

Volkswagen Aktiengesellschaft
K-GVO-LW
Group After Sales – Group Service, Literature
and Systems
Workshop Equipment
Letter Box 011/4915
38442 Wolfsburg

For internal use only
Technical amendments possible
Status 01/2021

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VOLKSWAGEN
AKTIENGESELLSCHAFT



Operations manual

CO2 coolant tester VAS 531 009

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Manufacturer: AVL DITEST GmbH

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AUSTRIA

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For more than 20 years, AVL DITEST has been developing integrated solutions for the automotive after sales sector and equips workshops and test centers in more than 50 countries worldwide. The main business areas of AVL DITEST are measurement technology, emission testing, automotive diagnostics, air conditioning service and e-mobility. In Europe, the developments of the Austrian-German automotive diagnostics and measurement technology specialist are considered the technological benchmark. The research and development ratio is an outstanding 20%. Testing organizations such as Dekra or TÜV, as well as leading automobile manufacturers, including Volkswagen AG, rely on the technical know-how from Graz and Cadolzburg.

AVL DITEST is part of the AVL Group. The company, together with its international subsidiaries, employed 320 people in 2019 and generated annual sales of € 57.4 million in 2019.



Introduction

Content Of The Operations Manual

This documentation describes the VAS 531 009 CO2 coolant tester and how to use it. The safety instructions in the Safety chapter and the remainder of the operations manual have to be strictly complied with.

This document is an integral part of the equipment. Store it for the life of the equipment and pass it on to any subsequent owners or users.

Intended Use

The VAS 531 009 CO2 coolant tester, herein after referred to as CO2 coolant tester, measures the CO2 content in the expansion tank of the engine cooling system. An increased CO2 content in the cooling system indicates leaks from between the exhaust system and the cooling system. During the measurement, minimum/maximum values and the time progression of the CO2 content and the cooling system pressure are displayed. A result report can be printed out and saved at the end of the measurement.

Target Group

The CO2 coolant tester is intended for motor vehicle repair/service workshops or similar institutions.

Safety

This manual contains important warnings and safety instructions that require attention by the user. Non-compliance with these warnings may result in death or serious injury.

IMPORTANT SAFETY INSTRUCTIONS

- Read the operations manual completely and carefully.
- In the event that the equipment is dropped or damaged, have it checked by a qualified service technician before starting operation again.
- Ensure that cables are not stretched or kinked or come into contact with sharp edges.
- Do not allow the equipment to come into contact with hot or moving parts.
- Always disconnect the equipment from the USB port when not in use.
- Pull on the plug and not the cable to remove the plug from the USB port.
- Allow the equipment to cool down completely before putting it away.
- When storing the equipment, lay the hoses loosely around the equipment.
- When storing the equipment, always store it in the case provided.
- To reduce the risk of fire, do not operate the equipment near open containers with flammable liquids (e.g. gasoline).
- Ensure adequate ventilation when working on combustion engines.
- Keep hair, loose clothing, fingers and all body parts away from moving parts.
- To reduce the risk of electric shock, avoid using the equipment on wet surfaces or exposing it to rain.
- Operate the equipment only as described in this manual.
- Only use accessories recommended by the manufacturer.
- ALWAYS WEAR SAFETY GLASSES. Everyday eyeglasses only have impact resistant lenses, they are not safety glasses.
- Perform all work in the engine compartment with the engine stopped and the ignition switched off.
- Do not come into contact with rotating parts such as the alternator, the radiator fan and their drives (e.g. V-belts).
- When the engine is running, make sure that the hoses and wiring are routed safely.
- Apply the handbrake or, with an automatic transmission, move the selector lever to P.
- Secure the vehicle adequately against rolling away.
- Care must be taken as burns can occur from touching hot parts.


SAVE THESE INSTRUCTIONS

INFORMATION

For more information, please contact your importer.

Comply with the regulations applicable in your country.
Read and follow these operations manual.

