

USER MANUAL

AVL DITEST GAS 1000



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PASSION INNOVATES FUTURE

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Warning and Safety Notices

This device manual contains important **warning and safety notices** that must be observed by the user.

The product is intended only for the highly specific use described in the user manual. The most important prerequisites and safety measures for the use and operation of the product are also described to ensure faultless operation.

No warranty can be given and no liability is assumed for applications beyond the described use, irrespective of observance of the necessary prerequisites and safety measures.

The product may only be used and operated by personnel who, based on their qualifications, are capable of adhering to the necessary safety measures during use and operation. Only accessories and consumables supplied by AVL DiTEST or approved by AVL DiTEST may be used. The measurement results obtained from the product in question depend not only on correct functioning of the product, but also on a series of general conditions. The results delivered by the product must therefore be evaluated by a specialist (e.g. plausibility check) before further measures are taken on the basis of a delivered measurement.

Settings and maintenance work on open devices while still live may only be performed by trained specialists who are aware of the associated danger.

The product may only be repaired in the factory of origin or by specialists specifically trained to perform such repair.

When using the product, it must be ensured by a specialist that the test object or test system is not brought into any operational state that could result in damage to goods or endangerment of people.



D I T E S T

Summarized Safety Notices



DANGER



Danger to life by electric potential on vehicles with hybrid drives

Deadly high voltages are present on the HV energy store (HV battery) and on parts connected to it! Make sure no-one can come into contact with the connections on the hybrid battery, connecting cables, HV battery or other parts under high voltage.



WARNING



Danger to life by electric potential on the ignition system

The ignition system carries a deadly high voltage!
Do not touch the ignition system while the motor is running!



WARNING



Danger to life by electric potential on vehicles with Xenon light

A lighting system that uses a xenon light carries a deadly high voltage!
Do not touch the components of the xenon light while the lighting is turned on!



WARNING

Danger from harmful or irritating substances

When performing measurements on the running motor in closed rooms (workshops, test halls, etc.), extract the vehicle exhaust gasses and ventilate the rooms thoroughly!



WARNING

Risk of burns from hot parts

Measurements must be performed at normal motor operating temperature or according to the test specification! Do not touch hot parts such as the motor, motor components or any of the entire exhaust system! Use cooling fans if necessary!

**WARNING****Risk of injury from rotating parts**

Only ever perform work in the engine bay while the motor is not running and the ignition is switched off!

Do not touch any rotating parts such as alternator, radiator fan or their drives (e.g. drive belts)!

Make sure measurement cables are laid safely while the motor is running!

**WARNING****Risk of injury from unsecured vehicle**

Engage the handbrake or shift the gearshift to P (on automatics)!

Adequately secure the vehicle against rolling!

**WARNING****Risk of explosions due to pyrotechnical setups and restraint systems**

Testing and assembly work may only be performed by trained personnel!

Never test the igniter with a multimeter!–

Only perform system tests with approved testing equipment!

Disconnect the battery when working on the airbag system!

When reconnecting the battery, the ignition must be switched off and there must be no person inside the vehicle.

Always store the airbag unit with the discharge side facing upwards or according to the storage specifications!

Never leave the airbag unit lying around unattended!

Protect the airbag unit against flying sparks, open fire and temperatures above 100°C!

Do not transport the airbag unit in the passenger space!

Do not allow the airbag unit to come into contact with oil, grease or cleaning agents!

An airbag unit that has been dropped from a height greater than 0.5 m must be renewed!

Dispose of untriggered airbag units!

Do not open or repair the airbag unit!

NOTICE

When maintaining the cut-off speed of diesel engines, observe the applicable manufacturer's specifications!

NOTICE

Always switch off the ignition before connecting or disconnecting the OBD connector or the various AVL DiTEST vehicle adapters!

AVL DiTEST GAS 1000 Safety Notices



WARNING



Danger to life by electric potential

To avoid the risk of fire or risk of electric shock, the device must never be exposed to rain or permanent humidity.

To avoid electric shock, the device may only be opened by qualified personnel.

Should an object or liquid penetrate inside the device, disconnect the device from the power supply and have it revised by a specialist before continuing to use it.

Make sure the device is powered with the correct voltage.

Disconnect the device from the power supply if changing a fuse.



WARNING

Danger from harmful or irritating substances

Corrosive condensate! During measurements, condensation water collects in the exhaust hose.

This condensate contains acids that can cause chemical burns to eyes, skin and clothes.

The device may not be operated in a potentially explosive environment.

NOTICE

Maintain the device as described in Chapter 5 *Maintenance*!

Maintenance and repairs may only be performed by specialist personnel!

NOTICE

All valves and fittings used for NO calibration must be suitable for NO and NO_x and must be resistant to corrosion!

Vents must not be blocked!

NOTICE

Before use, check whether the outputs from the O₂ sensor and NO sensor are free and not blocked, and whether the discharge hose is connected.

The device can be destroyed or deliver faulty measurement results if the gas output is blocked!

NOTICE

When bringing into use after any moving or transporting of the device, make sure the condensate discharge hose is not pinched off – otherwise the measuring cell will be contaminated with condensate.

