WAECO
AirCon Service

AIR CONDITIONING WORKSHOP EQUIPMENT

2019/2020

A/C service units, consumables and accessories for R 134a and R 1234yf

LOW EMISSION
FAST, ECONOMICAL, ECO-FRIENDLY

WAECO LOW EMISSION

SAVE COSTS AND PROTECT THE ENVIRONMENT

Using the WAECO ASC Low Emission technology, almost 100 % of the refrigerant can be recovered during A/C service. How does it work? Refrigerant loss mainly occurs in the phase when the refrigerant is forced out from the refrigerator oil by means of the vacuum pump. ASC Low Emission service units collect the escaping refrigerant in a hermetic, pressure-tight used oil container, recover it and return it to the refrigerant tank. The result is a refrigerant loss rate of close to zero percent!

The accurate identification of the amount of recovered refrigerant also allows conclusions to be drawn about the tightness of the air conditioner (diagnosis tool).

Save costly refrigerant and protect the environment!

LOW EMISSION PAYS OFF!
SAVE COSTS AND PROTECT THE ENVIRONMENT WITH LOW EMISSION A/C SERVICE UNITS

Scarce refrigerant resources and soaring prices are hot topics when it comes to the service of vehicle A/C systems. In the period from August 2017 to August 2018 alone the price for one kilogram of R 134a rose from about 17 € to about 46 € – and this trend is bound to continue.

The WAECO Low Emission service technology gives you an economical, safe and environmentally sound solution – for conventional R 134a A/C systems as well as for the alternative R 1234yf refrigerant.

The benefits:

- Close to 100% refrigerant recovery
- Virtually no harmful emissions and no money lost unnecessarily

ECO
ecologically friendly

BEST BRAND IN AIRCON SERVICE

ASC SERVICE UNITS BY WAECO

WAECO wins "Best Brand" award for the fourth time in a row

ASC service units convince workshop and service professionals alike: The readers of the German industry magazine "WERKSTATT aktuell" voted that WAECO ASC is the "Best Brand" in the category A/C service units. The award was granted for the fourth time in a row.

A/C SERVICE AT TOP LEVEL

ASC SERIES MEETS SAE J 2788, 2099 AND 2843

The standards developed by the Society of Automotive Engineers (SAE) are valid for the USA, while they can also be found in the factory specifications of several automotive manufacturers.

What are the most significant requirements and what do they mean for daily workshop operation?

Requirements for A/C service units:

- The unit must be able to recover **95 %** of the refrigerant contained in the automotive air conditioner within **30 minutes,** at ambient temperatures between 20 and 24 °C. In other words, no more than **5 %** of the refrigerant may be **left** in the air conditioner.
- Refrigerant **must** be charged with an accuracy of +/- 15 g after performing test.
- Refrigerant recovery **must** be made and displayed with an accuracy of +/- 30 g.

R 134A / R 1234YF – APPROVED OR RECOMMENDED BY AUTOMOTIVE MANUFACTURERS SEE airconservice.eu/approvals

EGEA QUALITY LABEL

FOR MOBILE A/C SERVICE UNITS R 1234YF

EGEA is the European Garage and test Equipment Association. We are the European and political representative in Brussels of the manufacturers of tools and equipment for the repair, servicing and technical inspection of vehicles, as an integral part of supporting the automotive industrial value chain.

1 **QUALITY-Standards**
Products designed and manufactured for an optimal and reliable operation, ensuring value for money and peace of mind

2 **PERFORMANCE-Standards**
Products designed to perform in the most efficient manner, including measuring accuracy.

3 **SAFETY-Standards**
Safety of both machine and operator when handling, in line with relevant EU legislation.

EGEA
EUROPEAN GARAGE EQUIPMENT ASSOCIATION
QUALITY LABEL

egea-association.eu

ASC BENEFITS AT A GLANCE

PROFITABLE, ECO-FRIENDLY, SAFE AND SECURE

TRULY AUTOMATIC UNITS – OFTEN COPIED, NEVER MATCHED!
Units with manual control valves involve the risk of erroneously charging the air conditioner from the low pressure side. Automatic units are safer, they have no manuell control valves.

HUMIDITY FREE STORAGE AND FEEDING SYSTEM FOR FRESH OIL AND UV ADDITIVE
Fresh oil and UV additive are stored in aluminium laminated bags contained in protective metal cylinders. This keeps moisture out.

INTEGRATED CHARGING AMOUNT DATABASE
The database contains vehicle-specific data such as the oil type and the amount of oil and refrigerant. It provides the option to create a personalised charging amount database for up to 100 vehicles. Updates can be made via the USB interface available on nearly all models. Simply insert a USB stick, turn the unit on, and you're done!

INTEGRATED REFRIGERANT CHARGING / RECOVERY AMOUNT MANAGEMENT
The total amount of refrigerant charged or recovered per month can be displayed on the service unit or printed out with the thermal printer. Alternatively, it can be exported to a USB stick or laptop via the USB interface (ASC G-series).

ALSO SUITABLE FOR HYBRID VEHICLES (optional)
Thanks to the optional hybrid flushing kit the unit can be used for service work on hybrid vehicles of all brands / manufacturers. Dangerous oil cross contamination is impossible. The required software is already installed.

ECONOMICAL DIAGNOSIS TOOL
Low Emission ASC service units have a refrigerant recovery rate of about 99.8 %. This saves on expensive refrigerant, and it also helps detect leaks.

CUSTOMISED FLUSHING PROCESS AND FLUSH BOTTLE (optional)
The efficient and safe flushing process was developed in consultation with the automotive industry.

TÜV-APPROVED REFRIGERANT PURITY
TÜV Rheinland confirmed that the effectiveness of the refrigerant cleaning function of ASC units complies with SAE J 2099 / J 2210.

PROTECTED ACCESS WITH INDIVIDUAL USER CODES
Up to 10 user names can be programmed in combination with individual PIN codes.

OPERATIONAL SOFTWARE IN MORE THAN 20 LANGUAGES
de, en, fr, it, sr, hr, sl, tr, nl, da, no, sv, pt, gl, ca, es, eu, fi, et, cs, ro, pl, hu, ru, zh

DESIGNED FOR WORLDWIDE USE
The ASC range includes service units ready for connection to 230 V/50-60 Hz and all models are available with country-specific mains plugs.

USER-FRIENDLY DISPLAY UNITS
The swivel and tilt manometer unit is easy to read from every angle.

COMPETITIVE LIFECYCLE COSTS

The operational costs are significantly lower than with comparable units. Accurate, electronic control of consumable use. Service intervals and warranty periods are considerably longer (24 months).

- Maintenance-friendly vacuum pump
- High-capacity filter drier
- Valve block
- High-capacity, vibration cushioned weighing cell
- Heat belt
- Humidity free storage and feeding system

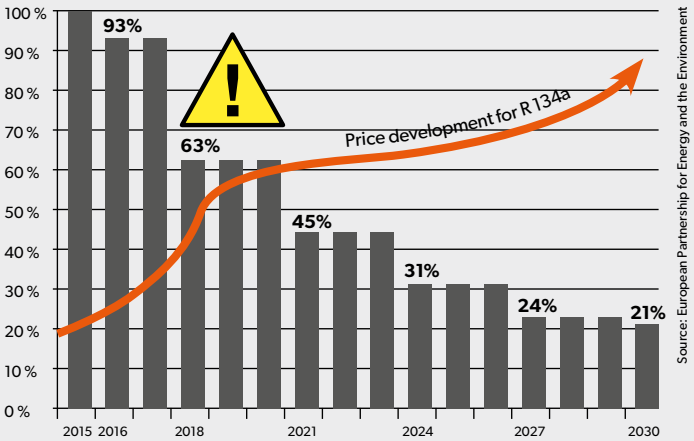
LOW EMISSION

ENVIRONMENTALLY SOUND AND PROFITABLE

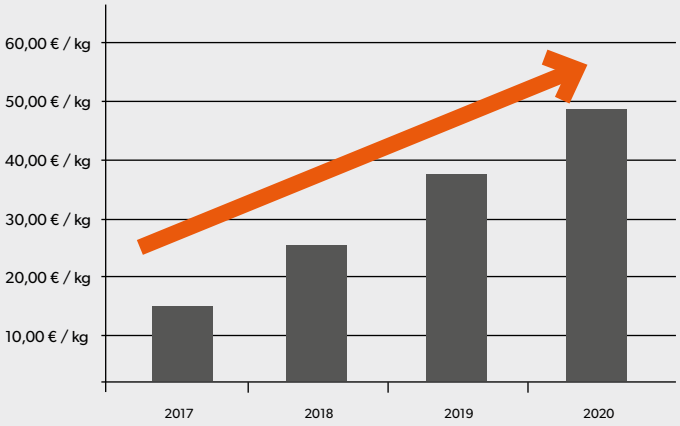
Scarce refrigerant resources and soaring prices are hot topics when it comes to the service of vehicle A/C systems. In the period from August 2017 to August 2018 alone the price for one kilogram of R 134a rose from about 17 € to about 46 € – and this trend is bound to continue.

R 134a has been prohibited for new type approvals since 01.01.2011 and for factory-fills of all new vehicles since 01.01.2017 (valid for vehicle categories M1 and N1) due to its high GWP (global warming potential). Unlike with R 12, using R 134a for service and repairs is not prohibited. The Forming Gas Regulation EU 842/2006 defines the maximum quantities of refrigerant to be imported from non-EU countries, which now leads to the price increases.

Phase-down timetable for R 134a



Expected price increase for R 134a



R 1234yf has been used since 01.01.2011 for new type approvals in the automotive industry. R 1234yf has a lower GWP than R 134a, but it is significantly more flammable. A conversion similar to that from R 12 to R 134a is not taking place for technical reasons.

The **WAECO Low Emission service concept** gives you an economical, safe and environmentally sound solution – for conventional R 134a A/C systems as well as for the R 1234yf refrigerant. The benefits: close to **100 % refrigerant recovery,** virtually **no harmful emissions** and no money lost unnecessarily.

ECO
ecologically friendly

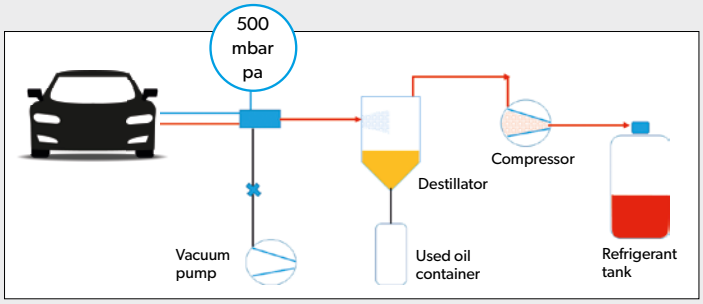
CHARACTERISTICS OF THE LOW EMISSION CONCEPT

Patented, low emission used oil container
prevents refrigerant loss during used oil purging; the refrigerant recovered with the used oil is supplied to the refrigerant tank and included in the weighing.

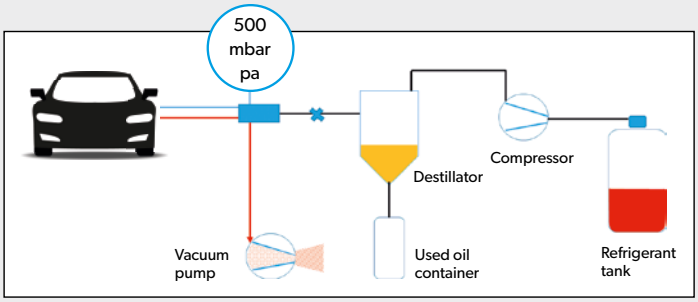
Vacuum pump with control block
ensures deep down evacuation of the A/C system. It pumps the evaporated refrigerant into the internal container of the Low Emission service unit, so no refrigerant can escape into the environment.

PROCESS FLOW DURING REFRIGERANT RECOVERY

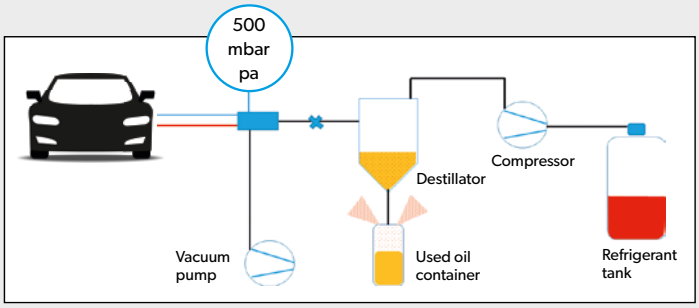
WITHOUT LOW EMISSION



Refrigerant discharge without Low Emission
The A/C system is not emptied completely. The remaining refrigerant generates a residual pressure of about 500 mbar (absolute pressure).