Danger Warnings

WARNING		WARNING indicates a dangerous situation which, if not avoided, can lead to death or serious injury.
WARNING		Danger from hot liquids and high pressure.
NOTE		This text refers to situations or operating errors that can lead to damage to property or data loss.
INFORMATION		This text refers to important information or instructions. Failure to follow these instructions will significantly prevent or hinder the successful execution of the actions described in this documentation.

Safety Concept

WARNING		<p>Risk of burns from hot parts</p> <p>Carry out measurements at normal engine operating temperature or according to the test specification. Do not touch hot parts like the engine, engine attachments and the entire exhaust system. Use cooling fans if necessary.</p>
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WARNING		<p>Risk of injury from damaged components</p> <p>Place the measuring system, especially the hoses and wiring, in a way that no damage can occur during operation by hot parts (exhaust system) and rotating parts (drive belts, radiator fans, etc.).</p>
WARNING		<p>Risk of burns from hot liquids and high pressure</p> <p>While the cooling system is under pressure, hot coolant can splash out when the expansion tank is opened. Only open the cover of the expansion tank (coolant tank) when the coolant has cooled down.</p>
WARNING		<p>Risk of explosion and/or fire</p> <p>The equipment must not be operated near open fuel tanks or below a minimum height of 460 mm above the workshop floor, otherwise there is a risk of explosion or fire due to gases and/or vapors.</p>
WARNING		<p>Risk of injury due to material damage</p> <p>The measuring system is under high pressure during application and is subject to the temperatures of the cooling system. Pre-damage to the measuring system can lead to a risk of injury during operation. During storage, always keep the measuring system in the equipment case supplied with it and protect it from harmful environmental influences. In particular, this prevents the material from being negatively affected by UV radiation.</p>
NOTE		Sensitive measurement technology is built into this equipment. Falls – even from a low height and impacts can damage the measurement technology and falsify results. In the event that the equipment is dropped or damaged, have it checked by a qualified service technician before starting operation again.
NOTE		<p>If the measuring system is pre-damaged, a loss of pressure can cause the cooling system of the vehicle to boil over and cause engine damage.</p> <p>During storage, always keep the measuring system in the equipment case supplied with it and protect it from harmful environmental influences. In particular, this prevents the material from being negatively affected by UV radiation.</p>

Scope Of Delivery

The system delivery comprises of the following components:

VAS no.	Components	Article number
VAS 531 009	CO2 coolant tester with coolant adapter and hose kit	ASE 531 009 00 000
-	Transport and storage case	-
-	USB cable Mini - Type A 1.8 m	-
-	USB stick with: - Documentation - Software	-
-	Quick start, printed	-
-	Information sheet USB stick, printed	-

Available Accessories

The following accessories can be ordered as options:

NOTE

Only use accessories approved by AVL DiTEST.

USB cable Mini - "Fischer" (for connecting the CO2 coolant tester to the VAS equipment using a "Fischer" socket, reference: VAS 5055/4)



