Warnings and safety instructions

This user guide provides an overview of the commissioning and operation of the AVL DiTEST leak detector. Despite the very detailed process descriptions, the user guide is not exhaustive. This user guide contains important warnings and safety instructions that must be observed by the user.

The product is intended for the sole specific purpose described in this user guide. It also includes the most important requirements and safety measures that must be complied with in order to use and operate the device and to ensure trouble-free operation. No responsibility or liability is assumed for any use beyond its intended purpose or in the case of non-compliance with the necessary requirements and safety measures.

The product may only be used and operated by personnel that is appropriately qualified to comply with the necessary safety measures when using or operating the product. It may only be used together with accessories and consumables supplied or approved by AVL DiTEST. Since the measuring results of this product depend not only on the proper functioning of the product itself, but also on a number of other boundary conditions, it is essential that the results provided by the product be reviewed by an expert (validity check) before any further measures based on these measuring results be made.

Adjustments and maintenance work may only be performed on open and live devices by trained personnel that is aware of the risks involved.

When using the product, a professional must ensure that the test object or test system cannot enter operating modes that could endanger persons or cause material damage.
Target group

The user guide is intended for personnel involved in the commissioning of the device. However, it should also serve as information for customers and operators for the entire operating process.

This user guide must be read by users prior to use. In particular, the following must be observed:

- The Safety section and
- The safety instructions in the individual sections.

Additional instructions

The operator is obliged to include instructions on applicable national occupational health and safety as well as environmental protection regulations in the user guide. Such obligations may also concern proper handling of dangerous goods or the provision/wearing of personal protective equipment.

Furthermore, the operator is obliged to include instructions on work organisation, work processes and deployed personnel. This includes instructions on supervisory and reporting requirements.

Storage of the user guide

Always keep the user guide ready at hand by the AVL DiTEST leak detector.
SAFETY

Safety instructions

This documentation contains important warnings and safety instructions that must be observed by the user. Trouble-free and safe operation can only be ensured if these requirements and safety measures are complied with.

The warnings listed in the individual sections of the user guide are identified as follows with a pictogram, signal word and signal colour:

---

**DANGER**

Indicates an imminent danger that can lead to death, severe injury or significant damage if not avoided.

---

**WARNING**

Indicates a danger that can lead to death, severe injury or significant damage if not avoided.

---

**CAUTION**

Indicates a danger that can lead to death, severe injury or significant damage if not avoided.

---

**NOTICE**

This text points to situations or maloperations that can lead to damage or data loss.

---

**Information**

This text provides important information
Pictograms

The following is a list of all prohibition, warning and mandatory signs that may be attached to the machine and/or that are used in this user guide.

Prohibition signs

Fire and open flames prohibited

Warnings

General
GENERAL SAFETY INSTRUCTIONS

WARNING
Read all instructions carefully!

DANGER
Danger to life due to electrical voltage on vehicles equipped with high-voltage systems
The HV energy storage system (HV battery) and the components connected to it are connected to a life-threatening high-voltage supply!
Make sure that nobody comes in contact with the HV battery, the connecting cables of the HV battery or any other live parts!

WARNING
Danger to life due to electrical voltage at the ignition system
The ignition system is connected to a life-threatening high-voltage supply!
Do not touch the ignition system with the engine running!

DANGER
Danger to life due to electrical voltage on vehicles equipped with high-voltage systems
The lighting system with Xenon lamps is connected to a high-voltage supply!
Do not touch the components of the Xenon lamps with the lighting system switched on!

WARNING
Danger due to harmful or irritant substances
When performing measurements with the engine running, make sure that the exhausts are extracted and that the room is sufficiently ventilated!
WARNING

Danger of burning due to hot parts

Only perform measurements when the engine is operating at normal temperature and in accordance with the test specification! Do not touch hot parts such as the engine, attachments or the entire exhaust system! Use cooling fans if necessary!

WARNING

Risk of injury due to rotating parts

Perform work inside the engine compartment with the engine and ignition system switched off whenever possible!

To not touch rotating parts such as alternator, radiator or their drive systems (e.g. V-belt)!

