Operating Instructions

BIOLYT

Multi component
NDIR Gas Analyzer

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1. Safety Instructions

Please observe the following instructions for your own safety!

Essential requirements for the safe and error-free operation of the BIOLYT are the orderly transport and storage of the equipment, proper installation and commissioning, as well as operation and maintenance in compliance with this description and with the due degree of care.

1.1. Safe Working with Gas

- Unless special safety precautions are taken, the BIOLYT is not suitable for the measurement of combustible (explosive) gas mixtures or gases that may combine with the surrounding air to form a combustible gas compound. Possible safety precautions applying to the measurement of combustible gases include flushing the housing with inert gas, for example, or using flame arresters.
- It is absolutely essential to avoid the occurrence of condensation inside the gas path of the BIOLYT; otherwise, the measuring system will be rendered useless. Should the measuring gas contain condensible components, then the BIOLYT must be preceded by an appro-priate measuring-gas conditioning system in order to preclude the possibility of condensate entering the instrument.

1.2. Electrical Safety

- The instrument must be disconnected from the power supply before being opened for adjustment, maintenance or repair work.
- If the instrument is required to be under electrical tension during adjustment or maintenance work, then the work may be carried out only by trained personnel familiar with the potential hazards of the instrument as well as its operation and maintenance. The personnel must be in possession of appropriate qualifications for the tasks performed.

- Strictly obey any safety regulations marked with **"Caution"** in these operating instructions! Failure to comply with these safety specifications may result in fatal accidents, bodily harm or damage to the instrument.

- If hazard-free operation of the instrument can no longer be assumed, immediately remove the instrument from service and and secure it against unauthorized startup.

Application and description

The BIOLYT is a NDIR industrial photometer allowing the continuous measurement of single-component concentrations in gases or vapours.

The BIOLYT has one infrared measuring channel and one paramagnetc oxygen sensor.
An analog output is available for both channels.

The analyzer units, the pneumatic assemblies and the electronic assemblies are accommodated in a case made of sheet aluminium. The LC- display, operating keys, one micro-filter and one flow meter are mounted on the front panel. The gas connecting fittings and electrical terminals are located on the rear panel.

2. Installation and Assembly

Caution ! **The gas connection nozzles must be fitted with seals. Removal of the seals is permissible only directly before connecting the gas lines.**

2.1. Scope of Delivery

The following accessory and replacement parts are supplied with the instrument:

- 1 power cable with two-pole and earthing-pin plug
- 2 connectors (for analogue output)
- 1 set of spare fuses

2.2. Place of Installation

The place of installation should be as close as possible to the measurement site.

- The gas-conditioning system and test-gas bottles, if any, should likewise be installed in the vicinity of the gas analyzer.
- The installation site must be dry and frost-free.
- The analyzer must be shielded against direct sunlight as well as any other source of thermal radiation.
- The analyzer must be protected from water precipitation (condensation).
- Ensure that the permissible ambient temperature (+5...+45°C) is complied with always.
- The installation site must be vibration-free.
- Sufficient air-circulation around the analyzer must be assured. Avoid heat congestion.

Caution ! **Never operate the BIOLYT in potentially explosive areas.**

2.3. Instrument Installation

The BIOLYT can be fitted in the usual manner in a 19" rack or ap-propriate housing. Slide-in rails must be used for the fitting.

The instrument must be inserted or placed in position horizontally.

If installing the instrument as a desk-top model, ensure that it is placed on a stable, level surface.

If the instrument is fitted inside an over-case, note that the temperature inside the over-case must comply with the permissible ambient temperature.

2.4. Measuring-Gas Conditioning

Disturbance-free, low-maintenance measuring with good results is possible only with a correctly installed overall measuring installation. These conditions are guaranteed primarily by the provision of efficient measuring-gas conditioning facilities. The careful installation of the conditioning equipment and the correct choice of gas-removal point is as important for the measuring quality as the analyzer itself (see Fig. 1).

Please comply with the following instructions:

- The measuring gas must be homogeneously mixed at the removal point. If strands form, the most favourable removal point must be determined by trials.
- Dust-laden measuring gases must be passed through an external dust filter (coarse filter) before removal in order to minimize the pollution of the measuring system.
- Condensation in the measuring-gas line must be counteracted by installation of a condensate separator at the lowest point in the measuring-gas line and if necessary by usage of a measuring-gas cooler.
- Test gases used for calibration should be fed to the gas supply line by means of a suitable reversing valve. Improved accuracy will be obtained if the test gases are passed through the measuring-gas conditioning system in the same way as the measuring gas.
- The pre-treatment of the measuring gas by de-condensation and cooling must be such that under no circumstances can condensation develop inside the analyzer. Otherwise the instrument will be rendered useless.

