

VOLKSWAGEN AG

VAS 581 009

Operating instructions V4.00

05/20



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Publisher: AVL DiTEST GmbH
 Alte Poststraße 156
 A-8020 Graz
 AUSTRIA

VAS 581 009/2
 ASE 581 009 00 000

AVL ID No.: AT7913EN Rev. 04

SAFETY INSTRUCTIONS

Sign and symbols

Symbols with the following meanings are used in the safety instructions of the operating instructions, unpacking instructions or other supplied instructions as well as on the display of the tester during operation and on the products themselves:



DANGER

Indicates an **extreme** danger that can lead to death if not avoided.



WARNING

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



CAUTION

Indicates a danger that can lead to moderate or minor injuries.

Prohibition signs



Fire and open flames prohibited

Warning signs



General



Risk of electric shock



Hazardous gases



Warning of gas cylinders



Danger of suffocation

Mandatory signs



Wear
protective
goggles



Wear gloves



Refrigeratin
g agent
cylinder
Secure CO₂
(R744)



Wear
protective
shoes



Wear
respiratory
protection



Wear
protective
clothing

Other symbols



Observe
operating
instructions



Fuse



First aid



Gas cylinder

Notices:

NOTICE

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

Information

This text indicates important information or instructions. Failure to comply with these instructions will prevent or significantly hinder the successful implementation of the actions described in this documentation.

SAFETY INSTRUCTIONS FOR CARBON DIOXIDE CO₂ (R744)

Always observe the manufacturer's safety data sheet!



WARNING



Contact with the product can cause cold burns or frostbite.
Gases/vapours are heavier than air. High concentration due to accumulation in closed rooms, work pits, cellars, etc. can cause asphyxiation, among other things. Symptoms: Loss of motor ability and consciousness. Affected persons do not realise that they are suffocating.
Do not allow carbon monoxide to enter sewage systems, pits or similar enclosures where gas accumulation may be dangerous.

Precautions and behaviour rules



WARNING



Storage: Store container in a well-ventilated place at a temperature below 50 °C. Protect container against impacts and falls (secure with chain).

Handling: Avoid contact with eyes and skin. Do not inhale the gas. Ensure that no water enters the gas cylinder/container.

Prevent the gas from flowing back into the gas tank. Only use equipment that is suitable for this product and the intended pressure and temperature. Check fittings, connections and lines for leaks. Eating, drinking and storing food in the working area are prohibited.

Respiratory protection: Self-contained breathing apparatus.

Eye protection: Tightly fitting protective goggles.

Hand protection: Protective gloves (material: leather).

Body protection: Protective clothing.

Behaviour in the event of danger

After a **gas leak**: Keep unprotected persons away. Ventilate rooms well. Wear protective gear and self-contained breathing apparatus. Close valves / stop gas leak. Avoid entry into cellars, pits and similar enclosures (danger of suffocation).

In case of fire: Wear protective gear and self-contained breathing apparatus. Stop gas leak if possible. Cool cylinders with a water jet from a secure position and remove them from the fire zone if possible to prevent explosion! The product itself is non-flammable.

Extinguishing agents: All known extinguishing agents can be used.

Escape routes: Escape routes must be known to staff.

Accident phone: The accident phone must be known to staff.

First aid



Please observe the instructions for use and safety of your refrigerant supplier.

SAFETY INSTRUCTIONS FOR NITROGEN N₂

Always observe the manufacturer's safety data sheet!



WARNING



High concentrations of the gas can cause suffocation.
Loss of motor ability and consciousness.
Rapid release of large quantities creates cold and fog.
Gas may accumulate in cellars, pits, etc., because it is about as heavy as air.
Container may burst or explode in the event of a fire.

Precautions and behaviour rules



WARNING



Employees must be instructed in the use of the gas before being allowed to work with it.
Do not inhale cylinder gas.
Secure cylinders from falling over.
Ensure good ventilation when working.
Filter masks do not protect against asphyxiation!
Wear protective gloves when transporting the cylinder.
Use the cylinder trolley.
Never open valves forcibly (no pliers, etc.)
Store cylinder in well-ventilated location at a temperature <50 °C.
Only use suitable equipment (pressure/temperature/product).
Ensure that no water can enter or flow back into the gas cylinder.
Always close cylinders, even if they are empty, before transporting them and secure with lock not and protective cap.
Lash down cylinders when transporting them in a vehicle. The loading space should be separate from the driver's cab and have vents in the ceiling and floor areas.

Behaviour in the event of danger



WARNING



Exposure to heat and fire may cause cylinders to burst/explode.

All extinguishing agents can be used.

If gas is escaping, close valve is possible.

Make sure that the gas does not enter cellars, recesses, pits, etc. where gas accumulation might be dangerous (danger of suffocation).

Fire: Remove container from the danger zone or, if this is not possible, cool it with water from a safe distance.

Ensure good ventilation.

In case a large quantity is released or in confined spaces: Evacuate area and enter only with self-contained breathing apparatus. Re-entry only after verification of safe level.

First aid



Please observe the instructions for use and safety of your refrigerant supplier.

SAFETY INSTRUCTIONS FOR WORKING ON AIR CONDITIONING SYSTEM



WARNING

The device must not be used if the heating band or cable is damaged. Contact the respective AVL DiTEST branch / AVL DiTEST partner in your country!

NOTICE

The oil level of the vacuum pump must be checked regularly. Top up if necessary. After 60 operating hours a regeneration of the pump oil is necessary (user notification). The regeneration can be performed from the maintenance menu. After 500 operating hours or one year, the pump oil must be changed (user notification). Oil changes can also be performed via the maintenance menu. The pump oil will also be changed as part of the annual servicing of the device by the service partner.

NOTICE

A device check is performed automatically once a week. It can also be triggered manually in the maintenance menu. The device check ensures that the system is sealed and all components are operating correctly. In case of a malfunction, the device will have to be serviced.

NOTICE

The filling levels of the oil/additive containers must be checked at regular intervals. Full used-oil containers must be emptied. Empty clean-oil and UV contrast medium bottles must be refilled if necessary.

NOTICE

Check the available printer paper and replace the paper roll if necessary.

NOTICE

We recommend that you have the device serviced by your service partner once a year. As part of every servicing the vacuum pump oil is changed and the calibration checked. If necessary, a recalibration is performed.

NOTICE

The VAS 581 009 may only be operated on a level and solid foundation. The refrigerating agent cylinder must be upright in the device. Any tilting may result in incorrect measurements by the cylinder scales and thus incorrect filling quantities!

NOTICE

Open the manual valve of the connected refrigerating agent cylinder before switching on.
If the VAS 581 009 is not being used, shut of the gas supply by closing the manual valve.

NOTICE

The VAS 581 009 performs a self-test when it is switched on. This is indicated by the brief sounding of the siren.

NOTICE

If the VAS 581 009 is not used for a prolonged period, the manual valve must be closed.

GENERAL OBLIGATIONS OF THE PERSONNEL

WORKING ON/IN ELECTRICAL COMPONENTS

Opening and working on the electrical components of VAS 581 009 may only be carried out by suitably trained electrical specialists (specialist personnel). If disregarded, there is danger to life from electrical voltage.

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.

GENERAL SAFETY INSTRUCTIONS



WARNING

Read all instructions carefully!



DANGER



Danger of life due to electrical voltage

The cylinder heater is operated via the mains voltage!
Only connect/disconnect the VAS 581 009 when it is **switched off**.



WARNING

Change the gas bottle only with assembly gloves. When changing the gas bottle, touching the unprotected hands of the gas bottle that has not yet been installed with the heating tape connected and the air conditioner can lead to an unpleasant but harmless electrical discharge.



CAUTION

The weight can result in persons or body parts being trapped. Ensure wheel brakes are applied during operation. Ensure that there is a minimum distance of 1.5 m to walls.

KEEP THESE INSTRUCTIONS IN A SAFE PLACE!

1 General information

1.1 General information

The VAS 581 009 is intended for filling vehicle air conditioning systems with CO₂ (R 744).

The VAS 581 009 is intended for repair/service workshops or similar institutions. It is intended solely for professionals who are familiar with the basic concepts of cooling, cooling systems, the refrigerating agent and the relevant regulations for pressure equipment and the damage it may cause.

Observe the regulations in force in your country!

Read and observe these operating instructions, especially the safety instructions.

The VAS 581 009 was subjected to extensive tests before it was placed into service and must be checked at regular intervals (in accordance with the relevant laws and regulations in force in the country) while in use.

It is the responsibility of the user to ensure that the air conditioning system is used in accordance with the national regulation in force.



Fig. 1-1

1.2 Safety instructions

Observe the safety instructions for the VAS 581 009.
They can be found below the table of contents.

1.3 EC Declaration of Conformity / CE marking

The manufacturer hereby declares that the VAS 581 009 is in conformity with the provisions of the following EC directives, including all applicable amendments.

2014/30/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
2014/35/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

The VAS 581 009 is in conformity with:

SAFETY:

EN 61326-1:2013
IEC 61010-1:2010

1.4 Acceptance report

A device-specific acceptance report is included in the delivery.

1.5 Intended use

The VAS 581 009 may only be used as prescribed in the operating instructions.

The described product has been developed, manufactured, tested and documented, taking into account the relevant safety standards. When observing the safety and prescribed placing into service instructions, using the device as intended and maintaining it as recommended, the VAS 581 009 normally does not pose a risk to property or health.

1.6 Other applicable documents

In addition to these operating instructions, the following other technical documents pertaining to the VAS 581 009 exist:

- unpacking and placing into service instructions, quick start guide VAS 581 009

1.7 Scope of application

The VAS 581 009 is intended for filling vehicle air conditioning systems with CO₂ (R 744).

1.8 Software licence

The software licence is available here:

<https://www.avlditest.com/index.php/de/ads-310-830.html>

2 Design

2.1 Front view

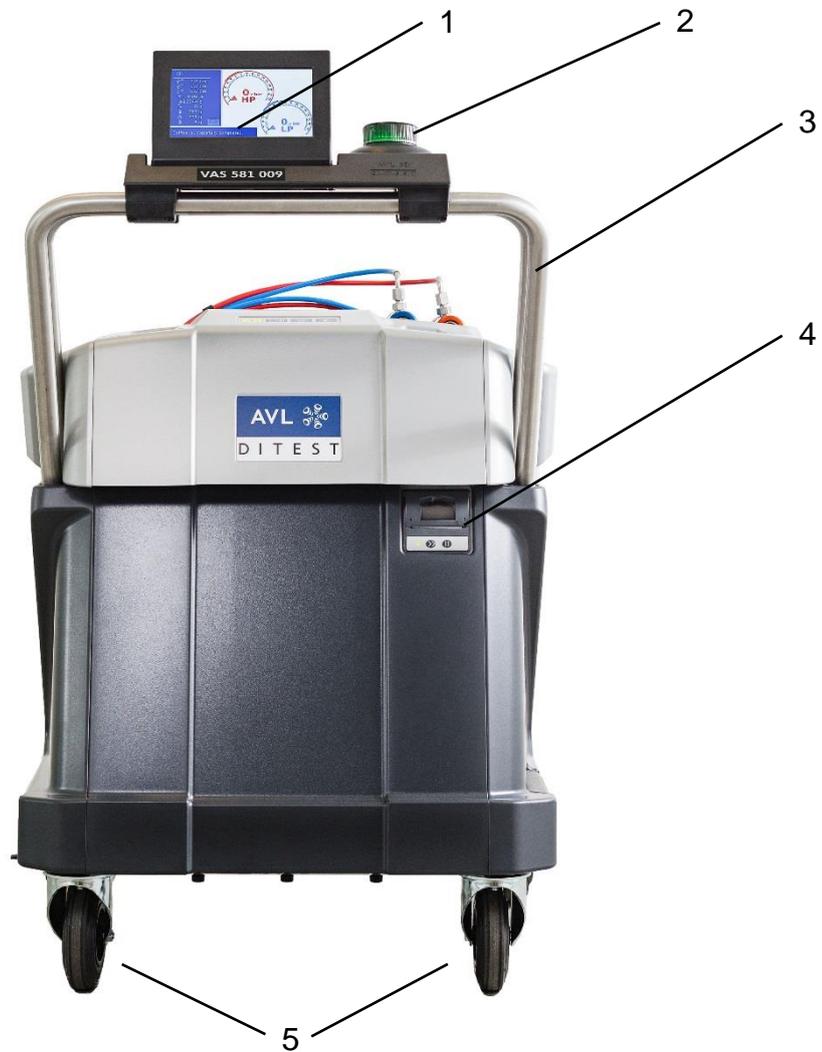


Fig. 2-1

- | | |
|---|-----------------------|
| 1 | Display |
| 2 | Multi-functional dial |
| 3 | Hand rail |
| 4 | Printer |
| 5 | Wheel brakes |

2.2 Side view, right



Fig. 2-2

- 1 Extractable collection container for drained vacuum pump oil
- 2 Socket screw for draining the vacuum pump oil
- 3 Gauge glass for vacuum pump oil

2.3 Rear view

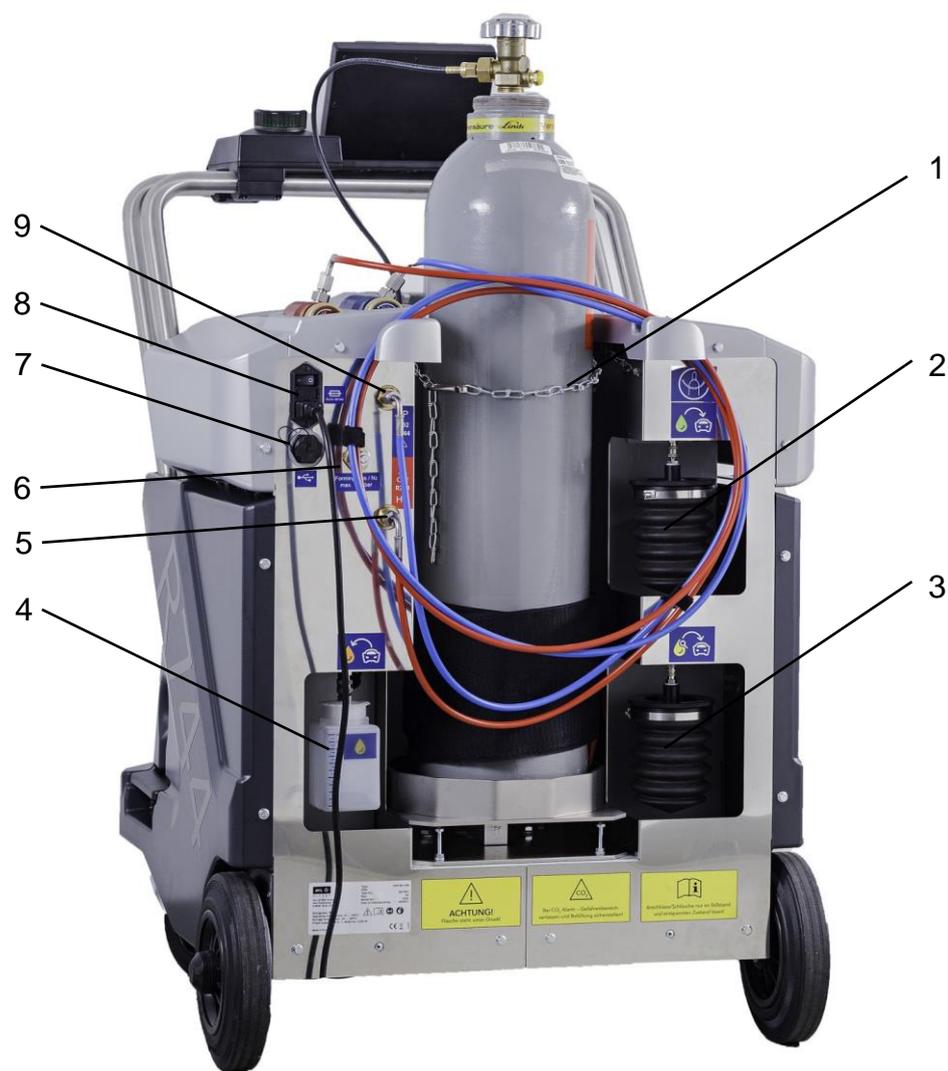


Fig. 2-3

- 1 Chain for securing the carbon dioxide CO₂ (R744) refrigerating agent cylinder
- 2 Container for clean oil 250 ml
- 3 Container for UV additive 250 ml
- 4 Container for used oil 250 ml
- 5 Quick connector HP red
- 6 Connection VAS 584 003, tightening torque 16 ... 18 Nm
- 7 USB port cover
- 8 Mains switch with fuse link
- 9 Quick connector LP blue

2.4 Quick connectors

Your VAS 581 009 is equipped with a quick connector system.

