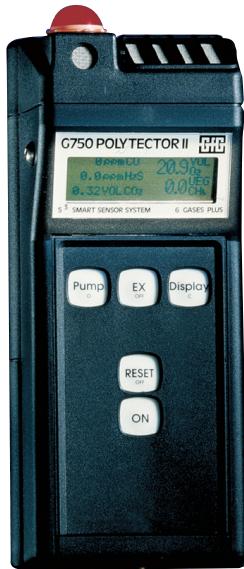


G750

Operation Manual



GfG Instrumentation

Worldwide Manufacturer of Gas Detection Solutions

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Introduction

For your safety

Like any piece of complex equipment, the G750 Polytector will do the job designed to do only, if it is used and serviced in accordance with the manufacturer's instructions. This manual must be carefully read by all individuals who have or will have the responsibility of using and servicing this product.

The warranties made by GfG Instrumentation with respect to the product are voided, if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and your employees by following them. The above does not alter statements regarding GfG Instrumentation warranties and conditions of sale and delivery.

Application

The G750 Polytector is a handheld detector for personal protection from gas hazards. The built-in pump allows gas samples to be taken before entering a confined space like sewers, vessels, etc. With the pump deactivated, the G750 Polytector operates permanently in diffusion mode and gives a visual and audible warning, if gas hazards arise.

The G750 Polytector has been tested for use in hazardous areas and certified with approval UL Class I, Div. I ABCD. Ex-Certificate is: BVS 97.Y.4003 for classification EEx ib IIC T5.

General description

The G750 Polytector can be a single- or multi-gas detector for simultaneous monitoring of up to six gas hazards, for example:

- Combustible gases (example: methane up to 100% LEL)

- Combustible gases (example: methane up to 100% volume)
- Oxygen deficiency or surplus
- Toxic gases (example: carbon monoxide)
- Toxic gases (example: hydrogen sulfide)
- Toxic gases (example: carbon dioxide)

The "smart sensor system" allows an easy change of the pluggable sensors to make the G750 Polytector suitable for new measurement tasks or to replace the sensors.

The G750 Polytector is easily operated with only a few keys, supported by the clear text in the display. All user functions are affected directly by means of the pump on/off, zoom on/off, alarm reset, display illumination on/off keys. In the detection mode every key stands for one function.

A service code gives access to additional functions for inspection and adjustment. The service mode also allows to change the settings of many parameters to make the G750 Polytector suitable for specific measuring tasks.

Detection principles

Depending on the gas to be monitored, the G750 Polytector uses different detection principles. Catalytic combustion (CC) and thermal conductivity (TC) are proven principles to measure combustible gases for explosion protection.

Electrochemical sensors (EC) with different characteristics are used to measure a wide range of toxic gases and oxygen. The infra-red sensor (IR) gives exceptional results for measuring carbon dioxide (CO₂).

Catalytic Combustion (CC)

This principle is used to measure combustible gases and vapors up to 100% LEL. The gas is supplied to and catalytically burned at a heated wire filament. This combustion changes the electrical resistance of the wire. The change in resistance is measured, as it is proportional to the gas concentration.

Thermal Conductivity (TC)

With this principle the gas passes a heated wire. Depending on its concentration, the gas more or less cools the wire, thus changing the electrical resistance. The change in resistance is measured, as it is proportional to the gas concentration. The G750 Polytektor uses the thermal conductivity principle to measure combustible gases up to 100% volume.

Electrochemical Sensors (EC)

The electrochemical sensors consist of an electrolyte, a working electrode (anode), a counter electrode (cathode) and, for certain models, a reference electrode. Selection of specific electrodes and electrolytes make the sensors suitable for the gas to be monitored. The conversion of the gas between the electrolyte and the electrode generates an electrical signal which is proportional to the gas concentration. GfG Instrumentation electrochemical sensors are operated on the capillary diffusion barrier technology, which, together with additional temperature compensation, prevents interference caused by changes in atmospheric pressure and temperature.

Infra-red Sensor (IR)

The infra-red sensor uses the characteristic of gases to absorb the light in certain spectral ranges. The light from an infra-red source passes the gas in the sensor cell, which reduces the radiation energy by absorption. The absorption of the infra-red radiation in a certain wavelength range is proportional to the concentration of the gas to be measured. The energy reduction of the infra-red radiation is measured by means of detectors. Simultaneously the infrared light is measured in a different wavelength range, in which the gas does not cause any absorption, to obtain a reference signal. This provides a high accuracy even if the light source changes or if the mirrors are dirty.

Design

The G750 Polytektor (fig. 1) is protected by an impact-proof compound casing. Operation and service is controlled by the keyboard (pos. 6). In the detection mode the large display (pos. 5) shows all measured components either simultaneously or in magnified letters. The gas is usually supplied to the sensor chamber through the diffusion inlet (pos. 4). When the pump is activated, the gas enters the sensor chamber through the pump inlet (pos. 1), to which you can also fix a sampling line. The red alarm LED (pos. 2) gives a visual warning. The audible alarm is signaled by a buzzer, protected by a wire mesh (pos. 3). The charging socket (pos. 7) for the battery pack is at the bottom of the casing. The battery pack is placed behind a cover (pos. 8), which is fixed with a lock screw (pos. 9).