2.5. Gas Connection Fittings

- Gas connection fittings on housing back panel: threaded hose coupling DN 4/6

  Measuring gas INPUT : input for measuring gas

  Gas OUTPUT : output for measuring gas

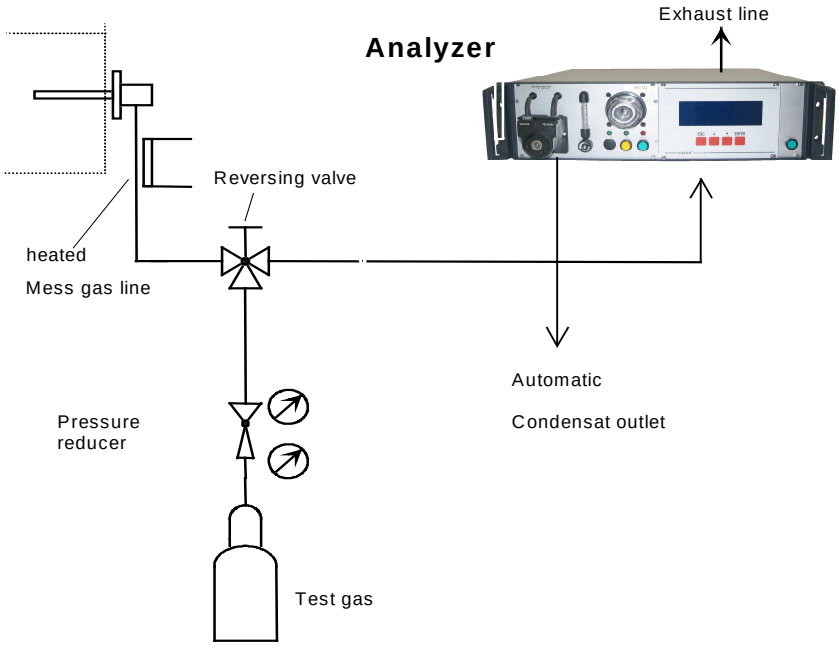
  Zero INPUT : input for zero gas

  Cal gas INPUT ; input for cal. Gas for CO2 and O2 and input for zero O2

  Condesat : output for condensat

- Before connecting the measuring-gas lines, check whether the measuring gas is liable to corrode the materials used in the measuring-gas path (see Specifications for materials).
- Keep flow rate constant at 20 - 100 l/h during operation.
- Without built-in pump: apply measuring gas with gauge pressure < 20 kPa to measuring-gas inlet.
- With built-in pump: the pump will deliver approx. maximum 120 dm3/h at 10 kPa partial vacuum (suction pressure).
- Direct the waste gas into the atmosphere or into a waste-gas line directly or via a large-diameter line which must be kept as short as possible.
- There must be no considerable pressure fluctuations at the test-gas outlet, nor is it permissible for counterpressure to build up.
- To regulate the flow, always install regulating valves in front of the measuring-gas inlet.
- If using instruments with flowing reference gas, supply and remove the reference gas in the same manner as the measuring gas.

Fig. 2:
Measuring-gas conditioning



2.6. Measuring-Signal Outputs

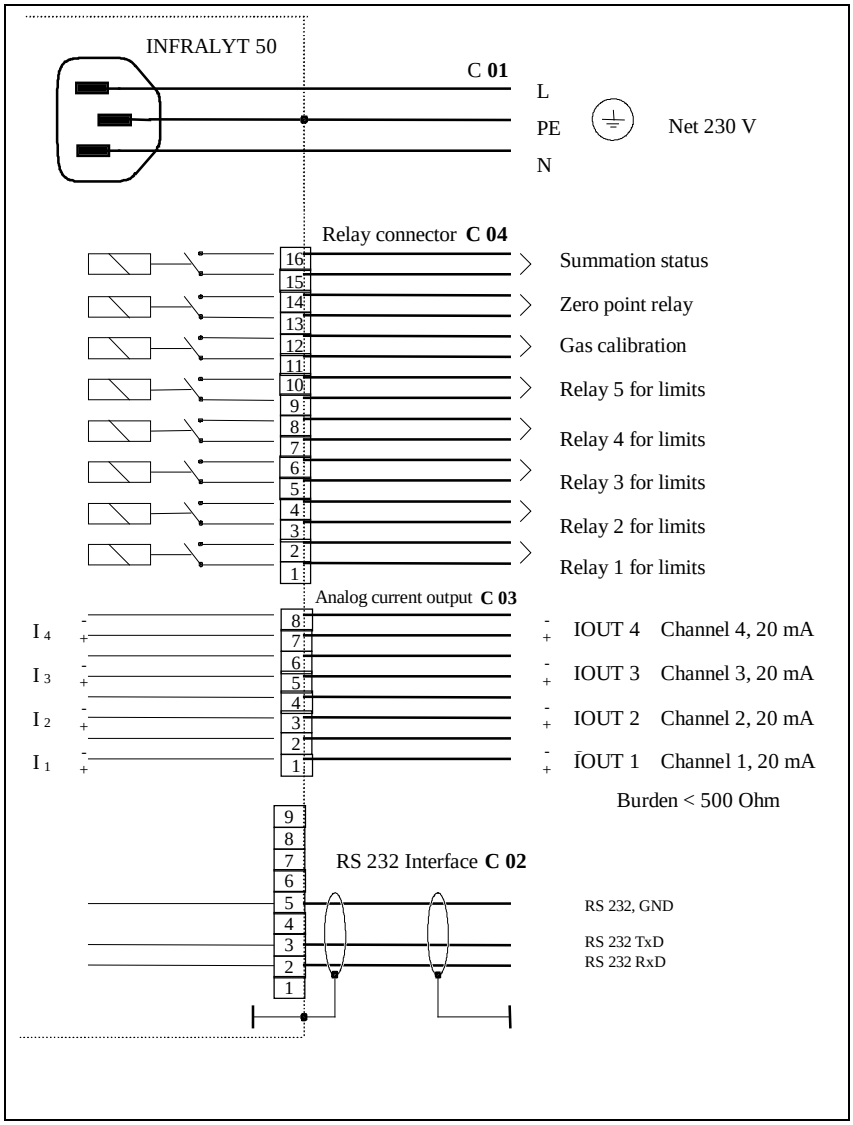
There are 2 analog measuring-signal outputs. The current range is factory-set to 0...20 mA. The maximum burden per measuring-channel output is 500 Ohm and may not be exceeded even if several instruments are connec-ted in series. The measuring outputs are floating.