WARNING

Danger of explosion due to pyrotechnic devices and restraining systems

- Test and assembly work must only be carried out by trained personnel!
- Never test the igniter using a multimeter!
- Only perform system tests with approved testing devices!
- Disconnect the battery when working on the airbag system!
- When connecting the battery, the ignition must be switched on and no persons must be located in the interior!
- Make sure that the exhaust area is facing up when storing removed airbag units and always adhere to the storage instructions!
- Do not leave airbag units lying around unattended!
- Protect airbag units from sparks, fire and temperatures above 100 °C!
- Do not transport airbag units in the passenger compartment!
- Make sure that the airbag unit does not come in contact with oil, grease or cleaning agents!
- Airbag units that have been dropped from higher than 0.5 metres must be replaced!
- Dispose of airbag units that have inflated!
- Do not open or repair airbag units!
LEAK DETECTOR SAFETY INSTRUCTIONS

WARNING

Only use this device for its intended purpose.
The AVL DiTEST leak detector was developed for FORMING GAS only. Other gases may damage the vehicle's air conditioning system.

Only use 10-litre or 20-litre gas cylinders with a maximum diameter of 204 mm.

Pay particular attention to the correct mixing ratio of 95 % nitrogen and 5 % hydrogen. Concentrations with more than 5.7% hydrogen are explosive.

Make sure that the valve of the cylinder is closed after every use with the AVL DiTEST leak detector.

Never directly inhale the gas.

Since hydrogen slowly leaks from steel cylinders over an extended period, the gas has to be replaced at least once a year.

When transporting the gas cylinders always make sure that the cylinder valve is closed and the pressure reducer removed. The pressure reducer must never be used as a grip when transporting the cylinders.

The pressure reducer must always be easily accessible. It must not be used to store hoses or other tools.

Never let the engine run when searching for leak.

Never turn on an air conditioning system filled with gas. This may damage the air conditioning system.

Always wear protective goggles and gloves when performing maintenance work on air conditioning systems. Body parts that come in contact with the refrigerating agent may result in frostbite, since the refrigerating agent withdraws heat from the body.

Refrigerant gases are heavier than air. Therefore, do not inhale refrigerating gases. They displace the oxygen required for breathing.

To not alter or modify the AVL DiTEST leak detector.

Repairs must only be carried out by trained personnel. Only AVL DiTEST original spare parts must be used.

Before using the device, always make sure that all service hoses are undamaged.

Do not use the AVL DiTEST leak detector if it is damaged.

After the leak test with the gas or after a repair the air conditioning system must be evacuated in accordance with the manufacturer's instructions.

When performing a "functional check", the sensor head of the gas detector must not be exposed to tobacco smoke. The tar residues in the smoke can deposit on the sensor surface and reduce its sensitivity.

Do not perform a "functional check" of the sensor head by holding the sensor head against the valve of the gas cylinder and opening the valve of the gas cylinder. This may damage the sensor.

The diffusion area of the sensor head of the gas detector must be kept clean and free from oils and greases. Spraying evaporated liquids or gases onto the sensor head will falsify the display values and cause error messages later on.

Avoid silicone-containing vapours and substances coming in contact with the sensor head.

In addition to these safety instructions also observe:

- Legal provisions for maintaining vehicle air conditioning systems
- Special maintenance instructions for vehicle air conditioning systems that may apply in your company
GENERAL OBLIGATIONS OF THE PERSONNEL

WORKING ON ELECTRICAL COMPONENTS

Before working on electrical components, the following minimum requirements must be observed:

1. Make sure that the system is fully de-energized
2. Secure against accidental re-activation
3. Check de-energized state
4. Earth and short
5. Cover adjacent live parts.

After the work has been carried out, perform these five steps in reverse order.

OPERATING AND AUXILIARY MATERIALS

Before using operating and auxiliary materials, the material safety data sheets for the product and the manufacturer’s instructions must be read.

An appropriate safety concept must be developed and adhered to based on these material safety data sheets.
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1 General

1.1 General description

This user guide describes the leak detector for persons who perform maintenance work on vehicle air conditioning systems and who are appropriately trained for this work. Carefully read this user guide before using it for the first time. The user guide contains all necessary information for safe and effective use of the AVL DiTEST leak detector. In addition, observe:

- Legal provisions on the use of air conditioning systems
- Special maintenance instructions for air conditioning systems that may apply in your company

Keep the user guide close to the AVL DiTEST leak detector so that you can consult it immediately whenever necessary.