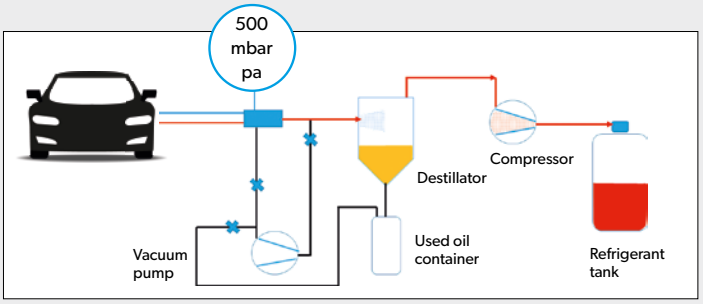


Vacuum phase without Low Emission
The remaining refrigerant (500 mbar) is discharged into the atmosphere via the ventilation side of the vacuum pump. Depending on the service unit this amounts up to 10 % of the refrigerant to be recycled.

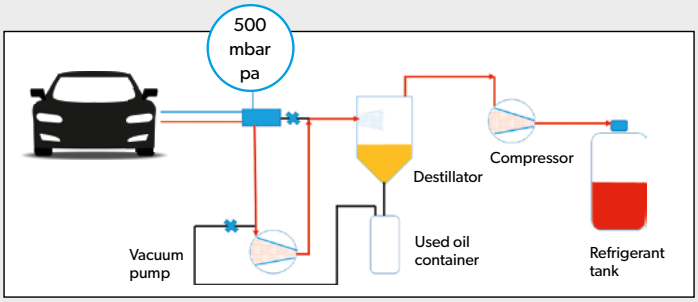


Used oil discharge without Low Emission
The refrigerant contained in the used oil escapes through the vent holes of the used oil container into the environment. Depending on the service unit the loss amounts to 40 – 100 g per service.

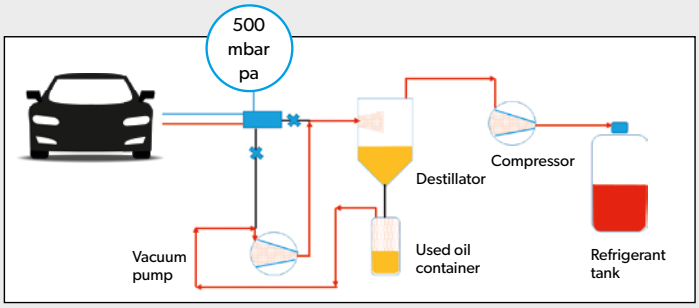
WITH LOW EMISSION



Refrigerant discharge with Low Emission
The compressor discharges the refrigerant from the A/C system up to a residual pressure of about 500 mbar. Then the deep-discharge with the Low Emission technology starts.



Deep-discharge with Low Emission
The compressor teams up with the vacuum pump to achieve a genuine deep-discharge of almost 100 %. As a result, virtually no refrigerant is lost.



Used oil discharge with Low Emission
The refrigerant is discharged by the vacuum pump from the hermetically sealed used oil container and then returned to the refrigerant tank by the compressor. That means you also recover the refrigerant contained in the used oil.

ASC A/C SERVICE UNITS

NOW EVEN MORE USER-FRIENDLY

ASC A/C service units have, over the years, gained a firm place in garages and air conditioning workshops. This is because they have the right quality and all it takes to make service work on automotive air conditioners a profitable and safe business.

With this philosophy in mind we have created the G-series, which is even more user-friendly. All models in this series come standard with a USB connection. That means that system software and databases can simply be updated with a USB stick and important service data can be retrieved.

CUSTOM MODELS –

NO PROBLEM FOR EUROPE'S LEADING MANUFACTURER!

In addition to the standard models presented in this catalogue, we also create customised A/C service units – e.g. for the authorised workshops of leading automotive manufacturers like BMW and Volkswagen. The new VAS service unit generation, featuring an integrated flush container, is standard equipment for A/C service on Volkswagen, Audi and Porsche passenger cars and utility vehicles.

ENGINEERED IN GERMANY

R 134a

ASC 1100 G
Universal entry-level model 10 – 11

R 134a

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Classic model for professionals 18 – 19

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Low Emission

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NEW

R 134a

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High-volume version for large refrigerant amounts 18 – 19

R 134a
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ASC 3500 G LE Low Emission
Highly efficient Low Emission unit for large refrigerant amounts 20 – 21

R 1234yf

ASC 5100 G
Reliable basic unit for service on R 1234yf systems 26 – 27

R 1234yf

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Safe service on air conditioners with R 1234yf refrigerant 28 – 29

R 1234yf
Low Emission

ASC 5500 G RPA Low Emission
Designed for highest demands on safety and efficiency 30 – 31

ASC 1100 G

ENTRY-LEVEL MODEL WITH UPGRADING OPTIONS

Are you just starting to provide A/C service on R 134a air conditioners, with only a few service orders per month? Here is a low-cost service unit that gives you all the features required for safe work. The new ASC 1100 G performs all service processes automatically achieving a refrigerant recycling rate of at least 95 %. The purity of the recovered refrigerant complies with the SAE J 2099 standard.

Expecting more orders in the future? You can easily upgrade your entry-level service unit at a later date – e.g. a heat belt for the charging cylinder. A USB port and a soft graphic display that can also display special characters are already included.

UPGRADING OPTIONS: HEAT BELT, HUMIDITY FREE STORAGE AND FEEDING SYSTEM FOR FRESH OIL OR UV ADDITIVE

ASC 1100 G – Entry-level automatic A/C service unit

- Charging cylinder storage capacity: 9 kg
- Automatic refrigerant recycling, oil or UV additive management controlled by load cell
- Purity of recovered refrigerant according to SAE J 2099
- Refrigerant recycling rate: at least 95 %
- Forced ventilation with two fans at the rear
- Soft graphic display – can also display special characters
- USB interface
- Load cell, no transport lock necessary
- 3 m service hoses
- Optional: dust cover
- Humidity free storage and feeding system for fresh oil or UV additive
- Optional: heat belt for the charging cylinder

ASC 1100 G	**Ref. No. 9103301884**
Instruction package	**Ref. No. 8889900001**
Dust cover	**Ref. No. 4445900081**
Optional:	
Heat belt for the charging cylinder	**Ref. No. 8885200277**

Scope of delivery
Service hoses (SAE standard, 3m), valve adapter for WAECO refrigerant bottles, operating instructions, used oil container (500 ml), goggles / safety gloves, test bottle of fresh oil WAECO DHO PS-F

Safe and secure: Electronic fan control

Fresh oil bottle on weighing cell, unique in entry level field

Used oil drain bottle on weighing cell, unique in entry-level field

MY BENEFITS

SOFT GRAPHIC DISPLAY

The soft graphic display can also display special characters such as Cyrillic or Chinese script.

COMPLIES WITH SAE J 2099

The purity of the recovered refrigerant complies with the SAE J 2099 standard.

UPGRADING OPTIONS

The ASC 1100 G can be upgraded with a heat belt. The unit is also prepared for the humidity free storage and feeding system for fresh oil or UV additive.

USB INTERFACE

Via the USB port you can simply update the software of the service unit.
Or export important data to a USB stick for further processing on a laptop or PC.

ASC 1300 G

FULLY AUTOMATIC A/C SERVICE UNIT

Fully automatic service unit for all A/C specialists. The ASC 1300 G has all it takes to perform standard service work on automotive air conditioners. The quick-start function comes in very handy in everyday workshop use. Simply enter the amount of refrigerant to be charged, make a total of three input instructions, and the unit will automatically do all the required functions:

Refrigerant recovery and recycling, residual pressure measurement, used oil drainage, evacuation, leak check, charging of fresh oil and UV additive, refrigerant charging with charging amount compensation of the service hoses.

All process steps are fully automatic and self-monitored by the system. Errors are indicated by acoustic and visual signals from the swivel-mount display unit. Software updates can simply be done with a USB stick.

WITH SPECIAL SOFTWARE FOR A/C FLUSHING TO VEHICLE MANUFACTURER'S SPECIFICATIONS

ASC 1300 G – Fully automatic A/C service unit

- Sturdy metal housing
- Charging cylinder storage capacity: 10 kg, vacuum pump capacity: 4 cars/h
- Humidity free storage and feeding system for fresh oil and UV additive
- Print-out of important service data, several print-outs possible
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099 and SAE J 2788
- Personalised charging amount database
- Operator guidance via large display and manometer
- Swivel and tilt manometer panel
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- Large recessed tray for tools
- 500 ml used oil container for longer change intervals
- Also suitable for hybrid vehicles if the optional flushing kit for the ASC's internal circuit was installed (see page 51)
- USB interface
- Soft graphic display
- **Optional: Can be completed with a refrigerant purity analysis tool according to SAE, easy retrofitting (plug & play)**

Illustration contains optional equipment

ASC 1300 G	**Ref. No. 9103301886**
Instruction package	**Ref. No. 8889900001**
Adapter for non-returnable bottles 1/4" HD	**Ref. No. 8885400035**
Optional: Gas analyser according to SAE	**Ref. No. 8885200279**

Scope of delivery
Service hoses (SAE standard, 3m), valve adapter for WAECO refrigerant bottles, operating instructions, used oil container (500 ml), adapter for 500 ml fresh oil and UV tracer dye bottle, heated refrigerant tank, goggles / safety gloves, test bottle of fresh oil WAECO DHO PS-F, test bottle UV additive

Standard on ASC 1300 G units: humidity free storage and feeding system for fresh oil and UV additive

Optional: gas analyser SAE

Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side

Rear side: filter is easy to access from the outside

MY BENEFITS

USB INTERFACE

Via the USB port you can simply update the software of the service unit. Or export important data to a USB stick for further processing on a laptop or PC.

INDIVIDUAL USER CODE

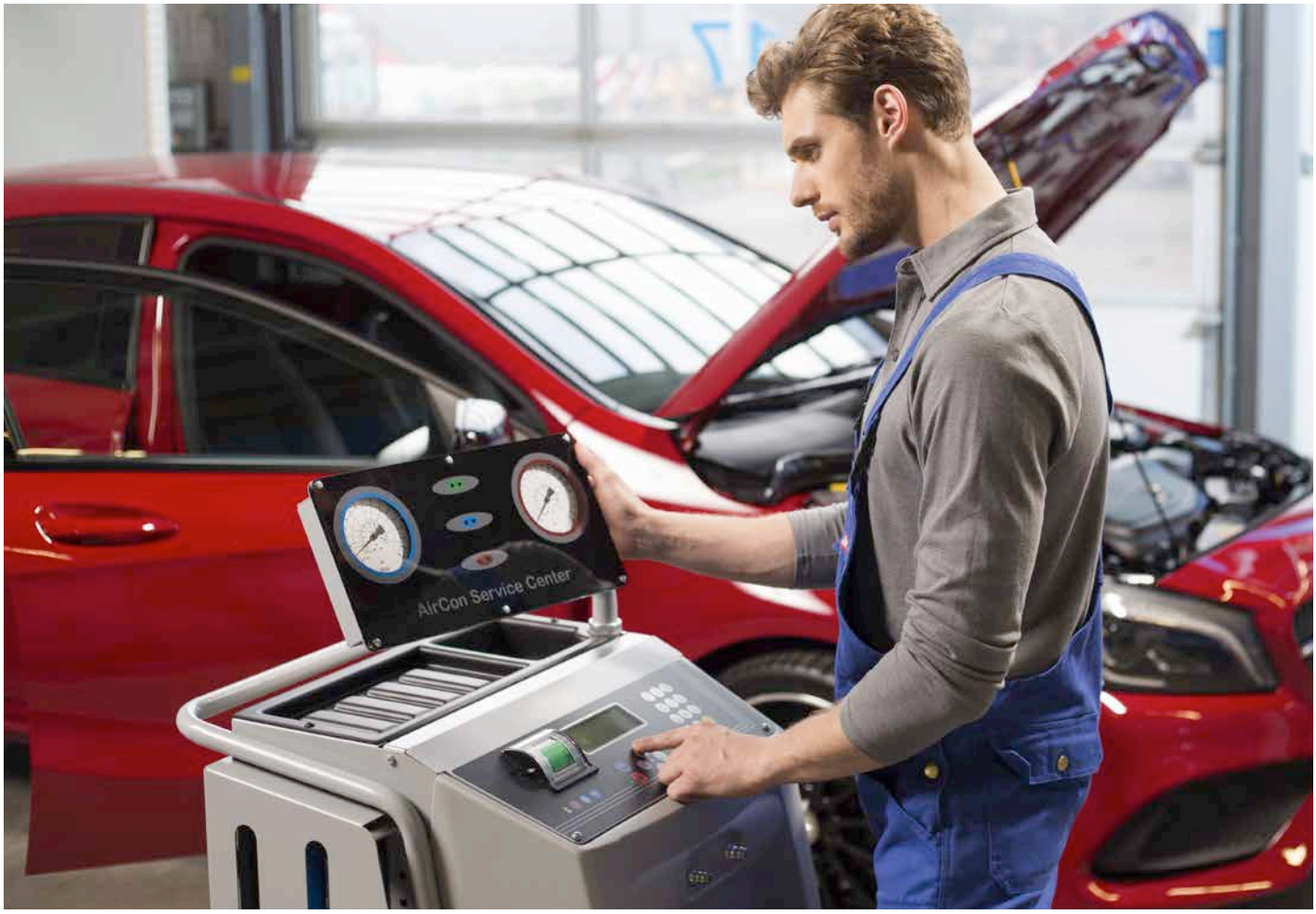
To prevent unauthorised use of WAECO A/C service units, up to 10 user names can be programmed in combination with

PERSONALISED CHARGING

ASC-series units give you the option to create a personalised charging amount database for 100 different vehicles.