The RS 232 C interface can be used by a higher-ranking system or service computer to interrogate measured values or trigger balance procedures. The interface can supply signals for maximum 8 components.

Connect the signals lines with shielded cabling to the 8-pin plug-in connectors supplied. Connect the cable shield to earth potential. Insert the plug-in connector into the identical-pole connector C 03 on the instrument back panel.

Connect the interface line with shielded cable (max. length 15 m) to the 9-pin subminiature Cannon connector supplied. Connect the cable shield to earth potential. Insert the plug-in connector in the identical-pole connector C 02 on the instrument back panel.

Fig. 2:
Terminal diagram BIOLYT



2.7. Status-Signal Outputs

Instrument status signals and alarm-threshold signals are routed outward via floating relay contacts (female connector C 04). Permissible load per switch contact: max. 10W/ 200VDC/ 0.75A (no value must be exceed).

2.8. Mains Connection

Consult the rating plate for the mains voltage, mains frequency and power consumption of the instrument.

Move power switch to "0" (off).

Insert power cable in jack on back panel and insert in a socket together with the shockproof connector.

Caution ! **Insert the power plug only in a socket with earthing contact.**
The protective conductor must not be interrupted at any point.

3. Commissioning

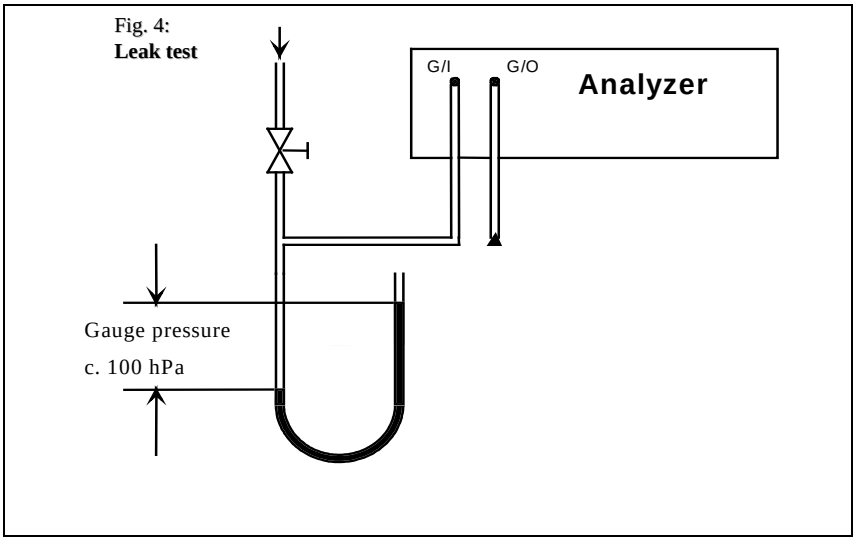
3.1. Leak Test (by hand)

Caution ! **The instrument must be disactivated before the gas paths are tested for leaks.**

Using a T-piece, connect the gas inlet of the analyzer with a U-pipe manometer (c. 1.5 m w.g.) and a cutoff valve (see Fig. 4).
Close the gas outlet of the analyzer with a plug.
By blowing air or nitrogen through the cutoff valve, produce a manometer gauge pressure amounting to c. 100 hPa (1m w.g.) and close cutoff valve.
The water column inside the U-pipe manometer may not fall by more than 50 Pa (5 mm w.g.) within 4 minutes.

A more pronounced water-column reduction indicates the presence of a leak in the gas path; the leak point must be pinpointed by examining individual gas sections.

Fig. 4:
Leak test



Instruments possessing automatic zero calibration must be subjected to the same testing of the zero-gas path. In such a case, leave the measuring-gas inlet and measuring-gas outlet open.

3.2. Operating and Display Elements

Power switch on instrument back panel.
LC- display (four-row, 20-column, backlit). The display shows the measuring results as well as error messages and operating instructions.
In conjunction with the displays and messages on the LC- display, the key-pad is used to operate the instrument and communicate with the analyzer.

Flow meter:
shows the volume stream of measuring gas in the BIOLYT. Addiltional the device has a electronical monitoring of the flow

Sight filter:
shows the degree of contamination. After discolor the filter paper is to change.

Display contrast:
During the warm up time there is the possibility to adjust the contrast through press the keys ↑ and ↓ simultaneous. Default value is 128. Decreasing/increasing can be done via the named keys. Back with both keys simultaneously again.

3.3. Switching On Instrument / Warm-Up Phase

Before switching on the instrument, make sure that the operating voltage set on the analyzer matches the mains voltage ! **Caution !**

Before switching on the instrument with the power switch on the back panel, wait until the instrument has warmed up to the room temperature. Otherwise condensation may form inside the apparatus.

The active status is indicated by the message "Warm-up time running" on the LC- display.

The instrument moves into measuring mode automatically.

The cooler works independently. The cooler is switch on with the key “power”. The pump is switching on with the key “pump”. Before switching on the pump the LED “cooler o.K” must be on and the LED “cooler error” must

be switch off. You find more information about the cooler in the manual JKD744.