These connectors offer the following safety features:

- No mechanical disconnection of connectors while under pressure.
- The connectors are self-ventilating.



WARNING

The quick connectors may only be unscrewed by authorised personnel!



Fig. 2-4

2.5 Refrigerating agent cylinder CO₂ (R744)



Fig. 2-5 Example

NOTICE

The VAS 581 009 is suitable for standard CO₂ (R744) refrigerating agent cylinders with a built-in riser tube. The following cylinder sizes can be used: 5 kg, 6 kg, 10 kg or 20 kg. Required purity equal or better than carbon dioxide 3.0 (99.9 % purity).



WARNING

Frostbites caused by refrigerating agent

Cylinders may only be replaced by professional staff. Follow step-by-step instructions on VAS 581 009.



CAUTION

Injuries to body parts.

Depending on the size, cylinders can weigh up to 50 kilograms.
Load the cylinder onto the VAS 581 009 with the help of another person.

NOTICE

Only use the VAS 581 009 if the filling hoses are correctly connected. Filling with incorrectly connected hoses will damage the VAS 581 009.

NOTICE

The VAS 581 009 is supplied with a CO₂ (R744) refrigerating agent cylinder.

Definition: Quick connector "screwed in" / "screwed out"**Screwed in:**

- ⇒ Screwed clockwise
- ⇒ Valve open



Fig. 2-6

Screwed out:

- ⇒ screwed counter clockwise
- ⇒ Valve closed



Fig. 2-7

2.6 Controls

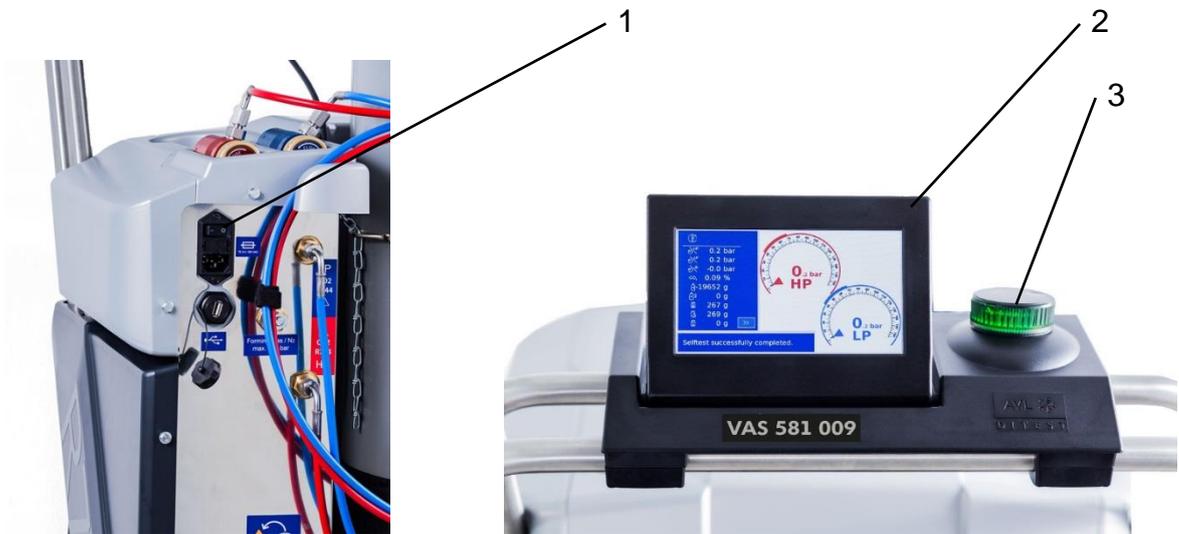


Fig. 2-8

- 1 Mains switch
- 2 Adjustable display
- 3 Multi-functional dial

2.7 User interface operation

The user interface is controlled via a multi-functional dial. The individual functions (buttons) are selected by turning the dial. To start a function, the dial must be pressed.

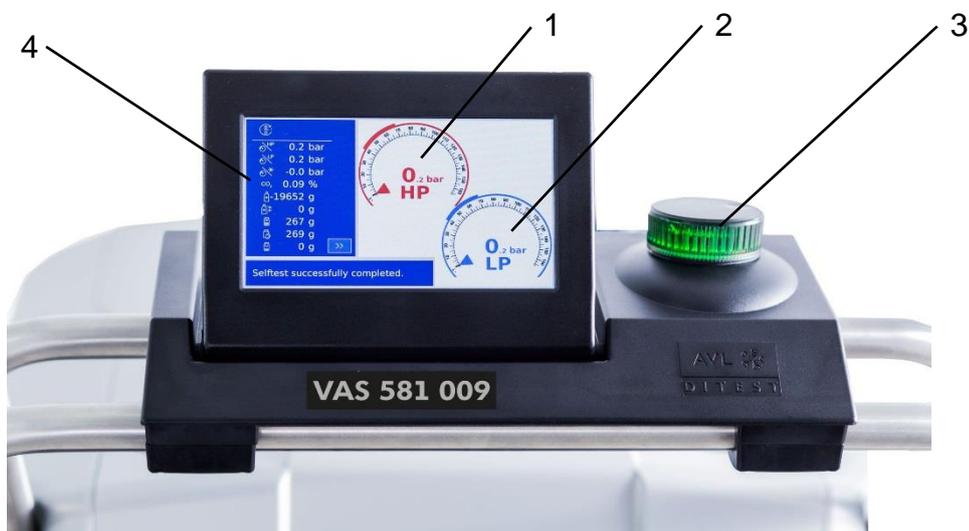


Fig. 2-9

1	HP High Pressure High pressure HP display of the refrigerating agent circuit
2	LP Low Pressure Low pressure LP display of the refrigerating agent circuit
3	Multi-functional dial To select and start a function
4	<p>Operating modes</p> <ul style="list-style-type: none">  Automatic mode ⇒ Sec. 3 "<i>Automatic mode</i>"  Manuel mode ⇒ Sec. 4 "<i>Manuel mode</i>"  Settings ⇒ Sec. 5 "<i>Settings</i>"  Maintenance ⇒ Sec. 6 "<i>Maintenance</i>"  Service ⇒ Sec. 7 "<i>Service</i>"  Overview ⇒ Sec. 8 "<i>„Overview“</i>"

2.8 User prompts

	Up Selects previous function
	Down Selects the next function.
	Back Goes back one step.
	Start Starts functions.
	Cancel Cancels an ongoing operation. Confirms questions with "No".
	RESET Resets values.
	OK Confirms questions with "Yes" or "OK".
	Next Continues to the next step.
	Print Prints logs.

2.9 Text and number inputs

If a number or letter is expected as an input, turning the dial will show the letters and numbers in sequential order. Pressing the dial will select the letter or number.

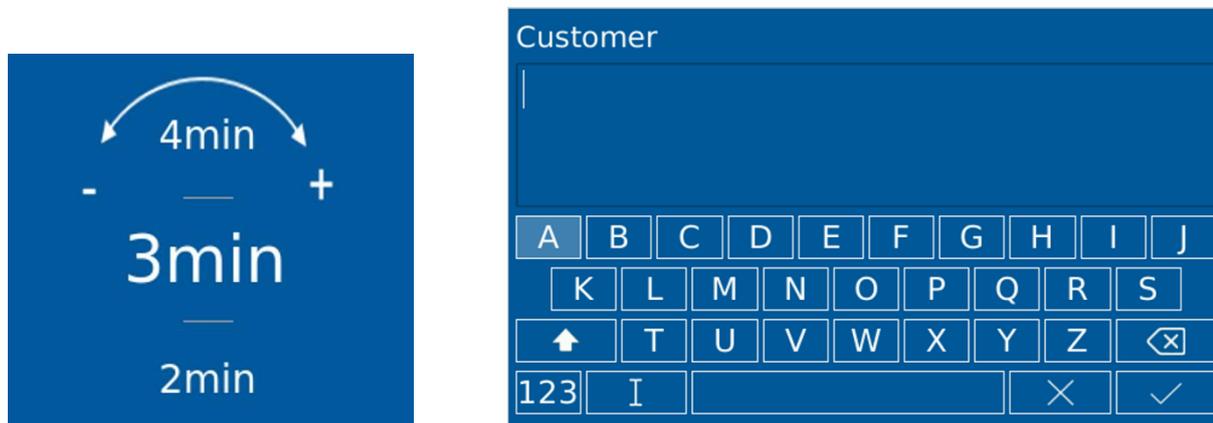


Fig. 2-10 Example input

The multi-functional dial is equipped with an indicator.

Meaning of the indicator:

Meaning	Indicator state
System start	Blue
Status OK / completed	Green
Ongoing process	Yellow
User information	Yellow flashing (1-2 Hz)
Error	Red flashing (1-2 Hz)
System error	Red fast flashing (10 Hz)

2.10 Overview of operating modes

Operating mode	Function	Explanation
Automatic cycle 	Automatic cycle: 1. Preparing device 2. Draining 3. Generating vacuum 4. Pressure test (if activated) 5. Filling	See Sec. 3
Manual cycle 	Drain hose Draining Generating vacuum Filling Pressure test HP/LP pressure test External pressure test	See Sec. 4.1 See Sec. 4.3 See Sec. 4.4 See Sec. 4.5 See Sec. 4.6 See Sec. 4.7 See Sec. 4.8
Settings 	Units Date/time Firmware update Workshop data Balance sheet Language Printout text size	See Sec. 5.1 See Sec. 5.2 See Sec. 5.3 See Sec. 5.4 See Sec. 5.5 See Sec. 5.6 See Sec. 5.7
Maintenance 	System info Operating hours Vacuum pump oil Cylinder replacement Pressure zeroing Oil//UV/additive scales zeroing Device check Save logs	See Sec. 6.6.1 See Sec. 6.6.2 See Sec. 6.2.1 See Sec. 6.3.1 See Sec. 6.3.2 See Sec. 6.3.3 See Sec. 6.2.8 See Sec. 6.3.5
Service 	Password-protected Only for authorised service staff	---
Overview 	Display of status information	See Sec. 8

2.11 Scope of delivery

2.11.1 System delivery

No	VAS No.	Components	Item number	
			AVL DiTEST	VOLKSWAGEN
1.	VAS 581 009	Basic device VAS 581 009 cplt.	VS9155	ASE 581 009 00 000
2.		Operating instructions on CD	BO7960	
3.		Unpacking instructions, placing into service instructions, quick start guide, printed	AT7912EN	
4.		Inspection log book, printed	AT7914EN	
5.		Quick connector CO2 HP red	GE7520	
6.		Quick connector CO2 LP blue	GE7522	
7.		Filling hose CO2 HP red	SS7520	
8.		Filling hose CO2 LP blue	SS7521	
9.		Cover	MK7532	
10.		Acceptance report		
11.		Cylinder adapter W21.8x1/14" incl. seal for connecting R744 cylinder to the VAS 581 009 Notice: It is possible that the supplied cylinder adapter is not compatible with a cylinder available in your country. This is why we offer a variety of different adapters. See "Available accessories".	DN7469	
12.		Protective goggles	GE7432	
13.		Protective gloves	GE7435	
14.		Cylinder adapter seal	DA7451	
15.		Printing paper	HP7003	
16.		Power cable EU	EX7075	
17.		Heating tape	BV8313	

2.11.2 Available accessories

No.	VAS No.	Components	Item number	
			AVL DiTEST	VOLKSWAGEN
18.		Vacuum pump oil 500 ml (2 units per package)	GE7427	
19.		Printer paper 57 mm, (minimum order quantity: 5 units)	HP7003	
20.		Cylinder heater (heating band) incl. connector	BV8313	
21.		External pressure test set	BO7948	VAS 584 003
22.		Cylinder adapter incl. seal: W21.7x1/14"	DN7470	
23.		Cylinder adapter incl. seal: 0.860"x14TPI	DN7471	
24.		Cylinder adapter incl. seal: G3/4"	DN7472	
25.		Cylinder adapter incl. seal: 0.825"x14NGO	DN7473	
26.		Cylinder adapter incl. seal: W27x2 mm	DN7474	
27.		Calibration kit VAS 581 009	BO7972	



WARNING

Only use accessories approved by AVL DiTEST!

3 Automatic mode "Air conditioning service"

There are a max. of three pre-set configurations available. There are all based on different default values. The default values can be applied or changed. Changes to default values are automatically saved in the configuration. Select **Automatic cycle** in the main menu.