ASC 2300 G

WITH HUMIDITY FREE STORAGE AND FEEDING SYSTEM FOR FRESH OIL AND UV ADDITIVE



Ease of use at its best. Designed for professional A/C service on **trucks and cars,** the ASC 2300 G minimises operator effort and throughput time. Prior to system start the operator can read the oil level from the display.

Afterwards, the following processes are performed fully automatic:

- **Refrigerant recovery and recycling, residual pressure measurement, used oil drainage, evacuation, leak check, fresh oil and UV additive charging, refrigerant charging with charging amount compensation of the service hoses**

Additional ASC 2300 G benefits:
Plus optional: prepared for refrigerant purity analysis tool; easy retrofitting – plug & play.

WITH SPECIAL SOFTWARE FOR A/C FLUSHING TO VEHICLE MANUFACTURER'S SPECIFICATIONS

ASC 2300 G – Fully automatic A/C service unit

- Charging cylinder storage capacity: 21 kg, vacuum pump capacity: 5 cars/h
- Humidity free storage and feeding system for fresh oil and UV additive incl. test bottles
- Print-out of important service data, several print-outs possible
- Dust cover included
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099 and SAE J 2788
- Personalised charging amount database
- Operator guidance via large display and manometer
- Swivel and tilt manometer panel
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- 500 ml used oil container for longer change intervals
- Also suitable for hybrid vehicles if the optional flushing kit for the ASC's internal circuit was installed (see page 51)
- USB interface
- Soft graphic display
- **Optional: Can be completed with a refrigerant purity analysis tool according to SAE, easy retrofitting (plug & play)**

Illustration contains optional equipment

ASC 2300 G	**Ref. No. 9103301887**
Instruction package	**Ref. No. 8889900001**
Adapter for non-returnable bottles 1/4" HD	**Ref. No. 8885400035**
Optional: Gas analyser according to SAE	**Ref. No. 8885200279**

Scope of delivery
Service hoses (SAE standard, 3m), valve adapter for WAECO refrigerant bottles, operating instructions, used oil container (500 ml), adapter for 500 ml fresh oil and UV tracer dye bottle, heated refrigerant tank, dust cover, goggles / safety gloves, test bottle of fresh oil WAECO DHO PS-F, test bottle UV additive

Standard on ASC 2300 G units: humidity free storage and feeding system for fresh oil and UV additive

Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side

Rear side: filter is easy to access from the outside

MY BENEFITS

USB INTERFACE

Via the USB port you can simply update the software of the service unit. Or export important data to a USB stick for further processing on a laptop or PC.

INDIVIDUAL USER CODE

To prevent unauthorised use of WAECO A/C service units, up to 10 user names can be programmed in combination with

PERSONALISED CHARGING

ASC-series units give you the option to create a personalised charging amount database for 100 different vehicles.

ASC 2500 G LOW EMISSION

ALSO GREAT AS DIAGNOSIS TOOL

Low Emission pays off – See also the sample calculation on page 17

The ASC 2500 G Low Emission integrates all refrigerant storage components on the weighing platform. That means the complete amount of refrigerant contained in the unit can be recorded and the amount of the recovered refrigerant can be exactly determined. This in turn will tell the operator about potential leaks in the A/C system. The accurate diagnosis function of the ASC 2500 G Low Emission is also very useful with regard to decreasing refrigerant charging amounts on modern-day vehicles. In the compact car segment we already see models with charging amounts of less than 300 g (e.g. Daihatsu Cuore). Older A/C service units won't be able to charge these systems with the required accuracy. Excessive or insufficient charging would entail major problems.

MY BENEFITS

LOW EMISSION

Virtually no refrigerant escaping into the environment and identification of the exact amount of the recovered refrigerant in the weighing procedure avoids unnecessary troubleshooting.

INDIVIDUAL USER CODE

To prevent unauthorised use of WAECO A/C service units, up to 10 user names can be programmed in combination with

PERSONALISED CHARGING

ASC-series units give you the option to create a personalised charging amount database for 100 different vehicles.

ASC 2500 G Low Emission

- Sturdy metal housing
- Charging cylinder storage capacity: 15 kg, vacuum pump capacity: 5 cars/h
- Humidity free storage and feeding system for fresh oil and UV additive including test bottles
- Print-out of important service data, several print-outs possible
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099 and SAE J 2788
- Close to 100 % refrigerant recovery
- Virtually 0 % service emission thanks to used oil container and Low Emission concept
- Personalised charging amount database
- Operator guidance via large display
- Swivel-mount display and information unit
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- Also suitable for hybrid vehicles if the optional flushing kit for the ASC's internal circuit was installed (see page 51)
- Used oil container
- Soft graphic display and USB interface

Illustration contains optional equipment

ASC 2500 G Low Emission	**Ref. No. 9103301871**
Instruction package	**Ref. No. 8889900001**
Adapter for non-returnable bottles 1/4" HD	**Ref. No. 8885400035**
Optional: Gas analyser according to SAE	**Ref. No. 8885200279**

ECO ecologically friendly

Scope of delivery

Service hoses (SAE standard, 3m), valve adapter for WAECO refrigerant bottles, operating instructions, hermetically closed used oil container (500 ml), adapter for 500 ml fresh oil and UV tracer dye bottle, heated refrigerant tank, dust cover, goggles / safety gloves, test bottle of fresh oil WAECO DHO PS-F, test bottle UV additive

Well engineered: Used oil container prevents unnecessary refrigerant loss

Complete refrigerant recovery – including the residual amount contained in the used oil

Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side

A/C service cost savings with low emission concept (250 vehicles) R 134a

A/C service R 134a without low emission concept		
Average amount of refrigerant charged into the A/C system	600 g	
Average market price for R 134a refrigerant	50,00 € / kg	
Refrigerant lost during used oil purging	35 g	1,75 €
Refrigerant recovered 95% = a loss of 5%	30 g	1,50 €
Refrigerant lost per service		3,00 €
For 3 x A/C service per week, the annual loss on refrigerant is		507,00 €

A/C service R 134a with low emission concept		
Average amount of refrigerant charged into the A/C system	600 g	
Average market price for R 134a refrigerant	50,00 € / kg	
Refrigerant lost during used oil purging	0 g	0,00 €
Refrigerant recovered from the A/C system	0,06 g	0,03 €
Refrigerant recovered 99,9% = a loss of 0,1%		0,03 €
For 3 x A/C service per week, the annual loss on refrigerant is		4,68 €

NEW HEAT BELT FOR REFRIGERANT COLLECTOR

UP TO 80 % LESS WORKTIME FOR A/C SERVICE

One of the key issues in bus and train workshops today is to save as much time as possible to avoid costly downtimes for their customers and cut service costs. The new heat belt from Dometic WAECO reduces the service time on bus and train air conditioners up to 80%.

Using conventional practice, servicing high-volume A/C systems takes several hours – about 6 to 10 hours for trains, 3 to 5 hours for buses. The main reason for this is the freezing refrigerant collector in the A/C system. That means service technicians have to wait until the collector is heated back up by the ambient temperature to get the remaining refrigerant out of the system. Many workshops are using a fan heater to accelerate the process. Alas, without success as most of the hot air is passing by and won't reach the affected part of the tank.

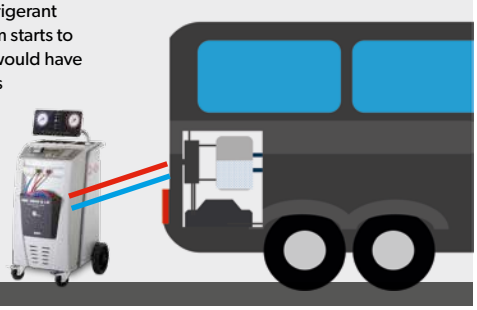
THE WAECO AIRCONSERVICE HEAT BELT SOLUTION IS MUCH FASTER AND MORE EFFECTIVE

To prevent freezing of the refrigerant collector, a special heat belt is fitted at the lowest possible point of the collector. The heat belt is switched in line with the compressor of the A/C service unit, so the heating process starts immediately at the beginning of the refrigerant recovery.

The new heat belt works in combination with our A/C service units ASC 3500 G LE Low Emission and ASC 3300 G. Naturally, the highest cost savings are achieved by using it with the Low Emission unit.

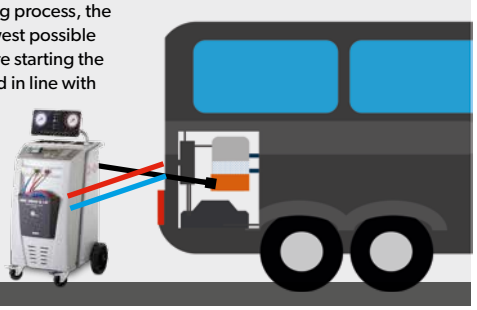
After about 60 min the refrigerant collector of the A/C system starts to freeze. From now on you would have to wait until the collector is heated back up by the ambient temperature to get the remaining refrigerant out of the system.

2



To force against the freezing process, the heat belt is fitted at the lowest possible point of the collector before starting the recovery process. Switched in line with the compressor of the A/C service unit, the heat belt comes into effect straight from the beginning of the recovery process.

3



ASC 3300 G

HIGH-VOLUME AIRCON SERVICE CENTER FOR BUSES, TRAINS, HELICOPTERS AND CUSTOM APPLICATIONS

Time is valuable, especially when it comes to air conditioning service on large vehicles such as **buses and trains** where downtimes are extremely costly for the operators. Speed and reliability are vital. Key service tasks such as refrigerant recovery, evacuation and refrigerant recharging need to be performed within a tight timeframe. The ASC 3300 G perfectly meets these requirements. The **192-litre vacuum pump is exactly designed for these applications.** An additional fluid pump ensures fast refrigerant recharging.

The following processes are performed fully automatically:

- **Refrigerant recovery and recycling, residual pressure measurement, used oil drainage, evacuation, leak check, fresh oil and UV additive charging, refrigerant charging with charging amount compensation of the service hoses.**

The ASC 3300 G optionally features the fresh oil and UV additive feeding system. It allows moisture-free and clean storage of refrigerant oils even over longer periods of time and thus cuts A/C service costs.

SAVING REFRIGERANT WITH LOW EMISSION EQUIPMENT PAYS OFF IN ANY CASE – EVEN WITH REFRIGERANTS THAT ARE NOT IN SHORT SUPPLY.

