pict 63

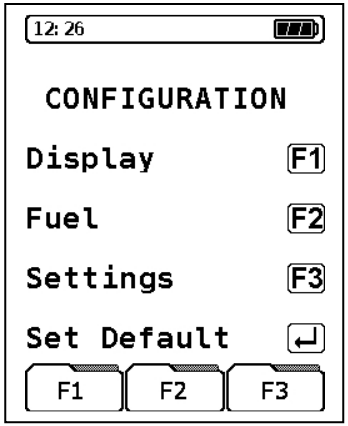


Pict 64



10.5 Programme group „Configure“

Pict 6



Start programme group “Configure” from the starting screen (10.1.1):

Start menu „Configure“ _____ **F2**

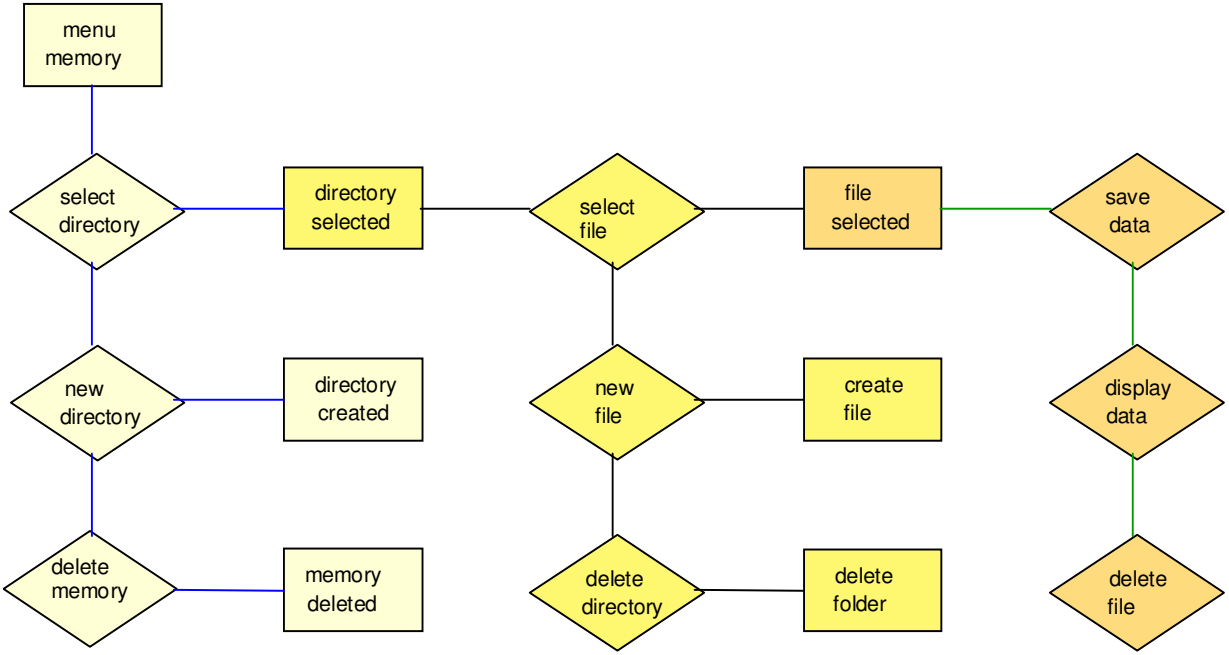
See chapt. 10.2.1.10 configuration menu „Configure“!

Note!

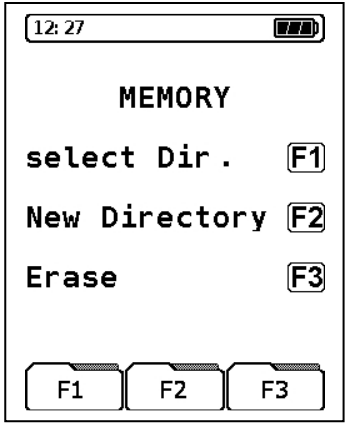
The configuration menu can be started directly after having switched on the device or from the measurement programmes “Flue gas” and “COambient”.

10.6 Programme group „Memory“

Data memory: Menu structure



Pict 7



The data memory is structured according to the menu structure shown above.

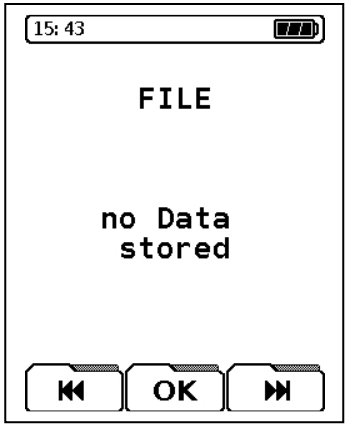
The organisation of the memory is dynamic, i.e. only already existing directories and files are available for saving data.
Additional directories and files can be created at any time.