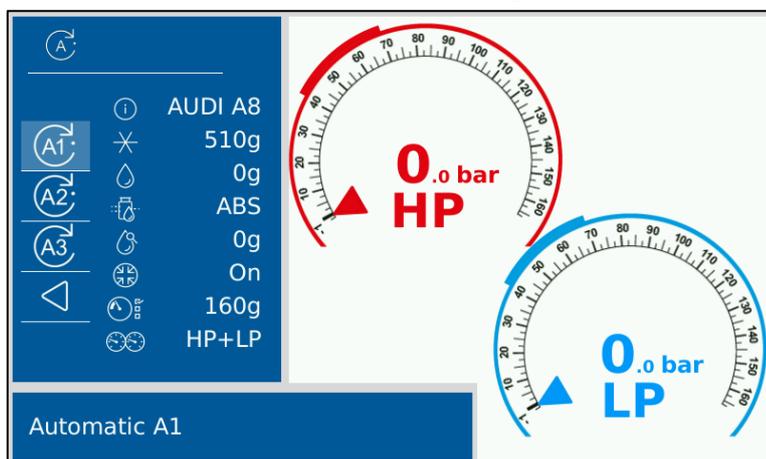


Fig. 3-1

The following functions are performed during the automatic cycle:

1. Preparing device
2. Draining
3. Generating vacuum
4. Pressure test (if activated)
5. Filling

Default values:

Button	Parameter	Unit	Selection
	Configuration name		
	Refrigerating agent quantity	g	0 ... 1500
	Oil quantity	g	0 ... 20
	Oil filling mode*		REC+/ABS/NO
	UV additive quantity	g	0 ... 20
	Vacuum time	min	5 ... 60
	Vacuum test time	min	5 ... 120

	Connection type**		LP, HP+LP, HP, HP+LP/LP
	Pressure test***		OFF, 10%/75g, 20%/75g, 30%/75g, 100g, 150g, 160g, 200g, 250g, 300g
	Pressure test time	min	1 ... 30
	Pressure loss	mbar	100 ... 1000
	Customer data		

***Oil filling mode:**

NO: No oil is pumped into the air conditioning system of the vehicle.
The set oil quantity is ignored.

ABS: The set quantity of oil is pumped into the air conditioning system of the vehicle.

REC+: Depending on the quantity of used oil recovered, this quantity of oil plus the set quantity of oil is pumped into the air conditioning system of the vehicle.
For example: Recovered oil quantity = 8 grams used oil,
set oil quantity = 10 grams,
-> 18 grams of oil are pumped into the vehicle

**** Connection type:**

HD: Filling only via high pressure hose

ND: Filling only via low pressure hose

HD+ND: Filling with both hoses

HD+ND/ND: Drain / vacuum with both hoses, filling only with low pressure hose

Which connection types are available depends on the selected preset configurations. In some configurations it is not possible to change the connection type

***** Pressure test:**

AUS: Pressure test is deactivated

10%/75g, ...: Pressure test with 10%, 20% or 30% of the set amount of refrigerant, but at least always 75 g.

100g, ...: Pressure test with the set amount of refrigerant

With some preset configurations it is not possible to change the pressure test.

Check the inputs and confirm with  .
The automatic cycle starts.

Follow the instructions on the screen.

The steps **Preparing device**, **Draining**, **Generating vacuum**, **Pressure test** (if enabled) and **Filling** are performed automatically. Take note of the messages on the screen and follow the instructions. Take note of the colour of the illuminated multi-functional dial, see Sec. 2.6.

Upon completion of the automatic cycle, you can print all results with  .

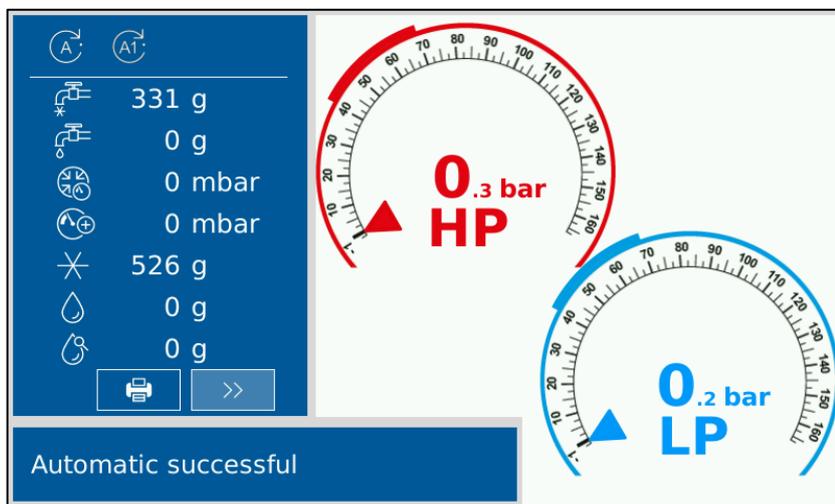


Fig. 3-2

Results:

	Drained refrigerating agent
	Drained oil quantity
	Pressure during vacuum seal test
	Pressure drop during pressure test
	Injected refrigerating agent quantity during filling process
	Injected oil quantity
	Injected UV additive quantity

4 Manual mode

NOTICE

Only connect the quick connectors to the air conditioning system of the vehicle once indicated by the VAS 581 009 on the display.

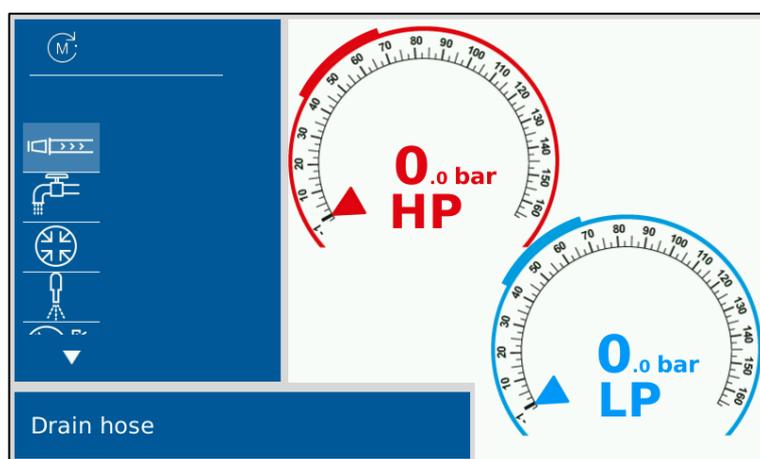


Fig. 4-1

During a manual cycle, the following functions can be started and executed separately.

- **Drain hose**
The filling hoses are completely emptied. To do so, disconnect the filling hoses from the vehicle.
- **Customer data:**
To log the following processes, customer data can be retrieved from the database
- **Draining**
This function drains the CO₂ refrigerating agent from the vehicle in a controlled manner.
The sub-function **Oil separation** takes place at the same time.
Oil separation:
The oil quantity drained out of the air conditioning system is transported away. The quantity of used oil is weighed and saved for logging purposes.
- **Generating vacuum**
A vacuum is generated inside the air conditioning system. This reveals any leaks inside the air conditioning system of the vehicle.

- **Filling**

This process compensates the oil quantity removed during draining with clean oil according to the selected settings. Then the air conditioning system of the vehicle is filled with the refrigerating agent CO₂ (R744).

- **Pressure test**

With this function, the vehicle's air conditioning system is filled with a set quantity of 70 to 300 grams of refrigerating agent. The pressure loss over the selected time period is determined. This reveals any leaks inside the air conditioning system of the vehicle.

- **HP/LP pressure test**

With this function, the pressure of the vehicle's air conditioning system while in operation is measured and displayed.

- **External pressure test**

With this function, a pressure of 90 to 100 bar is applied to the vehicle's air conditioning system from a nitrogen cylinder. The pressure loss over the selected time period is determined.

4.1 Drain hose

Select **Manual | Drain hose** in the main menu.

With the "Drain hose" function you can completely drain the external filling hoses.

4.2 Customer data

For all selectable processes (except for "Drain hose"), customer data can be entered for logging purposes.

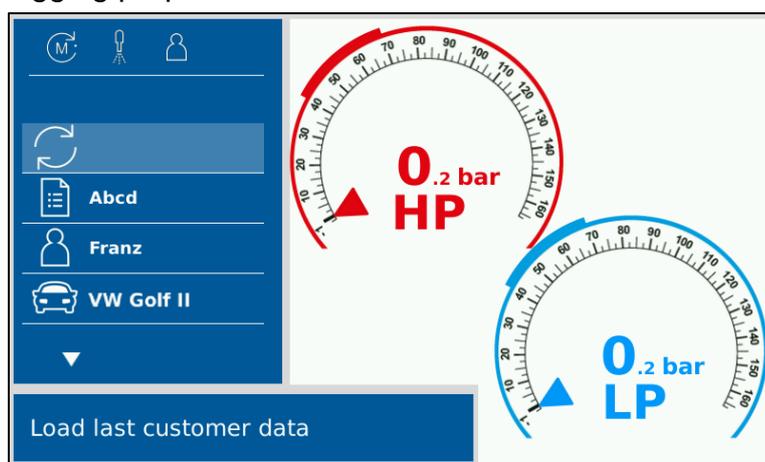


Fig. 4-2

4.3 Draining

Select **Manual | Drain hose** in the main menu.

With this function, the CO₂ (R744) refrigerating agent is drained from the vehicle.

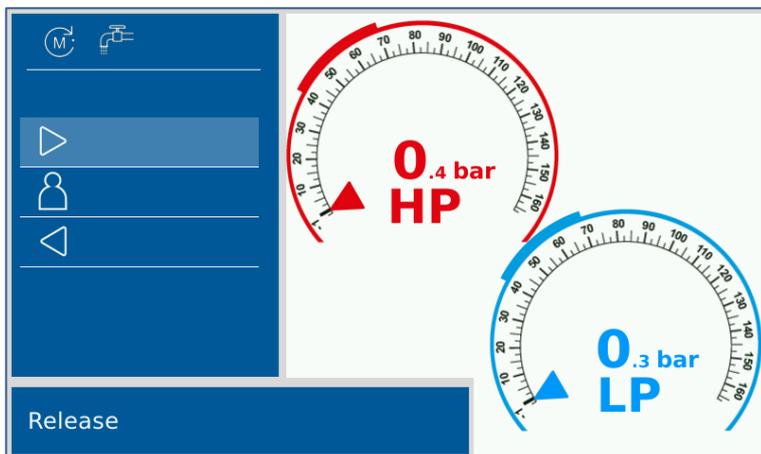


Fig. 4-3

Default values:

Button	Parameter	Unit	Selection
	Customer data		

Results:

-  Drained refrigerating agent
-  Drained oil quantity
-  Draining time

4.4 Generating vacuum

Select **Manual | Vacuum** in the main menu.

A vacuum is generated inside the air conditioning system. This reveals any leaks inside the air conditioning system of the vehicle.

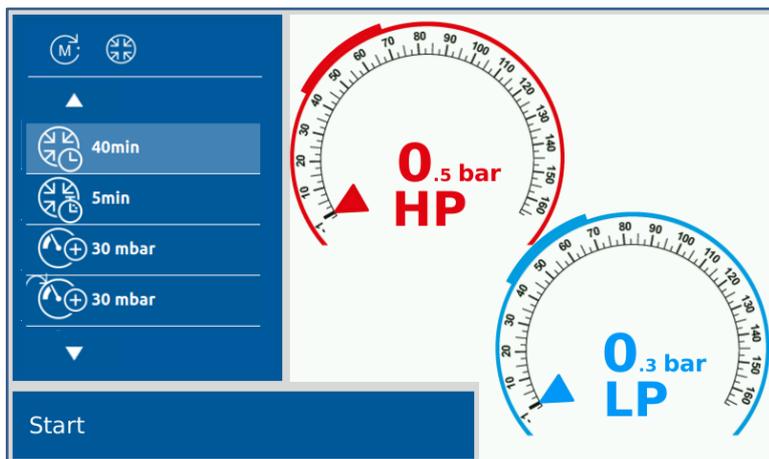


Fig. 4-4

Default values:

Button	Parameter	Unit	Selection
	Vacuum time	min	5 ... 60
	Vacuum test time	min	5 ... 120
	Pressure increase Repetition pressure increase		5 ... 1000
	Customer data		

Results:

 Vacuum pressure minimum value

 Pressure increase

 Number of repetitions

 Vacuum test time

Vacuum test evaluation ok/not ok only on printout!

Note:

If vacuum is used to check for leaks inside the device (no air conditioning system connected), we recommend you set the vacuum time to at least 60 minutes. After effects of the refrigerating agent CO₂ may result in the misinterpretation of the result due to too excessive pressure increase.

4.5 Filling

Select **Manual | Filling** in the main menu.

In the first step, the set oil and UV additive quantities are injected into the air conditioning system of the vehicle. Then it is filled with the set quantity of refrigerating agent CO₂ (R744).

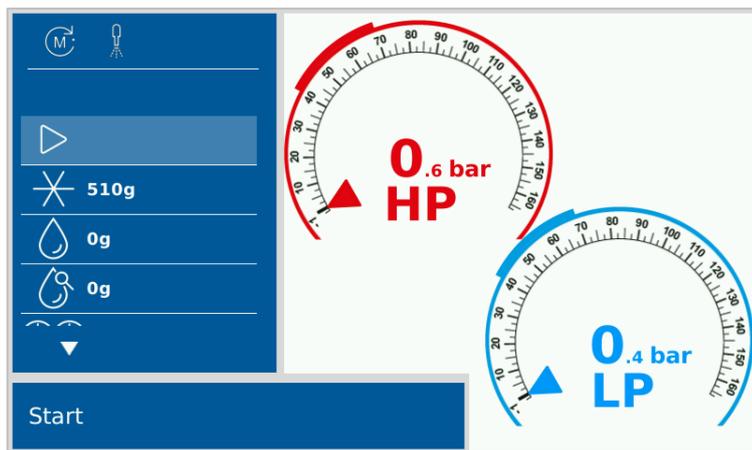


Fig. 4-5

Default values:

Button	Parameter	Unit	Selection
	Refrigerating agent quantity CO ₂ (R744)	g	0 ... 1500
	Oil quantity	g	0 ... 20
	UV additive	g	0 ... 20
	Connection type		LP / HP+LP
	Pressure test		OFF / 10 % / 75 g / 20 % / 75 g
	Duration of pressure test	min	1 ... 30
	Pressure loss	mbar	100 ... 1000
	Customer data		

Results:

-  Injected quantity of refrigerating agent
-  Injected oil quantity
-  Injected UV additive quantity
-  Set amount of refrigerant

4.6 Pressurecheck

Select **Manual | Pressure test** in the main menu.

The air conditioning system of the vehicle is applied with a preset quantity of refrigerating agent. After a stabilisation period, the pressure change can be determined based on the set length of the test. The actual pressure loss is determined and compared with the set max. permissible pressure loss.