NOTICE

Note that after transporting or storing the device at low temperatures, it is necessary to wait at least one hour after setting up the device to allow for temperature equalization before the device may be switched on (to avoid water condensation).

NOTICE

Instruments stored at temperatures below 0°C must be heated to at least +2°C before they are switched on.

Should the AVL DiTEST GAS 1000 detect a temperature of < 0°C when switched on, the device will be warmed by pumps for approx. 5 minutes.

Should the temperature be between 0°C and 10°C, the device will be warmed by pumps for approx. 60 seconds.

NOTICE

The device must not intake exhaust gas for an unnecessarily long time.

The probe should only ever be inserted into the exhaust when required for a measurement. Otherwise, the probe should be rinsed with ambient air while the pumps are running.

NOTICE

Never leave the probe lying on the floor.

Do not kink the probe.

Make sure neither liquids (e.g. water) nor other contaminants can be drawn up through the probe into the exhaust instrument.

NOTICE

Before switching off the device, the AVL DiTEST GAS 1000 must be rinsed with pure ambient air with the pumps running for at least 10 minutes.

NOTICE

Make sure the instrument is not set up in direct sunlight, rain, or snow, or in atmospheres that are corrosive or polluted with gasoline vapor.

NOTICE

Make sure no devices that cause strong electromagnetic interference (e.g. radio telephones, electronic welding equipment, large electric motors etc.) are operational in a vicinity of approx. 5 m around the instrument.

NOTICE

When a low gas flow is displayed, you must check whether the hose or probe are kinked or blocked or whether the filters are polluted and need to be cleaned or changed.

NOTICE

Use only:

- DiTEST - Standard exhaust probes
 - DiTEST - Standard replacement parts
-

NOTICE

After every measurement, immediately remove the probe from the exhaust.
Before switching off the AVL DiTEST GAS 1000, have the AVL DiTEST GAS 1000 rinse through with pure ambient air with the pumps running for at least 10 minutes.
That way, the filters and measuring cells will be rinsed with fresh air and no exhausts will remain in the device.

NOTICE

Choose an installation site where unhindered air circulation is allowed through the air vents on the device.

NOTICE

If the device is not operated in the manner specified by the manufacturer, the safety devices of the device may be impaired.

Important Notices

Maintenance

The AVL DiTEST GAS 1000 must be maintained according to specifications (see Chapter 5 *Maintenance*):

The half-yearly maintenances must be documented:

- On the maintenance sticker of the respective device with date and name.
- In the test logbook.

The time of maintenance, the work performed and the name of the person or company who performed the work must be specified.

These recordings must be kept for a period of 5 years and must be presented upon every calibration upon demand.

Calibration

Instruments for emissions testing are subject to design approval and obligatory calibration.

The AVL DiTEST GAS 1000 has the necessary design approvals.

The AVL DiTEST GAS 1000 is first calibrated in the factory.

The AVL DiTEST GAS 1000 must be calibrated at yearly intervals.

The calibration must be documented in the test logbook.

The date for the next calibration service must be entered on the maintenance sticker of the AVL DiTEST GAS 1000.

NOTICE

It is not permissible to exceed the calibration date.

The annual maintenance (with calibration service) can be performed by

AVL DiTEST Central Service

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1 General

1.1 General Description

4-gas and 5-gas module for gasoline engines:

- IR test bench, OIML R99 Class 0
- Exhaust probe can be used even under extreme condensation
- NO optional
- Position-independent operation
- Measures the relative volumetric fractions of gases CO, CO₂, HC, O₂ and NO.
- Calculates the air ratio λ
- Optionally calculates the air/fuel ratio AFR
- Optionally calculates CO, corrected

AVL DiTEST GAS 1000 front view:

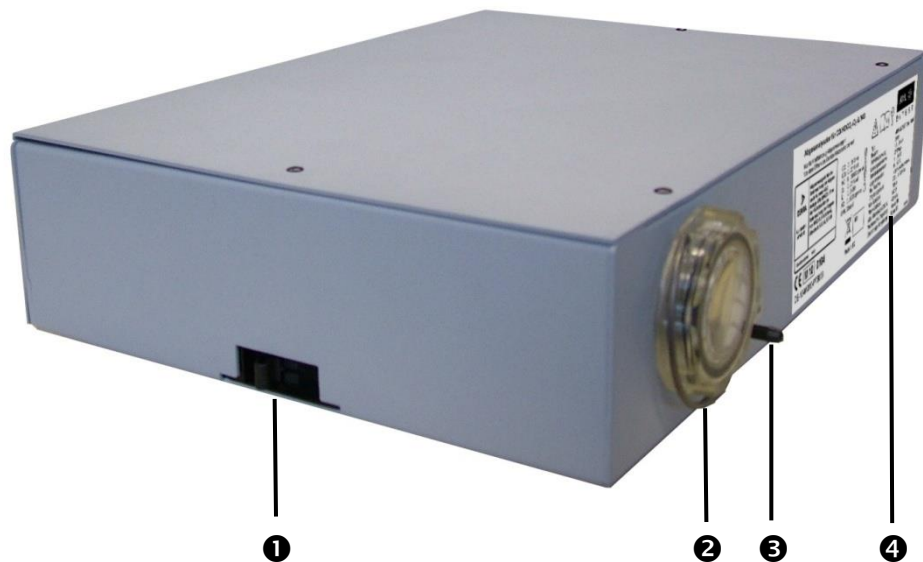


Fig. 1-1

- ① Lock point (when used in the CDS)
- ② Filter
- ③ Gas input
- ④ Type plate

AVL DITEST GAS 1000 rear view:



Fig. 1-2

- ❶ Socket for connecting to the CDS 1000, AUX, connection to AUX module
- ❷ Socket for MDS connection
- ❸ USB port, connection to PC
- ❹ Fan
- ❺ Bluetooth antenna (optional)
- ❻ Calibration gas input "CAL. GAS"
- ❼ Condensed water output "COND. OUT"
- ❽ Gas output "GAS OUT"

1.2 Safety Notices

This document contains important warning and safety notices that must be observed by the user. Faultless and safe operation can only be guaranteed if the prerequisites and safety measures are adhered to.

1.3 Typographic Conventions

Safety Notices:



DANGER

Refers to an **extremely hazardous** danger that, if not avoided, would lead to death.



WARNING

Refers to an immediate threat that, if not avoided, could lead to death or severe injuries.



CAUTION

Refers to a danger that could lead to moderate or light injuries.

Additional warning signs:



Danger from electric current.

Notices:

NOTICE

This text refers to situations or examples of incorrect operation that could result in damage to goods or loss of data.

Information

This text refers to important information or instructions. Failure to observe these instructions will prevent or significantly encumber successful conclusion of the actions described in this document.

Standard font formats:

bold	Important text/text passages, parameters
<i>italic</i>	Dialogues and reports on screen
ALL CAPITALS	Names of devices and operating modes
Menu Menu item	Selection of menu commands by clicking on buttons

List formats:

1. 2.	Step-by-step instructions to be performed in a specific order
•	instructions involving only one step
▪	Lists with no specific order
-	

2 Preparation for First Use

NOTICE

Observe the safety notices at the beginning of this device manual!
Observe Chapter 5 *Maintenance*!

1. Push the hose for fresh air / calibration gas, with activated charcoal filter, onto the **CAL. GAS** ④ connector.
2. Attach the 1.2 m long hose labeled **GAS OUT** onto the **GAS OUT** connector ⑥ on the rear side of the AVL DiTEST GAS 1000.
Make sure the hose is not kinked or damaged.
Do not block the measurement gas output!
The measurement gas must be able to escape unhindered, otherwise there is a risk of faulty measurement or even destruction of the measuring cells!
3. Attach the 1.2 m long hose labeled **COND OUT** to the **COND OUT** connector ⑤ on the rear of the AVL DiTEST GAS 1000.
Make sure the hose is not kinked or damaged.
4. If the AVL DiTEST GAS 1000 is equipped with an NOx sensor, connect the hose ⑦ as shown.