Check calibration and if necessary carry out calibration (see Chapter 5)

4. Operation

4.1. Measure mode

After the BIOLYT is switched on, it appears for 5 seconds the message of current version for optical bench und program:

BIOLYT
Progr. version 1.xx xx
Optical version xxx

During the following warm-up-time the display of measuring values is blocked with the message:

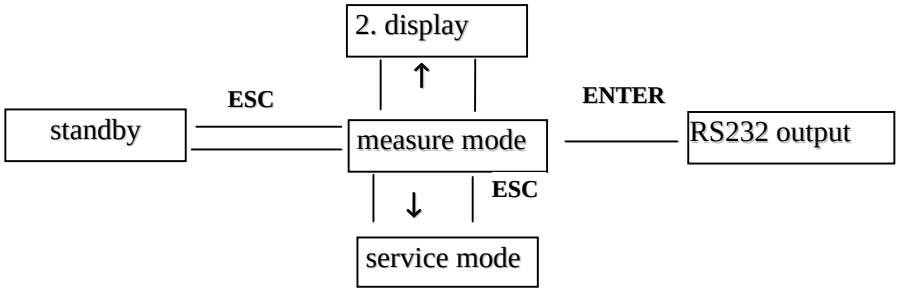
BIOLYT
Remaining warm-up time
x.xx min

Following this, the instrument switches automatically to measuring mode and displays the measured values.
Warm up time takes normally 60 min (possible from 10 up to 180 min) and 2 min if the device is off for a short time (max. 2 min).

If installed and activated, automatic nulling takes place for the first time directly after expiry of the warm-up time before the instrument switches to measuring mode.

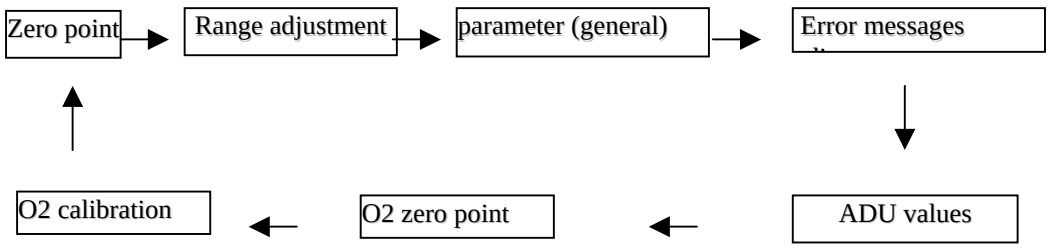
From measuring mode go to standby via ESC. Switching to more gas values (<3) is done by key ↑. Pressing **ENTER** in measuring mode send out a set of current data via interface. Via ↓ the service mode is available.

As the display is four rows long, the measured values for maximum four measuring components can be displayed simultaneously. The unit of measurement applying to each component is shown together with the measured value.



4.2. Service mode

The service mode is generated to adjust several parameters and to calibrate the analyzer. Selection is done by ↑- and ↓- keys.



Return to measuring mode with "ESC".

4.2.1. zero point

Possibility of start zero-adjustment by hand.

4.2.2. range adjustment

see cap. 5.

4.2.3. parameter (generally)

Changing general parameters is free accessible, but it should be done carefully because the function and accuracy could be affected.

-use pump
Possibility of adjustment use pump/don`t use pump

-limit values
Assignment of 8 limit relaies to the gas channels and state.

Attention Max. 5 relaies can be assign to gas channels, relay no. 8 is reserved for state.Relay no. 7 is reserved for the status of zero point. Releay no. 6 is reseveated for the status of gascalibration.

For instance:

relay 1	channel 1	60P	NC
relay 2	channel 1	85P	NO
relay 3			

relay 4

The adjustment of assignment, switching point, and the relay type is to do via Enter key. Relay no 1 und 2 are assign to gas channel 1.
Relay 1 is switching off at exceeding 60% from range. (Relay **N**ormal **C**losed)
Relay 2 is switching on at exceeding 85% from range. (Relay **N**ormal **O**pen).
The target area is between 60%and 85% of range.
Nonexceeding of minimum is shown by relay 1, transgression of maximum by relay 2. Inert target area both relaies are open.

Attention Max. switching power 10W, max. switching voltage 200VDC, max. switching current 0.75A

-analog output
Possibility of adjustment for current (if applicable)
0...20mA oder 4...20mA

-output serial
Output measuring values vai Interface 232 .
ON – continuous serial output , time of output between 1 s and 999sec
OFF - serial output when pressed key ENTER

-flow control
possibility of switching flow control on/off (if applicable)

-rinse times
Zero-adjustment with air: Adjustment rinse time for zero of IR-channels and 20.90%.value oxygen
Zero-adjustment with N_2: Adjustment rinse time for zero oxygen
Gas calibration: adjustment rinse time gas calibration
Warm up time: adjustment warm up time

-zero adjustment
Possibility of adjustment zero automatic
Automatic zero on/off (at **on:** in 60min intrvals zero)
First zeroafter switch on analyser on/off
Switch on meaningful if a zero solenoid valve is available. (s.5.3.)

-variable reset
to reset some values

4.2.4. error messages

If the status of the device is out of order , you see a blinked cursor on the right sight of the display. When you select the error message menu you see the error message.

4.2.5. ADU values

Display of ADC-values of all Gas and reference channels for service purposes and basic adjustment.

4.2.6. Oxygen zero adjustment

The zero point of O2 shuld be done with N2 or with gas without O2. Use the input gas cal. Input. The flushing time is 3 minutes..

4.2.7. Oxygen range adjustment

If the device has a paramagnetic cell you can adjust the O2 range in this menu. The adjustment is done with a pump (fresh air or test gas bottle). Input is the gas cal input.

5. Calibration

5.1. Test Gases

To be able to perform a full calibration, 2 test gases are necessary per measuring range and measuring component:

5.1.1. Test Gas for Zero Calibration

As a general rule, nitrogen can be used as zero gas; in many cases, pure outer air may be employed.

5.1.2. Test Gas for Sensitivity Calibration

Gas mixture composed of zero gas and a known concentration of the measuring components inside the range 70 % .. 90% upper range limit.