1.2 Intended use

The AVL DiTEST leak detector is intended for commercial use and is designed to detect leaks in vehicle air conditioning systems with the help of forming gas consisting of 95% nitrogen and 5% hydrogen. The AVL DiTEST leak detector must only be used by persons who are adequately training in maintaining vehicle air conditioner systems.

AVL DiTEST assumes no liability for damage caused by the following actions:

- Using the leak detector for purposes other than those described in this user guide
- Modifying the AVL DiTEST leak detector without the explicit consent of AVL DiTEST.
- Damage to the device caused by external influences.
- Incorrect operation
1.3 Front view

Fig. 1-1

1  Test instrument
2  Pressure reducer
3  R744 hoses
4  Gas cylinder
5  Cylinder trolley
6  Wheel
7  R134a, R1234yf hoses
1.4 Fitting

1. Indication of system pressure
2. Shut-off valve to low-pressure control valve R134a/R1234yf
3. Manual valve for draining
4. R744 outlet
5. Gas cylinder valve
6. Gas cylinder pressure gauge
7. Indication of set working pressure
8. Cylinder pressure reducer
9. HP R744 connection
10. LP R744 connection
11. Connection R1234yf red HP
12. Connection R1234yf blue ND (LP)
13. Connection R134a red HP
14. Connection R134a blue ND (LP)
1.5 **Gas detector**

Observe the documentation of the gas detector.
2 Commissioning

⚠️ WARNING
Commissioning must be performed by qualified personnel under strict observance of these instructions.

⚠️ WARNING
Observe the safety instructions!

CAUTION Make sure that the hoses are connected to the corresponding ports of the test instrument before using for the first time. The three high-pressure hoses (2 x R744 and supply hose) must be connected to the high-pressure side and tightened with the correct torque (16-18 Nm). Connecting the hoses incorrectly, insufficiently or not at all poses a risk to humans and/or may damage the vehicle's air conditioning system.

Fig. 2-1
WARNING

CAUTION Whenever a component (hose, connector, etc.) is replaced, a leak test must be performed on the system to ensure that humans are not endangered and the system is used correctly. To do so, follow these steps:

a. Close the cylinder valve (5)
b. Close the valves (2) and (3)
c. Close the cylinder pressure regulator (8) counter-clockwise until stop
d. Check the R744 components for leaks:
   a. Set the pressure to 80 bar using the cylinder pressure regulator (8)
   b. Close the cylinder valve (5)
   c. Observe the pressure drop on the pressure gauge (1)
   d. The maximum pressure drop is 6 bar in 30 min.
   e. Depressurise the system by opening the drain valve (3)
e. Check the R134a and R1234yf components for leaks:
   a. Set the pressure to 18 bar using the cylinder pressure regulator (8)
   b. Close the cylinder valve (5)
   c. Observe the pressure drop on the pressure gauge (1)
   d. The maximum pressure drop is 2 bar in 30 min.
   e. Depressurise the system by opening the drain valve (3)
To determine the exact location of a leak, use the H2 gas detector available as an accessory.

---

**WARNING**

**CAUTION** Make sure that the connection hoses are connected to the correct ports R134a, R1234yf and R744 prior to every use. Incorrect connections pose a risk for humans.
2.1 Preparation

Proceed as follows:

1. Make sure that the adjusting screw of the pressure reducer (2) is unscrewed counterclockwise until stop.
2. Make sure that the manual drain valve (1) is screwed in clockwise until stop.
2.2 Assembly

Proceed as follows:
1. Place the gas cylinder (3) onto the cylinder trolley (4).
2. Wrap the safety belt (2) around the cylinder and secure.
3. Attach the gas cylinder port (1) to the gas cylinder using a suitable open-end wrench.

**WARNING**

Only use 10-litre or 20-litre gas cylinders with a maximum diameter of 204 mm. Pay particular attention to the correct mixing ratio of 95% nitrogen and 5% hydrogen. Concentrations with more than 5.7% hydrogen are explosive!