ASC 3300 G – Fully automatic A/C service unit

- High capacity compressor
- Charging cylinder storage capacity: 30 kg, vacuum pump capacity 192 l/min
- Performance of the hermetic compressor 0,6 kW
- Integrated fluid pump for high-volume refrigerant charging
- Vacuum pump designed in cooperation with utility vehicle manufacturers, performance 192 l/min
- Print-out of important service data, several print-outs possible
- Humidity free storage and feeding system for fresh oil and UV additive including oil bottle POE oil SE55
- Dustcover included in the delivery kit
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check and charging of leak detection additive
- Complies with SAE J 2099 and SAE J 2788
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Personalised charging amount database
- Operator guidance via large display and manometer, large recessed tray for tools
- Swivel and tilt manometer panel
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- 500 ml used oil container for longer change intervals
- Service hoses 8 m
- USB interface and soft graphic display
- 3 separate weighing cells for UV additive and oil management
- **Optional: Can be completed with a refrigerant purity analysis tool according to SAE, easy retrofitting (plug & play)**

Illustration contains optional equipment

ASC 3300 G	**Ref. No. 9103301892**
Instruction package	**Ref. No. 8889900001**
Adapter for non-returnable bottles 1/4" HD	**Ref. No. 8885400035**

Scope of delivery
Service hoses (SAE standard, 8 m), valve adapter for WAECO refrigerant bottles, operating instructions, used oil container (500 ml), adapter for 500 ml fresh oil bottle, heated refrigerant tank, dust cover, goggles/safety gloves, bottle of fresh POE oil SE 55 (500 ml)

Optional: Heating belt

Optional heat belt for refrigerant collector – up to 80 % less worktime for A/C service

The new heat belt works in combination with our ASC 3500 G LE Low Emission and ASC 3300 G

Optional: gas analyser SAE

Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side

MY BENEFITS

OPTIONAL: HEAT BELT

Saves up to 80% worktime during A/C service on large-volume air conditioning systems.

HEAVY DUTY

No calibration needed due to the 8 bearing construction.

SIMPLY PERFECT

Easy-to-read manometer, humidity free storage and feeding system for fresh oil. The unit is suitable for mobile use and complies with automotive manufacturers' requirements.

ASC 3500 G LE LOW EMISSION

PROFITABLE A/C SERVICE ON SYSTEMS WITH HIGH VOLUME

The ASC 3500 G LE Low Emission A/C service unit offers all the benefits of the WAECO Low Emission technology: close to 100 % refrigerant recovery with our well proven four-step process, virtually zero harmful refrigerant emission into the atmosphere. Plus, not forgetting, an exact identification of the recovered amount of refrigerant, which avoids laborious (and unnecessary) troubleshooting and repairs.

Integrating a powerful vacuum pump with a flow rate of 192 litres per minute, the ASC 3500 G LE Low Emission qualifies for highly efficient A/C service on large vehicles, such as buses, trains and helicopters. This is where the WAECO Low Emission concept pays off in considerable savings, because the overall amount of refrigerant to be recovered per service run is much larger than with car A/C systems. An additional fluid pump ensures fast refrigerant recharging.

MY BENEFITS

OPTIONAL: HEAT BELT

Saves up to 80% worktime during A/C service on large-volume air conditioning systems.

HEAVY DUTY

No calibration needed due to the 8 bearing construction.

LOW EMISSION

Virtually no refrigerant escaping into the environment and identification of the exact amount of the recovered refrigerant in the weighing procedure avoids unnecessary troubleshooting.

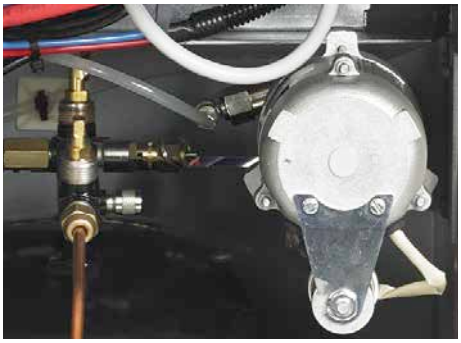
ASC 3500 G LE Low Emission

- Sturdy metal housing
- Charging cylinder storage capacity: 30 kg, vacuum pump capacity 192 l/min
- Performance of the hermetic compressor 0,6 kW
- Humidity free storage and feeding system for fresh oil and UV additive including oil bottle POE oil SE55
- Print-out of important service data, several print-outs possible
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099 and SAE J 2788
- Close to 100 % refrigerant recovery
- Personalised charging amount database
- Virtually 0 % service emission thanks to used oil container and Low Emission concept
- Operator guidance via large display
- Swivel and tilt manometer panel
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- Large recessed tray for tools
- Also suitable for hybrid vehicles if the optional flushing kit for the ASC's internal circuit was installed (see page 51)
- Service hoses 8 m
- Used oil container
- USB interface and soft graphic display
- 3 separate weighing cells for UV additive and oil management

ASC 3500 G LE Low Emission	**Ref. No. 9103301893**
Instruction package	**Ref. No. 8889900001**
Adapter for non-returnable bottles 1/4" HD	**Ref. No. 8885400035**

ECO ecologically friendly

Scope of delivery
Service hoses (SAE standard, 8 m), valve adapter for WAECO refrigerant bottles, operating instructions, adapter for 500 ml fresh oil bottle, hermetically closed used oil container, heated refrigerant tank, dust cover, goggles / safety gloves, bottle of fresh POE oil SE 55 (500 ml)



Integrated fluid pump:
For charging high-volume A/C systems

Complete refrigerant recovery – including the residual amount contained in the used oil

New heat belt for refrigerant collector – up to 80 % less worktime for A/C service

A/C service R 134a without low emission concept		
Average amount of refrigerant charged into the A/C system	12000 g	
Average market price for R 134a refrigerant	50,00 € / kg	
Refrigerant lost during used oil purging	100 g	5,00 €
Refrigerant lost via the vacuum pump	5 %	30,00 €
Refrigerant lost per service		35,00 €
For 5 x A/C service per week, the annual loss on refrigerant is		9.100,00 €

A/C service R 134a with low emission concept		
Average amount of refrigerant charged into the A/C system	12000 g	
Average market price for R 134a refrigerant	50,00 € / kg	
Refrigerant lost during used oil purging	0 g	0,00 €
Refrigerant lost via the vacuum pump	0,1 %	0,60 €
Refrigerant lost per service		0,60 €
For 5 x A/C service per week, the annual loss on refrigerant is		156,00 €

Annual savings per year with low emission concept: 8.944,00 €. Savings in 8 years: 71.552,00 €

Connection kit for buses

R 134a

For connection of high-volume service units to bus A/C systems

- Fits ASC 3500 G LE Low Emission and ASC 3000 G

Connection kit for buses — Ref. No. 8885400290

Compressor oil POE Oil SE 55

R 134a

- Moisture-free and clean storage, prevents penetration of contaminants into the A/C service unit

POE Oil SE 55, 500 ml — Ref. No. 8887200028

Universal oil for the coating of O-rings in vehicle A/C systems

- Small and compact can (100 ml) with brush in the cap
- New O-rings need to be coated with oil so that they achieve a good sealing effect when sliding. The threads must also be coated
- Compatible with nearly all lubricants
- Suitable for all kinds of refrigerants
- Does not absorb moisture (non-hygroscopic)

Universal oil for the coating of O-rings in vehicle A/C systems — Ref. No. 8887200047

Solenoid valve opener for use on buses

Tool for opening solenoid valves

- Opens locked refrigerant circuits
- Small and handy, fits into every pocket and thus saves time

Solenoid valve opener, 17 – 20 mm — Ref. No. 8885300259

Marksman II Ultrasonic leak detection tool

Utrasonic leak detector for pinpoint of refrigerant leaks of A/C or air leaks

- Convenient, easy-to-use, touch-control sensitivity pad and power switch
- 5-LED signal-intensity indicator and audible alarm easily pinpoint the exact problem source
- Internal Noise Control (INC) ensures tool is unaffected by ambient noise
- Self-adjusting Automatic Gain Control (AGC) circuitry enhances sensitivity and simplifies operation
- Precision-engineered hollow air probe helps isolate leak sources in cramped areas

Scope of delivery: Ultrasonic receiver, ultrasonic emitter, hollow air probe, contact probe, headphones and rugged carrying case, 2 batteries (Type D, mono cells)

Marksman II — Ref. No. TP-9367L

Heat belt

- Supplied incl. 12 m supply cord with plug, 230 V, 200 W, temperature limiter 60 °C, CE approved, protection class II

Heat belt, 60 x 350 cm, for **vertically mounted** collectors
13 cm – 18 cm in diameter Ref. No. 8885300260

Heat belt, 75 x 480 cm, for **vertically mounted** collectors
13 cm – 25 cm in diameter Ref. No. 8885300261

Heat belt, 130 x 300 cm, for **horizontally mounted** collector
13 cm – 18 cm in diameter Ref. No. 8885300262

Nitrogen pressure reducer

For controlled and safe admission of nitrogen to A/C systems (pressure test)

- Adjustment range from 0 to 20 bar, ideal for air conditioner inspections (§ 5 of the German Chemicals Climate Protection Ordinance)

Hose set for safe connection to vehicle A/C system
Scope of delivery hose set: service quick coupler, 1.8 m service hose for low-pressure side, 1/4" SAE x 1/2" ACME adapter


8885400135


8885400172 Hose set

Nitrogen pressure reducer Ref. No. 8885400135
Forming gas pressure reducer Ref. No. 8885400172
Hose set for nitrogen and forming gas pressure reducer Ref. No. 8885400136

Multi-gas leak detector, suitable for forming gas

Microprocessor controlled sensor electronics with multi-channel signal recognition

- Consistent sensitivity throughout the sensor's lifetime
- Can also be set for heavily contaminated environments (e.g. engine compartment)
- Complies with all international standards relevant for vehicle applications: SAE J2913 for R 1234yf, SAE J2791 for R 134a, EN14624:2005. Identifies all FC- and CFC-based refrigerants and blends as well as SF6

Multi-gas leak detector Ref. No. 8885100124

R 1234YF: START NOW!

NEW BECOMES STANDARD

Newcomers to the motor garage: vehicles with **R 1234yf A/C systems** increasingly come in for service, and not only after accidents. Younger models like Opel Mokka **have grown older in the meantime, and wear starts to take its toll.**

It's about time to get prepared for the new demand!

WAECO provides you with everything you need: purpose-built A/C service units, matching consumables and accessories – all perfectly adapted to R 1234yf. There are two things you have to bear in mind when dealing with the "new" refrigerant. First, it is no easy 1:1 replacement for R 134a or other refrigerants. Second, it is much more sensitive and must therefore be handled with ultimate caution and care.

Unlike R 134a, which is increasingly scarce in supply, the new R 1234yf refrigerant is readily available. But caution is advised her: **It is absolutely imperative to avoid any mixing of different refrigerants,** because it can lead to highly dangerous situations in the workshop or on the road. When doing service work on vehicle A/C systems, make sure you always use the refrigerant approved for the system you have. And always play safe when dealing with R 1234yf.

9 THINGS YOU OUGHT TO CONSIDER WHEN BUYING AN R 1234YF SERVICE UNIT

1 FULLY AUTOMATIC SELF-TEST

R 1234yf must not escape into the atmosphere. Therefore, it is important that the service unit performs a leak check fully automatically prior to every system start.

2 SERVICE COUPLERS WITH VENTILATED CLEARANCE

R 1234yf service couplers should have what is called a "ventilated clearance" to ensure that no refrigerant escapes even when you have a defective Schrader valve.

3 REFRIGERANT ANALYSISE

To prevent dangerous cross contamination, refrigerant purity has to be checked with an analysis tool. Ideally, the tool is already integrated in the service unit.

4 AUTOMATIC DISPOSAL OF NON-CONDENSABLE GASES (NCGS)

If the refrigerant is contaminated with non-condensable gases, the latter have to be removed automatically to ensure impeccable refrigerant quality.

5 SWITCH-ON DELAY + 6 EXTERNAL VENTILATION

R 1234yf is inflammable under certain conditions. To prevent the formation of an inflammable mixture, the service unit should be ventilated prior to every system start-up upon pressing the ON button. Once this has been done, the electrical system can be enabled without any risk.

It only makes sense to use an external fan, which takes in fresh air from the outside.

7 PAG OIL AND UV-ADDITIVE

R 1234yf A/C systems require special compressor oils and UV additives. Both need to be stored in humidity-free conditions. We recommend the patented container system from WAECO.

8 CLEARLY MARKED EQUIPMENT

Workshops will need two different A/C service units in the future, because R 134a and R 1234yf must not be mixed. To avoid confusion, the service units should be distinguishable at a glance.

9 EASY-TO-MAINTAIN FILTER

Proper handling of R 1234yf also means to replace the special filter regularly. An automatic change-filter indicator is advisable. Also, the filter should be easily accessible from the outside.

GOOD – BETTER – BEST

WHICH ASC SERVICE STATION FOR R 1234YF SUITS YOUR NEEDS?

There's a wide choice of A/C service units for R 1234yf. No matter if you are a fresh starter or a well established player in the business, a future-minded investor or a bit more cautious – WAECO quality equipment is available in different price and performance categories. All model versions have one thing in common: the focus on operator safety.

BEST

ASC 5500 G RPA LOW EMISSION

Advanced, fully automatic service unit with 16 kg charging cylinder and refrigerant saving Low Emission technology. Extra-safe: the integrated refrigerant analysis tool protects man and machine from dangerous refrigerant mixtures.