You must have a concentration more than 5% of the measuring range to start the gascalibration.

If using a multi-component measuring instrument, a mixed gas may be used if necessary that contains known concentrations of all or several measuring components.

5.2. Test Gas Supply

The test gases should be supplied to the gas analyzer under approximately the same conditions as the measuring gas, i.e.:

- at approximately the same flow rate
- under the same admission pressure as devices without built-in pump (max. 0.2 bar)
- In the case of devices with built-in measuring-gas pump: switch off pump and introduce the test gases with low gauge pressure (20 ... 50 hPa).
- In the case of instruments preceded by gas conditioning (condensate separation, cooler), the test gases should flow through the entire conditioning system - like the measuring gas - before entering the gas analyzer.

5.3. Calibrating Procedure

Depending on the instrument version and measuring application, the BIOLYT can be calibrated in two different ways:

- Manual calibration starting at zero point with zero gas, and sensitivity with suitable test gas.
- Automatic calibration of zero point in preselectable time intervals and manual calibration of sensitivity.

Which of the two methods are appropriate is determined by the measuring application in each case, the measuring components, the instrument equipment and the individual availability of zero and test gas.

5.3.1. Manual Calibration

Zero calibration with zero gas:
At Analyzers with automatic zero calibration admit the zero gas in zero input, at analyzers without automatic zero in measure input.

Start zero calibration.
Admit the zero gas to the BIOLYT and wait for a constant measured-value to be displayed.

The following message is displayed "Remaining flushing time ... sec"

After expiry of the flushing time, the measured values are set automatically to 0.
The flushing time is preselectable in item „service parameter-general“.

Sensitivity calibration with test gas:
Use the gas calibration input for input for the measuring gas.
Before start a range calibration software starts a zero calibration.
At Analyzers with automatic range calibration admit the zero gas in range calibration input, at analyzers without automatic range calibration in measure input.
Start the range calibration with Enter key. After zero calibration pass the test gas through the BIOLYT and wait for a constant value to be displayed.

The display now reads "Remaining flushing time ... sec"

On expiry of the flushing time the ACTUAL VALUE and SET VALUE of the measuring component is displayed.

Change set value to current bottle value via the digit keypad.

Press "ENTER" to conclude the gas calibration.

If more than one measuring components exist, the ACTUAL VALUES and SET VALUES of the measuring component currently in the test gas are displayed.

After adjusting the set values and pressing "ENTER", the display queries whether a further calibration is required.

In such a case, wait for the flushing time to expire and then begin the gas calibration of the next component.

If the test gas is a mixed gas containing the measuring components for which the BIOLYT is foreseen, the instrument recognizes the components automatically and the gas calibration can be confirmed with "ENTER" after the individual set values have been adjusted consecutively.

Following this, exit the calibrating mode by pressing "ESC".

If the query "Gas calibration?" is displayed, press "ESC" to terminate the calibrating mode.

5.3.2. Automatic Calibration of Zero Point

Zero calibration with zero gas:

Supply and connection of zero gas at the zero-gas inlet of the instrument.

Set following parameters at parameter level:

- zero-point flushing time
- zero-point cycle time
- zero-point automatic cycle yes/no

Zero calibration is then performed automatically with the set parameters.

In this case, sensitivity calibration must be performed manually as described under 5.3.1.

6. Maintenance

Caution ! ***Live parts may be exposed when covers are removed. Terminals may be live.***

The instrument must be disconnected from the supply before being opened for repair and maintenance purposes.

If repair or maintenance of the instrument is possible only with the instrument open and still connected to the power supply, then this work may be carried out only by trained personnel who are fully aware of the hazards involved.

Always replace fuses with new fuses of the same type and current rating.

If safe operation of the instrument can no longer be guaranteed, remove it from service and ensure that it cannot be started up accidentally.

6.1. Filter Change

The filter element of the fine-dust filter must be changed whenever it is noticably discoloured and once a month at least. Change the filter element in accordance with the following procedure:

- Slacken union nut on the micro-filter and remove the pressure disk together with the filter membrane.
- Replace spent filter membrane.
- Mount pressure disk with filter membrane and tighten in position with union nut.
- Ensure that sealing ring position is correct and that sealing surfaces are clean.

6.2. Condensate Collector

The condensate collectors of the measuring-gas cooler or condensate separator must be emptied at intervals according to the incidence of condensate.

6.5. Leak Test

The leak test should be performed in accordance with Point 3.1. at 6-month intervals as well as every time work is performed which affects the gas paths.

6.6. Changing Fuses

Switch off power supply to the BIOLYT.

The mains fuses are in the combined "mains plug/power switch" on the instrument back panel.

Fuse ratings:
for 200 ... 240 VAC: 1.0 A

6.7. Optical Equalization

The optical equalization of the IR optical system (or systems) must be performed in the following cases:

- If the zero point has drifted by more than a pre-defined value and the error message "Zero-point error" is displayed.
- Following the removal or fitting of a structural component (radiator, cell) in the optical path.

The optical equalization of the pyrodector optics ensures that the reference signal and measuring signal have the prescribed relation to each other.

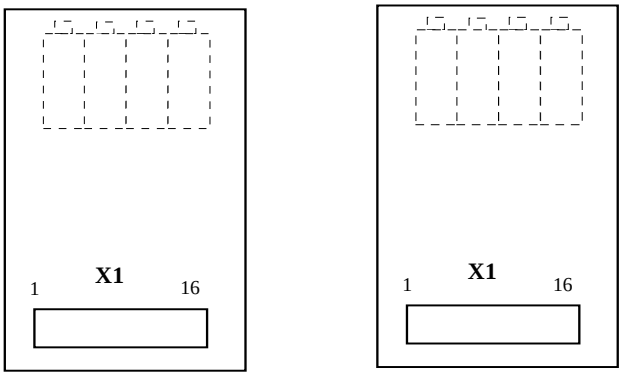
Caution ! This work may be performed by trained personnel only!