Prior to assembly, always check all parts for contamination, mechanical damage and oil and grease residues.
Do not attach the pressure reducer to a fault valve. Mark the gas cylinder and inform the gas supplier.
Check the hose connections and port of the gas cylinder for mechanical damage prior to every use. Make sure that the port seal of the gas cylinder is not damaged.
3 Leak tests with R744 air conditioning systems

**NOTICE**

These systems are subjected to a leak test at a test pressure of 100 bar. Leak tests are conducted at test pressures ranging between 90 and 95 bar.

Test pressure: 90 – 95 bar.

Proceed as follows:

1. Preparing the leak detector:
   - Turn the pressure reducer (5) of the gas cylinder counter-clockwise until stop (setting for 0 bar) and then open the cylinder valve (3).
   - The pressure indicated on the pressure gauge at the inlet side of the cylinder pressure reducer (4) must be at least as high as the desired test pressure.
   - The pressure gauge of the high-pressure valve unit (2) must not indicate any pressure. If it does, check whether the pressure reducer (5) of the cylinder is closed (regulator unscrewed until stop) and release any existing pressure through the drain valve!

**WARNING**

The shut-off valve to the low-pressure valve (1) must be fully closed (screwed in clockwise until stop)!

In order to perform the high-pressure test, the high-pressure hoses must be attached to the outlets of the high-pressure valve unit. Incorrect hoses may burst!

All filling hoses must be checked for damage prior to use!

![Diagram of leak detector](image-url)
2. Connect the AVL DiTEST leak detector with the vehicle:
Connect the two filling hoses for R744 to the service connection of the vehicle using the connectors for the high-pressure (1) and low-pressure (2) sides and open the connectors.

**NOTICE**

The cooling circuit of the vehicle must be completely drained before the test is carried out!

Fig. 3-2
3. Preliminary at 10 bar:
   Slowly unscrew the regulator (2) clockwise until the pressure gauge of the valve unit (1) indicates 10 bar.
   Perform preliminary leak test (visually, acoustically and/or with the gas detector).

4. Leak test at test pressure:
   Slowly screw the cylinder pressure reducer (1) clockwise until the desired test pressure is reached. Leak detection see Section 5.2

---

**WARNING**

Apply measures to ensure that no components of the vehicle's cooling circuit can burst!
5. Draining after completed test (see also Section 5-3):
Close cylinder valve (2). Release the pressure from the cooling circuit by carefully opening the drain valve (1). With decreasing pressure, the valve can be opened further step by step. All three pressure gauges must drop slowly. Releasing the pressure from a system filled at 100 bar should take at least five minutes, and it is important that the pressure be released as evenly as possible. Once the system has been completely depressurised, turn the cylinder pressure regulator (3) counter-clockwise until it reaches its end position. Then close the drain valve (2) again.

**NOTICE**

In the case of high pressures, open the drain valve slowly and carefully so as to ensure that the pressure in the vehicle's cooling circle does not drop too quickly. Risk of oil leak! Do not open the drain valve more than one turn and do not close too tightly!

6. Disconnect vehicle:
Once the pressure has been fully released, disconnect the service connections (1) and (2) from the vehicle. Place the filling hoses back in the storage box at the test vehicle.
4 Leak tests with R134a/R1234yf air conditioning systems

**NOTICE**

These systems in individual components are subjected to a leak test at a test pressure of 20 bar. Leak tests in fully assembled air conditioning systems are conducted at test pressures ranging between 10 and 15 bar.

Caution: Do not exceed the test pressure of 15 bar! Test pressure: 10 - 15 bar.

Proceed as follows:

1. Preparing the leak detector:
   - Turn the pressure reducer (5) of the gas cylinder counter-clockwise until stop (setting for 0 bar) and then open the cylinder valve (3).
   - The pressure indicated on the pressure gauge at the inlet side of the cylinder pressure reducer (5) must be at least as high as the desired test pressure.
   - The pressure gauge of the valve unit (1) must not indicate any pressure. If it does, check whether the pressure reducer of the cylinder is closed (regulator unscrewed until stop) and release any existing pressure through the drain valve.
   - Open the shut-off valve to the low-pressure valve unit (2) (one counter-clockwise turn).