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.

Note!

New devices are delivered without preset directories and files.

Pict 12

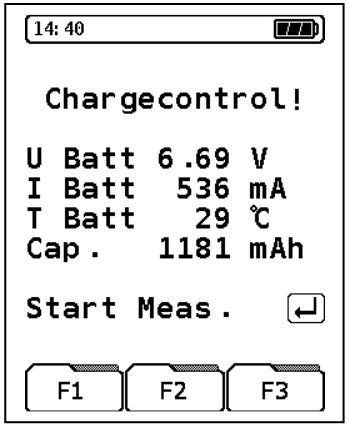


11. Info menu „Charge control“

The batteries are charged automatically when the device is switched on and off after being connected with the device specific recharger. Batteries will be recharged as well when the device is switched on.

During active recharging some parameters related to the battery and the recharging process are displayed on the charge control screen:

Pict 66



U batt. = current voltage
I Bat = current amperage
T Bat = measured battery temperature
Cap. = current battery capacity

Start measurement _____ ENTER

Note!

From the charge control menu measuring can be started immediately without having to interrupt the process of recharging.
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 and the charge control screen disappears.
When (active) recharging is finished the charger can remain connected to the device without damaging the battery.

Note!

The use of non-device-specific or non-authorised chargers is forbidden and can cause damage to the battery and/or the device in the worst case.

12. Maintenance

Waste Gas Cleaning System: see drawing on page 70.

Attention!

Empty the condensate reservoir completely after each measuring operation. Water residues within the measuring instrument will destroy the pumps and sensors!
Damage of the filter and / or improperly fitted filter will greatly decrease or eliminate the filter function and will eventually destroy pumps and sensors.

Check the micro filter for contaminations and replace as necessary.

If the pump capacity is reduced, exchange the diaphragm filter.

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.

Storage: Store in a cool and dry environment at a temperature of approx. 20°C (60 °F).

Damages: ***Guarantee and warranty obligations do not apply to damages caused by improper handling, negligence and grave external influences.***

13. USB-Interface

Connection for special service and data communication via PC, laptop, notebook, etc.

14. Battery / Line Voltage Operation

Battery operation: Maximum of 36 hours of continuous measuring (with backlight).

Battery charger: External Charger 230 V~/50 Hz.
Intelligent monitoring by means of an integrated charge-management-system.

To maintain the service life and performance of the NiNd battery, please observe the instructions 'Information on charging the battery' (see next page).

Information on Charging the Battery

MAXILYZER is equipped with an NiCd 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 service life of the NiCd battery can be significantly reduced when the instrument is operated at temperatures below 5°C (40 °F).

The graphic charge-level indicator of the MAXILYZER NG (consisting of 5 elements of a battery symbol) helps the user to estimate correctly the capacity of the battery.
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.

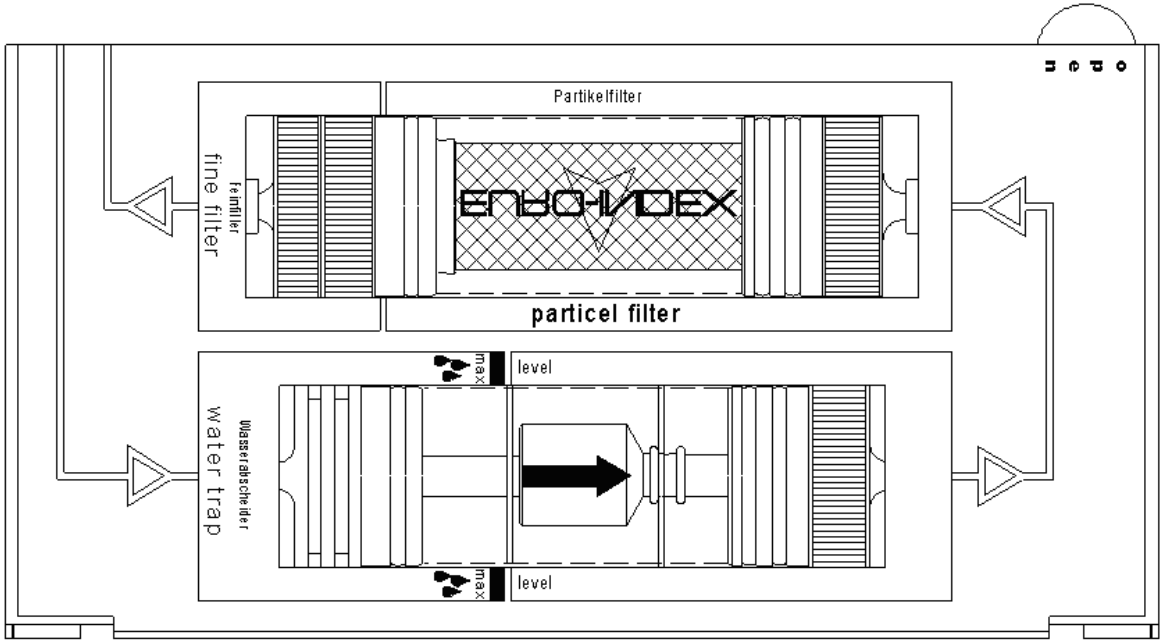
If the device is used outside the permitted temperature range, if the battery is quite old or if incomplete charging cycles (charging/discharging) are carried out the charge-level indicator can possibly not show the true charge-level anymore.