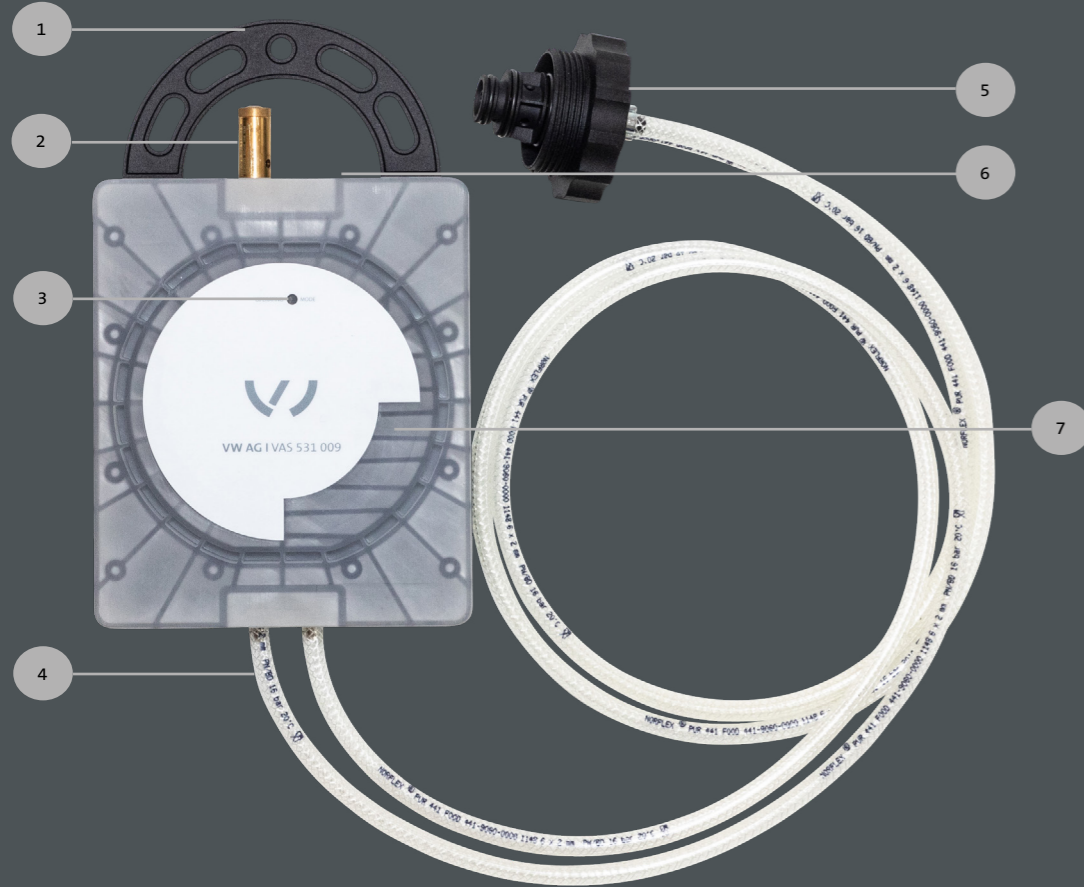
Illustration Of The Scope Of Delivery

The following table shows an illustration of the individual components:

Components	Photo
ASE 531 009 00 000 CO2 coolant tester with coolant adapter and hose kit	
Transport and storage case	
USB cable Mini – Type A 1.8 m	
USB stick with documentation and software	
Quick start, in printed format	
Information sheet USB stick	

Assembly






The following illustration shows the configuration of the equipment:



- 1 Mountings
- 2 Safety valve
- 3 LED red/green
- 4 2 hoses, permanently connected to VAS 531 009 and the coolant adapter
- 5 Coolant adapter
- 6 Mini USB port
- 7 Inspection window (for intake coolant)

Signals

A LED is installed on the equipment that signals the operating state of the equipment. The following table provides an overview of the different states of the LED and explains their meaning:

LED state		Meaning
	Green Constantly lit	The system is ready to start a measurement
	Green Slowly flashing	Measuring process active
	Green Quick flashing	Pump activated
	Red Constantly lit	CO coolant tester is not in normal position
	Red Flashing	A malfunction occurred. In this case, the software displays an error message which shows more detailed information

Commissioning

Installation Of The Software

INFORMATION	First install the software and then connect the CO2 coolant tester to the tester/specified laptop. Administrator rights are required for the installation.
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Proceed as follows to install the software:

1. Start the tester/specified laptop.
 2. Insert the USB stick with the software into a free USB port.
 - If **Autorun** is activated, then the installation program starts automatically.
 - If **Autorun** is not activated, double click on file **Install.CO2ContentCheck.x.x.xxxx.msi**.
 3. If required, enter the user name of the administrator and the password and click **Yes**.
 - The files are imported and installed.
 4. In the next window click **Next**.
 5. Click **Finish**.
 6. Perform a restart of the specified laptop.
- The software was successfully installed.