**NOTICE**

At the outlets of the high-pressure unit for the two high-pressure filling hoses, the corresponding filling hoses must be attached with connectors.
Alternatively, the outlets can also be sealed with caps.
All filling hoses must be checked for damage prior to use!

![Fig. 4-1](image-url)
2. Connect the device with the vehicle:
Connect the filling hoses (R1234a or R1234yf) to the service connections of the vehicle using the connectors for the high-pressure (1) and low-pressure (2) sides and open the connectors.

**NOTICE**

The cooling circuit of the vehicle must be completely drained before the test is carried out!
3. Leak test at test pressure:
   Slowly screw the cylinder pressure reducer (2) clockwise until the desired test pressure (1) is reached.
   Leak detection see Section 5.2

---

⚠️ **WARNING**

Apply measures to ensure that no components of the vehicle's cooling circuit can burst!

---

**Fig. 4-3**
4. Draining after completed test (see also Section 5-3):
   Close cylinder valve (2). Release the pressure from the cooling circuit by carefully opening the drain valve (1). Initially, the pressure drops between the cylinder and pressure reducer. The 1st pressure gauge at the pressure reducer indicates dropping pressure. As soon as the test pressure has been reached, all three pressure gauges will slowly start dropping. Now that the pressure is dropping, the drain valve (1) can be gradually opened more. Releasing the pressure from a system filled at 20 bar should take at least two minutes, and it is important that the pressure be released as evenly as possible. Once the system has been completely depressurised, turn the cylinder pressure regulator (3) counter-clockwise until it reaches its end position. Then close the drain valve (1) again.

**NOTICE**

In the case of high pressures, open the drain valve slowly and carefully so as to ensure that the pressure in the vehicle's cooling circle does not drop too quickly. Risk of oil leak! Do not open the drain valve (1) more than one turn and do not close too tightly!

5. Disconnect vehicle:
   Once the pressure has been fully released, disconnect the service connections (1) and (2) from the vehicle. Roll up the filling hoses again at the test vehicle.
5 Gas detector

5.1 General

If the gas detector has not been used for an extensive period or if it has been stored in an environment with contaminated or polluted air, particles may have deposited on the gas sensor of the device. This may result in an indication of a non-existent gas concentration. By switching the device on and heating it up several times, the sensor returns to its original zero point and is thus fully operational again. If this is not the case, perform a test with outdoor air and check whether the indoor air is contaminated.

Please read the operating instructions of the gas detector carefully!
5.2 Detecting a leak

If the gas detector indicates a leak, hold the sensor head for about five seconds in front of the leakage area. Then check whether the leak detector detects the leakage again in the same area. Repeat this process up to three times. This will ensure that there really is a leak in that area. While doing so, check whether the red LED 2 is flashing. In this case, the background concentration was automatically suppressed. First, hold the gas detector in a non-contaminated environment until the red LED 2 stops flashing.

In the case of major leaks their exact location is often revealed by the sound of the escaping gas. The pressure gauge of the system (39) indicates a rapid pressure drop. If you cannot locate the leak without the help of the gas detector, please follow the instructions on how to suppress the background concentration of hydrogen. If this does not work either, reduce the test pressure to 2 bar and blow out the area above the air conditioning with compressed air to reduce the hydrogen concentration.

Always make sure that the sensor cap is removed from the sensor head before performing a leak test.

---

**NOTICE**

Always check the components of the air conditioning system in the following order.

1. Blow out the service connections of the air conditioning system with compressed air to remove any remaining hydrogen that may have escaped while disconnecting the quick connectors. Then test the service connections for leaks.

---

Fig. 5-1
2. Prepare and connect the pressure tester to the ports in accordance with the respective refrigerating agent specified in Section 3 (R744) or Section 4 (R-134A, R-1234yf). Open the valve of the quick connectors. Regularly check the system pressure (1) indicator. If the pressure drops noticeably, refill gas into the air conditioning system.

![Fig. 5-2](image1)

3. Check the condenser for leaks.

![Fig. 5-3](image2)

4. Check the compressor for leaks.

![Fig. 5-4](image3)
5. Screw and other connections must be slowly "scanned", in other words, guide the sensor head around the entire connections.