G750 Polytektor - Design

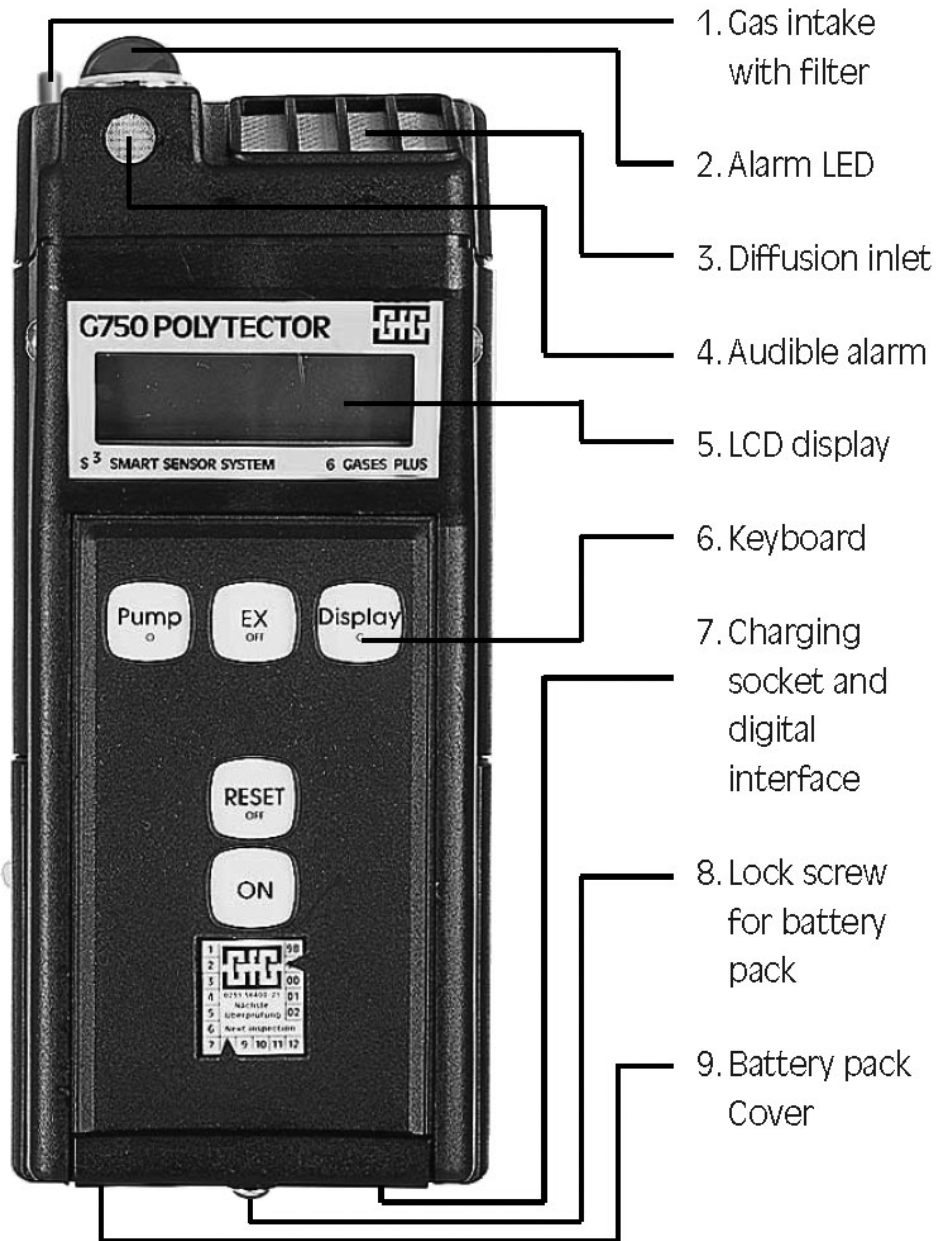


Fig. 1

Operation

Installation and replacement of sensors

The sensor chamber for three electrochemical sensors (EC1, EC2, EC3) — one infra-red (IR) and one combined catalytic combustion/thermal conductivity (CC/TC) sensor—is behind the diffusion inlet. Fig. 2 shows the sensor positions in the sensor chamber. The chart "Sensors and Gases" in the

appendix gives a survey on the combinations of sensors and gases available for being installed in the G750 Polytector.

Sensor positions in sensor chamber



Fig. 2

Detection mode

The detection mode comprises functions the user needs to know for the proper operation of the gas detector G750 Polytector.


Switching on

Switch the G750 Polytector on in an environment which is free from any gas before you enter a room that might contain gases or vapors.

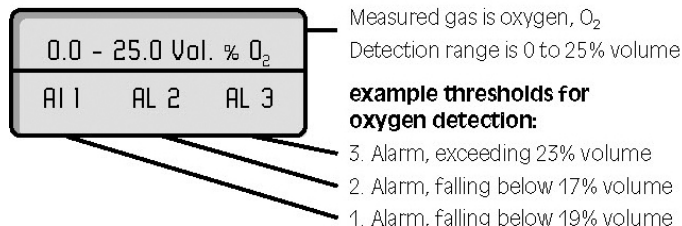
Press the key to switch the G750 Polytector on.

The display now gives a short message about the detector, the user, the date and the time (this message can be set in the service mode. See menu control in service mode.)

Should the date for the next inspection be exceeded, the G750 Polytector gives a rhythmic alarm and the display reads

“Inspection overdue.” You may reset this message by pressing the  key.

The display also informs about every gas being measured, its detection range and the current alarm thresholds. Example:





Before the detector finishes the warm-up time and turns to the detection mode automatically, it gives a short visual and audible alarm. The display reads:



Note: Whenever you press a key, the display illuminated is turned on for approximately 5 seconds and turns off automatically after that time.

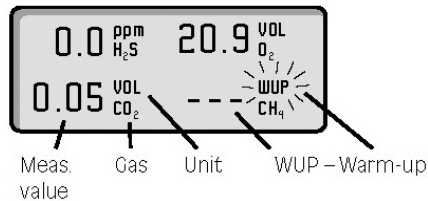
Switching off

To switch the G750 Polytector off, press the  and the  key simultaneously and keep them pressed for approximately 3 seconds. You will hear short beeps and read the message:




Readiness for operation

The G750 Polytector is ready for operation, if all measurement values, the unit and the gas are displayed. As long as "---" instead of the measurement value and "WUP" instead of the unit are shown, the relevant channel is not ready yet. The warm-up takes about 30 seconds. Example for the display of a G750 Polytector with four sensors:





In case an operational beep is activated, the G750 Polytector gives an audible signal, depending on the set interval (refer to “operational beep – SIG”).

Individual gas display – Zoom display

For magnification briefly press the  key to use the whole size of the display for a clear indication of individual gases.



Press the  key repeatedly to display all other measurement values and the battery capacity one after the other. Press  once more, or do not hit any key for approximately 10 seconds, and the display returns to the standard multi-gas reading.

Individual gas display – Memory display

The G750 Polytector is able to store and to display time weighted averages (TWA), short-term exposure levels (STEL), peak values (MAX) and minimum values (MIN). The stored values have the following meanings:

- STEL: The STEL (short-term exposure level) is an average value of the gas concentration over a time, which is determined by the short-term period. For most gases, the short-term period is 15 minutes.
- TWA: The time-weighted average (TWA) is an average value of the gas concentration over an 8 hour

working shift. For the calculation of the total TWA the G750 Polytector uses all measurements sampled since the detector has been switched on.



MIN / MAX: Minimum and peak value measured since the detector was switched on or since the stored values were reset.

For reading the stored values, you have to turn to the memory display by keeping the  key pressed for approximately 3 seconds, **while the zoom display is active.**

Note: You cannot turn to the memory display, if the zoom display is not active (i.e. if all gases or the battery capacity are shown in the display).


As an example we are showing the following readings of the memory display for carbon dioxide and methane:

Carbon dioxide, CO ₂			Methane, CH ₄	
MAX	15' STEL	8h TWA	MAX	MIN
0.09	0.08	0.01	14.5	0.0
VOL CO ₂	VOL CO ₂	VOL CO ₂	% LEL CH ₄	% LEL CH ₄

By repeatedly pressing the  key, the stored values for every gas are displayed one after the other. You can return to the standard display mode by pressing the  key for approximately 3 seconds, while the memory display is active. The G750 Polytector will also return to the standard display mode, if you switch it off and on again.

Resetting stored values


Resetting the stored values means that the currently measured values are accepted as minimum and peak values.

To reset the minimum and peak values, press the  key. You can only reset the MIN and MAX values of those gases,

which are shown in the display. After switching the G750 Polytector on, the TWA and STEL values are also set to 0.

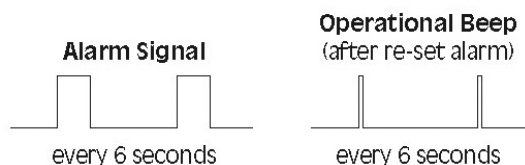
Battery capacity – Battery alarm


The fully charged battery pack of the G750 Polytector has a capacity for continuous operation of more than 8 hours in diffusion mode. The operational time may be reduced by sampling intervals and alarms. Use the ZOOM display for the indication of the residual capacity of the battery pack:

Press the  key several times, until the battery capacity is displayed:



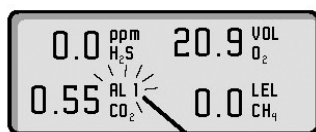
In the above example the battery has a residual capacity of 97%. The residual capacity refers to a voltage measurement at the battery. After the detector has been switched on, the voltage may reduce a little bit faster (within the first 15 minutes). When the capacity falls to 4%, the G750 Polytector gives a visual and audible warning. The display reads:



Press the key to  reset the battery alarm. In this case the G750 Polytector gives a short signal in intervals of 6 seconds to remind of the low battery status. When the G750 Polytector gives a battery alarm, it should be connected to its charger. The residual capacity after a battery alarm is sufficient to operate the POLYTECTOR II for at least 15 minutes in diffusion mode.