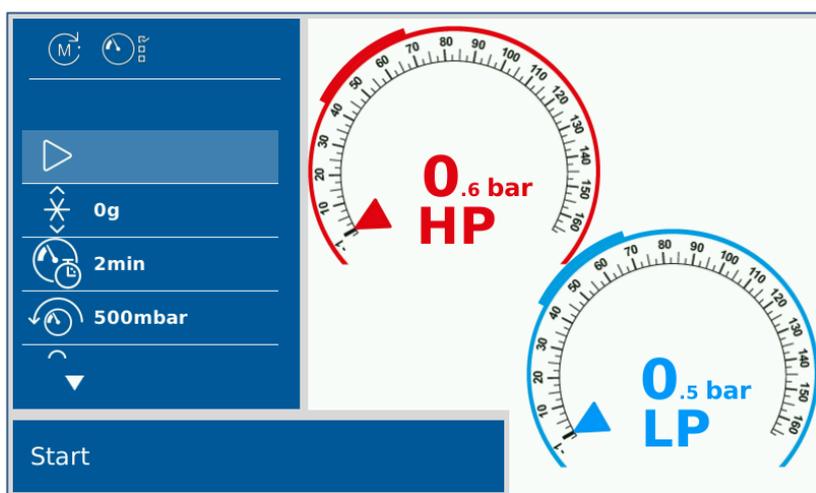


Fig. 4-6

Default values:

Button	Parameter	Unit	Selection
	Refrigerating agent quantity	g	70 ... 300
	Duration of pressure test	min	1 ... 30
	Pressure loss	mbar/min	100 ... 1000
	Customer data		

Results:

-  Injected quantity of refrigerating agent
-  Pressure at the end of the injection process
-  Pressure loss during pressure test

4.7 HP/LP pressure test

Select **Manual | HP/LP pressure test** in the main menu.

With this function, the pressure of the air conditioning system while in operation is measured. This allows you to check the high pressure side and low pressure side during operation.

The process starts with the hoses being filled with CO₂. This ensures that refrigerating agent loss from the air conditioning system of the vehicle is kept to a minimum. The minimum cylinder pressure must not drop below 50 bar. Next, you will be asked to switch on the air conditioning system of the vehicle. Confirm this on the VAS 581 009. The process must be terminated by the user.

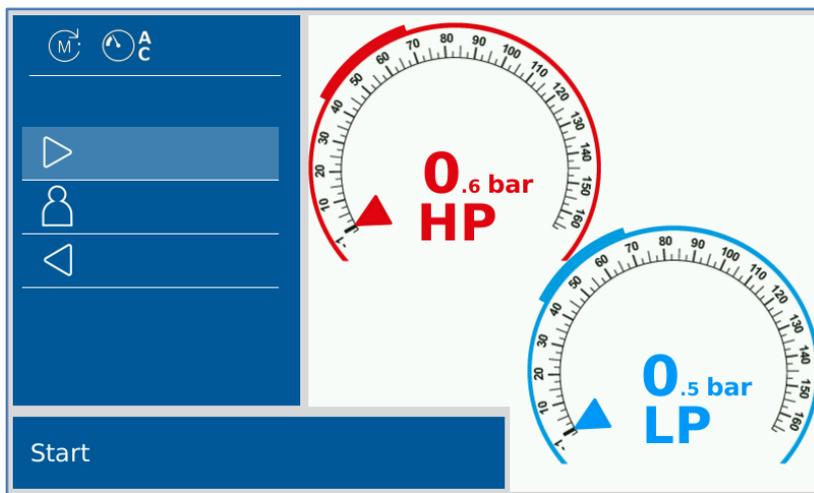


Fig. 4-7

Result:

Upon termination, the test time, highest pressure on the HP side and associated pressure on LP side are printed out.

4.8 External pressure test

With the external pressure test, the air conditioner can be tested for leaks with a pressure of 99 ... 101 bar. This requires a nitrogen cylinder and the external pressure test set VAS 584 003 (AVL ID No. BO7948).

Note the ext. Pressure test set enclosed Quickstart, AVL ID no. 7948.

Select **Manual | External pressure test** in the main menu.

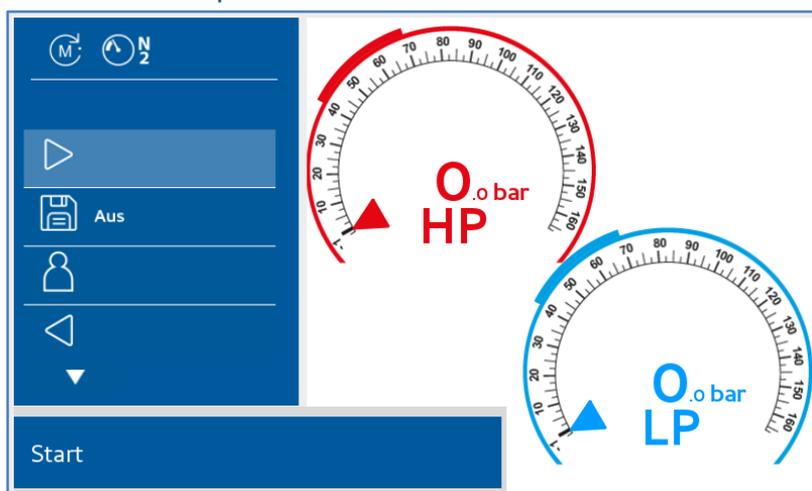


Fig. 4-8

Default values:

Button	Parameter	Unit	Selection
	Pressure threshold		0 ... 100
	Save log data		On / Off
	customer data		

Start the external pressure test with .

Follow the instructions on the screen in detail.

Process overview:

- Close manual valve on the refrigerant bottle.
- Connect couplings to the vehicle, screw in fittings.
- Connect nitrogen bottle N2. **VAS 584 003 - Note quickstart.**



- d) Set test pressure of 14 ... 15 bar.
To do this, slowly open the manual valve on the VA 584 003.
⇒ It is measured 2 times for 1 minute each time and the pressure (HP and LP) is displayed.
- e) Options:
-  Cancel
 -  Uncouple
 -  Repeat
 -  Continue
- f) Select **Continue**.
- g) Set test pressure of 99 ... 101 bar.
To do this, open the manual valve on the VA 584 003.
⇒ External pressure test is carried out.
The pressure (HP and LP) is displayed.
- h) Options:
-  Cancel
 -  Uncouple
 -  Repeat
- i) Exit ext. pressure check with **uncoupling**.

5 Settings

Under the "Settings" menu item you can change various parameters and enable various features.

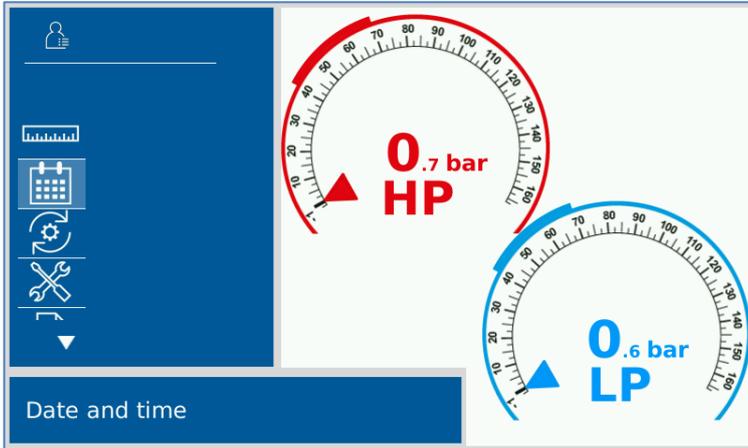


Fig. 5-1

Select the desired function.
Follow the instructions on the screen.

5.1 Units

With this function, you can select the units for pressure (bar/psi), temperature ($^{\circ}\text{C}/^{\circ}\text{F}$) and oil quantities (g/ml).

5.2 Date and time

Here you can enter/change the date and time. You can also select a country-specific date/time format, e.g. USA.

5.3 Firmware update

Here you can update the firmware of the VAS 581 009.

1. Remove the cover on the right side (below the mains switch) and plug in the USB stick containing the firmware.



Fig. 5-2

2. Select **Settings | Firmware update** in the main menu.
3. Confirm with .
4. The firmware update starts automatically.
5. Follow the instructions on the screen of the VAS 581 009.



WARNING

During the firmware update, you may hear the sired for up to two minutes.
The VAS 581 009 must not be disconnected from the power supply during this time.

The VAS 581 009 restarts and performs a self-test after a language has been selected.

5.4 Workshop data

Here you can enter/change workshop data (company, address, e-mail, telephone number).

5.5 Balance sheet

The balance sheet provides for a key date evaluation of the discharged refrigerating agent and recovered oil as well as the refrigerating agent and clean oil that has been topped up. The evaluation is shown under this menu item and can be printed or reset.

5.6 Language

Here you can select the language.
Once selected, the VAS 581 009 restarts.

5.7 Printout text size

Here you can choose between small, medium and large front for the printout.

Information

AVL DiTEST reserves the right to add new parameters to make the VAS 581 009 even more versatile and adapt it to market requirements.

6 Maintenance

6.1 Maintenance schedule

To ensure faultless operation, the VAS 581 009 must be serviced at regular intervals. All maintenance work that has been carried out must be recorded in the inspection log. If necessary, e.g. in case of problems, additional maintenance work can be carried out or information retrieved.

Component/assembly/function		Interval	Explanation
Regular maintenance			
Change vacuum pump oil		Every 500 operating hours or at least once a year	Sec. 6.2.1
Check oil level (vacuum pump oil)		Weekly	Sec. 6.2.2
Check CO ₂ (R744) refrigerating agent		Weekly	Sec. 6.2.3
Check cylinder adapter		Weekly	Sec. 6.2.4
Check LP and HP hoses		Weekly	Sec. 6.2.5
Check quick connectors		Weekly	Sec. 6.2.6
Check cylinder heater (heating band) while switched off		Daily	Sec. 6.2.7
Inspect device		Weekly	Sec. 6.2.8
Ad-hoc maintenance (as required)			
Cylinder replacement		As required	Sec. 6.3.1
Pressure zeroing		As required	Sec. 6.3.2
Oil/UV additive scales zeroing		As required	Sec. 6.3.3
Oil regeneration		As required	Sec. 6.3.4
Save logs		As required	Sec. 6.3.5
Printer	Add new printer paper	As required	Sec. 6.4
Fuse	Replace fuse	As required	Sec. 6.5
Other maintenance information			
System info		---	Sec. 6.6.1
Operating hours		---	Sec. 6.6.2
Replace seals		---	Sec. 6.6.3



WARNING

Danger to life from electric current

Make sure that the VAS 581 009 is disconnected from the power supply before opening it!



WARNING

Do not make any modifications to the VAS 581 009 that are not explicitly specified in this chapter.



WARNING

Only use original AVL DiTEST spare parts!

6.2 Regular maintenance

6.2.1 Change vacuum pump oil

Change the vacuum pump oil after 500 operating hours (at least once a year). The VAS 581 009 will inform you when the vacuum pump oil needs changing.

1. Select **Maintenance | Vacuum pump oil**.
2. This display will show:
 - Time since last oil regeneration
 - Remaining time until next oil regeneration
 - Time since last oil change
 - Remaining time until next oil change
 - Start regeneration of vacuum pump oil
 - Reset vacuum pump oil meter (when changing vacuum pump oil)
3. Switch the VAS 581 009 off and pull the power plug.
4. Unscrew the socket screw to drain the oil (a).
The oil drains into the extractable oil container (b).

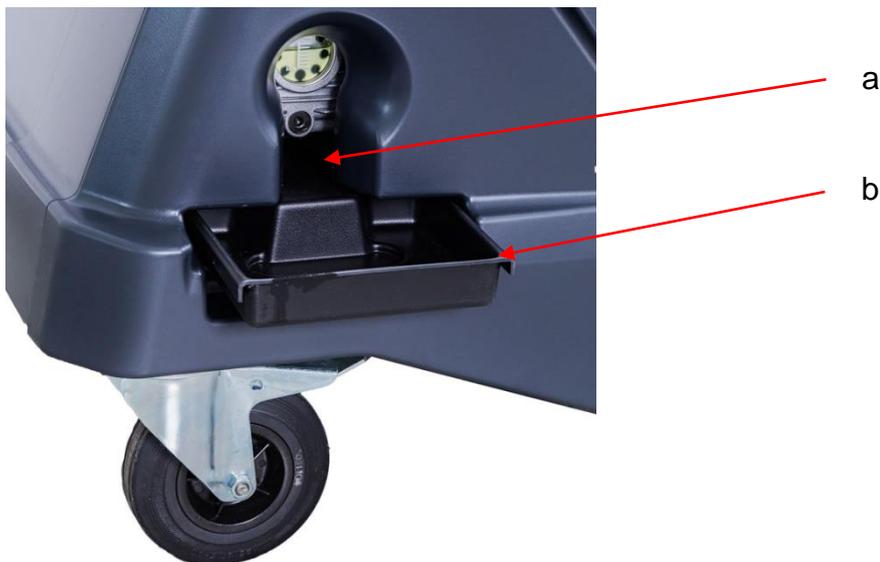


Fig. 6-1

5. Screw the socket screw back in again (a).
6. Empty the oil container (b).

- Remove the housing.
To do so, unscrew the two screws (c), pull the housing (d) slightly outwards and then press it forwards.

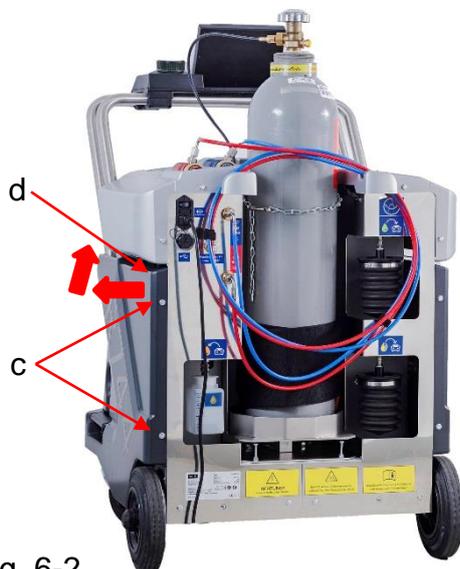


Fig. 6-2

- Unscrew the cap (e) and fill in the oil;
fill quantity 250 ml Only use the vacuum pump oil specified in the 2.11.2 "Available accessories" section.
Screw the cap (e) back on again.

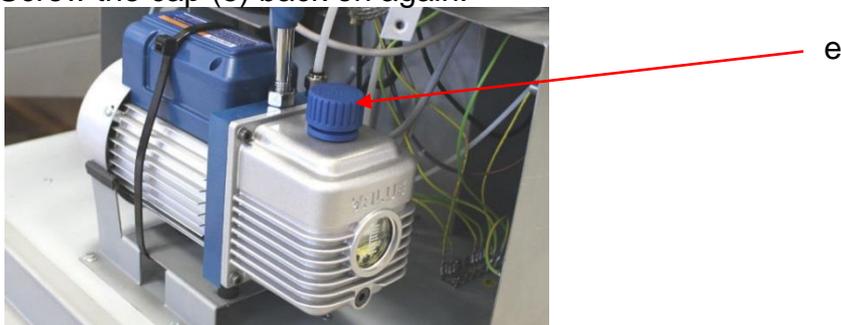


Fig. 6-3

- Check the oil level (f) through the gauge glass.