BETTER

ASC 5300 G

Classic, fully automatic service unit with 16 kg charging cylinder. Integrated charging amount database, practical display, heated charging cylinder, printer, patented oil and UV-dye charging system and more.

GOOD

ASC 5100 G

Inexpensive fully automatic service unit with 8 kg charging cylinder. For workshops with little A/C service work to do. Also ideal as a "backup" unit in the peak season. Many upgrading options.

ASC 5100 G

SERVICE UNIT FOR R 1234YF

ENTRY-LEVEL MODEL WITH UPGRADING OPTIONS

Are you just starting to provide A/C service on R 1234yf air conditioners, with only a few service orders per month? Here is a low-cost service unit that gives you all the features required for safe work with the new refrigerant: e.g. fans for the mandatory forced ventilation. The new ASC 5100 G performs all service processes automatically achieving a refrigerant recycling rate of at least 95 %. The purity of the recovered refrigerant complies with the SAE J 2099 standard.

Expecting more orders in the future? You can easily upgrade your entry-level service unit at a later date – e.g. a heat belt for the charging cylinder. A USB port and a soft graphic display that can also display special characters are already included.

UPGRADING OPTIONS: HUMIDITY FREE STORAGE

AND FEEDING SYSTEM FOR FRESH OIL OR UV ADDITIVE

ASC 5100 G – Entry-level automatic A/C service unit

- Charging cylinder storage capacity: 8 kg
- Automatic refrigerant recycling, oil or UV additive management controlled by load cell
- Purity of recovered refrigerant according to SAE J 2099
- Refrigerant recycling rate: at least 95 %
- Forced ventilation with two fans at the rear
- Soft graphic display – can also display special characters
- USB interface
- Load cell, no transport lock necessary
- 3 m service hoses
- Optional: dust cover
- Optional: humidity free storage and feeding system for fresh oil or UV additive
- Optional: heat belt for the charging cylinder

ASC 5100 G	**Ref. No. 9103301878**
Instruction package	**Ref. No. 8889900001**
Dust cover	**Ref. No. 4445900081**
Optional:	
Heat belt for the charging cylinder	**Ref. No. 8885200277**

Scope of delivery
Service hoses (SAE standard, 3 m), valve adapter for WAECO refrigerant bottles, operating instructions, used oil container (500 ml), goggles / safety gloves, test bottle WAECO DHO 1234yf

Safe and secure:
Electronic fan control

Fresh oil bottle on weighing cell,
unique in entry level field

Used oil drain bottle on weighing cell,
unique in entry-level field

MY BENEFITS

SOFT GRAPHIC DISPLAY

The soft graphic display can also display special characters such as Cyrillic or Chinese script.

USB INTERFACE

Via the USB port you can simply update the software of the service unit. Or export important data to a USB stick for further processing on a laptop or PC.

UPGRADING OPTIONS

The ASC 5100 G can be upgraded with a heat belt. The unit is also prepared for the humidity free storage and feeding system for fresh oil or UV additive.

Complies with SAE J 2099

The purity of the recovered refrigerant complies with the SAE J 2099 standard.

ASC 5300 G

SERVICE UNIT FOR R 1234YF WITH OPTIONAL GAS ANALYZER

Illustration shows unit with additional equipment

Are you in the market for an A/C service unit for the new R 1234yf refrigerant? Do you want one from a renowned manufacturer without spending more money than necessary? Then this basic version of the ASC 5300 G could be just the right thing for you. The unit integrates a wealth of WAECO know-how and experience. Professional A/C service work is performed fully automatically, with little operator effort. All standard ASC-series features are provided, including refrigerant charging and recovery management, personalised charging amount database and automatic vacuum check. The ASC 5300 G can be added with an external refrigerant analysis tool.

ASC 5300 G – Fully automatic A/C service unit

- Sturdy metal housing
- Charging cylinder storage capacity: 15 kg, vacuum pump capacity: 5 cars/h
- Humidity free storage and feeding system for fresh oil and UV additive
- Print-out of important service data, several print-outs possible
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099, 2788 and 2843
- Personalised charging amount database
- Operator guidance via large display
- Swivel and tilt manometer panel
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- 500 ml used oil container for longer change intervals
- Large recessed tray for tools
- Also suitable for hybrid vehicles
- USB interface
- Soft graphic display
- Including adapter for refrigerant bottles
- **Optional: Can be completed with a refrigerant purity analysis tool according to SAE, easy retrofitting (plug & play)**

Illustration contains optional equipment

ASC 5300 G	**Ref. No. 9103301869**
Instruction package	**Ref. No. 8889900001**
Optional: gas analyser according to SAE	**Ref. No. 8885200278**

Scope of delivery
Service hoses (SAE standard, 3 m), valve adapter for WAECO refrigerant bottles, operating instructions, adapter for 500 ml fresh oil and UV tracer dye bottle, heated refrigerant tank, dust cover, used oil container (500 ml), goggles/safety gloves, test bottle UV additive and test bottle WAECO DHO 1234yf

Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side

Safe and secure: high-performance fan

Integrated printer for documentation of important service data

MY BENEFITS

AIR FLOW

Controlled air flow and a high-performance fan with special electronics guarantee adequate ventilation.

USB INTERFACE

Via the USB port you can simply update the software of the service unit. Or export important data to a USB stick for further processing on a laptop or PC.

SOFT GRAPHIC DISPLAY

Via the USB port you can simply update the software of the service unit. Or export important data to a USB stick for further processing on a laptop or PC.

PERSONALISED CHARGING AMOUNT DATABASE

ASC-series units give you the option to create a personalised charging amount database for 100 different vehicles.

ASC 5500 G RPA LOW EMISSION

LOW EMISSION SERVICE UNIT FOR R 1234YF WITH INTEGRATED GAS IDENTIFIER

They may be only a few, but they are there – the first new vehicle models with A/C systems prepared for the use of R 1234yf refrigerant. Brand-bound motor garages, in particular, are obliged to get prepared for servicing these systems. Against this backdrop WAECO's AirCon professionals have designed, in close cooperation with the automotive industry, the ASC 5500 G RPA service unit.

As R 1234yf is very sensitive to contamination with other refrigerants, **the ASC 5500 G RPA was fitted with an integrated analysis tool that checks the refrigerant purity.**

Designed inside out for use with R 1234yf refrigerant, the ASC 5500 G RPA meets fire regulations and offers all the benefits known from the "classic" models in the ASC series.

MY BENEFITS

EXTRA SAFETY

The service unit comes with integrated refrigerant analysis function. Explosion protection: hazard analysis performed by an independent test institute.

SWITCH-ON DELAY AND EXTERNAL VENTILATION

R 1234yf is flammable under certain conditions. Therefore, the system start will only activate the external fan. After the fan has been running for 35 seconds, the voltage is passed on to the system.

LOW EMISSION CONCEPT

Virtually no refrigerant escaping into the environment and identification of the exact amount of the recovered refrigerant in the weighing procedure avoids unnecessary troubleshooting.

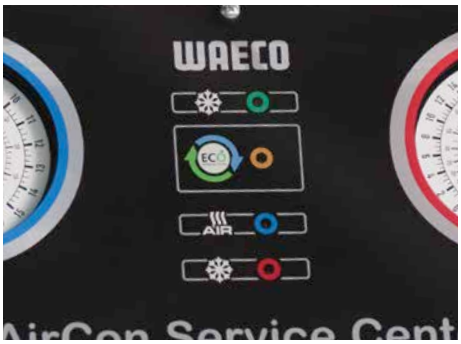
ASC 5500 G RPA Low Emission

- Sturdy metal housing
- Charging cylinder storage capacity: 16 kg, vacuum pump capacity: 5 cars/h
- Optional: humidity free storage and feeding system for fresh oil and UV additive
- Integrated fully automatic refrigerant analysis function
- Fully automatic refrigerant recycling, oil and additive management
- Automatic vacuum check
- Automatic leak check prior to service start
- Automatic charging of leak detection additive
- Integrated refrigerant charging and recovery amount management
- Integrated charging amount database
- Complies with SAE J 2099, 2788 and 2843
- Close to 100 % refrigerant recovery
- Personalised charging amount database
- Operator guidance via large display
- Heated charging cylinder for high-speed charging, heat-up also possible during the charging process
- Special, 8-bearing weighing platform
- Special air conditioner flush function
- Large recessed tray for tools
- Also suitable for hybrid vehicles
- Used oil container
- Including adapter for non-returnable bottles 1/4" HD
- 3 separate weighing cells for UV additive and oil management

ASC 5500 G RPA Low Emission **Ref. No. 9103301882**
Instruction package **Ref. No. 8889900001**

Scope of delivery
Service hoses (SAE standard, 3 m), valve adapter for WAECO refrigerant bottles, operating instructions, adapter for 500 ml fresh oil and UV tracer dye bottle, heated refrigerant tank, dust cover, used oil container (500 ml), hermetically closed used oil container, goggles / safety gloves, test bottle UV additive and test bottle WAECO DHO 1234yf

Practical: Innovative used oil container with refrigerant return system



Complete refrigerant recovery – including the residual amount contained in the used oil

Rear side: Filter is easy to access from the outside (as required by TÜV)

A/C service cost savings with Low Emission concept

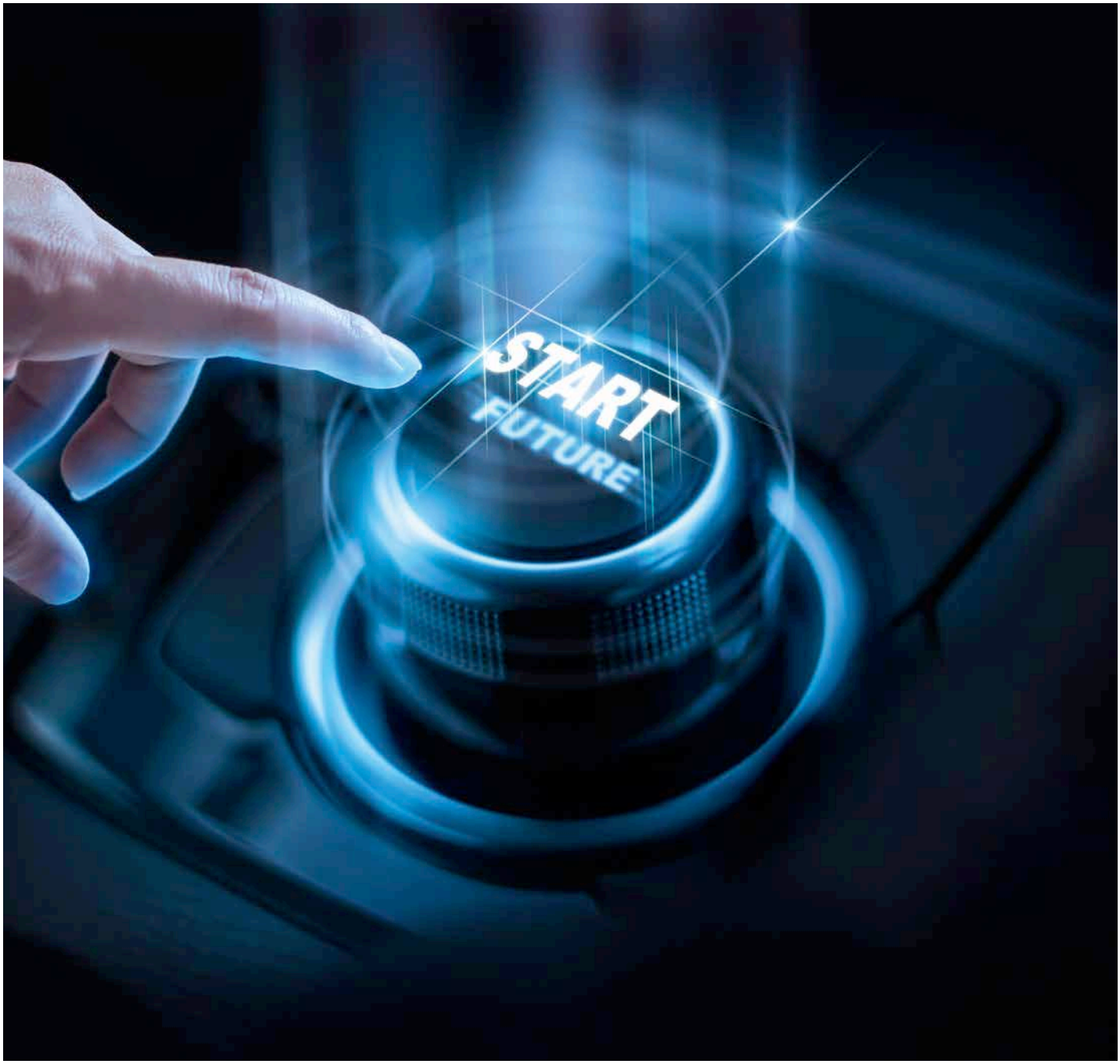
A/C service R 1234yf without Low Emission concept		
Average amount of refrigerant charged into the A/C system	600 g	
Average market price for R 1234yf refrigerant	130,00 € / kg	
Refrigerant lost during used oil purging	25 – 35 g	3,25 €
Refrigerat lost i.a. via vacuum pump	5 %	3,90 €
Refrigerant lost per service		7,15 €
At 3 x A/C services per week, the annual loss on refrigerant is		1.115,40 €

A/C service R 1234yf with Low Emission concept		
Average amount of refrigerant charged into the A/C system	600 g	
Average market price for R 1234yf refrigerant	130,00 € / kg	
Refrigerant lost during used oil purging	0 g	0,00 €
Refrigerant lost	0,01 %	0,08 €
Refrigerant lost per service		0,08 €
At 3 x A/C services per week, the annual loss on refrigerant is		12,48 €

Annual savings: approx. 1.102,92 € per year with Low Emission concept (based on 3 x A/C services per week). Calculated to 8 years, that means savings of up to 8.823,36 €!