Fig. 5-5

6. To check whether a condenser is leaking, set the ventilation to the lowest setting and hold the sensor head (18) against the ventilation slots in the centre console.

**NOTICE**

Do not switch the air conditioning system on!

Fig. 5-6
7. For optimal checking of the air conditioning line, hold the sensor head as closely as possible to the air conditioning line from the top. Guide the sensor head slowly along the air conditioning line (max. 1 cm/sec.). If the leak still cannot be located at 10 bar in R1234yf or R134A systems, manually turn the drive shaft of the compressor and check the radial shaft seal for leaks.

![Image of sensor head guiding along air conditioning line]

Fig. 5-7

8. If you want to test the connection valves in the vehicle, remove the quick connectors from the R134A and/or R1234yf systems. Please make sure that you are wearing our personal protective equipment correctly, since a powerful jet of gas may escape. In the case of R744 systems, simply unscrew the connector until the gas escapes the compression chamber with a bang. Do not remove the connector. Then blow off the connectors with compressed air, similar to 5.2.1, and then perform the leak test at the connector openings.
5.3 Steps to be carried out following a successful leak detection

Proceed as follows:

1. If in the case of the R134A or R1234yf the connection between the test device and the vehicle's air conditioning system is separated, the high-pressure quick connector (1) must be connected to the high-pressure service connection and the low-pressure quick connector (2) to the low-pressure service connection of the air conditioning system, and both valves opened. In the case of R744 systems, the valves may be to be screwed back in again to open them.

   ![Fig. 5-8](image)

2. Release the gas from the air conditioning system to the environment by slowly turning the drain valve (1) counter-clockwise.

   ![Fig. 5-9](image)

**WARNING**

Hold the test instrument firmly in your hand when releasing the gas.
Point the outlet away from your body, ideally downwards.
Do not point the outlet on other persons.
3. The air conditioning system is empty when the pressure gauge (1) and the system pressure indicator (2) shows 0 bar.

4. Disconnect the high-pressure quick connector (1) and low-pressure quick connector (2) from the air conditioning system.
5. Turn the drain valve (1) clockwise until stop.

**NOTICE**

After a trace gas leak test or after a repair, the air conditioning system must be evacuated in accordance with the manufacturer's instructions!
After a major leak the air has a high concentration of hydrogen.
Ventilate the area well before performing the next leak test!
5.4 Air conditioning systems with only one service connection

**NOTICE**

Make sure that the pressure reducer of the gas cylinder (2) is unscrewed counter-clockwise until stop.
Make sure that the manual valve is screwed in clockwise until stop.

If the air conditioning system only has a service connection, the corresponding quick connector must be connected to the air conditioning system.

Proceed as follows:

1. Connect the connecting hose to the available service connection. Leave the quick connector closed.

![Fig. 5-13](image)

2. Slowly open the gas cylinder valve (1)

![Fig. 5-14](image)
3. Turn the adjusting screw of the pressure reducer of the gas cylinder (2) clockwise until the test pressure gauge (1) shows the desired operating pressure of 5 bar.

4. Slowly open the valve of the quick connector (1).
5. Close the gas cylinder valve (1) after approx. 1 min.

6. The indicated operating pressure (1) must remain constant. A quick pressure drop is an indication of a major leak.

7. Disconnect the quick connector from the air conditioning system to check the valve in the service connection for leaks.
8. Perform leak test.

Fig. 5-20
If the air conditioning system only has a high-pressure service connection, the high-pressure quick connector must be connected to the connecting hose.

9. Connect the connecting hose to the available service hose. Open the quick connector.

![Fig. 5-21](image)

10. Release the gas from the air conditioning system to the environment by slowly turning the drain valve (1) counter-clockwise.

---

**NOTICE**

Hold the test instrument firmly in your hand when releasing the gas!
Point the outlet away from your body, ideally downwards!
Do not point the outlet on other persons!

---

![Fig. 5-22](image)
11. The air conditioning system is empty when the gas cylinder pressure (1) and system pressure (2) is 0 bar.