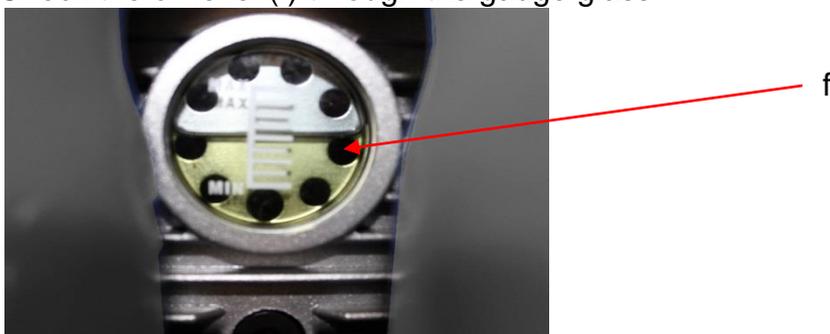


Fig. 6-4

10. Re-attach the housing (d), see Item 7.
Make sure that the three white studs snap into the black plastic parts before screwing the housing back on.

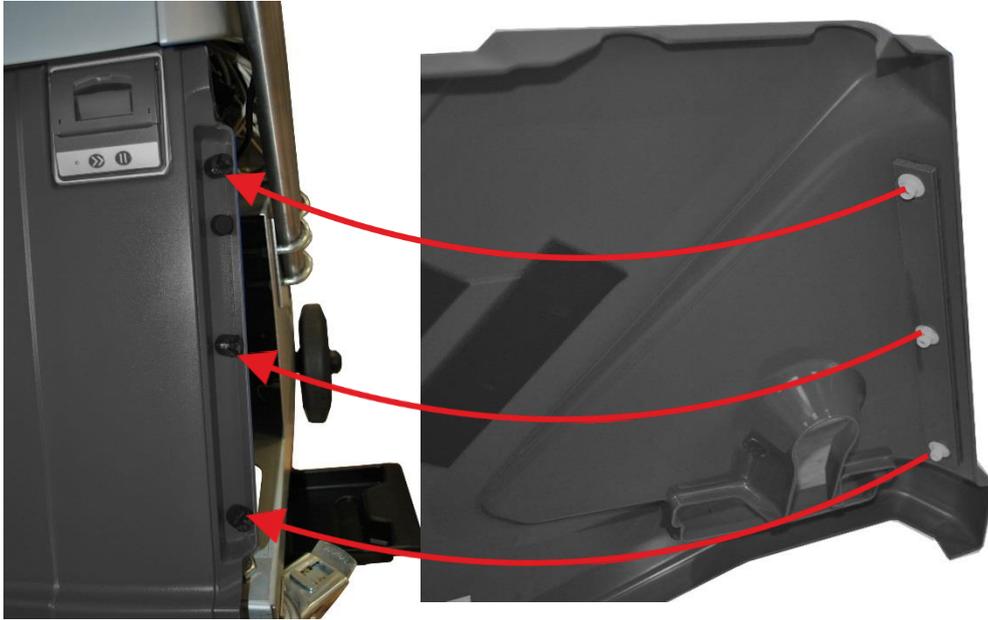


Fig. 6-5

11. Switch the device off again.
Navigate to **Maintenance | Vacuum pump oil | Reset vacuum pump oil meter**.
This will reset the values shown under Item 2.

6.2.2 Check oil level (vacuum pump oil)

Check the oil level through the gauge glass weekly.
Top up or change the vacuum pump oil if necessary, see Sec. 6.2.1.

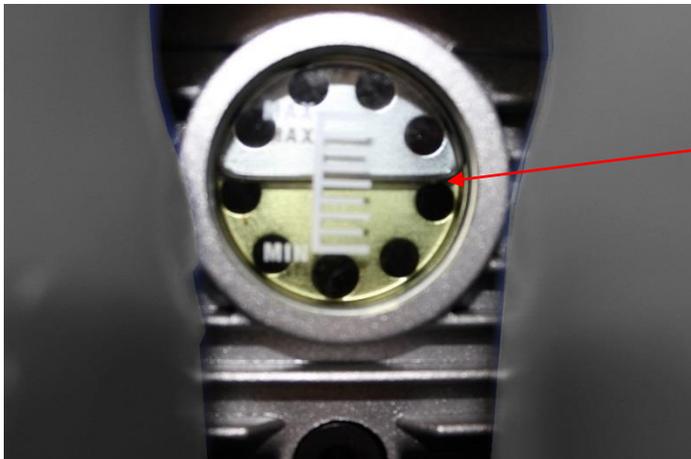


Fig. 6-6

6.2.3 Refrigerating agent cylinder CO₂ (R744)

Check the refrigerating cylinder weekly for corrosion, leaks and damage.
Under normal operating conditions, the device has a service life of at least 20 years
(provided there is no wear or other damage).



Fig. 6-7

6.2.4 Cylinder adapter

Check the cylinder adapter weekly for corrosion, leaks and damage.



Fig. 6-8 (exemplary photo)

6.2.5 LP and HP filling hoses

Check the LP (blue) and HP (red) filling hoses weekly for leaks, defects or damage.

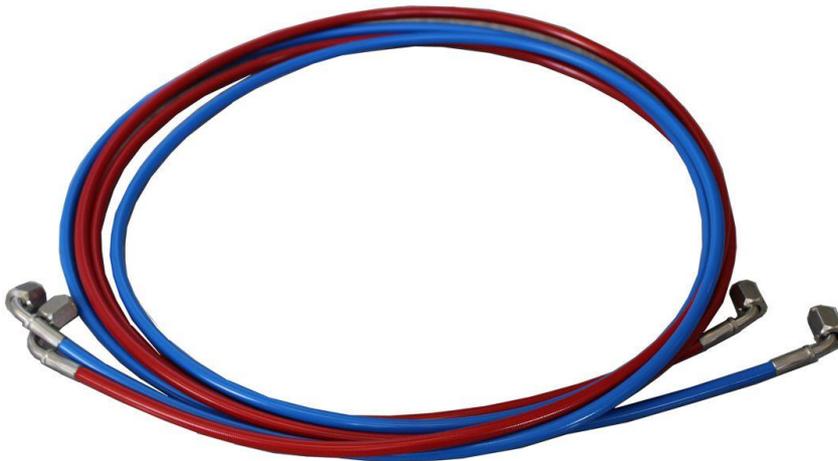


Fig. 6-9

6.2.6 LP and HP quick connectors

Check the LP (blue) and HP (red) quick connectors weekly for leaks, defects or damage.



Fig. 6-10

6.2.7 Cylinder heater (heating band)



WARNING

Check the bottle heater (heating tape) only when the mains plug is disconnected!
The device must not be used if the heating band or cable is damaged. Contact the respective AVL DiTEST branch / AVL DiTEST partner in your country!

Check the cylinder heating / cables daily for defects or damage.
Make sure that the cylinder heating is connected correctly.



Fig. 6-11

6.2.8 Inspect device

Performs an internal self-test by switching on all valves and checking the system for leaks.
This self-test must be performed every seven days.

6.3 Ad-hoc maintenance, as required

6.3.1 Refrigerating agent cylinder CO₂ (R744)

Proceed as follows:

1. Switch on the VAS 581 009.
2. The following message appears after a successful self-test.

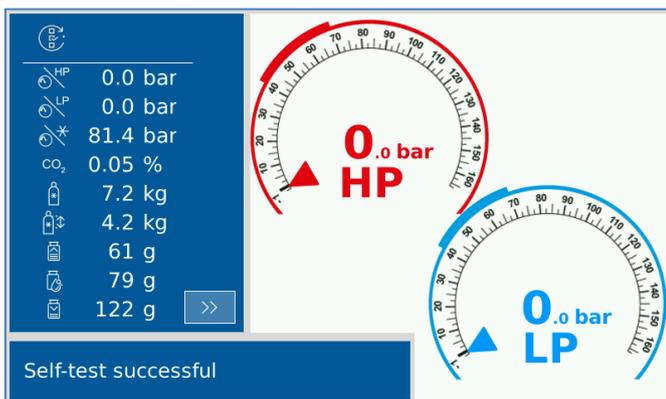


Fig. 6-12

3. Continue with  .
4. You are in the main menu. Tap **Maintenance**.

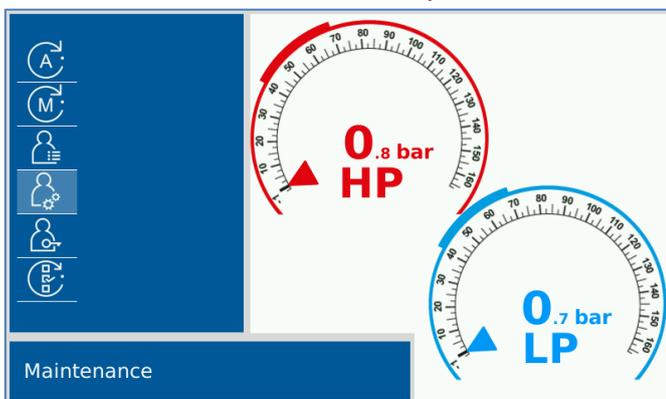


Fig. 6-13

5. Select **Replace refrigerating agent cylinder** in the maintenance menu.

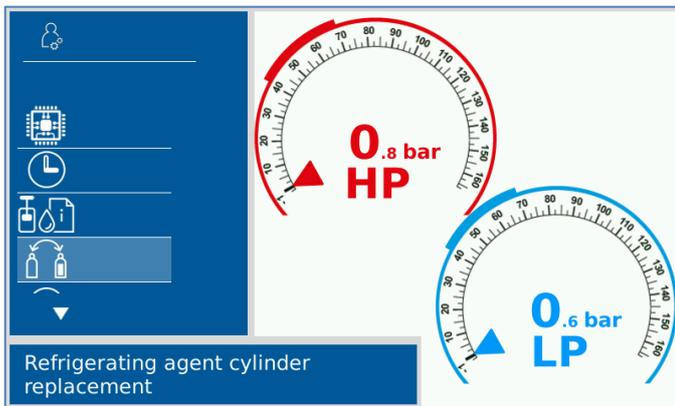


Fig. 6-14

6. Now select **Cylinder content**.

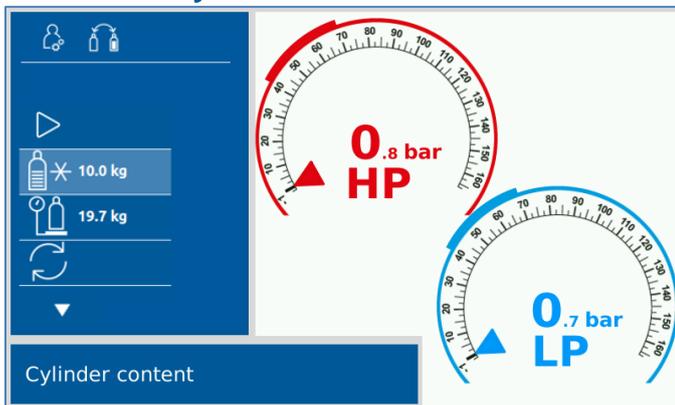


Fig. 6-15

7. Enter the weight of the cylinder content. (= nominal quantity of the content / nominal capacity of the cylinder, not the actual cylinder capacity!). Incorrect entries inevitably result in incorrect calculations of the available/usable cylinder capacity.

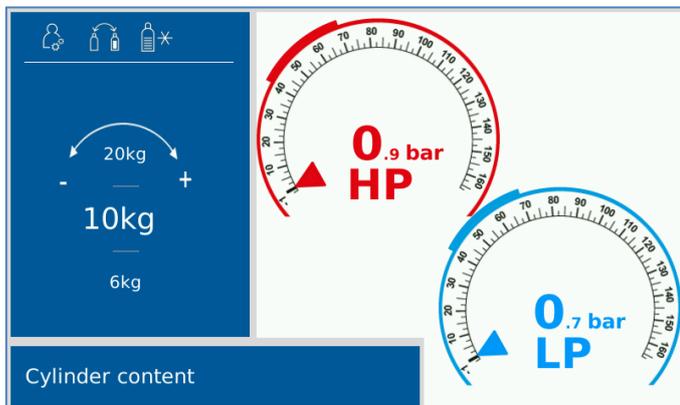


Fig. 6-16

8. Select **tare weight**.

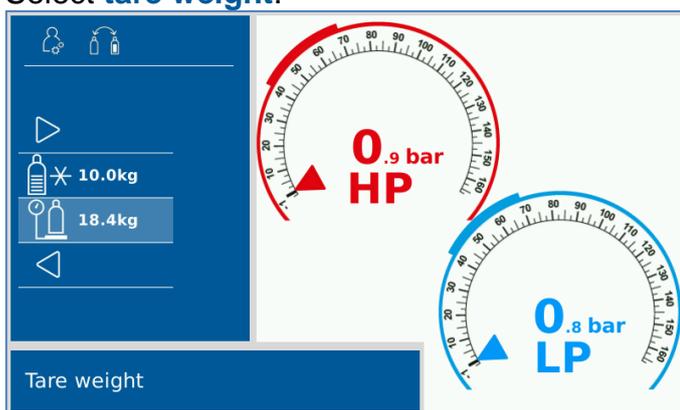


Fig. 6-17

9. Refrigerating agent cylinder with protective cap:
- a) In order to read the tare weight, the protective cap must be removed from the refrigerating agent cylinder



Fig. 6-18

- b) Note down the tare weight.
The tare weight represents the net weight of the used cylinder (empty).
This weight is usually shown on the cylinder, sometimes embossed.



Fig. 6-19

- a) Mark the location of the outlet valve on the refrigerating agent cylinder.



Fig. 6-20

- b) Re-attach the protective cap.