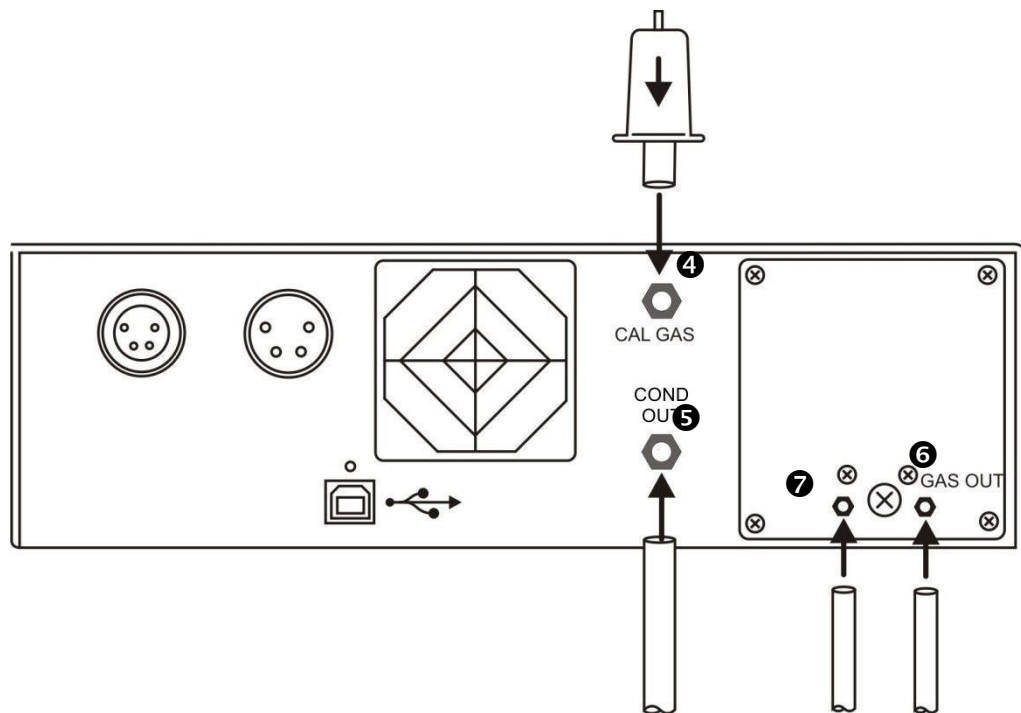



Fig. 2-1

5. Connect the exhaust probe with the connector hose to the **GAS IN**  connector.

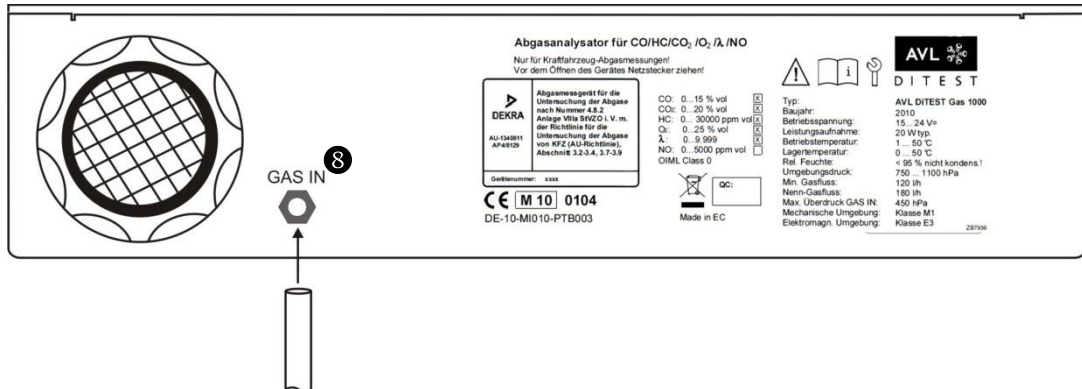


Fig. 2-2

6. Switch the AVL DiLink 480 / AVL CDS 1000 / AVL MDS on.
7. After switching on, the AVL DiTEST GAS 1000 first runs through a self-test and then automatically the warm-up phase. The duration of the warm-up phase depends on the environmental temperature and is approximately 2 minutes. You will next be prompted to perform the daily leak test.
 Should the AVL DiTEST GAS 1000 detect a temperature of $< 0^{\circ}\text{C}$ when switched on, the device will be warmed by pumps for approx. 5 minutes. Should the temperature be between 0°C and 10°C , the device will be warmed by pumps for approx. 60 seconds.
8. The AVL DiTEST GAS 1000 is now ready for use.

NOTICE

Only insert the exhaust probe into the exhaust when then the AVL DiTEST GAS 1000 is switched on.

After every measurement, immediately remove the probe from the exhaust.

Before switching off the AVL DiTEST GAS 1000, have the AVL DiTEST GAS 1000 rinse through with pure ambient air with the pumps running for at least 10 minutes.

That way, the filters and measuring cells will be rinsed with fresh air and no exhausts will remain in the device.

3 Operation

The AVL DiTEST GAS 1000 is operated exclusively from the PC software.

4 Operating Modes

For PC-controlled AU and an exact description of the Service menu, please refer to the device manual *AVL DiX AU-Software* or *AVL CDS 1000 / AVL MDS*.

The following operating modes are found in the Service menu of the DiX AU software.

- Initialization
- Start gas measurement
- Leak test
- Pump
- Valve
- Set date/time
- Calibration

4.1 Measurements

After switching on, the AVL DiTEST GAS 1000 first runs through a warm-up phase.

Then, the leak test is prompted once each day.

The measurement display can be activated using the command "Start gas measurement".

4.2 HC Residue Test

The HC residue test tests the gas path of the AVL DiTEST GAS 1000 for residue of hydrocarbons, which could falsify the measurement results.

The program starts automatically with the command Initialize and is user-guided; follow the instructions on the monitor/display.

Should the gas tester not pass the test,

- Disconnect the exhaust probe from the In-connector on the AVL DiTEST GAS 1000.
- Blow compressed air through the exhaust hose (not through the AVL DiTEST GAS 1000!)
- Reconnect the exhaust hose to the gas tester
- Repeat the HC residue test.

4.3 Leak Test

The device automatically prompts for the leak test once each day.

During the leak test, the hose, hose filter and probe must be connected to the device and the probe must be firmly closed!

The leak test must also be performed when a filter has been changed.

Follow the instructions on the screen.

Should a leak be detected,

- Check whether the probe opening is firmly closed for the test,
- Check the exhaust hose for damage and, if necessary, swap it for a new one,
- Make sure that
 - The fine filter and O-ring are correctly inserted,
 - The O-ring and sealing surface are clean, and
 - The screw cap of the fine filter is firmly closed.

4.4 Zero Adjustment

The actual zero adjustment runs automatically.

It is initiated automatically at certain time intervals or by the operator.

Make sure fresh air can be drawn into the **CAL. GAS** input.

Inside the AVL DiTEST GAS 1000, the gas transport path is appropriately switched so that the probe can remain in the exhaust.