Alarm

Should the measured gas concentration exceed a pre-set threshold, the detector immediately gives an audible and visual alarm. An optionally available vibrator allows you to feel the alarm. In addition to this, the display indicates the exceeded alarm threshold of the gas which has caused the alarm. The following example shows the display for the exceeded first alarm of CO₂ (carbon dioxide):





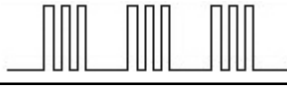


AL 1 means that the first threshold is exceeded
The display and the unit blink alternately


The G750 Polytektor provides three alarms for the currently measured values of oxygen and combustible gases (example: CH₄) and two alarms for toxic gases (example: CO, H₂S, CO₂). These alarms are activated if the gas concentration exceeds or falls below the relevant threshold. For the toxic gases, there is an additional alarm for exceeded time weighted averages and short term exposure levels (TWA and STEL).

Alarm	Sensors	Number of alarms	Description
Current value (AL)	Oxygen Comb. gases Toxic gases	3 3 2	A current value alarm is activated immediately, if the gas concentration exceeds or falls below a pre-set threshold. The current value alarms are adjustable.
Short term (STEL)	Toxic gases	1	The short-term value (STEL) is the average concentration over a short period (example: 15 minutes). The reference time is adjustable. The STEL alarm is not latching. It resets automatically as soon as the concentration has fallen below the threshold.
Long term value (TWA)	Toxic gases	1	The long-term value (TWA) refers to an 8 hour shift and calculates the average concentration. The TWA alarm cannot be reset. It is only de-activated, if the detector is switched off.

The audible and visual alarms provide different sound and flash frequencies:

Alarm threshold	Audible and visual alarm	
AL 1	Low sound and flash frequency (1 pulse in 1.5 seconds)	
AL 2	Middle sound and flash frequency (2 pulses in 1.2 seconds)	
AL 3	High sound and flash frequency (3 pulses in 1 second)	
STEL	Middle sound and flash frequency (2 pulses in 1.2 seconds)	
TWA	High sound and flash frequency (3 pulses in 1 second)	

The alarm thresholds are limit values for gas concentrations. The thresholds can be variably adjusted within the detection range of every measured gas, or they can be de-activated (refer to "Alarm Thresholds"). Alarms AL 2 and AL 3 are latching, i.e. they remain activated even if the gas concentration has fallen below the threshold. For alarm reset

press the  key. The first alarm (AL 1) is not latching, but resets automatically, if the gas concentration has fallen below the set value.


Diffusion mode

When you switch the G750 Polytector on, the monitor is automatically set in diffusion mode. In this mode, all concentrations are shown in the display. In addition, short-term and long-term averages (STEL and TWA) are calculated for toxic gases, and for non-toxic gases peak and minimum values (MAX and MIN) are stored. The stored values can be read from the display, if you turn to the relevant display mode (refer to “Individual gas display – Memory display”).

Note: During diffusion operation the diffusion inlet must not be covered.

The measurement results can also be stored in the optionally available data logger and transmitted and evaluated later on, over the PC interface.


Pump mode

Press the  key briefly to run or stop the sampling pump. During the pump mode the measurement values are shown in the display just as in the diffusion mode. The G750 Polytector allows selection from one of three different sampling modes (refer to “pump function – PUMP”).

Note: During the pump mode the diffusion inlet must be covered. An open diffusion inlet might result in false measurement values.

The diffusion inlet can be covered with the lid fixed to the back of the leather case. Make sure that the lid is secured with the snap fastener.



100% volume measurement of methane and natural gas

For measuring methane (CH₄) during standard detection the G750 Polytektor uses a sensor, which is designed for a range from 0 to 100% LEL. For measuring higher methane concentrations press the  key to turn the range to 0 to 100% volume. High concentrations of methane (up to 100% volume) can only be measured with the sampling pump.



Note: As in the pump mode, this measurement requires the diffusion inlet to be covered. An open diffusion inlet might result in false measurement values.

During the standard measurement in percent volume, all alarms are de-activated. They can, however, be activated.

Measurement of methane up to 100% volume is effected as follows:

1. Connect a hose to the intake. The hose should provide a dust and water filter to prevent soiling of the sensor chamber (see accessories).
2. Bring the open end of the hose into the room to be checked. For measurements above the surface of liquids we recommend use of a swimmer probe.
3. Press the  key to run the pump and to start the EX-measurement. To stop the pump, press the  key. This does not finish the "percent volume" measurement yet,


but continues in diffusion mode. The diffusion inlet must be opened again.

The percent volume measurement is finished by pressing the  key again. The pump starts automatically for at least 10 seconds to purge the sensor with fresh air. This purging process prevents a false alarm caused by residual gas in the sensor chamber. If you press the  key again during the purging process, the pump is stopped and the purging process is finished early.

Special notes for LEL monitoring

For LEL monitoring, the G750 Polytektor uses a catalytic combustion (CC) sensor. Due to this principle the G 750 Polytektor cannot distinguish between measurement values in the LEL range and those in the high volume range (example: > 20% volume CH₄).

If the detector also includes an oxygen sensor, you can determine gas concentrations in the high percent volume range which are not accurately measured by the CC sensor. It is absolutely necessary, however, that you have already switched the detector on in an EX-free environment.

If the detector does not provide an oxygen sensor, an exceeded LEL range remains stored until it is cancelled by pressing the  key. This is only possible if the measurement value is within the detection range, and must only be done if the user has carefully checked that there is no high percent volume concentration.

This check can be done by turning the EX range to the percent volume range, if the detector includes a TC sensor.

Attention: The direction of the gas display from the TC sensor is different, depending on the calibration for heavy gases like propane or butane or for light gases like methane or hydrogen.

Influence of interfering gases and oxygen

Accurate measurements cannot be made of gas and/or vapor concentrations in the LEL range if the oxygen concentration is below 10% volume. In these cases the CC sensor lacks sufficient oxygen for proper catalytic combustion. The approvals do not cover the use of the detector in oxygen enriched atmospheres.

Certain components, known as “sensor or catalyst poisons”, may affect the signal behavior of the CC sensor. The “sensitivity” (i.e. the capability of the sensor to give signals) is reduced. Components of this kind are, for example, sulfuric, lead or silicone compounds. Practical experience shows, however, that these components are present very rarely and only in very low concentrations.

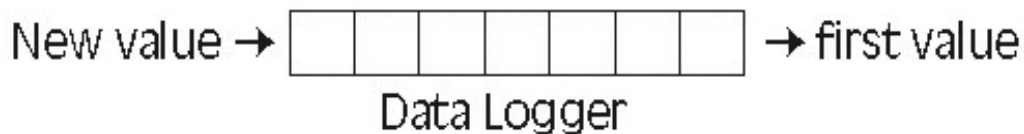
Storing of data in data logger

The data logger of the G750 Polytektor stores the measurement data automatically during detection. You do not have to activate the data logger separately. The following data are stored:

- Measurement values of every detection range
- Date and time of every measurement value
- Location, if LOC was entered
- Alarm activation of every detection range
- Special events

In menu point “REC” you can select different functions of data logging, for example, whether you want the measurement

values stored as current or average or peak values. The measurement data are stored in succession. Should the data logger be full, the first value stored is deleted.







Measurement data is transferred to a PC with an interface cable and the GfG Instrumentation software program.











Activation of service mode

In the service mode the G750 Polytektor can be adjusted by changing the program parameters. A clear menu leads the way through the different adjustment possibilities. Several menu points require an access code "0011" to prevent accidental modification of important functions.