Fig. 6-21

10. Enter the tare weight.

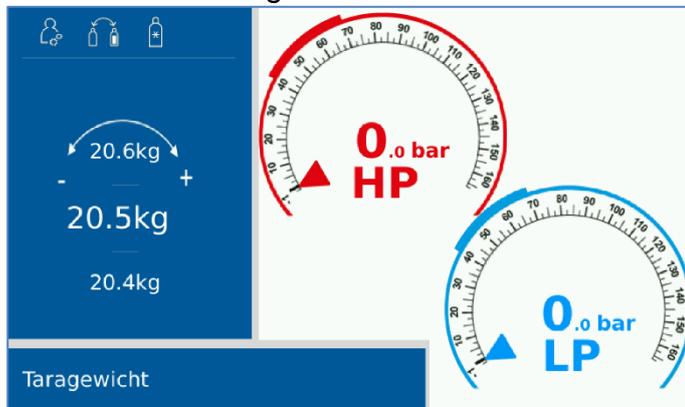


Fig. 6-22

11. Press  to continue replacing the cylinder.

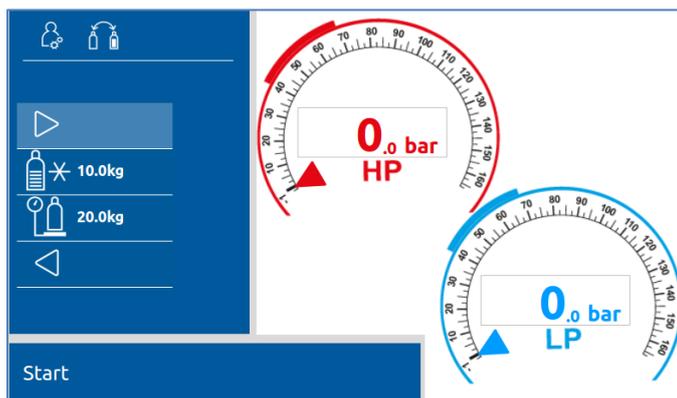


Fig. 6-23

12. Follow the instruction and release the screw fitting at the connectors.

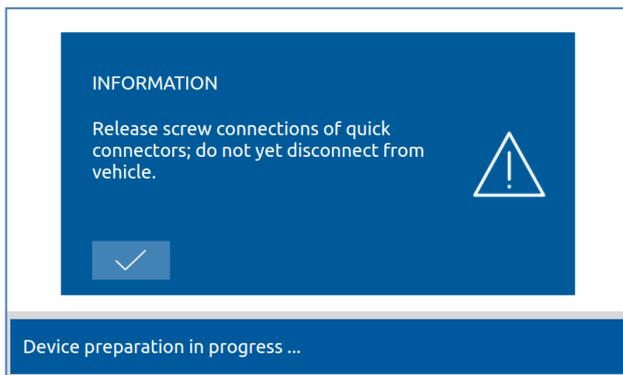


Fig. 6-24

13. Continue with  . The hose is automatically emptied.

14. Disconnect the quick connectors from the vehicle.

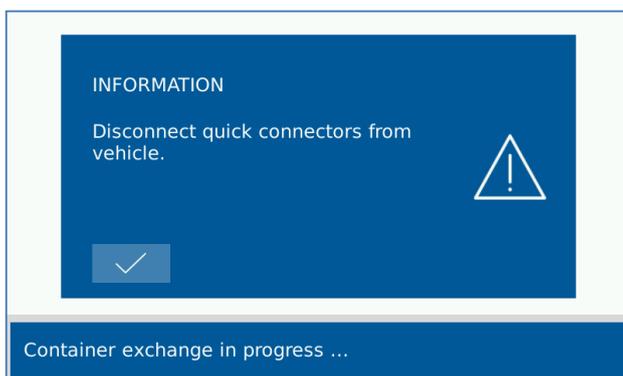


Fig. 6-25

15. Continue with  .

16. Close the manual valve on the refrigerating agent cylinder. Continue with .

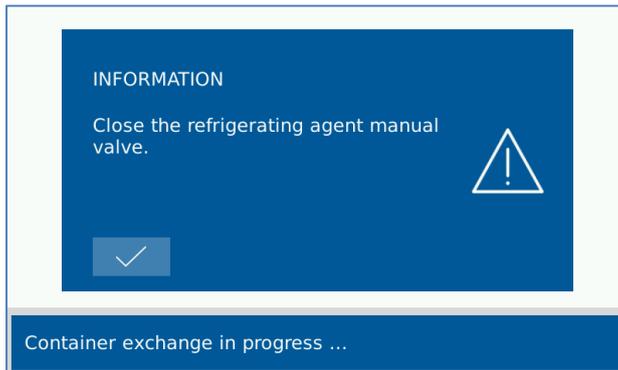


Fig. 6-26

17. Follow the instruction.

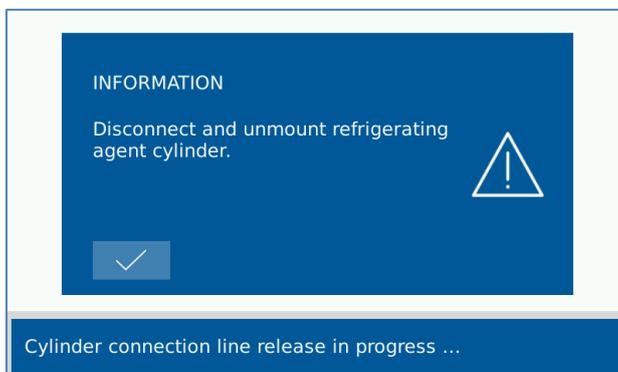


Fig. 6-27

**WARNING**

The following work may only be carried out with assembly gloves!

- a) Disconnect the hose from the cylinder adapter. Spanner width: 14 mm



Fig. 6-28

- b) Unscrew the cylinder adapter



Fig. 6-29

- c) Unscrew the protective cap



Fig. 6-30

- d) Release the securing chain and remove the refrigerating agent cylinder from the refrigerating agent scales.

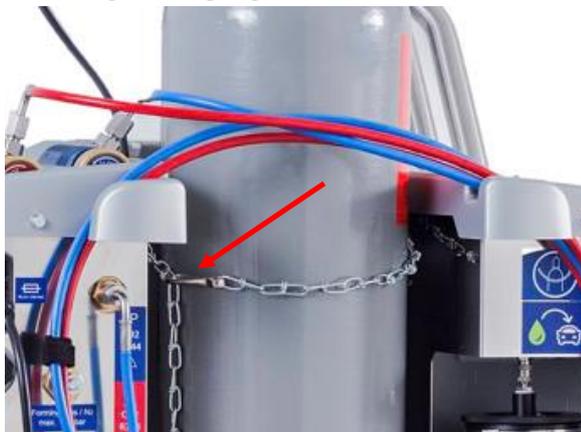


Fig. 6-31

e) Place the securing chain on the VAS 581 009 as illustrated.



Fig. 6-32

f) Remove the cylinder heater (heating band).



Fig. 6-33

18. Continue with  .

19. The scales are reset to zero. Follow the instructions.
Make sure the scales are unladen.

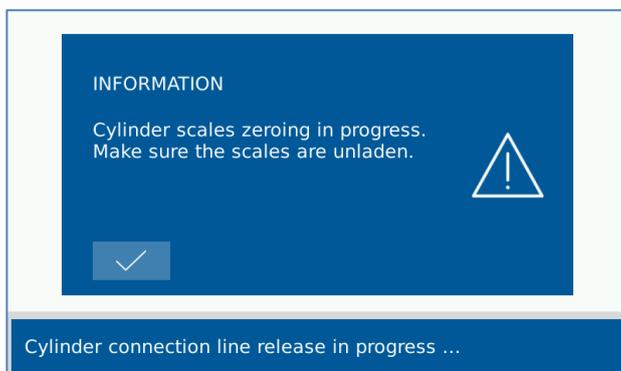


Fig. 6-34

20. Continue with  .

21. Follow the instruction.

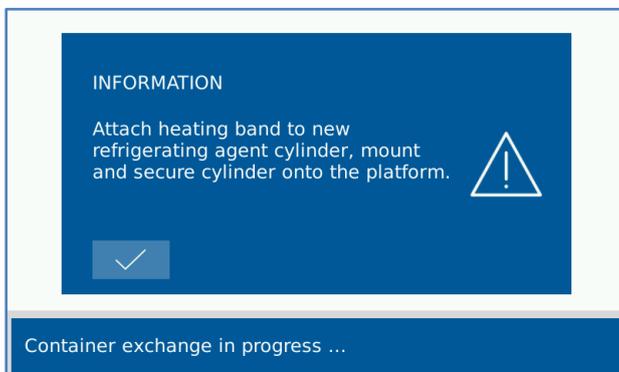


Fig. 6-35

a) Attach the cylinder heater (heating band) around the lower third of the cylinder.
Important: The closure of the cylinder heater must be located on the opposite side of the outlet valve.

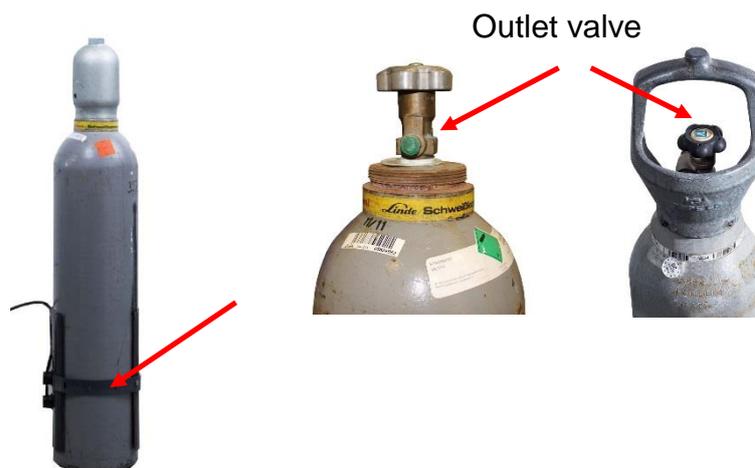


Fig. 6-36

b) Make sure that the cylinder heater (heating band) is connected.



Fig. 6-37

- c) Place the new refrigerating agent cylinder onto the refrigerating agent scales. Note that the bottle heating cable is not placed on the balance during the assembly of the bottle. Attach the securing chain.

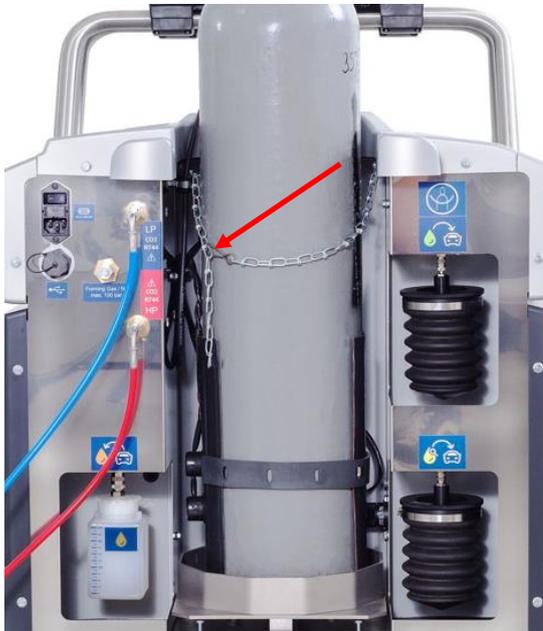


Fig. 6-38

22. Continue with  .

23. Refrigerating agent cylinder with protective cap:
Remove the protective cap.
Make sure that the connection of the refrigerating agent cylinder is facing the device and not away.

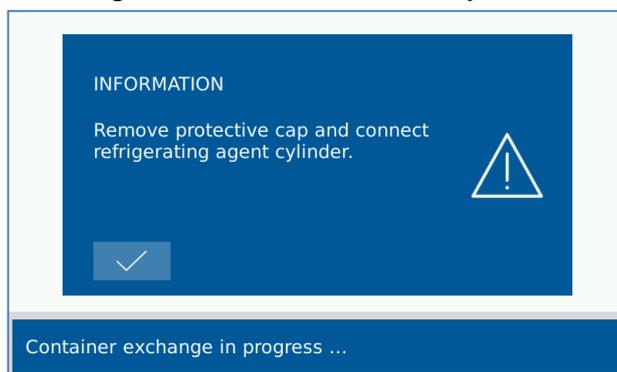


Fig. 6-39

24. Zeroing and hose emptying are performed automatically.

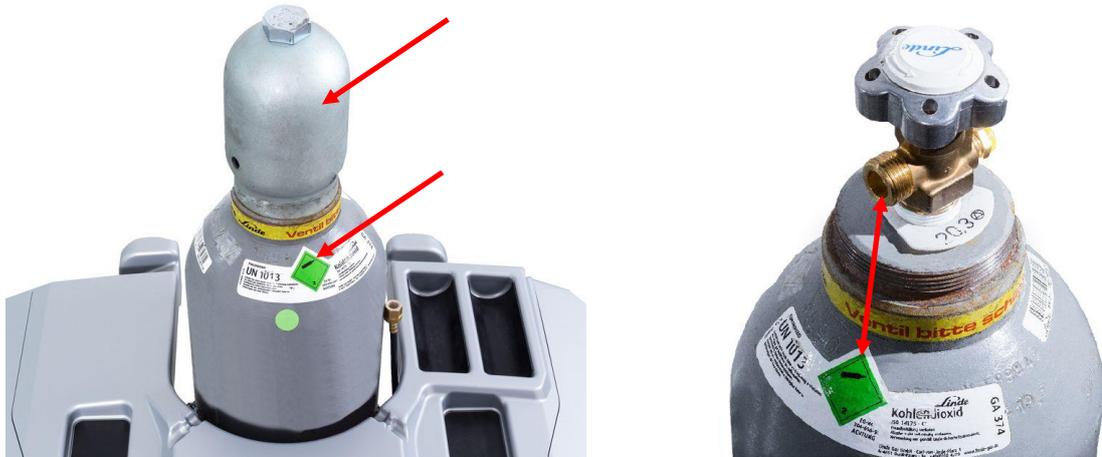


Fig. 6-40

25. Remove the hose from the plastic cap if necessary.



Fig. 6-41

26. Remove the plastic cap on the outlet valve if necessary.



Fig. 6-42

27. Attach the supplied cylinder adapter.
Torque: 30 ... 32 Nm, max. 35 Nm.



Fig. 6-43

28. Connect the hose to the cylinder adapter. Spanner width: 14 mm.
Torque: 16 ... 18 Nm, max. 20 Nm.



Fig. 6-44

29. Continue with .

30. **Make sure** that the hose/hose connection is facing the device.
It must **not lead away from the rear** of the device.
This could lead to a faulty measurement of the cylinder weight.

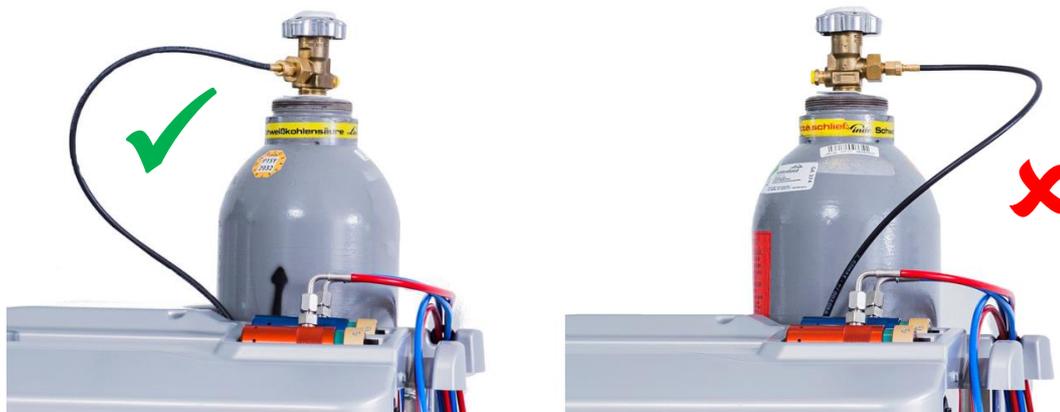


Fig. 6-45

31. **Note** that the hose / hose connection does not point towards the center, but approx. 20... 25 degrees to the left.