Hardware

NOTE	When the CO2 coolant tester is delivered, condensation must be prevented inside the equipment. Leave the equipment to stand for 3 hours at the operating location for temperature compensation before switching it on.
------	--

Connect the CO2 coolant tester using the USB cable (Type A – Mini or Type A – "Fischer") to the tester/specified laptop.




Measurement

To perform a measurement proceed as follows:

INFORMATION	First install the software and then connect the CO2 coolant tester to the tester/specified laptop. Administrator rights are required for the installation.
WARNING	Risk of burns from hot engine and coolant Ensure that the engine is switched off and that the engine and coolant have cooled down.

1. Open the engine hood.
2. Hang the CO2 coolant tester on a raised point using the suspension bracket. The CO2 coolant tester must be in normal position, i.e. hanging vertically. Do not place the CO2 coolant tester in the engine compartment or elsewhere.

WARNING	Risk of burns from hot liquids Only open the cover of the expansion tank (coolant tank) when the coolant has cooled down.
---------	---

3. Unscrew the cover of the expansion tank (coolant tank) and install the coolant adapter. Make sure that the coolant adapter is tightly fitted on the thread.
4. Start the CO2 coolant tester by double-clicking **CO2 Content Check** .
5. Click on **CO2 Test**. (With **Display equipment data** the data of the CO2 coolant tester is shown).
6. Follow the instructions on the screen and comply with and confirm all safety instructions.

At the end of the measuring sequence, a result protocol appears with the measured values (CO2 and cooling system pressure) and a graphic representation of the CO2 and cooling system pressure curve. This results report can be printed out and saved.

NOTE	Always observe the vehicle-specific repair information provided by the manufacturer.
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Maintenance

Visual Inspection

Perform a visual inspection regularly. Check for:

- Gross contamination
- Wear
- Check all parts regularly for damage
- Damage and leakage of the media lines

If parts are damaged, contact AVL DiTEST Service:

Phone: 0 9103 7131-200 Germany
+49 9103 7131-222 International
FAX: +49 9103 7131-112
E-Mail: vas.service@avl.com

Cleaning

Clean the equipment if it is dirty.

NOTE The equipment must not be under pressure during cleaning. Make sure that no liquid enters the housing.

NOTE Do not use a high-pressure cleaner or caustic cleaning agents to clean the equipment.

Wipe the CO2 coolant tester with a lint-free cloth.
The cloth can be moistened with water or an alkali-free cleaning agent. It can be moist but not wet.

Software Update

The software may need to be updated. Get regular information from Volkswagen AG about the current version of your DSS software.

Troubleshooting

This chapter provides an overview of potential errors that may occur in the hardware. If there are other errors, the software will display error messages that are not included in this chapter. If this is the case, follow the solutions shown on the screen and carry out all the measures offered.

If an error cannot be eliminated, contact the AVL DiTEST Service:

E-Mail: vas.service@avl.com.

The following table lists potential errors in the hardware and their possible causes and solutions:

Symptoms	Possible causes	Solution
CO2 coolant tester does not start, LED does not light up	The CO2 coolant tester is incorrectly connected to the PC.	Ensure that the USB cable is plugged in at both ends. The LED is green when correctly connected. If the error persists, contact the AVL DiTEST Service.
Connection between the CO2 coolant tester and the PC system is interrupted	The CO2 coolant tester is incorrectly connected to the PC.	Ensure that the USB cable is plugged in at both ends. The LED is green when correctly connected. If the error persists, contact the AVL DiTEST Service.
The LED lights up red constantly	The equipment is not in normal position. The equipment has not been attached in the center of the suspension bracket.	Attach the CO2 coolant tester centrally to the suspension bracket.
Plug does not fit in socket	Wrong cable or wrong cable side.	Use the correct cable or insert the appropriate plug into the correct socket.