Connect zero-point gas

Address analyzer with PC (laptop) and service program via the RS232 interface.

Preamplifier :
potentiometer: (view on preamplifier from preamplifier)

K1 R0 K2 K0 K4 R1 K5 K3



View ADU values of pyrodetector optics (K0...K2 and R0) and (K3...K5 and R1).

When zero gas has been applied and the instrument has warmed up, the ADU values should lie within the ranges below:

measuring channels (K0 ... K2), und (K3...K5)	50 - 1500
reference channels (R0), (R1)	3000 - 3900

Channel K8 and K9 are reserved for non-IR-channels.

Proceed as follows to re-align:

- Open instrument cover for setting purposes (open for shortest possible time in order to minimize disturbance of thermal balance, especially in the case of thermostatically-controlled variants).
- Using the potentiometers on the pre-amplifier (receiver side), set the following values (Reference – normal direction of rotation, measuring channels – reverse direction of rotation!):

measuring channels (K0...K2), und (K3...K5)	700 +/- 100
reference channels (R0), (R1)	3680 +/- 100

- Close instrument cover once more.

6.8. Post-Linearization with Two-Point Calibration

Post-linearization may become necessary if the linearity deviation exceeds the permissible value of +/-2 % of the measuring span. Two test gases for the corresponding measuring range (concentrations: 20...30 % and 80...100 % of the upper limit of effective range) are required for the two-point calibration foreseen for post-linearization.

Caution ! **Two-point calibration can be performed only in service mode via the RS232C interface with a PC (laptop) and associated service program, and should be performed by trained service personnel only.**

6.9. Troubleshooting

This chapter serves the purpose of helping you to trace and eliminate the causes of operating disturbances and malfunctions of the BIOLYT. The listed actions are confined to those which can be quickly carried out by the user without special auxiliary equipment. Should these remedies prove unsuccessful, please contact an after-sales service engineer.

6.9.1. Measured-Data Display Unstable

Possible cause	Information / Remedy
Pressure fluctuation at measuring-gas outlet	Install extra exhaust line for the BIOLYT
Mechanical vibrations	Install instrument in a vibration-free place. If necessary, increase electronic time constant.
Display damping too small for the application	Increase damping if necessary.
Leakage in gas paths	Check sealing (see 3.1.)
Radiator modulation defective (diaphragm wheel scraping)	Remove cell and check diaphragm wheel for uniform running.

6.9.2. Zero Point Not Alignable

Possible cause	Information / Remedy
Measuring cell soiled	- Remove test cell - Clean and blow - dry measuring side - Re-fit measuring cell - Perform optical calibration - Check measuring-gas conditioning system for faults

6.9.3. Measured Value Obviously Incorrect

Possible cause	Information / Remedy
Zero point or sensitivity incorrectly calibrated	Calibrate (see 5.3.) Check test gases
Instruments without pump: Measuring-gas admission pressure is incorrect	Check: max. 0.20 bar
Measuring-gas path leaking	Check for leakages (see 3.1.)
Loss of Data	P46, P41 data file from CD
Measurement output burden excessive	max. 500 Ohm

6.9.4. Sensitivity Calibration Not Possible

Possible cause	Information / Remedy
Incorrect test-gas concentration	Analyze and, if necessary, change test gas
Incorrect calibration	P46, data file from CD
Gas path leaking	Check for leaks (see 3.1.)

6.9.5. ERROR "FLOW"

Possible cause	Information / Remedy
Measuring-gas paths clogged	Check all filters Kinks in tubing ?
Measuring-gas path leaking	Check hose couplings
Instruments with built-in pump: excessive partial vacuum in suction line	Check conditions in gas-conditioning system
Flow sensor defective	Have flow sensor exchanged by after-sales service
Fault in gas supply	Check gas-conditioning system

6.9.6. ERROR "THERMOSTAT DEFECTIVE"

Possible cause	Information / Remedy
Heating-current circuit disr.	Check lines Check ADU-value of thermostat current via command „i“ adu1 for 1.thermostat adu2 für 2. (ok for 11...235)
Temperature controller defec.	Have exchanged by after-sales service

6.9.7. ERROR "RADIATOR CURRENT"

Possible cause	Information / Remedy
Radiator current-circuit interrupted	Check circuit and connections Check ADU-value of radiator current via command „i“ Adu0 for radiator current (o.k.: 1 radiator: 120+/-20 2 radiators: 200+/-30)
Radiator filament defective	Have radiator exchanged by after-sales service
Fault in radiator-current source	Have repaired by after-sales service

6.9.8. ERROR "MODULATION ERROR"

Possible cause	Information / Remedy
Motor not rotating	Check; change motor

6.9.9. ERROR "ZPRAM"

Possible cause	Information / Remedy
Data loss in computer	1.Input new values for test gases 2.Command P46 (load origin calibration values from EEPROM) via PC-service program. 3.Perform a RESET 4.Zero and range calibration

6.9.10. ERROR "EEPROM"

Possible cause	Information / Remedy
Data loss in computer	1.Perform command P41 (programming of parameters from data file) via PC-program. 2.Load LIN-table via command "I" in PC-program. .3Perform commandos P46 (load origin calibration values from EEPROM) 4.Input new values for test gases 5.Perform Perform a RESET 6.Zero and range calibration

6.8.11. ERROR "CHANGE O2 CELL"

Possible cause	Information / Remedy
Power of oxygen cell too low; data loss may result in computer	ADU Value <1650? Than change oxygen cell (see 6.3.)