Fig. 6-46

32. Follow the instructions and open the manual valve of the refrigerating agent cylinder.

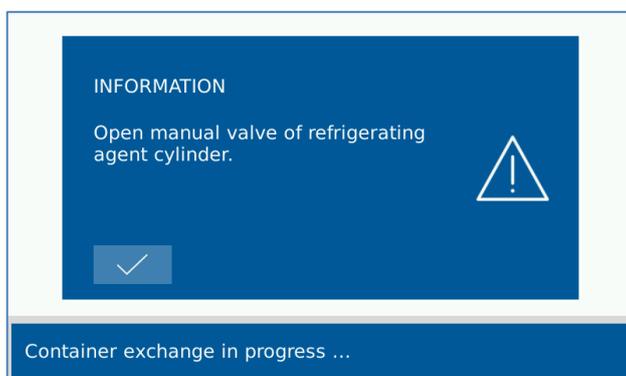


Fig. 6-47



Fig. 6-48

33. End the replacement of the refrigerating agent cylinder with  .

The system is flushed with CO₂, i.e. the filling hoses are first flooded with CO₂, then the CO₂ is discharged. The VAS 581 009 must not be connected to the vehicle at this time!

34. Exit the menu with  .
35. Select  to return to the main menu.

6.3.2 Pressure zeroing

1. Select **Maintenance** in the main menu.

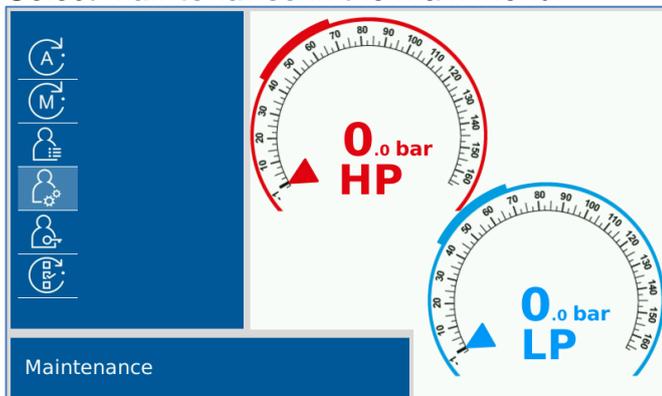


Fig. 6-49 Maintenance

2. Select **Reset to zero**.

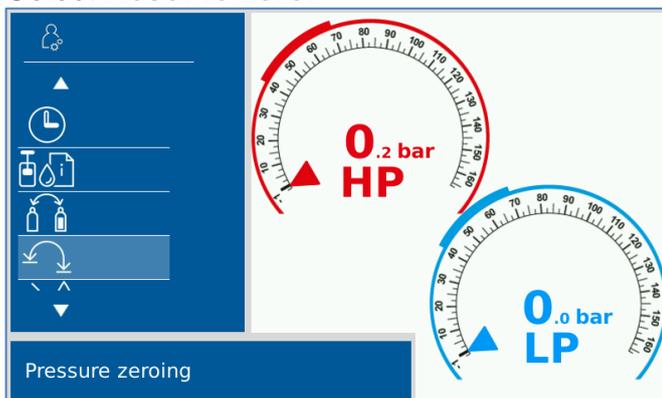


Fig. 6-50 Pressure zeroing

3. Start pressure zeroing with .

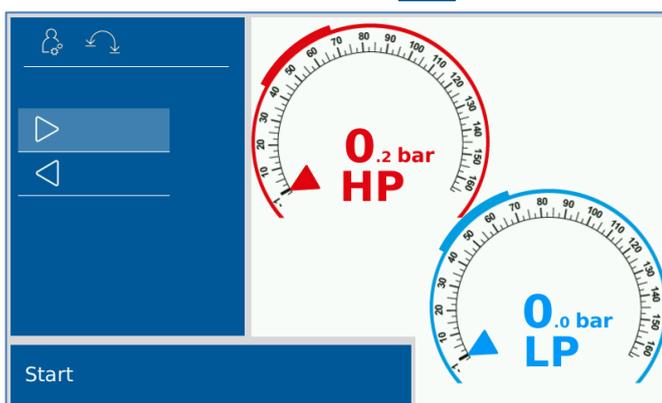


Fig. 6-51 Pressure zeroing – Start

Pressure zeroing takes about 60 seconds. The counter is displayed. Wait until the process is complete.

4. "Pressure zeroing" is complete.
5. Exit "Pressure zeroing" with .

6.3.3 Oil/UV additive scales zeroing

1. Select **Maintenance** in the main menu.

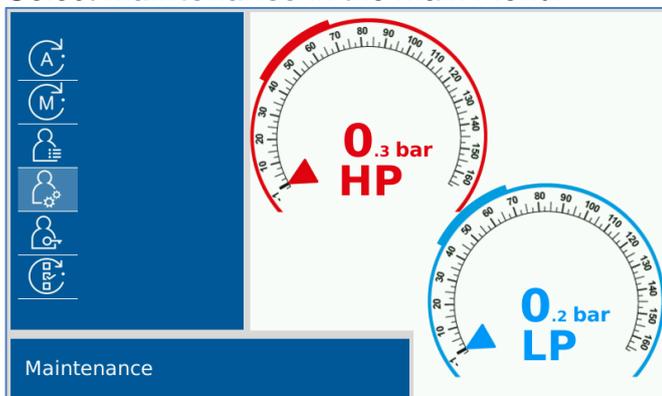


Fig. 6-52 Maintenance

2. Select **Reset Oil/UV additive scales to zero.**

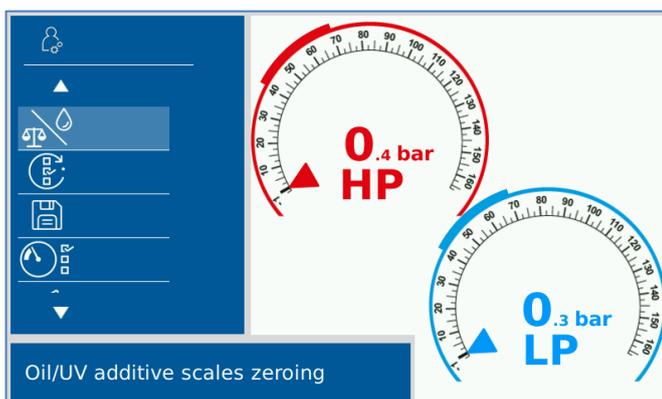


Fig. 6-53 Oil/UV additive scales zeroing

3. Start Oil/UV additive scales zeroing  .

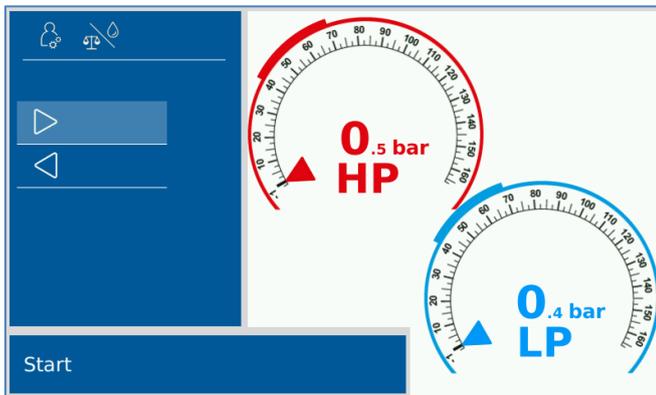


Fig. 6-54 Scales zeroing

Follow the instructions on the display. (e.g. mount empty oil/UV additive containers, etc.). Note:

The mounted oil containers must be completely empty for zeroing. If this is not the case, an error message may occur during zeroing.

4. "Oil/UV additive scales zeroing" is complete.
5. Exit "Oil/UV additive scales zeroing" with  .

6.3.4 Oil regeneration

Select **Maintenance | Oil regeneration | Carry out oil regeneration** in main menu. Oil regeneration is carried out automatically.

6.3.5 Save logs

Data is logged and can be copied to a USB stick in case of an error and sent to AVL DiTEST Service for error analysis.

Logging is started/suspended with  .

Note:

Once data logging is enabled it remains active even when the device is switched off.

6.4 Add new printer paper

Press the black tab outwards and folder the cover up.



Fig. 6-55

Take the empty paper roll out and place a new one inside. Pay attention to the direction of rotation.

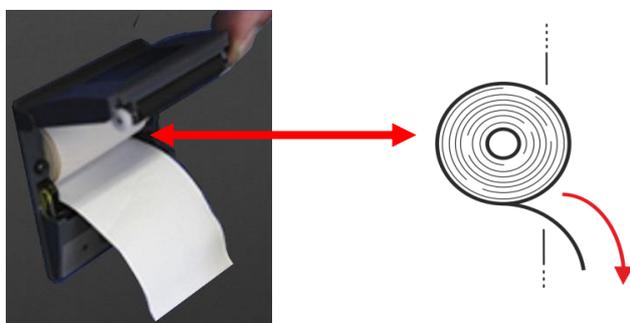


Fig. 6-56

Pull the paper out until it is visible from outside. Close the cover.

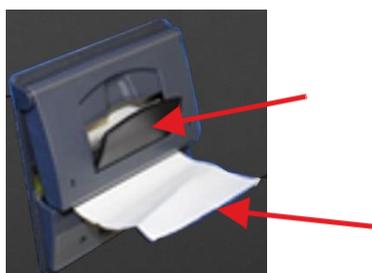


Fig. 6-57

Press the black tab inwards. The printer is now ready for use.

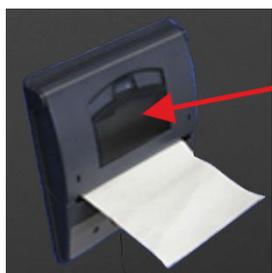


Fig. 6-58

6.5 Replacing fuses

NOTICE

Only use original AVL DITEST fuses with the ID number EV0051 or fuses with the same specification:

Glass tube fuse 5x20 mm, 6.3 A, 250 V, inert.

Pull the fuse unit out and replace with a new fuse.



Fig. 6-59

6.6 Other maintenance information

In case of problems, various maintenance steps can be carried out via the maintenance menu.

Select the desired function.
Follow the instructions on the screen.

6.6.1 System information

The "*System info*" menu shows the

- software version
- device type
- serial number
- HW revision status

6.6.2 Operating hours

Shows the total operating hours of the device, the total vacuum pump running time and number of switching cycles of the individual solenoid valves of the valve block.

6.6.3 Replacing quick connector seals

Tools required

- 2 slot screwdrivers (2 mm wide)
- Tweezers

Important: The screwdrivers and tweezers must have been carefully deburred and rounded.

Overview

The seal consists of two parts:

- 1 x O-ring
- 1 x supporting ring

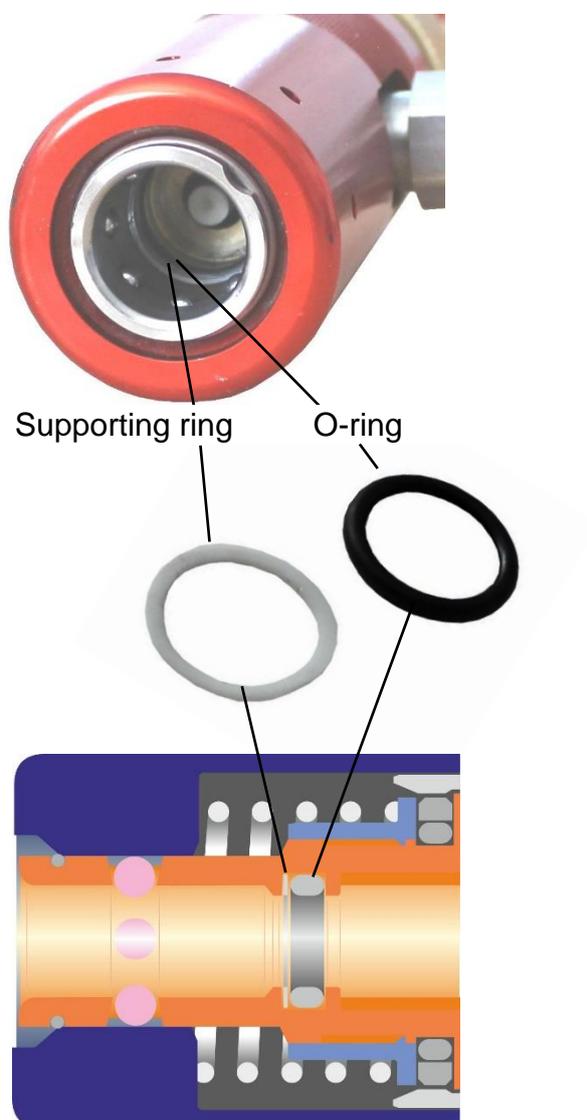


Fig. 6-60

Removing the rings

Remove O-ring and supporting ring with screwdrivers.
Apply caution to avoid damaging the service connection.



Fig. 6-61

Installing the O-ring and supporting ring

1. Bend the supporting ring slightly in the middle. Do not bend it together completely as otherwise it will be damaged.



Fig. 6-62

2. Insert the supporting ring into the connector with your fingers.

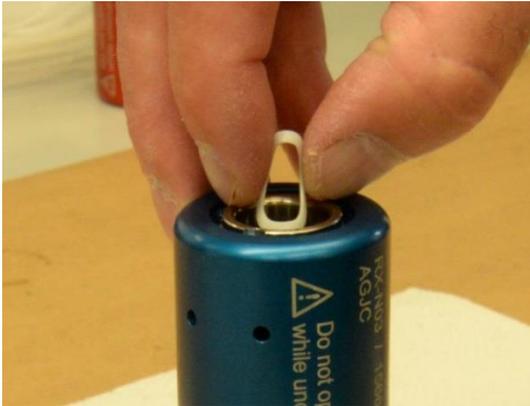


Fig. 6-63

3. Push the supporting ring further into the connector and then position it in the O-ring groove.
The supporting ring must fit perfectly in the groove without exhibiting any unevenness or damage.