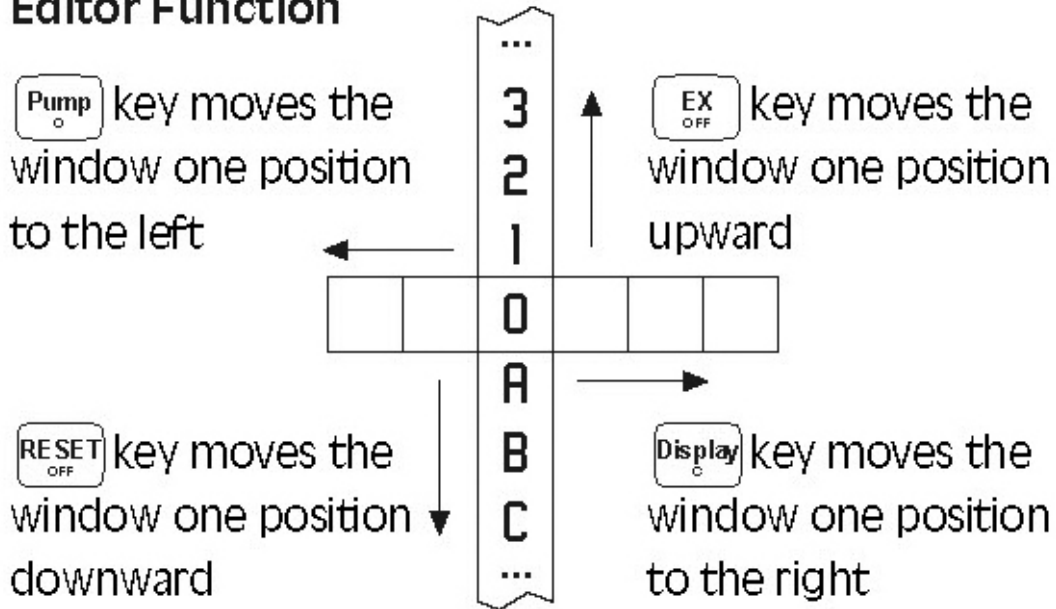
Menu control in service mode

In all service menus, the , , , and  keys have special functions and are used for the menu control and for entering. The functions of the keys are explained in bold, abbreviated letters in the bottom line of the display.

The abbreviations stand for:

RET	ET = Return, key  . Returns to the previous menu point. Repeated pressing of "RET", no matter from which position, brings you back to the start and to the detection mode.
< < <	= Cursor to the left, key  . Goes to the previous point displayed.
SEL	= Select, key  . Selects the marked point (cursor position). With "SEL" you can go to the next menu point.
> > >	= Cursor to the right, mainly key  . Goes to the next point displayed.
..9../..Z..	Editor function. For entering figures or letters. Key  = next figure/letter. Key  = previous figure/letter.
+ /-	Changing figures. Key  = Increase value. Key  = Reduce value.
ON / OFF	Functions are turned on and off. Key  or  = Turn function on (activate) or off (de-activate).
< or >	Bring the cursor in this position to select the previous menu point. Is < or > existing, this substitutes "RET."
Cursor position	The cursor is always in the blinking position.

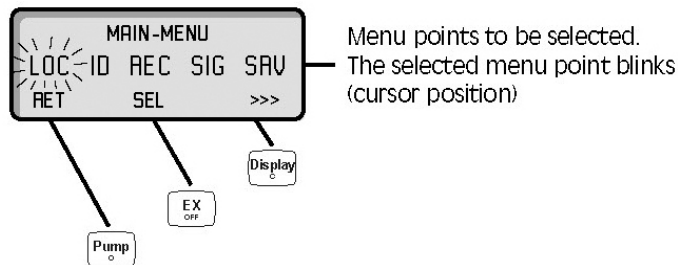
Editor Function



Activation of service mode



With the detector switched on, press and hold the **Pump** key for approximately 3 seconds to activate the service mode.

Menu control in service mode



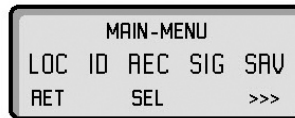
All adjustments in the service mode are menu controlled. The three top keys are used to activate the function that is shown in the bottom line of the display:

Example: "LOC" blinks in the above display. This means, that menu point "LOC" was selected. The different menu points are explained below. Press "SEL", key **EX OFF**, to open the menu point "LOC." To move the cursor one position to the

right, press ">>>", key , and you select the next menu point "ID." With "RET", key , you return to the previous menu point then back to the detection mode.

Survey main menu




The main menu is the first menu point in the service mode:



Explanation of display:

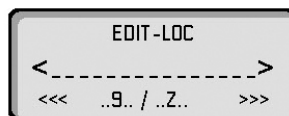
LOC	Entering a location of G750 Polytector
ID	Free entering of identity
REC	Data logger function
SIG	Interval for operational beep
SRV	Entering the service mode Requires access code

Entry options:





	Key	
RET		Back to detection mode
SEL		Open selected menu
>>>		Cursor to the right Pump

Entering location – LOC

You can enter up to 15 letters / figures to store a location in the G750 Polytector.



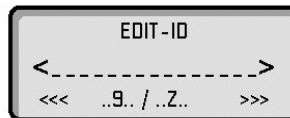
Entry options:

	Key	Meaning
< < <		Cursor to the left.
..9..		Next figure / letter
..7..		Previous figure / letter
> > >		Cursor to the right





Entering the location is finished automatically, when the cursor has reached the mark “<” or “>.” In combination with a data logger (option) you can enter a location for every measurement. This way, the measurement always refers clearly to a certain location.

Identification – ID

You can enter up to 15 letters / figures to store an “Identification” in the G750 Polytektor. Entering the identification is finished automatically, when the cursor has reached the mark “<” or “>.”



Entry options:

	Key	Meaning
< < <		Cursor to the left.
..9..		Next figure / letter
..7..		Previous figure / letter
> > >		Cursor to the right




Data logger functions – REC

The menu point REC is only available for detectors with data logger. REC allows the adjustment of various parameters to set the memory function of the data logger to your individual requirements.




The selected menu point (FULL, MODE and INTV) blinks in the display.

Entry options:

	Key	Meaning
RET		Back to user menu. If you have changed something, you are asked whether you want the changes saved or not.
Clearing, charging, +/-	 	Changing the selected mode. Depending on the mode you will read different function descriptions from the display.

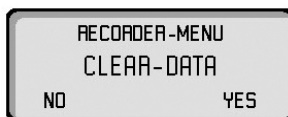
The menu points FULL, MODE and INTV stand for:

Memory display and clearing of data logger – FULL

FULL indicates which percentage of the data logger capacity is already used. In the example below, 5% of the data logger are used. Press the  key to clear the data logger memory.



Before all data are deleted, the display asks you



Entry options:

	Key	Meaning
NO		The data will not be deleted
YES		All data will be deleted

Storing mode – MODE

You can select one of three different storing modes.



Function	Explanation
INST	The currently measured value is stored in the data logger. You can set the time interval*.
AVG.	The average value over the set time interval* is calculated and stored in the data logger.
PEAK	Only the peak value within the set time interval* it's stored in the data logger.

* refer to menu point INTV

Press the key to select the required function.

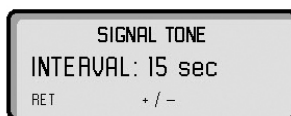
Storing interval – INTV

The function INTV is used for changing the time interval for the storing modes described above. The interval can be set to 1, 10, 20, 30 seconds or to 1, 2, 3, 5, 10, 20, 30 minutes. Changing of the interval is done as follows:




	Key	Meaning
+		Increasing the time interval by one step
-		Reducing the time interval by one step

Operational beep – SIG

The G750 Polytector can provide an operational beep in regular intervals. In the menu point “SIG” the interval can be turned on or off. To turn the interval on, enter the desired interval time between 15 and 90 seconds. Two dashes in the display “--” indicate that the operational beep is deactivated.



Entry options:

	Key	Meaning
RET		Back to user menu. If you have changed something, you are asked whether you want the changes saved or not.
+ /-	 	Changing the interval. The interval is displayed in seconds. Two dashes “--” indicate that the operational beep is de-activated.

Access to service menu – SRV

The security code is the “key” for opening the service mode “SRV.” It prevents unauthorized persons from changing the

adjustments and parameters of the G750 Polytector, as this might affect the measurement and warning.