Automatic Zero Adjustment

The automatic zero adjustment is initiated every 60 minutes or upon sudden temperature changes. If, however, an exhaust measurement is being performed, then the zero point adjustment will be suppressed until the measurement is complete.

The corresponding message will appear in the status bar until the zero adjustment has been successfully performed. If you still wish the zero adjustment to be performed during an exhaust measurement, it must be initiated automatically.

Manual Zero Adjustment

You can initiate a zero adjustment at any time using the Initialize command.

This will naturally interrupt any exhaust measurement that may be running, but the probe does not need to be removed from the exhaust.

Once the zero adjustment is complete, you can switch back to the measurement image. The 60-minute interval for automatic zero adjustment is reset by a manual zero adjustment.

4.5 O₂ Sensor Test

This test checks the state of the O₂ sensor.

This test must be started by the F5 button and performed whenever you insert a new O₂ sensor.

If the state of the O₂ sensor checks OK, then any existing message in the status bar that the O₂ sensor is depleted or faulty will be deleted.

4.6 Date / Time

Here, you can set the current date and time. The AVL DiTEST GAS 1000 adopts the current settings from the PC.

4.7 Parameters

General

Various parameters are displayed, for example:

- Ser. No.	0999	(Serial number)
- Firmware Vers.	1.22	(Firmware version)
- Checksum.	5DD9	(CRC16 checksum)
- Boot Vers.	1.00	(Boot software version)
- Driver Version	2.0	(Version of the software driver)
- Driver Checks.	384A7B0D	(checksum of the software driver)
- N.Gas Cal.	12.08.2010	(Date of the next gas calibration)
- N. NO Cal.	12.01.2010	(Date of the next NO calibration)
- Bank FW-V.	0.4	(Firmware version of the IR measuring cell)
- Bank No.–	358	(Serial number of the IR measuring cell)

Lambda Calculation

The lambda equation (Brettschneider equation) is:

$$\lambda = \frac{\text{CO}_2 + \frac{\text{CO}}{2} + \text{O}_2 + \left(\frac{\text{H}_{\text{cv}}}{4} \cdot \frac{\text{K}}{\text{K} + \frac{\text{CO}}{\text{CO}_2}} - \frac{\text{O}_{\text{cv}}}{2} \right) \cdot (\text{CO}_2 + \text{CO})}{\left(1 + \frac{\text{H}_{\text{cv}}}{4} - \frac{\text{O}_{\text{cv}}}{2} \right) (\text{CO}_2 + \text{CO} + \text{K1} \cdot \frac{\text{HC}[\text{ppm}]}{10000})}$$

With the constants

■ H _{cv}	1.730	
■ O _{cv}	0.020	
■ H _{cv} -LPG	2.530	
■ O _{cv} -LPG	0.000	
■ H _{cv} -CNG	4.000	
■ O _{cv} -CNG	0.000	
■ K	3,5	(Water gas equilibrium constant)
■ K1	6	(Conversion factor FID/NDIR)

H _{cv}	=	Hydrogen to carbon atomic ratio
O _{cv}	=	Oxygen to carbon atomic ratio
LPG	=	Liquid Petrol Gas (propane, C ₃ H ₈)
CNG	=	Compressed Natural Gas (methane, CH ₄)

PEF

PEF = Propane Equivalency Factor

The PEF is the device-specific conversion factor between propane and hexane value:

Propane [ppm vol] x PEF = Hexane [ppm vol]

To obtain the greatest possible precision, the AVL DiTEST GAS 1000 works with a variable PEF.

The value for 2000 ppm vol propane (calibration point) is displayed in the Service menu.

Logbook

As soon as firmware is loaded into the AVL DiTEST GAS 1000, a logbook entry is added.

A history of updates/downloads can thus be followed.

The logbook holds a maximum of 100 entries.

This function is especially of interest to the calibration service.

Status

In the Service menu, by clicking on **F8 Next**, you can call up 3 display pages with important internal information on the AVL DiTEST GAS 1000, which is very useful when servicing.

Status Page 1:

- HC residue test necessary
- Leak test necessary
- Stabilization necessary
- Automatic stabilization permitted
- Automatic rinsing permitted
- Automatic fan control
- Automatic stabilization running
- Automatic rinsing running
- Fan running (automatic)
- Warm-up phase running
- Condensation warning

- Pump running
- Valve 1
- Valve 2
- Valve 3
- Valve 4
- Fan running

- Calibration warning (CO, CO₂, HC)
- CO, CO₂ and HC calibration expired
- NO_x calibration expired
- NO_x sensor depleted
- O₂ sensor soon depleted
- O₂ sensor depleted
- NO₂ calibration expired
- NO₂ sensor depleted

- Throughput too low (gas off)
- Throughput too low (cal. gas off)
- Throughput too low (gas off)
- Gas test bench error
- Hardware error
- CPU temperature error
- Condensate voltage error

Clicking on **F8 Next** swaps to page 2 of the status values.

Status Page 2:

- Temperature of mainboard
- Temperature of gas test bench
- Ambient air pressure
- Pressure at exhaust tester
- Voltage at condensate separator
- Voltage at pump

Clicking on **F8 Next** swaps to page 3 of the status values.