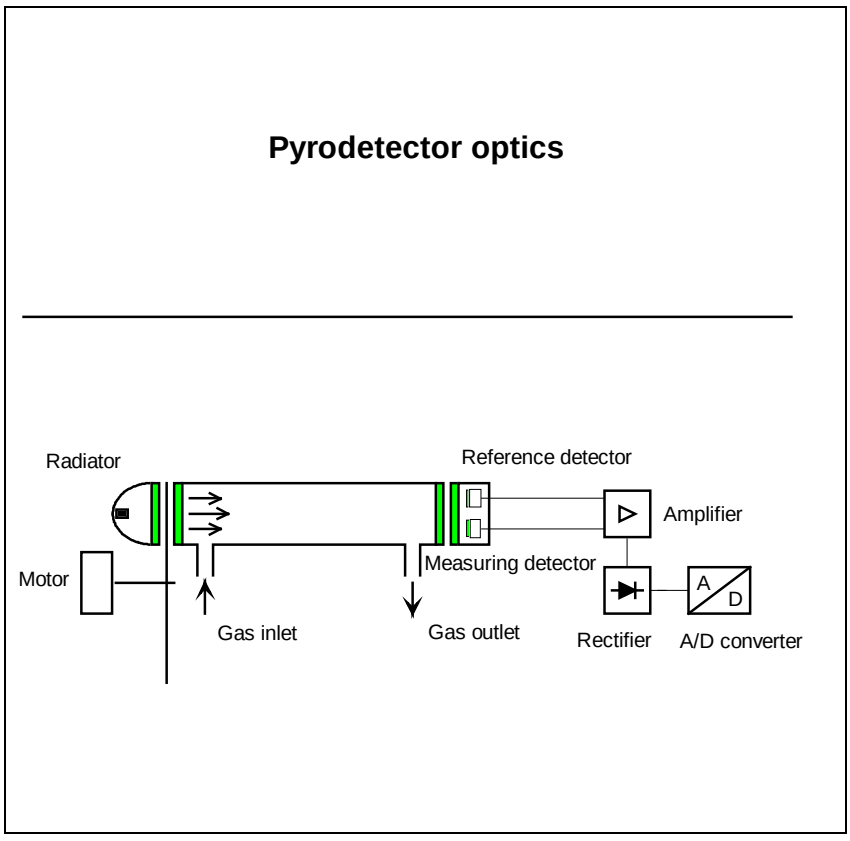
7. Description

7.1. Mode of Operation

The operating mode of the BIOLYT is based on the non-dispersive infrared absorption principle. Polyatomic, non-elementary gases absorb on characteristic wavelengths from 2 to 12 µm.
In compliance with the Lamber-Beer law, absorption is dependent on the extinction coefficients, on the cell length and on the gas concentration.

Figure 5 is a diagrammatic representation of the measuring principle.

Fig. 5:
Operating mode of BIOLYT



The NDIR principle is also the basis for work in the pyrodetector optics (Fig. 5) possibly used for larger measuring ranges or for compensation. Here, the selective treatment of the measuring component is implemented by means of appropriate, selected narrow-band interference filters located in front of the pyroelectric detector. The reference signal employed is that of a separate pyrodetector possessing an interference filter permitting the transmission only of wavelengths that are not influenced by the measuring component. The quotient is formed from the measuring and reference signal, so that influences affecting both signals are eliminated to a first approximation. Here choppering is used to achieve alternating signal processing

7.2. Instrument Structure

The BIOLYT is assembled in a 19" aluminium sheet housing. Near the front panel the optical bench together with circuit boards is placed (Fig. 6).
The four-row LC- display is mounted directly on the front panel, which is also fitted with the keypad, micro-filter and a flow meter (Fig. 7).

The gas connection fittings, the power switch and electrical plug connectors for the signal outputs (analog and digital) are located on the housing back panel (Fig. 8).
The housing is sealed at the top and bottom by cover panels that can be removed by unscrewing the two sets of 2 screws at the instrument back panel.

8. Specifications

8.1. Conditions for Use

Temperature:	+5°C ... 45°C
Rel. humidity:	< 75 % annual mean, 95 % max. 30 days in year, occasional, light dewing permissible.
Air pressure:	760 ... 1160 hPa
Position:	horizontal or at angle of max. 25° in all directions

8.2. Transport and Storage Conditions

Temperature:	-25°C ... +65°C
Max. humidity:	95 % rel. hum.
Max. temp./humid. coupling	30/90

8.3. Influence Errors

Zero-point drift:	≤ 1 % of span per week
Sensitivity:	≤ 1 % of span per week
Linearity deviation:	≤ 2 % of span
Display instability:	≤ +/- 0.5 % of span
Mains voltage influence:	≤ 0.2 % of span in case of supply fluctuations in range of +10 % / -15 % and +/- 2Hz frequency change
Air-pressure influence:	≤ 0.2 % of measured value per10 hPa (in range 760 ... 1160 hPa)
Temperature influence:	≤ 1 % of span / 10K (in range +5°C ... 45°C)
Warm-up time:	60 min

8.4. Measuring-Gas Supply

Measuring gas connections:	Threaded hose coupling DM 4/6 for hose DN 4/6
Measuring gas flow rate:	20 ...100 dm3/h
Permissible measuring-gas pressure:	EXTERNAL GAS CONDITIONING **minimum:** 20 hPa gauge pressure, pump necessary for low pressure. **maximum:** 200 hPa gauge pressure, pressure reducer necessary for higher pressures INTERNAL GAS CONDITIONING -80 ... + 20 hPa
Measuring gas temperature:	+5 ... 45°C

8.5. Measured-Value Output

Measuring signal	**analog:**	0 ... 20 mA / measuring channel, linearized, electrically separated. Adjustable by parameter input: 0 - 20 mA 4 - 20 mA
	digital:	RS232C
Limit values:		2 limits per measuring channel (freely configurable), max. 5 floating limits 10W; 200VDC, 0.75A (no parameter must be crossed!)