The security code is: 0011

Entry options:

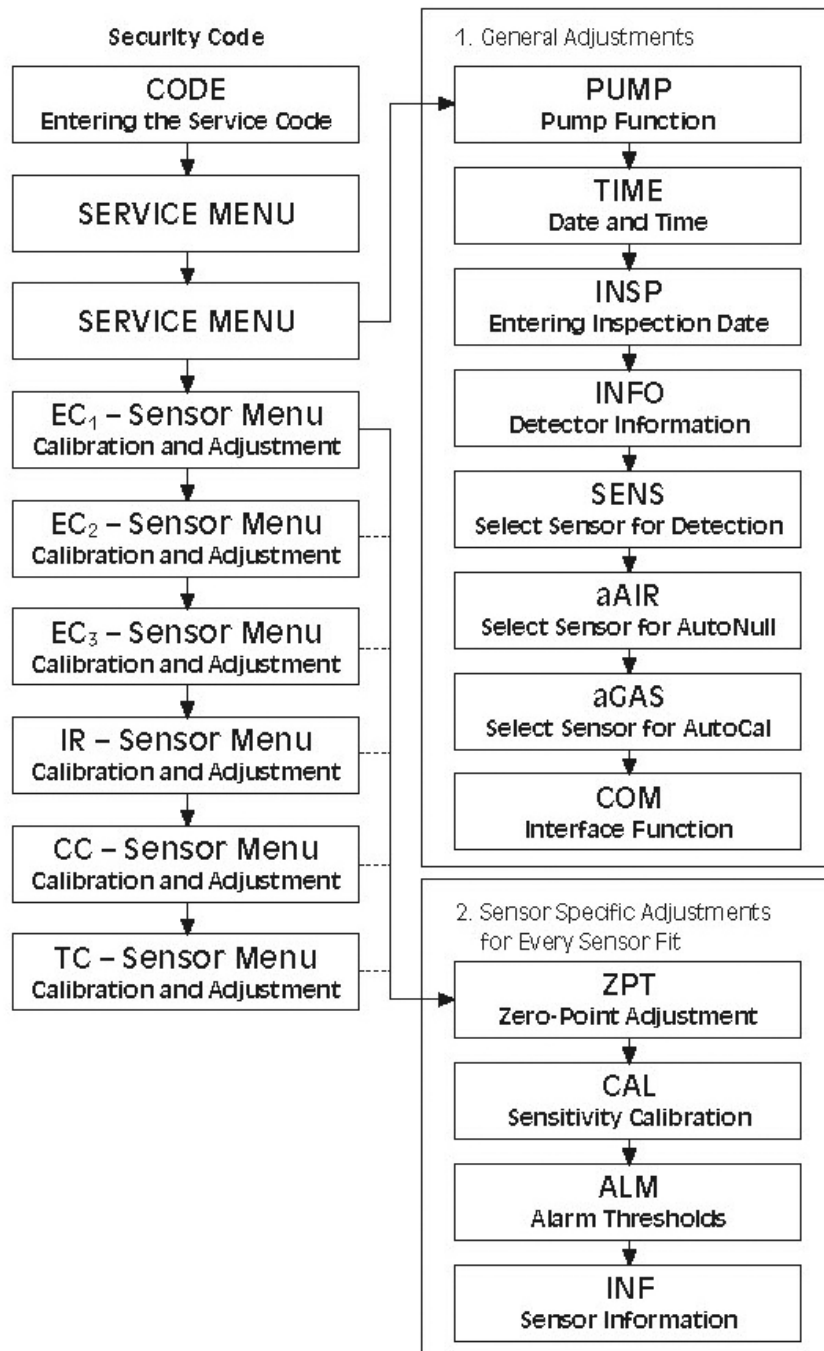
	Key	Meaning
< < <		Cursor to the left
..9..		Next figure / letter
..Z..		Previous figure / letter
> > >		Cursor to the right

Entering the security code is automatically finished when the cursor has reached the mark "<" or ">." If the code has been entered correctly, you enter the service mode, which allows you to change and adjust a variety of parameters in the G750 Polytector. They are:

1. General adjustment of parameters.
2. Sensor and gas specific setting of parameters.

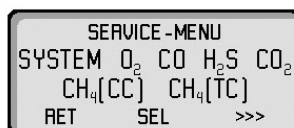
Survey of service menu

The picture shows the service menu structure. The sensor specific adjustments are present for every sensor. All adjustments are only valid for the previously selected sensor.



General adjustments – SYSTEM




The G750 Polytector can be adjusted for different measurement tasks.



Explanation of display:

SYSTEM	General adjustments and information.
(GASES)	Sensor specific adjustments and information.

Entry options:

	Key	Meaning
RET		Back to previous menu
SEL		Open selected menu
> > >		Cursor to the right



Pump function – PUMP

You can select one of 3 pump modes:


Mode 1 (ON/OFF)


Press the  key shortly to start the pump, and press again to stop it.

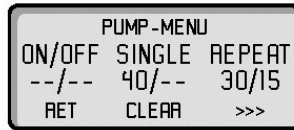
Mode 2 (SINGLE)

Press the  key shortly to start the pump. The pump will stop automatically after a pre-set time. Should the G750 Polytecor detect a change of the gas concentration, the sampling time is extended over the set time. You may stop the pump at any time by pressing the  key again.

Mode 3 (REPEAT)

Press the  key shortly to start the pump. Now the sampling is done in cycles, which include automatic stops and starts of the pump at regular intervals, which can be adjusted as required. Should the G750 Polytecor detect a change in the gas concentration, the sampling time is extended over





the set time interval. You can stop the pump cycle by pressing the  key again.





Explanation of display:

ON/OFF	Mode 1: Pump on/off via key, no time interval.
SINGLE	Mode 2: Min. sampling time can be set in seconds.
REPEAT	Mode 3: Time intervals for On/Off cycles can be set in seconds.

Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increase time interval by one second
-		Reduce time interval by one second
> > >		Cursor to the right

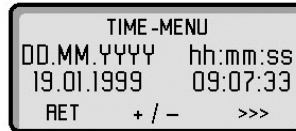
Selection of pump mode:

- Move the cursor with > > >,  key to the required mode:
 ON/OFF = Mode 1.
 SINGLE = Mode 2
 REPEAT = Mode 3
- The selected pump mode blinks.
- Press "RET" key  to leave the menu point.

Date and time – TIME

The date and time can be read and, if required, adjusted.

Explanation of display:







Explanation of display:

DD	Day
MM	Month
YYYY	Year

hh	Hours
mm	Minutes
ss	Seconds

Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increase value by one
-		Reduce value by one
> > >		Cursor to the right

Note: Date and time are important parameters for storing data in the data logger (option).

Inspection date – INSP

You can enter a date for the next inspection or service.

Should the entered date be exceeded, the G750 Polytektor

gives a warning. When the inspection date is exceeded, the





G750 Polytektor gives a warning every time it is switched on.



Explanation of display:

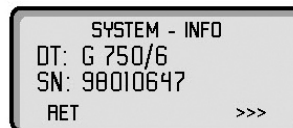
DD	Day of next inspection date
MM	Month of new inspection date
YYYY	Year of next inspection date

Entry options:

	Key	Meaning
RET		Back to previous menu
+ /-		Increasing day, month or year by one
+ /-		Reducing day, month or year by one
> > >		Cursor to the right

Detector information – INFO

This menu point shows general information about the detector. This data cannot be changed.

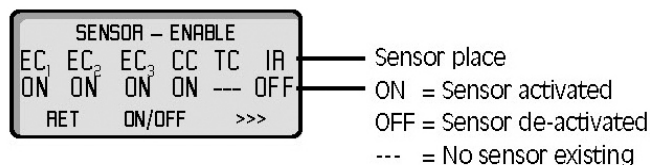


Explanation of display:

DT	Detector type
SN	Serial number

Selection of sensors – SENS





Sensors may be enabled or disabled individually. You can use this function if there is no longer a need to measure a certain gas or if additional or different sensors need to be added or replaced.