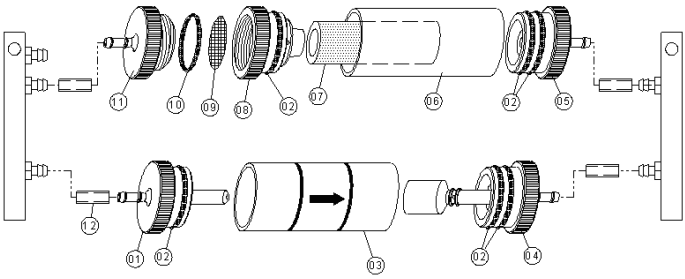
In this case the indicator can be corrected as explained in the following:
Discharge batteries by switching on the device until it runs out of battery power and switches off automatically. Now connect the device to the charger and start the charging function (recharging completely takes approx. 5 hours, depending on surrounding temperature). After having finished active recharging the MAXILYZER NG switches off automatically. This so called “reconditioning cycle” can be repeated as necessary.

Used or dead Battery

For replacement of a used or dead battery, the analyser has to be sent back to the supplier / manufacturer.

15. Watertrap





Replacement and spare parts	part-no.
01 Inlet piece	20594
02 O-Ring 23 x 2 mm	20370
03 Glass piston with arrow mark	20596
04 Outlet piece with cylinder	22017
05 Outlet piece middle	21954
06 Glass piston with logo	20595
07 Infiltec mirco filter	20919
08 Connection piece	20592
09 Teflon membran 23,5 mm	20921
11 Outlet piece	20591
12 Silikon tube 3x2 mm	20636

Maintenance / Care

- Empty condensate trap after use.
- Check micro filter for cntamination, replace if required.
- Exchange teflon membran filter in case of degrading pump flow.
  If damaged or inserted improdperly, the filtering function will be lost!
- Grease all O-Rings with vaseline or silicongrease as required!

Important notice concerning measurement of SO2 and NO2 (option)

SO2 and NO2 gases have a high solubility in water. For measurement of SO2 and NO2 concentrations it is therefore necessary to remove the condensate residues form the gas filtration and drying system. These residues can absorb SO2 and NO2 which could cause measurement deviations.

Furthermore, when carrying out SO2 and NO2 relevant measurements no additional desiccant should be used. Even when it is dry this filter material can absorb significant parts of the SO2 and NO2 content.

bluegiga
TECHNOLOGIES

Declaration of Conformity

Product type: WT12-A Bluetooth Module

Manufacturer: Bluegiga Technologies Oy

Application of Council Directive: 73/23/EEC on the harmonization of laws related to Member States relating to electrical equipment designed for use within certain voltage limits, as amended by: Council Directive 93/68/EEC and Council Directive 89/336/EEC on the approximation of the laws related to Member States relating to electromagnetic compatibility, as amended by: Council Directive 93/68/EEC.

Referenced EMC Standards:
ETSI EN 300 328-1 v1.3.1.(2001-12)
ETSI EN 300 328-2 v1.2.1 (2001-12)

Electromagnetic emission
- EN 301 489-17 v1.2.1:
  - o EN 55022 (1998): Cont. conducted (Class B)
  - o EN 55022 (1998): Radiated (Class B)

Electromagnetic immunity
- EN 301 489-17 v1.2.1:
  - o EN 61000-4-2 (1995): ESD
  - o EN 61000-4-3 (1996): EM Radiated field of RF

I, the undersigned, herby declare that the equipment specified above conforms to the above Directives and Standards.

Mikael Björkas
VP, Production

March 30th, 2006

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TCB

GRANT OF EQUIPMENT AUTHORIZATION

TCB

Certification

Issued Under the Authority of the

Federal Communications Commission

By:

EMCCert Dr. Rasek GmbH
Boelwiese 5
D-91320 Ebermannstadt,
Germany

Date of Grant: 04/10/2006

Application Dated: 04/10/2006

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: QOQWT12
Name of Grantee: BlueGiga Technologies Inc.
Equipment Class: Part 15 Spread Spectrum Transmitter
Notes: Bluetooth Module

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.00222		

Modular Approval. Power output listed is conducted. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

17. Notes

SYSTRONIK

Messtechnologie

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