Fig. 6-64

4. Press the O-ring together and push it into the connector.



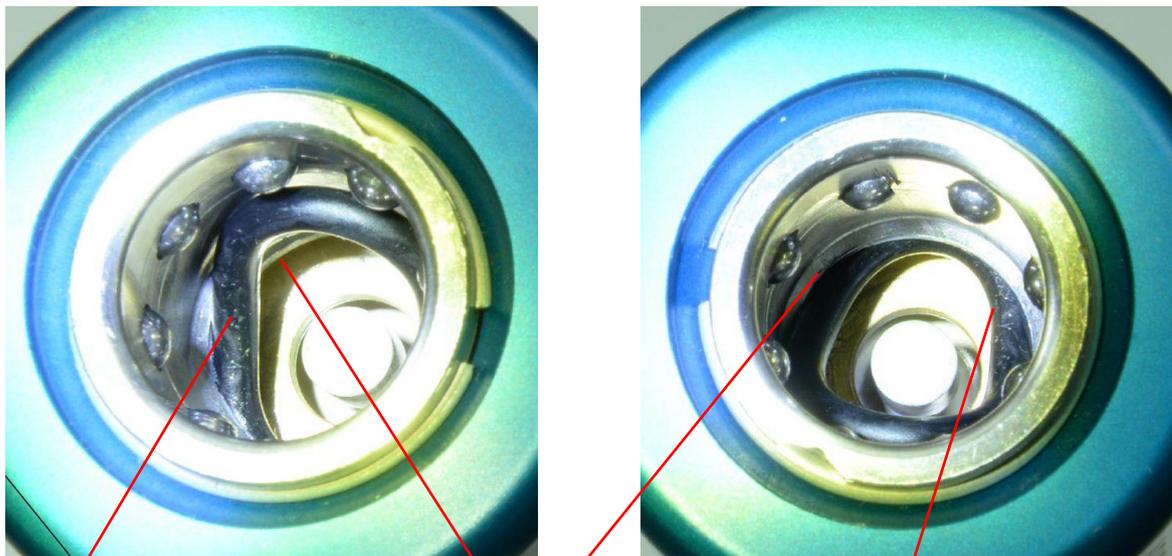
Fig. 6-65

5. Position the O-ring as shown in the following figures.
The correct position is behind the supporting ring.
The correct position is essential to the proper functioning of the connector and must be adhered to.



Fig. 6-66

6. Press one side of the O-ring under the supporting ring and into the O-ring groove.



O-ring
Fig. 6-67

Supporting ring

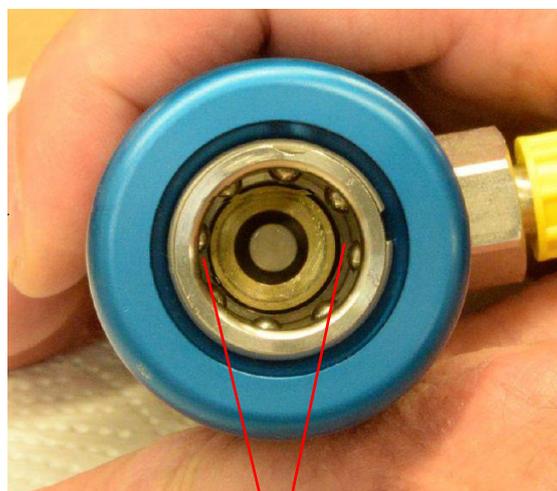
O-ring

7. Push the O-ring further into the groove until the O-ring is seated evenly in the groove as shown in the figures.



Supporting ring
Fig. 6-68

O-ring



Seated evenly all round

If you experience problems or have any questions, please contact your AVL DiTEST service partner.

7 Service

The "Service" operating mode is password-protected and may only be used by AVL DiTEST Service staff!

8 Overview

This overview shows all current system values.

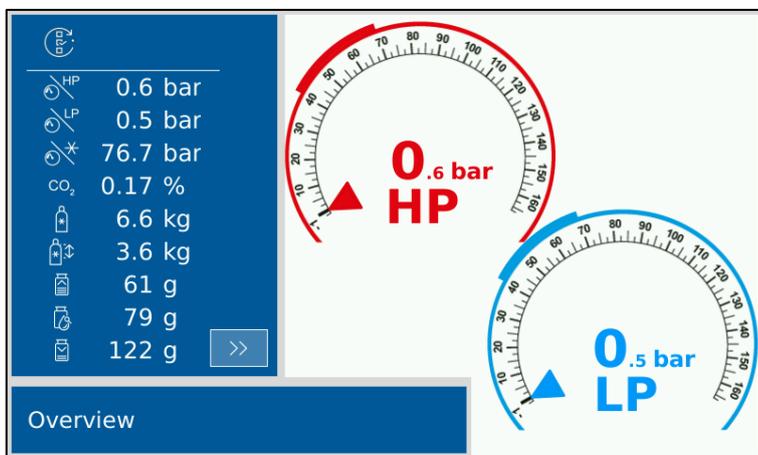


Fig. 8-1

Explanation of the symbols

	Pressure at high-pressure side
	Pressure at low-pressure side
	Pressure at refrigerating agent connection
	CO ₂ concentration in %
	Measured cylinder content
	Calculated, usable cylinder content
	Measured, available quantity of clean oil
	Measured, available UV additive quantity
	Measured oil quantity in used-oil container

9 Placing out of / into service / storage

9.1 Taking out of service

Observe the national regulations when emptying the CO₂ (R744) refrigerating agent. Contact your service partner if in doubt.

9.1 Transport

Information

When transporting the air conditioning system, all safety instructions specified in applicable national accident prevention regulations must be complied with!



WARNING

Transport only without CO₂ cylinder, empty or removed oil container, depressurised VAS 581 009 and in upright position!

9.2 Storage

To store the VAS 581 009, disconnect it from the power supply and place it in a safe location where it is not exposed to high temperatures, humidity and where there is no risk of impacts with other objects that may damage it. Please also take into account the technical data. The device should also be covered with the supplied cover. If stored for a prolonged period of time, we recommend that you remove the refrigerating agent cylinder and store it separately.



WARNING

Remove CO₂ cylinder and heating band if stored in an environment where the temperature exceeds 50 °C!

9.3 Placing back into service

Check the VAS 581 009 in accordance with national laws and regulations before placing it back into service.

10 Error table / in case of error

Try to determine the cause of the error and pinpoint its location as accurately as possible. Follow the recommended steps on the screen and carry out all suggested measures. If this does not resolve the error, please contact the responsible AVL DiTEST branch / AVL DiTEST partner in your country.

Warnings:

Warnings	Possible cause/s, solution/s
Warning	A warning indicates a problem during operation. However, the operation continues. LED indicator: flashes yellow
Insufficient refrigerating agent pressure.	Refrigerating agent cylinder not connected or empty Self-test continues.
Not enough paper in the printer; replace paper roll.	There is not enough paper in the printer for printing. Please replace the paper roll.
Device moving; please stabilise device.	The cylinder weight is monitored prior to filling. If a discrepancy is detected (e.g. if the cylinder moves), the filling process does not start. Stabilise the device so that the filling process can start.
Insufficient refrigerating agent; refrigerating agent cylinder must be replaced. Proceed anyway?	Before a process that depends on the refrigerating agent starts, a check is performed to ensure that a sufficient quantity is available. If no sufficient quantity is available, this message appears. The refrigerating agent cylinder needs to be replaced. Do you want to try to perform the step anyway?
Refrigerating agent cylinder not connected or nearly empty.	Refrigerating agent cylinder not connected or empty Connect a refrigerating agent cylinder containing a sufficient quantity of refrigerating agent.
Oil filling incomplete Proceed anyway?	The desired oil quantity could not be injected within the specified time. Do you want to continue with the injection process anyway?
UV additive injection incomplete Proceed anyway?	The desired quantity of UV additive could not be injected within the specified time. Do you want to continue with the injection process anyway?

Error messages:

Error message	Possible cause/s, solution/s
Error	An error indicates that the current operation needs to be aborted due to a problem. LED indicator: flashing red
Wrong pressure at CO2 outlet. Maintenance/repair required.	The measured pressure at the CO2 outlet is incorrect. Maintenance/repair by service technician required.
Leak detected.	Target pressure of evacuation could not be reached within the specified time. Check device for leak.
Draining failed.	Draining the refrigerating agent has failed. Remaining pressure could not be released within the specified time. Repeat the process.
Air conditioning circuit still under pressure; termination.	The vehicle cannot be filled with refrigerating agent, because it is already or still filled. If you wish to continue with filling, first drain the refrigerating agent.
Too high pressure while generating vacuum; termination.	Overpressure with potential of damaging vacuum pump was detected while generating vacuum. The process was therefore aborted. Drain any refrigerating agent from the system and repeat the step.
Filling incomplete. Replace refrigerating agent cylinder.	Filling could not be completed due to insufficient quantity of refrigerating agent. The refrigerating agent cylinder must be replaced.
Pressure test failed. Replace refrigerating agent cylinder.	The pressure test cannot be performed due to insufficient quantity of refrigerating agent. The refrigerating agent cylinder must be replaced.
Pressure test failed. Leak in air conditioning system.	Excessive pressure drop in system during pressure test. The most common cause is a leak in the air conditioning system of the vehicle.
Draining of hose failed.	Draining of hose taking too long; operation was aborted. Vehicle may still be connected or valve to vehicle leaking.
Device moving; termination.	The cylinder weight is monitored during filling. If a discrepancy is detected (e.g. if the cylinder moves), the filling process is aborted. Repeat the filling process and don't move the device during this process.
Manual valve on refrigerating agent cylinder still open; termination.	Following the request to close the manual valve on the cylinder, the system pressure cannot be released. This typically occurs when the manual valve has not been closed correctly. Check.
Internal pressure test failed. Maintenance/repair required.	Error detected during internal pressure test. Maintenance/repair by service technician required.

Device check failed. Maintenance/repair required.	Error detected during device check. Maintenance/repair by service technician required.
Device check failed. Please start device check again from maintenance menu.	If an error is detected during the automatic device check, the user must start the device check manually from the maintenance menu. If the error occurs again, more detailed information on the type of error is provided there.
Device check incomplete. Replace refrigerating agent cylinder.	Device check could not be completed due to insufficient quantity of refrigerating agent. The refrigerating agent cylinder must be replaced.
Invalid calibration data; calibration failed.	If incorrect calibration data is detected during calibration, calibration is aborted and this error message shown.
Insufficient refrigerating agent for calibration; refrigerating agent cylinder must be replaced.	The calibration cannot be performed because the quantity of refrigerating agent required for calibration is not available. The refrigerating agent cylinders must be replaced.

Error message	Possible cause/s, solution/s
System error	A system error indicates that the device is temporarily or permanently out of service. LED indicator: flashing red quickly
Check pressure sensors.	Invalid signal detected on one of the pressure sensors. All pressure sensors must be checked!
Check temperature sensors!	Invalid signal detected on one of the temperature sensors. All temperature sensors must be checked!
Check scales!	One of the scales providing invalid signal. All scales must be checked!
CO2 concentration limit exceeded! Ventilate room well!	CO2 concentration is above the recommended limit. Make sure that the room is well ventilated and leave the room until the CO2 concentration has dropped to a safe level and the indicator stops flashing red!
CO2 sensor not connected.	CO2 sensor is not connected. The device can be used for safety reasons. The CO2 sensor must be checked.
Refrigerating agent cylinder pressure too high.	The pressure of the refrigerating agent cylinder is outside the safety limits. The device cannot be used until the pressure has dropped to a safe level again.
System pressure too high!	The pressure at the connectors is exceeding the safety limits. The device cannot be used until the pressure at the connectors has dropped to a safe level again!

Error/error messages, electrical:

Error/error message	Possible cause/s	Solution/s
Device does not switch on	No power	Check power supply. Check fuses.

Error/error messages, mechanical:

Error/error message	Possible cause/s	Solution/s
Self-test does not start	No refrigerating agent	Connect or open refrigerating agent cylinder
		Disconnect from vehicle
		Close gas cylinder and discharge manually
Not enough oil	Oil container empty	Fill oil container
Check connection	Vehicle not connected or empty	Connect quick connectors to vehicle
Oil level: oil level too low	Oil container empty	Fill oil container
Circuit under pressure		Drain

11 Maintenance and care

11.1 Visual inspection

Periodically perform a visual inspection.
Check all parts for damage (e.g. fractures) and dirt.
Check the service adapters regularly for damage.



CAUTION

Always replace damaged parts (power cable, quick connectors, connecting hoses, cylinder adapters)!

11.2 Cleaning

Wipe the VAS 581 009 with a lint-free cloth.
You can moisten the cloth with water or non-alkaline detergent. Make sure that the cloth is damp but not wet.



CAUTION

Pull the plug before cleaning! The device must not be pressurised!
Make sure that no liquid penetrates into the housing.

12 Technical data:

General data	
Refrigerating agent	R744
Nominal voltage	230 VAC
Frequency	50 Hz
Power consumption	1.2 kW
Weight	approx, 75 kg
Dimensions	67x100x81 cm
Display	7-inch graphic TFT colour display
Controls	Multi-functional dial
Pressure indicator	Digital (HP and LP)
PC interface	USB interface
Max. pressure	HP 140 bar; LP 130 bar
Hose length	2.5 m
Printer	Thermal printer, 24 bars
Interface	USB standard
Refrigerating agent	
Refrigerating agent	R744
Cylinder weight	5, 6, 10 or 20 kg
Cylinder type	Cylinder with integrated riser
Load cell	max. 50 kg
Scales accuracy	± 10 g
Oil/UV additive	
Oil container	3 (1 clean oil container; 1 used oil container, 1 additive container)
Oil container volume	250 ml
Load cell	3 kg
Oil/UV additive accuracy	± 2 g / ± 2 g
Vacuum pump	
Suction capacity	3 m ³ /h
End pressure	0.002 mbar
Service interval	500 h / 1 year
Climatic conditions	
Operating temperature	+10 ... +50 °C
Storage and transport temperature	-25 ...+80 °C
Humidity	10 ... 90 % non-condensing

Disposal:

For disposal, it is essential to comply with local legal obligations!

13 Error reporting fax

Fax no.: _____

Please fill in all applicable sections (ideally in English or German) and fax to responsible service centre.

1. Registration details

Serial number _____

Is your device still covered by the warranty (12 months)? Yes

If yes, please include proof of warranty (registration and copy of delivery note).

2. Dealer information

Authorised VW workshop <input type="checkbox"/>	Independent workshop <input type="checkbox"/>
Sales centre / importer No. _____	Dealership no. _____
Company name _____	Tax ID No. ¹ _____
Contact _____	Telephone Fax _____
<u>Postal address:</u>	<u>Delivery address</u> (if different from postal address):
Street _____ No. _____	Street _____ No. _____
Postcode Place _____	Postcode Place _____
Country _____	Country _____
Tel. No. _____	Tel.-No. _____
Fax No. _____	Fax No. _____

1. for EU countries only

Error reporting fax continuation

3. Problem description

Basic problems

Error message/pattern: _____

Is the error reproducible? Yes

Does the error occur sporadically? Yes

What software version is installed?

Software: _____

We hereby acknowledge that we are aware and accept the service conditions for replacing components.

Place _____ Date _____ Signature _____ Stamp

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