Status Page 3:

- Test bench type
- Serial number
- Firmware version
- Status [0]
- Status [1]
- Status [2]
- Status [3]
- Extended error [0]
- Extended error [1]
- Extended error [2]
- Extended error [3]

5 Maintenance

5.1 Maintenance Plan

The following maintenance procedures must be performed as necessary or at the latest within the maintenance cycles specified below!

Maintenance Task	As required	Weekly	Half-yearly	Yearly	Comments	Entry into test logbook
Leak test	●	●	●	●	Prompted automatically by the device ⇒ Chapter 5.2	
Exhaust probe and hose	●	●	●	●	⇒ Chapter 5.3	
Fine filter	●	●	●	●	⇒ Chapter 5.4	
Probe filter (1 piece)	●	●	●	●	⇒ Chapter 5.5	
O ₂ sensor	●	●	●	●	⇒ Chapter 5.6	●
Tube filters (2 pieces)			●	●	⇒ Chapter 5.7	●
Activated charcoal filters				●	By authorized service only	●
Software update (as required)				●	By authorized service only	●
Battery				●	By authorized service only	●
Gas calibration				●	⇒ Device manual AU Software / CDS 1000	●

5.2 Leak Test

The device automatically prompts for the leak test once each day.

During the leak test, the hose, hose filter and probe must be connected to the device and the probe must be firmly closed!

The leak test must also be performed when a filter has been changed.

Should a leak be detected,

- Check whether the probe opening is firmly closed for the test,
- Check the exhaust hose for damage and, if necessary, swap it for a new one,
- Make sure that
 - The fine filter and O-ring are correctly inserted,
 - The O-ring and sealing surface are clean, and
 - The screw cap of the fine filter is firmly closed.

5.3 Exhaust Probe and Hose

NOTICE

Remove the probe from the AVL DiTEST GAS 1000 before working with compressed air, in order to avoid damaging the AVL DiTEST GAS 1000!

Do not kink the probe!

Check the exhaust probe as follows:

1. Pull the probe and hose off the AVL DiTEST GAS 1000.
2. Pull the probe filter off the exhaust hose and exhaust probe.
3. Loosen residues in the probe by careful knocking.
4. Blow compressed air through the probe and hose.
5. Clean the probe on the outside using a cloth.
6. Reassemble the probe, hose filter and hose and push the hose onto the measurement gas input.
Make sure the probe is firmly attached.

5.4 Fine Filter

The fine filter is located on the left side of the device.

The fine filter must be changed as necessary.

When changing, make sure:

- The O-ring sits correctly,
- The O-ring and sealing surface are clean.

5.5 Probe filter

The probe filter must be changed as necessary.

Change the probe filter as follows:

1. Pull the probe and hose off the AVL DiTEST GAS 1000.
2. Pull the probe filter off the exhaust hose and exhaust probe.
3. Push the new probe filter onto the probe and exhaust probe.
4. Reassemble the exhaust probe, probe filter and exhaust hose and push the exhaust hose onto the measurement gas input.
Make sure the probe is firmly attached.

5.6 O₂ and NO Sensor

NOTICE

Observe the safety notices when handling the O₂ and NO sensors!
Changing the O₂ or NO sensor must be documented!

If the message "Change O₂ sensor" or "Change NO sensor" appears, the O₂/NO sensor must be changed!