![Fig. 5-23](image)

12. Disconnect the connected quick connectors from the air conditioning system.

![Fig. 5-24](image)

13. Turn the drain valve (1) clockwise until stop.

![Fig. 5-25](image)
14. Perform the following steps:
   - Roll up the connecting hose onto the hose reel.
   - Hang the test instrument onto the mounting hook using the mounting hook provided.
   - Roll up the connecting hose onto the hose reel.
   - Place the protective sensor cap onto the sensor head of the AVL DiTEST leak detector.

**NOTICE**

After the trace gas leak test with the gas or after a repair the air conditioning system must be evacuated in accordance with the manufacturer's instructions!
6  Maintenance

6.1  Cleaning and care

Clean the components with a damp cloth if necessary.
Do not use solvents or abrasive cleaning agents.
Check the service hoses and adapters regularly for damage.
Do not use the AVL DiTEST leak detector if a component is damaged.

6.2  Leak detector maintenance

**NOTICE**
The AVL DiTEST can be maintained by the customer.

Customers must adhere to an annual inspection cycle. An inspection tag affixed to the housing of the device documents when the last inspection was carried out and when the next inspection is due. Customers must visually check for loose screws and external damage (e.g. cracks or fractures).

6.3  Pressure reducer maintenance

Replace the gas cylinder’s seal around the connection during every maintenance.
7 Service

Our service department provides product support as well as repair and replacement service.

System hotline: +49 9103 7131-454
(Mo. to Fr.: 08:00 – 18:00)

E-mail: support.ccc@avl.com
Fax: +49 9103 7131-112

AVL DiTEST GmbH
Schwadermühlstr. 4
90556 Cadolzburg, GERMANY
## 8 Troubleshooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| The system pressure gauge does not reach the test pressure when filling the air. | - The gas cylinder is empty.  
- The pressure in the gas cylinder is too low.  
- The gas cylinder's valve is closed.  
- The working pressure was set too low.  
- The test instrument is defective.  
- The leak is too extensive.  
- The drain valve is open.  
- Only for R744: The shut-off valve to the low-pressure unit is open. | - Make sure that you have observed the instructions in sections 3, 4 and 5.  
- Make sure that the gas cylinder is not empty.  
- Make sure that the gas cylinder's valve is not closed.  
- Make sure that the correct working pressure is set at the pressure reducer.  
- Make sure that the high-pressure connector's valve is not closed.  
- Make sure that the low-pressure connector's valve is open.  
- Make sure that the test instrument is not faulty.  
- In the case of a major leak, the leak must be located acoustically by following the sound of the escaping gas.  
- Make sure that the air conditioning system is not blocked.  
- Close the drain valve.  
- Only for R744: Close the shut-off valve to the low-pressure unit. |
9 Warranty

9.1 New devices

The new device has a warranty of 12 months.
The agreements with your suppliers apply.
The date on the delivery note applies.

The warranty is void:
- if not properly and / or sufficiently maintained according to instructions
- if mechanically damaged (e.g. due to a drop, etc.)
- if liquids have entered (e.g. water, oil, acids, etc.)
- if it has been tampered with (e.g. repairs performed by unauthorized persons)
- Incorrect operation (e.g. using the touch screen with sharp or pointed objects or cleaning it with compressed air)
- Incorrect storage, maintenance and care (e.g. cleaning the device with cleaning agents containing solvents)

Excluded from the warranty:
- Consumables (e.g. paper, filter, oils)
- Parts that are subject to natural wear

9.2 Replacement or rental devices

The agreements with your suppliers apply.
The date on the delivery note applies.

9.3 Case of damage

In case of damage, please contact a AVL DiTEST branch / respective AVL DiTEST partner in your country.
10 Scope of delivery