FIT FOR THE FUTURE

ASC 7400 G A/C SERVICE UNIT FOR R 744



R 744 – THE REFRIGERANT OF THE FUTURE

Carbon dioxide (R 744) is over a thousand times less harmful on the atmosphere than the conventional R 134a refrigerant. It has an excellent cooling capacity, it is not flammable and readily available worldwide at low cost. Leading automotive manufacturers already launched the first car models with R 744 air conditioners.

As a trendsetter and innovation partner for an eco-friendly and profitable A/C service we are pleased to present you the first WAECO ASC service unit for R 744 air conditioners.

ASC 7400 G – A/C service unit for R 744

- 7" colour display, touch widescreen
- USB interface
- CAN bus interface
- Error indication in plain text
- Monitoring of the internal sensor system with error indication on the display
- Remote maintenance via an internet link
- Tightness and performance test
- Software update via USB / network
- Wi-Fi (optional)
- Multi-lingual
- Fully automatic unit
- Safety service hoses
- Easy, menu-guided replacement of R 744 bottles
- No transport locking device
- Maintenance-free refrigerant scales
- Printer

ASC 7400 G	**Ref. No. on request**
Instruction package	**Ref. No. 8889900001**

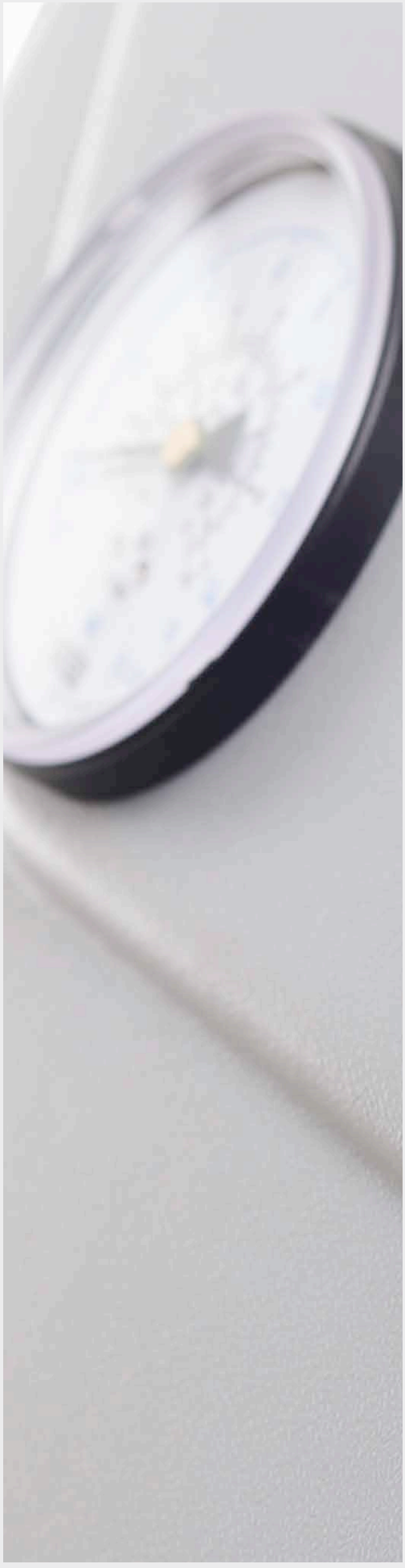
CO_2 A/C systems and thus the service hoses are subject to high system pressures of up to 180 bar.

Bearing in mind that service hoses are exposed to everyday stress in the workshop anyway. A situation which is difficult to simulate in the laboratory. Bending and compression loads cause hoses to age faster than one would expect. It might lead to the "tearing" of a hose, which causes so-called "hose whips", which can lead to serious injuries to anyone standing close by. The new WAECO hose package helps to avoid this.

Thanks to the integrated "safety rope" working on CO_2 A/C systems becomes much safer.

AirCon Service Center – R 134a	ASC 1100 G	ASC 1300 G	ASC 2300 G
Power supply 220/240 V – 50/60 Hz	●	●	●
Suitable for refrigerant	R 134a	R 134a	R 134a
Ref. No.	9103301884	9103301886	9103301887
Recovery / recycling			
Purity of recovered refrigerant according to SAE J 2099	●	●	●
Refrigerant recovery rate in kg/h	30	30	30
Vacuum pump capacity	5 cars/h	4 cars/h	5 cars/h
Performance of the hermetic compressor in kW	0.32	0.32	0.32
Dry filter capacity in kg	150	150	150
Refrigerant recycling rate	min. 95 %	min. 95 %	min. 95 %
Can be used as diagnosis tool	–	–	–
Charging			
Charging cylinder	9 kg	10 kg	21 kg
Processes			
Refrigerant analysis	–	–	–
Recovery/recycling	automatic	automatic	automatic
Purging of non-condensable gases	automatic	automatic	automatic
Purging of used oil	automatic	automatic	automatic
Evacuation	automatic	automatic	automatic
Vacuum check	automatic	automatic	automatic
Nitrogen leak check	–	–	–
Injection of leak detection additive	–	automatic	automatic
Injection of oil into the A/C system	automatic	automatic	automatic
Refrigerant charging	automatic	automatic	automatic
Control panel			
High/low pressure indicated by	Manometer	Manometer	Manometer
Vacuum indicated on	Display	Display	Display
Total process control via display	●	●	●
Option to set the evacuation time	●	●	●
Protocol print-out with printer	–	●	●
USB connection for software- and database updates	●	●	●
Printer	–	●	●
Accessories and spares			
Charging hoses HP	8885100065	8885100065	8885100065
Charging hoses LP	8885100064	8885100064	8885100064
Service quick couplers HP	8885400027	8885400027	8885400027
Service quick couplers LP	8885400026	8885400026	8885400026
Service filter	4440400009	4440600127	4440600127
Spare rolls for printer		4445900088	4445900088
Bottle set for ASC series	4440600110	4440600110	4440600110
Used oil bottle	4440600033	4440600033	4440600033
Used oil container	–	–	–
Lid	–	–	–
O-ring	–	–	–
Metal strip used oil bottle	–	–	–
Vacuum pump oil	8887200018	8887200018	8887200018
USB stick update ASC G series	4441000174	4441000174	4441000174
Universal flush container	8885200088	8885200088	8885200088
Replacement filter	8880700246	8880700246	8880700246
Dimensions			
W x H x D (mm)	600 x 1040 x 600	560 x 1300 x 650	560 x 1300 x 650
Weight (kg)	90	95	100

ASC 2500 G Low Emission	ASC 3300 G	ASC 3500 G LE Low Emission
●	●	●
R 134a	R 134a	R 134a
9103301871	9103301892	9103301893
●	●	●
30	30	30
5 cars/h	192 l/min.	192 l/min.
0.32	0.32	0.32
150	150	150
Close to 100 %	min. 95 %	Close to 100 %
●	–	●
16 kg	30 kg	30 kg
–	–	–
automatic	automatic	automatic
automatic / electronic	automatic	automatic/electronic
automatic	automatic	automatic
automatic	automatic	automatic
automatic	automatic	automatic
–	–	–
automatic	automatic	automatic
automatic	automatic	automatic
automatic	automatic	automatic
Manometer	Manometer	Manometer
Display	Display	Display
●	●	●
●	●	●
●	●	●
●	●	●
●	●	●
8885100065	8885100065	8885100065
8885100064	8885100064	8885100064
8885400027	8885400027	8885400027
8885400026	8885400026	8885400026
4440600127	4440600127	4440600127
4445900088	4445900088	4445900088
4440600110	4440600110	4440600110
4440600033	4440600033	4440600033
4440600131	4440600131	4440600131
4440600133	4440600133	4440600133
4443300115	4443300115	4443300115
4442500710	4442500710	4442500710
8887200018	8887200018	8887200018
4441000174	4441000174	4441000174
8885200088	8885200088	8885200088
8880700246	8880700246	8880700246
560 x 1300 x 650	560 x 1300 x 650	560 x 1300 x 650
100	110	110



AirCon Service Center – R 1234yf	ASC 5100 G	ASC 5300 G	ASC 5500 G RPA Low Emission
Power supply 220/240 V – 50/60 Hz	●	●	●
Suitable for refrigerant	R 1234yf	R 1234yf	R 1234yf
Ref. No.	9103301878	9103301869	9103301882
Recovery / recycling			
Purity of recovered refrigerant according to SAE J 2099	●	●	●
Refrigerant recovery rate in kg/h	30	30	30
Vacuum pump capacity	5 cars/h	5 cars/h	5 cars/h
Performance of the hermetic compressor in kW	0.32	0.32	0.32
Dry filter capacity in kg	150	150	150
Refrigerant recycling rate	min. 95 %	min. 95 %	Close to 100 %
Can be used as diagnosis tool	–	–	●
Charging			
Charging cylinder	8 kg	16 kg	16 kg
Processes			
Refrigerant analysis	–	extern/optional	integrated/automatic
Recovery/recycling	automatic	automatic	automatic
Purging of non-condensable gases	automatic	automatic / electronic	automatic / electronic
Purging of used oil	automatic	automatic	automatic
Evacuation	automatic	automatic	automatic
Vacuum check	automatic	automatic	automatic
Nitrogen leak check	–	–	–
Injection of leak detection additive	–	automatic	automatic
Injection of oil into the A/C system	automatic	automatic	automatic
Refrigerant charging	automatic	automatic	automatic
Control panel			
High/low pressure indicated by	Manometer	Manometer	Manometer
Vacuum indicated on	Display	Display	Display
Total process control via display	●	●	●
Option to set the evacuation time	●	●	●
Protocol print-out with printer	–	●	●
USB connection for software- and database updates	●	●	–
Printer	–	●	●
Service and equipment			
Charging hoses HD	4440600175	4440600175	4440600175
Charging hoses ND	4440600176	4440600176	4440600176
Service quick couplers HD	8885400164	8885400164	8885400164
Service quick couplers ND	8885400163	8885400163	8885400163
Service filter	4445900221	4445900221	4445900221
Spare rolls for printer	4445900088	4445900088	4445900088
Bottle set for ASC series	4440600110	4440600110	4440600110
Used oil bottle	4445800050	4445800050	4445800050
Used oil container	–	–	4440600131
Lid	–	–	4440600133
O-ring	–	–	4443300115
Metal strip used oil bottle	–	–	4442500710
Vaccum pump oil	8887200018	8887200018	8887200018
USB stick update ASC G series	4441000174	4441000174	4441000174
Universal flush container	8885200272	8885200272	8885200272
Replacement filter	8880700246	8880700246	8880700246
Adapter R1234yf	8885400343	8885400343	8885400343
Dimensions			
W x H x D (mm)	600 x 1040 x 600	560 x 1300 x 650	560 x 1300 x 650
Weight (kg)	90	100	110

INDISPENSIBLE ANALYSIS TOOLS

PROTECT YOUR EQUIPMENT AGAINST REFRIGERANT MIXTURES

GETTING SCARCER:
Due to EU laws, the availability of R 134a is limited. Some repair shops respond to this situation by filling some other refrigerant in R134a A/C systems. Please note: A mixture of different refrigerants can be dangerous both in the workshop and on the road. If you notice an unknown refrigerant mixture, it needs to be disposed properly by a specilized company. To be sure you are dealing with the refrigerant you are expect to find in a vehicle, WAECO offers various analysis tools. Thus, you can protect your valuable equipment from contamination, and your employees from dangerous situations.