1. Disconnect the AVL DiTEST GAS 1000 from the power by unplugging the power cord at the rear of the device.

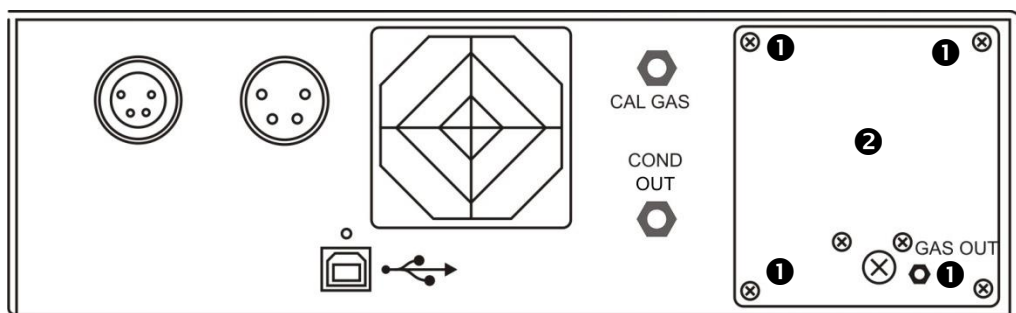


Fig. 5-1

2. Unscrew both screws **1** and remove the cover **2**.

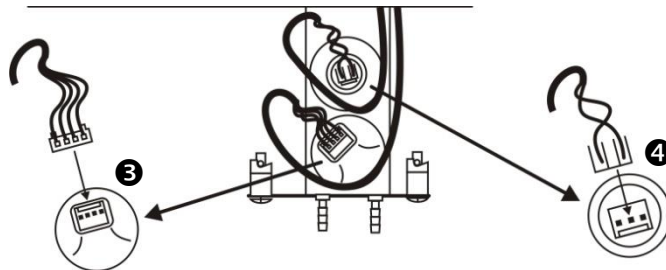


Fig. 5-2

3. Pull off the plug of NO sensor **3** or O₂ sensor **4**.

4. Unscrew the NO sensor or O₂ sensor.
5. Insert the new NO sensor or O₂ sensor.
6. Push the plug on (NO_x sensor **3** 4-pin and O₂ sensor **4** 2-pin).
Ensure correct assembly and correct reverse polarity protection of the sockets and plugs.
7. Replace the cover **2** on the device and screw in the screws **1**.
8. Perform an O₂ sensor test. To do so, observe Chapter 4.5.
or perform an NO_x sensor calibration.

Safety Notices for Handling O₂ and NO_x Sensors

The O₂ and NO_x sensors are sealed and normally present no danger to your health.

The following notices apply if a leak is discovered on a sensor:

- Before you remove a sensor from the original, gas-tight packaging, check the packaging for any leaks.
- Always avoid direct contact with the skin if any leak damage is discovered.
- In such a case, wear rubber gloves and protect your eyes.



WARNING

Danger from caustic or harmful substances

The O₂ and NO Sensors contain potassium hydroxide and lead.

When changing a sensor, check for leaks on both old and new sensors!

First Aid Measures:

- Please observe the instructions for use and safety instructions of your O₂ / NO sensor supplier.

5.7 Tube Filters

On the underside of the device are two tube filters.

These filters must be checked at half-yearly intervals and changed if necessary.



To test or change the filters, you must unscrew the filter caps.

When changing, make sure:

- The O-ring sits correctly,
- The O-ring and sealing surface are clean.

6 Scope of Delivery

6.1 System Delivery

Name	Order No.
AVL DiTEST GAS 1000 with hose set for: <ul style="list-style-type: none"> ▪ Calibration gas ▪ Gas output ▪ Condensate output 	BO7720
User Manual AVL DiTEST GAS 1000	AT7651D
Test logbook	AT0507D
Probe AVL DiTEST GAS 1000, adjustable with Viton hose and centering point 	BO7103

6.2 Replacement Parts


Name	Order No.
Probe filter Located between exhaust probe and probe hose	MF0478
Tube Filters	MM7474
Activated charcoal filters	MM7421
O ₂ sensor	EZ0147
NO sensor	EZ0206
Round filter (exhaust filter front) 55 mm diameter Packing unit 100 pieces	MM7468

6.3 Options

Designation	Order no.
Desktop power supply 19V / 90 W	BV7589
Bluetooth module WT11u-E	EN7576



7 Technical Data

Measured quantities:	Measuring range:	Resolution:	Accuracy:
CO:	0 ... 15 % vol	0.01 % vol	< 0,6 % vol: ± 0.03 % vol ≥ 0,6 % vol: ± 5 % v. M.
CO ₂ :	0 ... 20 % vol	0.01 % vol	< 10 % vol: ± 0.5 % vol ≥ 10 % vol: ± 5 % v. M.
HC*:	0 ... 30000 ppm vol	1 ppm vol	< 200 ppm vol: ± 10 ppm vol ≥ 200 ppm vol: ± 5 % v. M. ≥ 10000 ppm vol: ± 10 % v. M.
O ₂ :	0 ... 25 % vol	0.01 % vol	< 2 % vol: ± 0.1 % vol ≥ 2 % vol: ± 5 % v. M.
NO:	0 ... 5000 ppm vol	1 ppm vol	< 500 ppm vol: ± 50 ppm vol ≥ 500 ppm vol: ± 10 % v. M.
Lambda:	0 ... 9.999	0.001	Calculated from CO, CO ₂ , HC, O ₂
Power supply:			
Power supply:	15 ... 24 V DC		
Power draw:	Approx. 20 W		
Miscellaneous:			
Warm-up time:	Approx. 2 min		
Connection CAL. GAS:	60 ... 140 l/h, max. positive pressure 450 hPa!		
Connection Gas In.:	Approx. 180 l/h, max. positive pressure 450 hPa!		
Response time:	t ₉₅ ≤ 10 s (t ₉₅ : 95% of the gas concentration must be detected within the time t ₉₅)		
Operating temperature	5 ... 45 °C		
Storage temperature:	0 ... 50 °C		
Relative air humidity:	≤ 95 %, non-condensing		
Tilt:	0° or 90° (GAS IN directed upwards)		
Dimensions (WxDxH):	270 x 320 x 85 mm		
Weight:	2.5 kg net without accessories		
Interfaces:	USB		
Disposal: 	This product of AVL DiTEST is a high-quality electrical and electronic device that may not be disposed of in the household waste. For disposal, it is essential to comply with local legal obligations!		


* Hexane

The IR test bench satisfies the requirements of OIML R99 Class 0.

Subject to technical change.