8.6. Design and Installation

Type of construction:	19" bay or desk-top unit
Case material:	Aluminium sheeting
Housing dimensions:	see dimension diagram (Fig. 1)
Housing enclosure:	IP 20 to DIN 40050
Type of installation:	Fitting in switchboard or 19" rack, bench model
Mass:	8...10 kg

Materials used in gas-feeding parts:

Test-cell pipe:	Brass, nickel-plated and gold-plated
Cell flange:	AlMgSi0,5
Cell window:	Fluorite CaF2
Test-cell nozzle:	AlMg3
Hose connection fittings, internal:	PVDF
Gas connection fittings, external:	PVDF
Hose connectors:	Fluorelastomer

Further materials according to instrument version

8.7. Electrical Connections

Measuring-signal output:	8-pin Mini-Combicon plug connector MC 1.5/8-ST-3.81
Status, limits:	16-pin Mini-Combicon plug connectorMC 1.5/16-ST-3.81
RS 232 C interface	9-pin subminiature Cannon socket according to DIN 41652
Mains supply	3-pin appliance connector (European-standard connector)

8.8. Power Supply

Mains voltage:	220, 230 V +10/-15 %
Mains frequency:	50 Hz +/-2 %
Power consumption:	60 VA (without thermostat)

9. Warranty Instructions

The „**SAXON**® Junkalor GmbH“ gives a 12 month warranty from the date of sale to the final customer, in accordance with its conditions of delivery applicable on the date of sale.
For some parts of the device the warrenty is only 6 month .

Upon demand, complaints must be sent in writing to the seller, to a workshop authorized by the manufacturer, or to the manufacturer. The invoice serves as proof of the warranty and a copy of it must be enclosed with the written complaint.

If you should tamper with the unit, the warranty will become void.

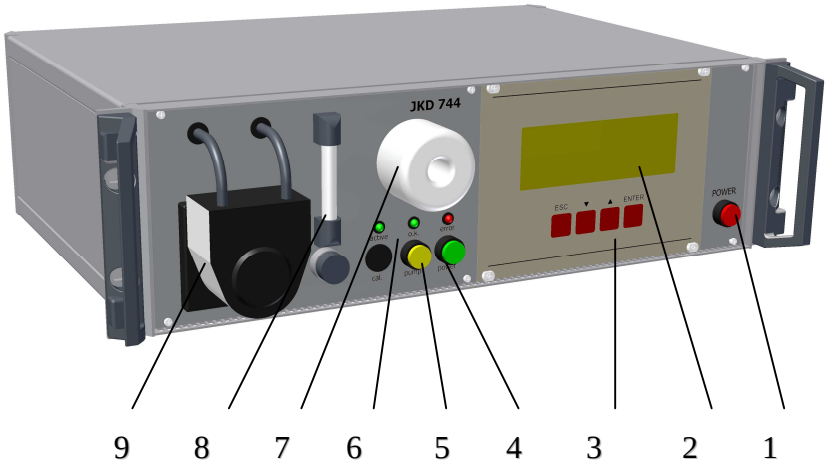
10. Packing and Transport

Prior to the transport and packing of the BIOLYT, provide the gas connection fittings with protective caps or plugs.

Ideally, the instrument should be packed in the original packing materials. If these are no longer available, wrap the instrument in air-blister film sheeting and place in a box of sufficient size which is lined with shock-absorbing material (e.g. foam plastic).

11. Appendix

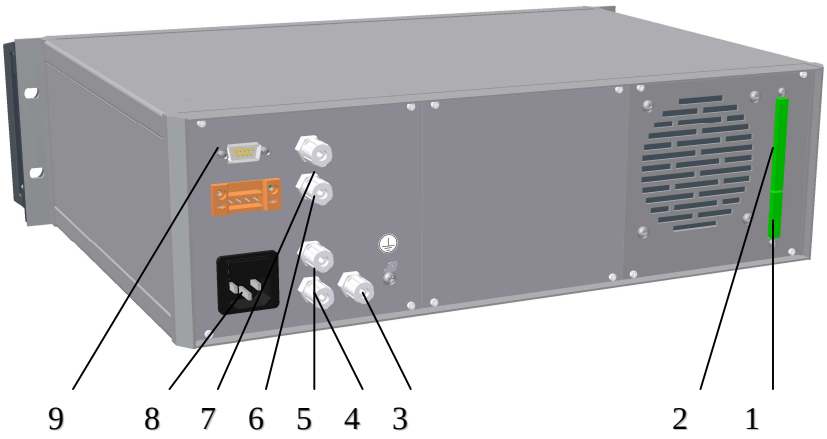
Fig.6



BIOLYT, front view

1	Main switch
2	LCD display 4x20 char.
3	sealed keypad
4	Main switch cooler
5	Switch pump
6	Status LED cooler
7	Micro filter
8	Flow meter
9	Pump condensat

Fig.7



BIOLYT , rear view

1	connector analog output C03
2	connector relays C04
3	output condensat
4	gas cal input
5	zero point input
6	gas output
7	input measuring gas
8	main connector with fuse C01
9	RS232 port C02

Fig.8 device dimension