EC₁	1. Electrochemical sensor – oxygen, O ₂
EC₂	2. Electrochemical sensor – toxic gases (example: carbon monoxide, CO)
EC₃	3. Electrochemical sensor – toxic gases (example: hydrogen sulfide, H ₂ S)
CC	Catalytic combustion sensor – EX-detection up to 100% LEL (example: methane, CH ₄)
TC	Thermal conductivity sensor – EX-detection up to 100% volume (example: methane, CH ₄)
IR	Infra-red sensor – carbon dioxide, CO ₂

ON	Sensor is activated
OFF	Sensor is de-activated
---	No sensor in detector

Entry options:

	Key	Meaning
RET		Back to previous menu
ON		Activate
OFF		De-activate
> > >		Cursor to the right

Selection of sensors for automatic sensor adjustment – aAIR and aCAL

The G750 Polytektor allows a quick sensor adjustment in fresh air (aAIR) and with test gas (aGAS). This adjustment is started by a certain key combination and sets all sensors. Should you wish to exclude one or several sensors, you can turn them off

in the menu point "aAIR" for adjustment in fresh air and in "aGAS" for adjustment with test gas.

Use of aAIR

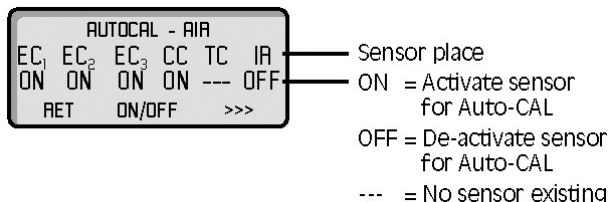
The automatic adjustment with fresh air (aAIR) is recommended if the zero-points of several sensors and the sensitivity of the oxygen sensor are to be adjusted at the same time.

Note: You should not adjust the zero-point of the CO₂ IR sensors in fresh air, as even fresh air contains several hundred ppm CO₂. The zero-point adjustment of the CO₂ IR sensor should, therefore, always be done individually by supplying 100% nitrogen.

Use of aCAL

The automatic calibration with test gas or test gas mixtures is done to adjust the sensitivity calibration of several sensors and the zero-point of the oxygen sensor at the same time. A reasonable combination would be the simultaneous adjustment of the EC2, EC3, and CC sensors with approved test gas mixtures.

Note: When using test gas mixtures, make sure that you do not supply it to those sensors which show a cross sensitivity to any component of your mixture, as this might result in an incorrect calibration. Automatic adjustment of the oxygen sensor zero-point is not recommended. This should always be done with a test gas of 100 % nitrogen.







Explanation of display:

EC₁	1. Electrochemical sensor – oxygen, O ₂
EC₂	2. Electrochemical sensor – toxic gases (example: carbon monoxide, CO)
EC₃	3. Electrochemical sensor – toxic gases (example: hydrogen sulfide, H ₂ S)
CC	Catalytic combustion sensor – EX-detection up to 100% LEL (example: methane, CH ₄)
TC	Thermal conductivity sensor – EX-detection up to 100% volume (example: methane, CH ₄)
IR	Infra-red sensor – carbon dioxide, CO ₂

ON	Sensor is activated
OFF	Sensor is de-activated
---	No sensor in detector

Entry options:

	Key	Meaning
RET		Back to previous menu
ON		Activate
OFF		De-activate
> > >		Cursor to the right

Serial interface – COM

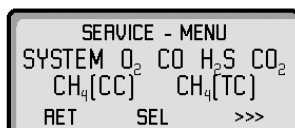
In the menu point COM you can set the data transmitting speed (BAUD) of the data from the data logger (option) to a PC or printer.

Calibration and maintenance

Sensor specific functions – 'GAS'

The following functions refer to the individual sensors in the G750 Polytektor. In the service menu you can select each sensor individually. The adjustment possibilities described below are available for the relevant sensor selected.

The oxygen sensor is used to show the sensor-specific adjustments in the example below. The same procedures apply to the other sensors as well.






```
SERVICE - MENU
SYSTEM O2 CO H2S CO2
CH4(CC) CH4(TC)
RET SEL >>>
```

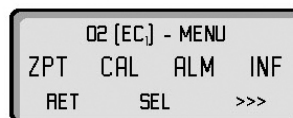
Explanation of display:

SYSTEM	General functions and information
O₂	Functions and information for EC1 sensor (example: O ₂)
CO	Functions and information for TOX1 sensor (example: CO)
H₂S	Functions and information for TOX2 sensor (example: H ₂ S)
CO₂	Functions and information for TOX3 sensor (Infra-red, example: CO ₂)
CH₄ (CC)	Functions and information for EX Sensor up to 100% LEL (example: CH ₄)
CH₄ (CC)	Functions and information for EX Sensor up to 100% volume (example: CH ₄)

Entry options:

	Key	Meaning
RET		Back to previous menu
ON		Open selected menu
> > >		Cursor to the right




The following functions and information are valid for every sensor.



Explanation of display:

ZPT	Zero-point adjustment
CAL	Sensitivity calibration
ALM	Setting of alarm thresholds
INF	Sensor information

Entry options:

	Key	Meaning
RET		Back to previous menu
SEL		Open selected menu
> > >		Cursor to the right

Zero-point adjustment – ZPT

The zero-point adjustment refers only to the previously selected sensor. Do not expose the detector to the gas to be measured or to an interfering gas during zeroing. In case there is an interfering gas in the ambient air, use the pump inlet to supply a zero gas to the detector. In this case make sure that the diffusion inlet is covered.

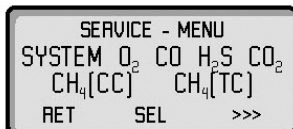
Zero gas is:

- For zero-point adjustment of combustible and toxic gases (except carbon dioxide, CO₂) – “clean ambient air” or synthetic air.
- For zero-point adjustment of carbon dioxide (CO₂) – 100% nitrogen (N₂) or synthetic air (without CO₂ content).
- For zero-point adjustment of oxygen (O₂) – 100% nitrogen (N₂).

Adhere to the following procedure:

- Cover the diffusion inlet and supply zero gas to the sensors over the intake of the G750 Polytecor.





Adjustment of zero-point:



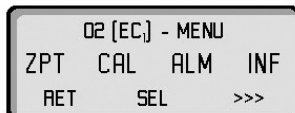
Explanation of display:

ACT	Actually measured gas concentration
NOM	Nominal value, to be set to "0.0"

Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increasing the nominal value "NOM" by one
-		Reducing the nominal value "NOM" by one
START		Start of zero-point adjustment




After the zero-point program is started, the pump is activated automatically, and you will hear a rhythmic signal.



Explanation of display:

ACT	Actual measured gas concentration
NOM	Nominal value, to which the sensor is to be set

Entry options:

	Key	Meaning
RET		Pump is started or stopped
+		Zero-point adjustment is interrupted
START		Zero-point is adjusted to the nominal value

If the G750 Polytektor recognizes a faulty zero-point adjustment, it displays an error message. In this case you have to repeat the zero adjustment.

Note: Another way to adjust the zero-point is described in "sensor adjustment in fresh air."

Sensitivity calibration – CAL

During the calibration you adjust the display sensitivity of the G750 Polytektor. This requires a test gas of a known concentration.

Test gas is:

- For calibration of combustible and toxic gases – a gas, which is equivalent to the gas measured by the selected sensor. The test gas concentration should be between 50 and 100% of full scale.
- For calibration of oxygen – "clean ambient air" and synthetic air.

Adhere to the following procedure:

- Supply a test gas concentration to the intake of the G750 Polytektor. The kind of gas and its concentration depends on the sensor selected for calibration. Supply the test gas for at least 3 minutes to avoid calibration errors due to gas absorption in the sampling line.