10.1 System delivery

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leak detector</td>
<td></td>
</tr>
<tr>
<td>Quick start guide</td>
<td></td>
</tr>
<tr>
<td>User guide</td>
<td></td>
</tr>
<tr>
<td>Gas detector incl. batteries and user guide</td>
<td></td>
</tr>
</tbody>
</table>
10.2 Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace gas pressure reducer with threaded connection W21, 80-14-LH</td>
<td></td>
</tr>
<tr>
<td>Trace gas pressure reducer with threaded connection CGA350</td>
<td></td>
</tr>
<tr>
<td>Trace gas pressure reducer with threaded connection 1/2&quot;-14-BSP-LH</td>
<td></td>
</tr>
<tr>
<td>Trace gas pressure reducer with threaded connection 5/8&quot;-14-BSP-LH</td>
<td></td>
</tr>
<tr>
<td>Trace gas pressure reducer with threaded connection W20-14-LH</td>
<td></td>
</tr>
<tr>
<td>Trace gas pressure reducer with threaded connection W22-14-LH</td>
<td></td>
</tr>
<tr>
<td>Test instrument</td>
<td></td>
</tr>
<tr>
<td>Connection hose</td>
<td></td>
</tr>
<tr>
<td>High-pressure quick connector</td>
<td></td>
</tr>
<tr>
<td>Low-pressure quick connector</td>
<td></td>
</tr>
<tr>
<td>Protective sensor cap</td>
<td></td>
</tr>
<tr>
<td>Earphones</td>
<td></td>
</tr>
<tr>
<td>Seal for trace gas pressure reducer</td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**

Only use original AVL DiTEST accessories!

Contact the respective AVL DiTEST branch / AVL DiTEST partner in your country.
## 11 Technical data:

### Leak detector

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder trolley</td>
<td>Suitable for gas cylinders with a capacity of 10 l or 20 l</td>
</tr>
<tr>
<td>Dimensions (length x width x height)</td>
<td>390 x 450 x 1225 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>17 kg</td>
</tr>
</tbody>
</table>

### Test instrument

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet</td>
<td>¼” SAE</td>
</tr>
<tr>
<td>Outlet</td>
<td>¼” SAE</td>
</tr>
<tr>
<td>System pressure gauge</td>
<td>0 100 bar, 2 bar resolution, 80 mm diameter, class 1.0</td>
</tr>
<tr>
<td>Dimensions (length x width x height)</td>
<td>65 x 70 x 200 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>400 g</td>
</tr>
</tbody>
</table>

### Cylinder pressure reducer

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suitable for</td>
<td>nitrogen or forming gas N₂ / H₂ (95 % / 5 %)</td>
</tr>
<tr>
<td>Adjustable pressure</td>
<td>0 to 100 bar</td>
</tr>
<tr>
<td>Hose connection</td>
<td>¼” SAE</td>
</tr>
<tr>
<td>Gas cylinder connection</td>
<td>DIN 477 No.1</td>
</tr>
<tr>
<td>Dimensions (length x width x height)</td>
<td>55 x 200 x 210 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1400 g</td>
</tr>
</tbody>
</table>

### R134a, R1234yf connection hose

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections</td>
<td>1/4” SAE</td>
</tr>
<tr>
<td>Length</td>
<td>3000 mm</td>
</tr>
<tr>
<td>max. bend radius</td>
<td>40 mm</td>
</tr>
<tr>
<td>max. operating pressure</td>
<td>50 bar</td>
</tr>
</tbody>
</table>

### R744 connection hose

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connections</td>
<td>1/4” SAE</td>
</tr>
<tr>
<td>Length</td>
<td>3000 mm</td>
</tr>
<tr>
<td>max. bend radius</td>
<td>40 mm</td>
</tr>
<tr>
<td>max. operating pressure</td>
<td>140 bar</td>
</tr>
</tbody>
</table>

### Quick connectors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threaded connection</td>
<td>1/4” SAE</td>
</tr>
<tr>
<td>Weight</td>
<td>150 g</td>
</tr>
</tbody>
</table>

### Disposal of the packaging material

Recycle cardboard packing material. Recycle plastic packaging material.

### Disposing of the device

If you want to take the device out of service, bring it to a recycling centre or contact your AVL DiTEST customer service.
# List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(KFZ)</td>
<td>Vehicle</td>
</tr>
<tr>
<td>HD (HP)</td>
<td>High pressure</td>
</tr>
<tr>
<td>LP</td>
<td>Low pressure</td>
</tr>
<tr>
<td>HV</td>
<td>High voltage</td>
</tr>
<tr>
<td>LED</td>
<td>Light-Emitting Diode</td>
</tr>
<tr>
<td>R744</td>
<td>Carbon dioxide CO\textsubscript{2}</td>
</tr>
</tbody>
</table>
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