ANALYSIS TOOLS FOR EVERY WORKING METHOD AND EVERY BUDGET

R 134a or R 134yf SAE Analysis, optional for different Aircon Service Center
Gas analyser configured according to SAE standard: with robust metal housing and gas probe on low pressure side.

ASC 5500 G RPA Low Emission with integrated gas indentifier for R 1234yf
As R 1234yf is very sensitive to contamination with other refrigerants, the ASC 5500 G RPA was fitted with an integrated analysis tool that checks the refrigerant purity.

ASC 5500 G RPA

Miniature Identifier
The identifier helps you to check the quality and presence of R 134a or R 1234yf in vehicle A/C systems and storage bottles.
For more information see page xx.

Miniature identifier
R 134a

Miniature identifier
R 1234yf

Multi-gas leak detector, suitable for forming gas

R 1234yf

Microprocessor controlled sensor electronics with multi-channel signal recognition

- Consistent sensitivity throughout the sensor's lifetime
- Can also be set for heavily contaminated environments (e.g. engine compartment)
- Complies with all international standards relevant for vehicle applications:
  SAE J 2913 for R 1234yf, SAE J 2791 for R 134a, EN14624:2005.
  Identifies all FC- and CFC-based refrigerants and blends as well as SF6

Multi-gas leak detector — Ref. No. 8885100124

Universal flush container

R 1234yf

Accelerates the flushing process when integrated into the flushing circuit

Scope of delivery: Pressurised container with 2-way extraction valve, universal mounting bracket for pressurised container, purifier filter, sight glass, hose to connect the container to the air conditioner and the A/C service unit connected

Universal flush container, R 1234yf — Ref. No. 8885200272

Spare parts

Replacement filter — Ref. No. 8880700246

Adapter R 1234yf, 3/8" SAE — Ref. No. 8885400343

Extension kit (for use on R 1234yf air conditioners)

R 1234yf

Extension kit for nitrogen pressure gauge and leak detector (8885400092)

Scope of delivery:
High side service coupler, low side service coupler, adapter, HP adapter, LP adapter, blue hose, red hose, O-ring

Nitrogen extension kit — Ref. No. 8885400165

Service quick coupler HP

R 1234yf

For hard-to-access service ports, suitable for Ford

Service quick coupler HP — Ref. No. 8885400340

Service quick coupler LP

R 1234yf

For hard-to-access service ports

Service quick coupler LP — Ref. No. 8885400345

Recovery equipment for contaminated refrigerant

R 1234yf

Scope of delivery: seal, adapter for recycling bottle, filling hose LP, service coupler LP side, bottle fixture, insulating container

Recovery equipment — Ref. No. 8885200271

LED violet light UV leak detection lamp OPTI-PRO™ UV

R 1234yf

- Powerful, effective and full of new features, catch leaks with ease using our new OPTI-PRO™ UV Plus leak detection light
- Complete with an adjustable focus lens, high/ low lighting, strobe light and fluorescence-enhancing glasses. Leaks will glow brightly when paired with one of our Tracerline dyes

Scope of delivery: Smart charger with AC plug, fluorescence-enhancing glasses and lanyard

LED violet light UV leak detection lamp OPTI-PRO™ UV — Ref. No. TPOPUVP

4-way manifold

R 1234yf

- Complete with hoses and quality couplers
- Ideal for mobile R 1234yf charging
- Suitable for R 1234yf recovery

4-way manifold — Ref. No. 8885100162

Oil injector

R 1234yf

Injector for manual injection of oils and/or UV additives

- Easy-to-use, sturdy design, ideal for workshop use
- With ml and oz scales for oil and an extra scale for additive

Scope of delivery: oil injector, coupler and hoses

Oil injector — Ref. No. 8885300132

Hand pump for adding leak detection additives

R 1234yf

For adding TRACER® leak detection additives (based on SPA2) to the suction side of charged R 1234yf air conditioners

- Accurate dosing via spindle adjustment
- Integrated non-return valve protects against over-pressure

Scope of delivery: Low-pressure service hose with quick coupler for R 1234yf A/C systems, 2 cartridges of additive, vent adapter, hand spindle, label with instructions

Hand pump — Ref. No. TP-9828

Spare parts

Spare spindle — Ref. No. 9103500683

3 cartridges, 14.80 ml each — Ref. No. TP-9825-0301

COMPRESSOR OILS

PROFESSIONAL TIPS ON OILS

Which oil for which A/C compressor? Here is a simple rule from our A/C professionals: always make sure you use the right type! If there is PAG oil in the system, recharge with PAG oil, if it's POE oil, fill up with POE oil. Also, it is recommendable to use the special oils of the respective compressor manufacturer, because they are perfectly coordinated with the system.

To find out which type of oil is flowing through the cooling circuit, refer to the vehicle documents or the service sticker of the A/C system. When in doubt better always check and make a note of the viscosity!

DOUBLE END CAPPED

IDEMITSU is the world's leading manufacturer of polyalkylene glycol (PAG) oil, the primary lubricant used for automotive air conditioners. The Daphne Hermetic PAG offers superior performance, longevity and system compatibility. Ordinary, open-ended PAG molecules are quite chemically active. Typical PAG products are formulated by capping one end of the main carbon chain. The lubricants in the Daphne Hermetic PAG series, however, are formulated with both ends capped, making chemically inactive and very stable.

PAG oils
PAG oils are fully synthetic, hygroscopic oils based on polyalkylene glycol. Vehicle and compressor manufacturers are using them in their factories in various viscosities – in A/C systems with R 134a or R 1234yf refrigerant.

PAO oils
PAO oils are fully synthetic, non-hygroscopic oils. That means that, unlike other oils, they do not absorb moisture from the ambient air. PAO oils are used for R 134a refrigerant, but they have no approval from compressor manufacturers.

POE oils
Polyolester oils, abbreviated POE, are organic compounds and also belong to the category of fully synthetic oils. Compared to mineral oils, they excel with their high thermal stability. In terms of elastomer compatibility and hydrolysis resistance, they are inferior to mineral oils. POE oils are hygroscopic.

WHY PAG OILS HAVE TO BE PROTECTED AGAINST MOISTURE

PAG oils quickly absorb moisture. What used to be tolerable for R 134a A/C systems now turns out to be a real problem, because R 1234yf is interacts much more sensitive. The thermo-chemical stability of the refrigerant/oil blend is critical for the reliability of the air conditioning system. And it is at risk if moisture (water) comes in. If refrigerant, oil and water react with one another, this can lead to the formation of acids or slurries which might damage the A/C system circuit, e.g. corrosion of the compressor.

What is more, the increased humidity can impair the lubricating properties of the oil. This, in turn, reduces the lifetime of the A/C components. Insufficient lubrication is the second most common cause of compressor damage! The results are the breakdown of the air conditioning system, costly repairs or time-consuming processing of complaints.

Therefore, when it comes to the maintenance and repair of vehicle A/C systems, it is recommended to use a high-quality, chemically and thermally stable Double End Capped oil that is stored in an effectively vapour-tight container and injected into the A/C system without getting in touch with the ambient air.

Test to proof the moisture absorption of PAG oils from the ambient air
A test conducted by an independent institute proofed that PAG oil in non-vapor-tight containers quickly absorbs moisture. Five used oil containers of various service equipment manufacturers and an open glass vessel as a neutral reference were tested. Result: After three days the amount of moisture was already above the warning value in four out of five containers. Only the oil in the steam-tight WAECO used oil container remained below the warning value. In our mobile test setup, we show a simplified version of this test at trade shows.

HUMIDITY FREE STORAGE AND FEEDING SYSTEM FOR FRESH OIL AND UV ADDITIVE

Double-wall storage container – design and function

Bag-in-bottle container system
The hallmark of this container is its double-wall design, which complies with the specifications of the automotive industry in an ideal manner.

Outside: protective metal container
The sturdy, pressure-free metal container protects the laminated bag inside. Pressure compensation for shrinking contents is via a small opening on the top.

Inside: moisture-free laminated bag
The double-layer aluminium laminated bag provides optimal storage for compressor oils or UV dyes. The special charging process as well as the storage in the laminated bag guarantees moisture-free conditions.

Loss-free discharge
The storage bottle is connected to the ASC service unit (on the oil scales port) with a special adapter. This adapter releases the special extraction mechanism of the bottle. The vacuum pump generates a vacuum to discharge the laminated bag, which increasingly contracts in the process. An axially aligned spiral hose ensures complete discharging of the laminated bag.

WAECO patent

1 **Special connection**

2 **Opening in the metal jacket**
to balance the pressure

3 **Laminated bag**
with double-layer aluminium laminate

PROFESSIONAL OIL SYSTEM FOR HUMIDITY-FREE STORAGE – NOW ALSO AVAILABLE IN 150 ML CANS FOR THIRD-PARTY SERVICE UNITS

Special cans featuring our professional oil system have been successfully used on WAECO ASC service units for many years. The patented, vapour-tight containers are now also available to customers who do not have a WAECO A/C service unit. By using the new professional oil system with 150 ml cans as well as the matching adapters, the most commonly used third-party service units can now also be equipped with the humidity-free storage system. This is an effective method to keep moisture out of the A/C system and prevent subsequent damage and customer complaints.

Adapter for professional oil system with 150 ml cans

Texa

Fits the following models	760R, 760R Bus, 770S, 780R, 744
Ref. No.	**8885400353** (Sales pack: 2)

AVL

Fits the following models	ADS 110, ADS 120, ADS 130, ADS 130D, ADS 310
Ref. No.	**8885400354** (Sales pack: 3)

Bosch/Robinair

Fits the following models	AC1234-8, AC1234-7, AC1234-3, AC1x34-3
Ref. No.	**8885400355** (Sales pack: 3)

Bosch/Robinair

Fits the following models	ACS 753, ACS 763, ACS 863, AC1x34-7i, AC1234-7i, AC1234-8i
Ref. No.	**8885400357** (Sales pack: 3)

Ecotechnics

Fits the following models	Eck 3500-up, Eck 3500-HFO, Eck 3900-up, Eck3900-HFO, Eck 4000, Eck 4000-HFO,Eck twin-pro
Ref. No.	**8885400356** (Sales pack: 3)

Professional oil system for WAECO ASC service units

TecAlliance Certified Data Supplier

Original oil – double end capped

Oil type	Refrigerant	Description	Application	Viscosity	Contains	Ref. No.
PAG	R 134a	WAECO DHO PS-F	vehicle air conditioners	ISO 46	250 ml can	**8887200058**
					500 ml profi oil system	**8887200059**
	R 134a	WAECO DHO PR	vehicle air conditioners	ISO 100	250 ml	**8887200060**
					500 ml profi oil system	**8887200061**
	R 134a	Denso ND8	vehicle air conditioners	ISO 46	500 ml profi oil system	**8887200021**
POE	R 134a, R 1234yf	Denso ND11 (suitable for hybrid)	vehicle air conditioners	84	500 ml profi oil system filled with 100 ml	**8887200035**
PAG	R 1234yf	WAECO DHO 1234yf (suitable for hybrid)	vehicle air conditioners	ISO 46	250 ml can	**8887200062**
					500 ml profi oil system	**8887200063**
	R 1234yf	VC 200yf	vehicle air conditioners	ISO 100	500 ml profi oil system	**8887200046**
	R 1234yf	Sanden SPA2 (suitable for hybrid)	vehicle air conditioners	ISO 46	500 ml profi oil system	**8887200039**
					250 ml can	**8887200048**
	R 1234yf	Denso ND12	vehicle air conditioners	ISO 46	500 ml profi oil system filled with 100 ml	**8887200031**

Aftermarket oil

Oil type	Refrigerant	Description	Application	Viscosity	Contains	Ref. No.
PAG	R 134a	PAG 46	vehicle air conditioners	ISO 46	250 ml can	**8887200001**
					500 ml profi oil system	**8887200013**
	R 134a	PAG 100	vehicle air conditioners	ISO 100	250 ml can	**8887200002**
					500 ml profi oil system	**8887200014**
	R 134a	PAG 150	vehicle air conditioners	ISO 150	250 ml can	**8887200008**
					500 ml profi oil system	**8887200019**
PAO	R 134a	Universal PAO	vehicle air conditioners	ISO 68	500 ml profi oil system	**8887200017**
					1000 ml	**8887200009**
POE	R 134a	SE 55	bus air conditioners	55	500 ml profi oil system	**8887200028**
					1000 ml	**8887200029**
PAG	R 1234yf	PAG 46yf	vehicle air conditioners	ISO 46	250 ml can	**8887200042**
					500 ml profi oil system	**8887200041**
POE	R 134a, R 404	SEZ 80	vehicle air conditioners, WAECO Frigo freezing	80	1000 ml	**8887200006**
Vacuum pump oil	R 134a, R 1234yf	HT 32	vehicle air conditioners	–	1000 ml	**8887200018**

Professional oil system 150 ml cans for third-party service units

Oil type	Refrigerant	Description	Application	Viscosity	Contains	Ref. No.
PAG	R 134a	WAECO DHO PS-F	vehicle air conditioners	ISO 46	150 ml can profi oil system	**8887200067**
	R 134a	WAECO DHO PR	vehicle air conditioners	ISO 100	150 ml can profi oil system	**8887200068**
PAG	R 1234yf	WAECO DHO 1234yf (suitable for hybrid)	vehicle air conditioners	ISO 46	150 ml can profi oil system	**8887200069**

R 134A AND R 1234YF REFRIGERANT IN THE PROVEN REFILLABLE WAECO BOTTLE

Quality by experience: the type-tested refillable WAECO bottle for R 134a refrigerant has proven itself in daily workshop use for decades. Naturally, we also offer a version for the new refrigerant R 1234yf – clearly recognisable by the signal red colour of the stand-up collar. No confusion possible!