Setting of calibration value:





```

CO2 (IR) - CAL
ACT: 4.00 VOL CO2
NOM: 4.00 VOL CO2
RET  + / -  START
    
```

Explanation of display:

ACT	Actual measured gas concentration
NOM	Nominal value, to be set to test gas concentration

Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increasing the nominal value "NOM" by one
-		Reducing the nominal value "NOM" by one
START		Start of calibration

After the calibration program is started, the pump is activated automatically, and you will hear a rhythmic signal.




```

CO2 (IR) - CAL
ACT: 4.00 VOL CO2
NOM: 4.00 VOL CO2
PUMP  ESC  STOP
    
```

Explanation of display:

ACT	Actual measured gas concentration
NOM	Nominal value, to which the sensor is to be set

Entry options:

	Key	Meaning
PUMP		Pump is started or stopped
ESC		Calibration is interrupted
STOP		Sensitivity is set to the nominal value

If the G750 Polytektor recognizes a faulty calibration, it displays an error message. In this case you have to repeat the calibration and, if necessary, the zero-point adjustment.

Note: Another way of calibration is described in “Sensor adjustment with test gas.”

Alarm thresholds – ALM

The G750 Polytektor provides two alarm thresholds for the toxic gases (example: hydrogen sulfide, carbon monoxide, carbon dioxide) and three current value alarm thresholds for the non-toxic gases (example: oxygen, methane). The alarms are activated if the gas concentration exceeds or falls below the set threshold. For the toxic gases the detector provides an additional warning for exceeded long-term (TWA) and short-term (STEL) averages. Each threshold can be set individually, independent from each other, within the relevant detection range. The period for the calculation of the short term average can be set separately.

Setting of alarm threshold for non-toxic gases





O ₂ [EC] - ALARM		
AL1	AL2	AL3
19.0	17.0	23.0
RET	+ / -	>>>

Example: Display for oxygen, O₂

Explanation of display:

AL1	First alarm threshold (for oxygen: always falling below)
AL2	Second alarm threshold (for oxygen: always falling below)
AL3	Third alarm threshold (for oxygen: always exceeding)

Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increasing alarm threshold by one
-		Reducing alarm threshold by one
> > >		Cursor to the right, to next alarm threshold

Setting of alarm threshold for toxic gases





CO [EC ₂] - ALARM			
AL1	AL2	15'STL	8hTWA
30	180	120	30
RET	+ / -	>>>	

Example: Display for carbon monoxide, CO

Explanation of display:

AL1	First alarm threshold
AL2	Second alarm threshold
15'	Period of calculation for STEL (minutes)
STL	Threshold for short term exposure level
8h	Time (hours) to which the time weighted average refers to
TWA	Threshold for time weighted average

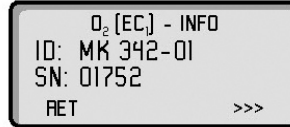
Entry options:

	Key	Meaning
RET		Back to previous menu
+		Increasing alarm threshold by one
-		Reducing alarm threshold by one
> > >		Cursor to the right, to next alarm threshold and to set the period for average calculation

Note: In case you do not want a warning from TWA and STEL values, enter “- - -” instead of a figure.

Sensor information – INF

Here you can read specific information about the sensor:



Explanation of display:

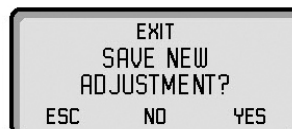
ID	Sensor type
SN	Serial number of sensor
DR	Detection range of sensor
TR	Temperature range of sensor
GfG Instrumentation	Production date
SRV	Date of latest calibration

Entry options:




	Key	Meaning
RET		Back to previous menu
> > >		To the next information

Exit service mode

Repeated pressing of the key (shown as RET in the display) brings the G750 Polytektor back to the detection mode. Before leaving the service mode you are asked if you want to save the new configurations.





Entry options:

	Key	Meaning
ESC		Back to service menu
NO		Changes are not stored. The G 750 Polytektor returns to the detection mode
YES		All changes are stored. The G 750 Polytektor returns to the detection mode

Sensor adjustment with fresh air

A special adjustment routine allows you to adjust the sensors quickly in fresh air. This routine is started by pressing a certain key combination and adjusts all activated sensors one after the other (refer to "aAIR").




- Make sure that the ambient air is free from any interfering gases. If necessary, de-activate the relevant sensors.
- Press the keys  and  simultaneously and keep them pressed for approximately 3 seconds.
- Now you are asked for a safety check:



Explanation of display:

NO	Leaving the adjustment program
MANUAL	Turning to manual zero-point adjustment
AUTO	Automatic zero-point adjustment is started for all sensors activated in "aAIR"




Entry options during automatic adjustment program:

	Key	Meaning
PUMP		Pump is started and stopped
ESC		Adjustment is interrupted
STOP		Adjustment is done immediately (value is accepted)

Once all sensors are adjusted, the G750 Polytecor requires confirmation:





Entry options:

	Key	Meaning
ESC		Re-start of adjustment
NO		Adjustments are not stored
YES		Adjustments are stored. Detector is completely set

Sensor adjustment with test gas

The G750 Polytecor provides a special calibration routine, which adjusts the sensors to a test gas. This routine is started by pressing a certain key combination and adjusts all activated sensors one after the other (refer to "aCAL").

Attention: Before starting the program, make sure that suitable test gases are available for every detection range. If necessary, de-activate relevant sensors.

- Press the  and  the keys simultaneously and keep them pressed for approximately 3 seconds.

- You are now asked for a safety check:






Explanation of display:

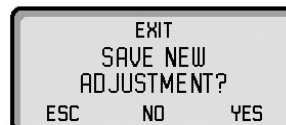
NO	Leaving the adjustment program
MANUAL	Turning to manual calibration
AUTO	Automatic adjustment is started for all sensors activated in "aCAL"

All activated sensors are calibrated one after the other. Supply the relevant test gases over the intake. Make sure that the diffusion inlet is covered.




Entry options:

	Key	Meaning
PUMP		Pump is started and stopped
ESC		Adjustment is interrupted
STOP		Adjustment is finished immediately (value is accepted)

Once all sensors are adjusted, the G750 Polytector requires for confirmation:



Entry options:

	Key	Meaning
ESC		All adjustments are displayed again
NO		Adjustments are not stored
YES		All adjustments are stored. The detector is set completely.

Maintenance – Repair

The function check must be done before the instrument is used and at least once a year and includes:

- Position of zero-point
- Charging status of battery
- Pump and diffusion inlet
- Display with zero gas and standard test gas and adjustment, if necessary
- Alarm signal activation (example: with alarm test gas concentration)
- Constantly amplified signal with standard test gas
- Response time

Any repair of the G750 Polytektor must be done according to the manufacturer's instructions and with genuine spare parts.

Cleaning

After having used the G750 Polytektor, you should give it a quick outside inspection. The casing may be cleaned with a damp cloth. **Do not use any solvents or cleaning agents!**

Service and inspection

Service and inspection are measures to keep gas detectors in proper condition. Part of service and inspection work is a regular check and adjustment of sensitivities and zero-points.

In addition to this, the proper functioning of the detector must be checked.

Gas warning instruments may show different behavior, depending on the ambient conditions. It is important to check the detectors before use and at least once every 30 days, independent from service and inspection work. This check includes:

- Charging status of battery
- Readout with zero gas and test gas
- Calibration

Reading data from data logger

- Start GfG interface program
- Turn G750 Polytektor "ON"
- Select "File" >> New >> G750 Polytektor
- Connect G750 Polytektor with interface and enter "OK"
- Data is transmitted from the data logger to the PC

For operating the GfG interface program refer to the relevant instruction manual.