The following hardware errors are indicated by the software:

Symptoms	Error message/description	Solution
LED flashes red	Pump overflow The hoses and/or the equipment have filled with liquid or are blocked.	Stop operation and drain the liquid or remove the blockage. If this is not possible, contact AVL DiTEST service.
LED flashes red	Operating temperature too high. The equipment is used in a hot environment.	Stop the operation and let the equipment cool down to 45 °C.
LED flashes red	Operating temperature too low. The equipment is used in a cold environment.	Operate the equipment in an environment of at least 5 °C.
LED flashes red	5 V voltage supply outside of tolerance range. Possible causes: • The USB plug is dirty or corroded. • The equipment is operated at the USB hub at the same time as other equipment.	Check the USB connector and replace the cable if necessary. Connect the equipment to a separate USB port on the PC or supply the USB hub with a separate power supply.
Software displays error message "Too little pressure increase or too little pressure in the cooling system detected!"	The engine cooling system or the measuring system is leaking.	Stop the operation and the engine and let the cooling system cool down. Check the engine and measuring system for leaks. If necessary, contact the AVL DiTEST service.
Software displays the error message "Calibration of CO2 sensor necessary"	The CO2 sensor must be recalibrated.	Contact the AVL DiTEST service.
Software displays the error message "Overpressure in cooling system detected!"	There is a defect in the engine cooling system (e.g. a defective cylinder head gasket or the radiator fan does not work).	Switch off the engine immediately and let the system cool down before taking further steps. Check the engine cooling system and correct any malfunctions before starting a new measurement.

When the system stops responding, it is a fault in the CO2 coolant tester or the application running on it. Try to exit and restart the software. If this is not possible, plug the equipment in again and again.

Technical Data

General data	
Dimensions	185x300x65 mm (without coolant adapter)
Weight	About 3.2 kg
Power supply	via USB interface of tester/specified laptop
Display	LED green LED red
PC interface	USB cable, 1.8 m length
Hose length to coolant adapter	1.5 m
Climatic conditions	
Operating temperature	+5 ... +45 °C
Storage and transport temperature	-40 ... +70 °C
Air humidity	Operation: up to 80 % non condensing Storage: up to 100 % non condensing
Measured values	
Measuring range	400 ... 10,000 ppm
Pressure measuring range	0 ... 1.6 bar [rel.]

Disposal



This AVL DiTEST product is a high quality electrical and electronic device that should not be disposed of with household waste.

When disposing of it, local legal requirements must be met.

Declaration Of Conformity

This product meets all relevant guidelines, directives, standards, etc.

The complete text of the EC Declaration of Conformity can be found in the Internet under:

<https://www.avlditest.com/index.php/de/downloads-de.html>

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

VAS 531 009
B08044 / VS9223

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

2014/30/EU	Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit <i>Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility</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>

und dass folgende harmonisierten Normen zur Anwendung gelangt sind:
and the following harmonized standards were applied:

EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 1: General requirements
EN 50581:2013	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Graz, 31.07.2020

DI Anton Kohl Entwicklungsleiter Director R & D	Mag.(FH) Kurt Leitinger Leiter Operations Director Operations
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Referenced Document: Checklist DoC VAS531009

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We have checked the content of the documentation for compliance with the described status. However, deviations cannot be excluded so that we cannot guarantee complete conformity. The information in this documentation is, however, checked regularly and necessary corrections are included in subsequent editions. We are grateful for suggestions for improvement.

Changes to the scope of delivery in form, equipment and technology are possible. The information, illustrations and descriptions in this operating manual can therefore not be taken as a basis for claims. Reproduction, duplication or translation, even in part, is only permitted without the written approval of the Volkswagen Group/the manufacturer in such a way that user documentation is provided for each equipment. A passing on to third parties is not permitted. All rights under the German Copyright Act are expressly reserved by the Volkswagen Group and the manufacturer.

Subject to change without notice.