Compliance:

**EU – KONFORMITÄTSERKLÄRUNG
EU – DECLARATION OF CONFORMITY**



Wir,
We

Hersteller: **AVL DiTEST GmbH**
Manufacturer:

Anschrift: **A-8020 GRAZ, Alte Poststrasse 156**
Address:

erklären, auf Basis des in der Anlage referenzierten Dokument, in alleiniger Verantwortung, dass
das von AVL DiTEST GmbH hergestellte Produkt
*declare, based on the referenced document, see annex under our sole responsibility, that the
product produced at AVL DiTEST, called*


AVL DiTEST GAS 1000

in Übereinstimmung mit den Bestimmungen der nachstehenden EU-Richtlinien ist
in accordance with the regulations of the following EU-directives

2014/53/EU	Richtlinie des Rates über die Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Funkanlagen auf dem Markt <i>Council Directive on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment</i>
2014/32/EU	Richtlinie des Rates über die Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Messgeräten auf dem Markt <i>Council Directive on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments</i>
2011/65/EU	Richtlinie des Rates zur Beschränkung der Verwendung bestimmter Stoffe in Elektro- und Elektronikgeräten <i>Council Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment</i>

Nachfolgend werden die harmonisierten Normen sowie andere technische Spezifikationen angegeben, die zugrunde gelegt wurden / *the following harmonized standards or references to the other technical specifications have been applied:*

Referenced Document: Checklist DoC Gas 1000 signed



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Grundlegende Anforderungen Essential requirements	Fundstellen References	Kommentare Comments
Art. 3.1 a) Sicherheit (2014/53/EU)	EN 61010-1:2010	Zur Erfüllung der Schutzziele gemäß Art. 3.1 a) unter der RED 2014/53/EU wurde die harmonisierte Norm, gelistet unter der LVD 2014/35/EU, für das Messsystem angewendet. <i>In order to meet the protection goals according to Art. 3.1 a) under RED 2014/53/EU, the harmonized standard listed under LVD 2014/35/EU applied for the measuring system.</i>
Art. 3.1 b) EMV (2014/53/EU)	EN 61326-1:2013	Zur Erfüllung der Schutzziele gemäß Art. 3.1 b) unter der RED 2014/53/EU wurde die harmonisierte Norm, gelistet unter der EMCD 2014/30/EU, für das Messsystem angewendet. <i>In order to meet the protection goals according to Art. 3.1 b) under RED 2014/53/EU, the harmonized standard listed under EMCD 2014/30/EU applied for the measuring system.</i>
Art. 3.1 b) EMV (2014/53/EU)	EN 301 489-1 v2.1.1	Funkteil, ratifizierte ETSI-Norm angewendet, nicht unter der RED gelistet. <i>Radio part, ratified ETSI standard applied, not listed under the RED.</i>
Art. 3.1 b) EMV (2014/53/EU)	EN 301 489-17 v3.1.1	Funkteil, ratifizierte ETSI-Norm angewendet, nicht unter der RED gelistet. <i>Radio part, ratified ETSI standard applied, not listed under the RED.</i>
Art. 3.1 b) RF (2014/53/EU)	EN 300 328 v2.1.1	Funkteil, ratifizierte ETSI-Norm angewendet, nicht unter der RED gelistet. <i>Radio part, ratified ETSI standard applied, not listed under the RED.</i>
MID (2014/32/EU)	OIML R 99-1 & 2:2008	Empfehlung hinsichtlich messtechnischer Belange im Bereich der Abgasmessung. <i>Recommendation regarding measurements in the field of vehicle exhaust emissions.</i>
RoHS (2011/65/EU)	EN 50581:2012	Unter der RoHS 2011/65/EU als harmonisierte Norm gelistet, für das Messsystem angewendet. <i>Listed as a harmonized standard under RoHS 2011/65/EU applied to the measuring device.</i>

Referenced Document: Checklist DoC Gas 1000 signed





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Die Benannte Stelle Physikalisch-Technische Bundesanstalt, Kennnummer 0102, hat die Konformitätsbewertung nach Richtlinie 2004/22/EG Modul B durchgeführt und die EG-Baumusterprüfbescheinigung DE-10-MI010-PTB003 ausgestellt.
The Notified Body Physikalisch-Technische Bundesanstalt, Identification number 0102, has carried out the type examination according to Directive 2004/22/EC Annex B and issued the type examination certificate DE-10-MI010-PTB003.

Die Benannte Stelle Physikalisch-Technische Bundesanstalt, Kennnummer 0102, hat die Konformitätsbewertung zur Anerkennung des Qualitätsmanagementsystems nach Richtlinie 2014/32/EU Modul D durchgeführt und das Zertifikat mit der Registriernummer DE-M-AQ-PTB081 ausgestellt.
The Notified Body Physikalisch-Technische Bundesanstalt, Identification number 0102, has carried out the assessment of conformity of type based on quality assurance of the production process according to Directive 2014/32/EU Annex D and issued the certificate DE-M-AQ-PTB081.

Graz, 21.04.2020

	
DI (FH) Jürgen Menhart	Mag. (FH) Kurt Leitinger
Project Management Office	Global Director Supply Chain

Referenced Document: Checklist DoC Gas 1000 signed

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