Charging and replacing the battery pack

The battery pack is on the back side of the detector (fig. 1). For reasons of EX-protection the battery cells and fuses are encased within the enclosure.

Attention: **Make sure that the detector is switched off before you replace the battery pack.** To remove the battery pack, remove the Allen screw on the bottom and slide the complete battery pack off, including the cover. Now slide a fresh battery pack on and replace the Allen screw.

Hints for recharging the battery pack

For recharging the battery pack use the GfG Instrumentation universal charger or plug-in charger. You may recharge the battery pack separately or while it is installed on the detector.

Universal charger

The universal charger recharges the batteries completely within 8 hours. Once this is completed, the universal charger turns to "trickle charge." A lower charging current keeps the batteries fully charged and prevents overcharging. In case you keep the battery pack connected to the charger for a long time, you should discharge and recharge it again after a period of approximately six weeks.

Plug-in Charger

With the plug-in charger, the charging time is approximately 12 to 16 hours. Make sure that the plug-in charger is disconnected from the battery pack after this time, to prevent overcharging and subsequent damaging the batteries.

Appendix Troubleshooting

Failure, display	Reason	Solution
Detector cannot be switched on	<ul style="list-style-type: none"> - Depleted battery - Blown fuse - Keyboard is faulty 	<ul style="list-style-type: none"> - – Recharge battery*
Detector cannot be charged	<ul style="list-style-type: none"> - Faulty charger - Blown fuse in G 750 Polytector 	<ul style="list-style-type: none"> - Call GfG Instrumentation service
Functions cannot be selected	<ul style="list-style-type: none"> - Functions not available - Faulty keyboard 	<ul style="list-style-type: none"> - Purchase functions*
“Memory error xx”	<ul style="list-style-type: none"> - Faulty parameter chip at sensor 	<ul style="list-style-type: none"> - Switch off and on again*
“RAM – Error”	<ul style="list-style-type: none"> - Faulty working memory 	<ul style="list-style-type: none"> - Call GfG Instrumentation service
“ROM – Error”	<ul style="list-style-type: none"> - Faulty program memory 	<ul style="list-style-type: none"> - Call GfG Instrumentation service
“Inspection overdue!”	<ul style="list-style-type: none"> - Exceeded inspection date 	<ul style="list-style-type: none"> - Get service/inspection done by authorized experts*
“Adaptation of sensor signal is incorrect”	<ul style="list-style-type: none"> - Sensor signal too high or too low - Faulty sensor 	<ul style="list-style-type: none"> - Calibrate sensor*
“Pump fault”	<ul style="list-style-type: none"> - Pump capacity too low - Obstacles in sampling line, faulty pump 	<ul style="list-style-type: none"> - Replace filter*
“CC/TC-power-fault”	<ul style="list-style-type: none"> - EX-Sensor operated with wrong voltage 	<ul style="list-style-type: none"> - Check battery connection*
“Temperature”	<ul style="list-style-type: none"> - A sensor is operated beyond its temperature range - Faulty temperature sensor 	<ul style="list-style-type: none"> - Bring detector into normal temperature range*
“Range”	<ul style="list-style-type: none"> - Detection range exceeded/fallen below - Faulty calibration 	<ul style="list-style-type: none"> - Leave area with high concentration - Check calibration

Failure, display	Reason	Solution
"Value is too high! Adjustment impossible!"	<ul style="list-style-type: none"> - Zero-point adjustment with test gas - Zero-point is too positive 	<ul style="list-style-type: none"> - Do zero-point adjustment with zero gas*
"Value is too low! Adjustment impossible!"	<ul style="list-style-type: none"> - Sensitivity calibration done with insufficient test gas concentration - Sensor has lost sensitivity 	<ul style="list-style-type: none"> - Use test gas with a concentration of 50 to 100% of full scale - Replace sensor
"Automatic off"	<ul style="list-style-type: none"> - Battery voltage too low 	<ul style="list-style-type: none"> - Charge battery pack
"Remove battery!"	<ul style="list-style-type: none"> - Detector cannot be switched off 	<ul style="list-style-type: none"> - Check battery connection*

*If suggested solution does not correct the problem, call GfG Instrumentation service: 1 (800) 959-0329.

Accessories

	DESCRIPTION	PART NUMBER
1.	G750 Plug-in charger 230 V , charging time 12 to 24 hours	1750244
2.	Universal charger 230 V/50 Hz with cable for G750 (standard/trickle charge)	1750240
3.	Universal charger 115 V/60 Hz with cable for G750 (standard/trickle charge)	1750242
4.	G750 leather carrying case	1401-124
5.	Carrying strap for leather case, without probe holder	1750249
6.	Telescopic probe CrNi 4.5 ft.	1000205
7.	Sampling line 10 ft., anti-static, with dust/water filter	1000208
8.	Sampling line 10 ft., anti-static, with filter and flow indicator	1000209
9.	Dust/water filter (set of 3 each)	1000207
10.	Spare NiMH battery pack, interchangeable	1750203
11.	G750 Interface connection cable	1750232

Sensors and gases

Sensor	Part number	Range	Resolution
Oxygen (O ₂)	5701-016	0 to 25% volume	0.1% volume
Hydrogen sulfide (H ₂ S)	5703-027	0 to 100 ppm	1 ppm
Carbon monoxide (CO)	5704-027	0 to 500 pp	
Sulfur dioxide (SO ₂)	1750218	0 to 20ppm	
Carbon dioxide (CO ₂)	1750210	0 to 10,000 ppm	50 ppm
	1750211	0 to 5% volume	0.01 to 0.05% volume
	1750212	0 to 25% volume	0.01 to 0.20% volume
	1750213	0 to 70 (100)% volume	0.01 to 0.50% volume
Catalytic combustion	1750225	0 to 100 % LEL	
Thermal conductivity	1750226	0 to 100 % LEL / 0 to 100 % volume	0.5% volume

Technical data

Gases

EX	Combustible gases LEL Combustible gases % volume
OX	Oxygen (O ₂) % volume
TOX	Carbon monoxide (CO) Hydrogen sulfide (H ₂ S) Sulfur dioxide (SO ₂)
IR	Carbon dioxide (CO ₂)

Ranges

EX	CH ₄ 0 to 100% LEL CH ₄ 0 to 100% volume
OX	O ₂ 0 to 25% volume
TOX	Cl ₂ 0 to 10 ppm CO 0 to 1,000 ppm CO 0 to 500 ppm HCN 0 to 100 ppm H ₂ S 0 to 100 ppm H ₂ S 0 to 50 ppm NO 0 to 100 ppm NO ₂ 0 to 50 ppm SO ₂ 0 to 20 ppm
IR	CO ₂ 0 to 70% volume CO ₂ 0 to 25% volume CO ₂ 0 to 5% volume CO ₂ 0 to 10,000 ppm

Detection principles (sensors)

EX	Catalytic combustion Thermal conductivity
OX	Electrochemical
TOX	Electrochemical
IR	Infra-red dual beam

Detection method

Built-in sampling pump and diffusion

Expected sensor life

EX	> 3 years
OX	2 years
TOX	> 3 years

Weight

26 oz (750 g)

Dimensions

3.5 x 8 x 2.5 inches (WxHxD)
90 x 199 x 60 mm (WxHxD)

Display

Graphic alpha-numeric display

Alarms

Visual – large red LED
Audible – buzzer, 80 dB (earphone connector)

Operational time

7 to 14 hours (depending on sensors, alarms and sampling time)

Power source

Rechargeable NiMH battery pack

Temperature range

+14 to +122° F (-10 to +50° C)

Humidity range

0 (20) to 98% r.h. (non-condensing)

Pressure Range

800 to 1,300 mbar

Casing

Carbon fiber reinforced polyamide

Approvals

CENELEC EEX ibd IIC T5
UL Class I, Div. 1 A, B, C, D

Options

Data-logger



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