Type-tested refillable steel bottle

R 134a

Reusable system with refill safety device. Capacity: 12 kg of R 134a refrigerant

- Sturdy design, good stability, stand-up collar and practical extraction valve, bottle without riser tube for extraction in gas or liquid form
- Suitable for all charging units in mobile or stationary use

Fill of WAECO refillable bottle	Ref. No. 8887100007
Purchase of bottle*	Ref. No. 8887100008
Bottle adapter	Ref. No. 8885400129

* Purchase price is refunded if bottle is returned within 2 years

8885400129

Type-tested refillable steel bottle

R 1234yf

Reusable system with refill safety device. Capacity: 5 kg of R 1234yf refrigerant

- Sturdy design, good stability, stand-up collar and practical extraction valve, bottle without riser tube for extraction in gas or liquid form
- Suitable for all charging units in mobile or stationary use

5 kg fill	Ref. No. 8887100019
Purchase of bottle*	Ref. No. 8887100018
Bottle adapter, for large bottle valves	Ref. No. 4440600148

* Purchase price is refunded if bottle is returned within 2 years

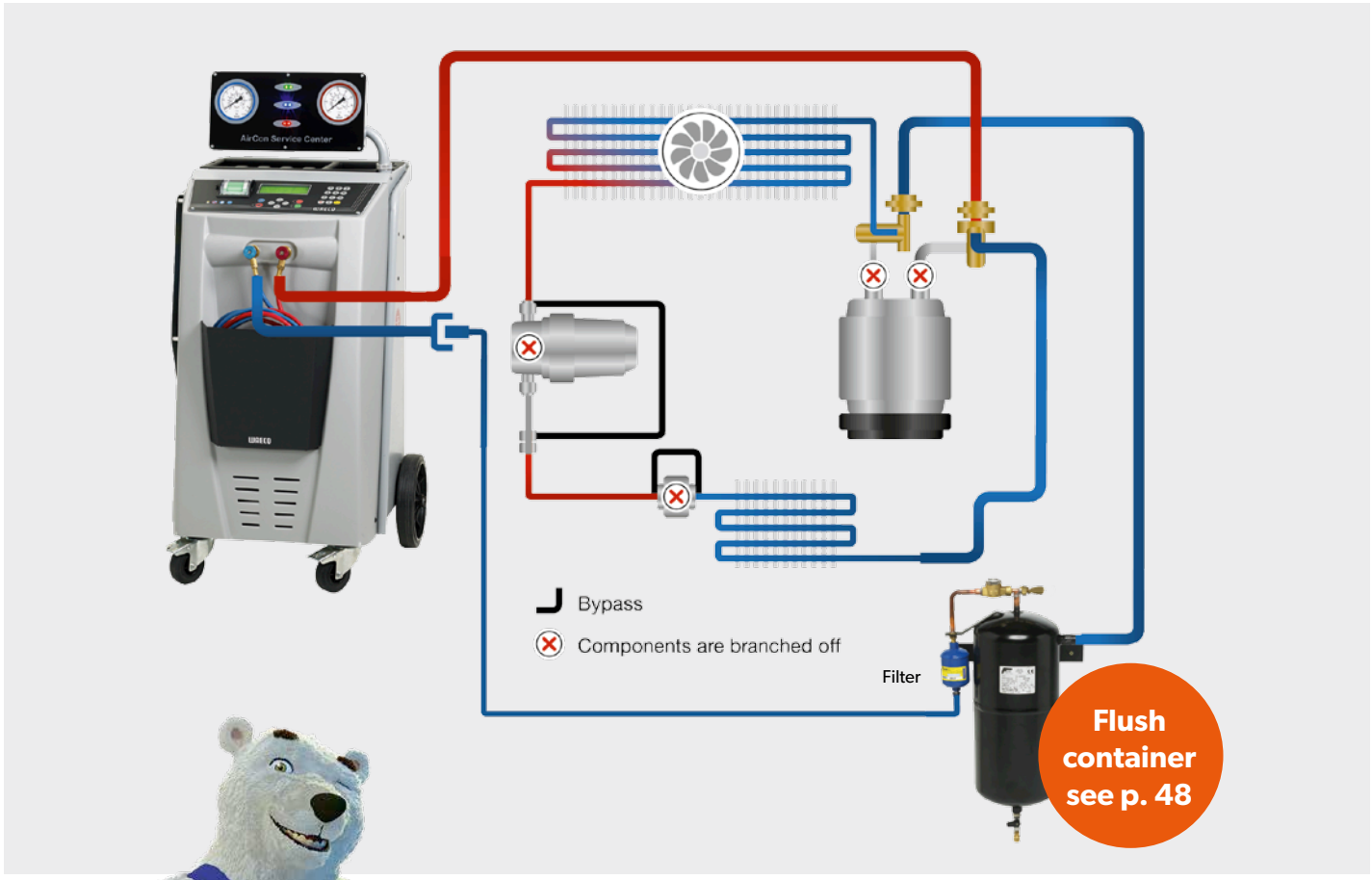
4440600148

CLEAN WORKING – IT PAYS TO FLUSH!

Professional service on automotive A/C systems naturally also includes flushing the system to clear away aggressive substances and contaminants from the refrigerant circuit. Flushing protects all parts of the air conditioner from damage, especially the compressor being its core component.

You will never get a hundred per cent clean refrigerant circuit, this because of the parallel flow evaporator technology commonly used these days. **We strictly recommend you** to add a **chip filter** to the suction line when you flush the system. This will **protect the compressor** and is especially advisable when you've replaced the compressor, as it will keep the remaining particles away from the newly fitted unit.

Important note: The filter (Ref. No. 8880700246) should be replaced after every flushing process (for each vehicle)!



Safe and fast flushing – with the A/C service unit and the flush container connected to it

- Spares you the time and effort required to preheat the refrigerant bottle
- No need to illegally remove the refill blocking device as would be required with other methods
- No additional equipment (e.g. two refrigerant bottles) required!
- Automatic processes controlled via the A/C service unit avoid operating errors
- Approved by renowned vehicle manufacturers

Some manufacturers offer flushing kits which work without an A/C service unit. Please consider the following facts:
1. Time factor: Refrigerant bottle has to be heated up to 70 °C, takes about 1.5 – 2 hours.
2. Extra work: Collector tank must be placed in a cold water container when ambient temperatures are high.
3. Safety factor: The refill device and the residual pressure safety device on the refrigerant bottle must be removed for this method; the bottle system has no ground point.

Flushing air conditioners

Neccessary flushing equipment – Speeds up the flushing process to the required level when integrated into the flushing circuit

Scope of delivery: Pressurised container with 2-way extraction valve, universal mounting bracket for pressurised container, purifier filter, sight glass, hose to connect the container to the air conditioner and the A/C service unit connected

Universal flush container, R 134a	Ref. No. 8885200088
Universal flush container, R 1234yf	Ref. No. 8885200272
Adapter R 1234yf, 3/8" SAE	Ref. No. 8885400343
Spare filter (R 134a + R 123yf)	Ref. No. 8880700246

A/C flush adapter kit, 17 items

For bypassing expansion valves and dryers

- For direct connection of A/C service hoses to the compressor's suction and pressure hoses
- Made of high-quality brass-aluminium materials to withstand the rigours of workshop use
- Supplied in sturdy workshop case

Scope of delivery: Universal flush adapter kit for many Audi and VW models as well as for other makes

A/C flush adapter kit	Ref. No. 8885300089
Adapter 3/8" on high-pressure side	Ref. No. 8885400104
Adapter R 1234yf, 3/8" SAE	Ref. No. 8885400343

A/C flush adapter kit, 18 items

Adapter set for bypassing air conditioning components

- Set includes a variety of adapters, e.g. for expansion valves and compressors
- Air conditioner is flushed with refrigerants, no need to dispose of cleaning agents
- Ideal for removing oil from the system
- Flexible use with various adapter options
- Refrigerant is recycled by the A/C service unit and can then be reused
- Causes no damage to gaskets and components

SK43, universal A/C flush adapter set	Ref. No. 8885300125
Repair set of 6 gaskets	Ref. No. 8885300090

A/C flush adapter kit III, 5 items

For targeted flushing of condensers and evaporators

- For bypassing expansion valves and dryers
- Special clamps with brass connectors
- Connectors for 3/8" service hoses

SK46, A/C flush connector	Ref. No. 8885300127
Repair set of 4 gaskets	Ref. No. 8881500878

A/C flush adapter kit IV, 65 items

Adapter set for bypassing air conditioning components

- Set includes a variety of adapters, e.g. for expansion valves and compressors
- Air conditioner is flushed with refrigerants, no need to dispose cleaning agents
- Ideal for removing oil from the system
- Flexible use with various hose connection options
- Refrigerant is recycled by the A/C service unit and can then be reused
- Causes no damage to gaskets and components

A/C flush adapter kit IV — Ref. No. 8885300080

Flush adapter set V, 143 items

For use with O-ring and taper connections

- Universal flush adapter set
- The variable connectors can be adapted, which allows the use on flange connections
- Multiple connections possible
- Supplied in sturdy plastic case
- Suitable for workshop use

Scope of delivery: Sturdy service case, brief application instructions with illustrations, 12 gaskets, fixing material, various adapters

A/C flush adapter kit V — Ref. No. 8885300104

Set of chip filters, 60 items

Filter catches contaminants coming from the system to protect the compressor

- Keeps a newly installed compressor free from chips
- Easy to fit; no need to cut pipes or insert fittings
- Choice of sizes to suit different A/C systems

Scope of delivery: 60 filters in 20 different sizes, SK 47 including set of tools

SK47, set of chip filters with tool	Ref. No. 8885300128
Filter for Audi A3, VW Golf V and VW Touran	Ref. No. 8887300038
Chip filter 22 mm	Ref. No. 8887300019
Chip filter 23 mm	Ref. No. 8887300020

Recycle Guard

R 134a

Separates and removes sealants from A/C systems

- During refrigerant recovery the Recycle Guard is connected between the A/C service unit and the air conditioning system
- The unit reliably separates sealants before they can enter and cause damage to the service unit
- The integrated filter insert can be used several times

Suitable for A/C service units of all makes

Universal mounting bracket, fits all A/C service units

Recycle Guard, R 134a	Ref. No. 8885200060
Universal mounting bracket	Ref. No. 8880600008
Spare filter	Ref. No. 8885200061

airconservice.eu/recycleguard

Sealant contamination in the A/C service unit without the use of the Recycle Guard

Recycle Guard

R 1234yf

Separates and removes sealants from A/C systems

Product details see product above

Recycle Guard, R 1234yf	Ref. No. 8885200275
Universal mounting bracket	Ref. No. 8880600008
Spare filter	Ref. No. 8885200061

Oil Checker Easy

For a fast and easy check of the oil and refrigerant in an A/C system

- Can be used to check the state of the oil and refrigerant while the A/C system is in operation
- Detects damage early on and avoids costly repairs

Scope of delivery: Oil checker, LP service hose, HP service hose, LP service coupler, HP service coupler, sturdy case

8885100163

8885100164

Oil checker Easy, R 134a	Ref. No. 8885100163
Oil checker Easy, R 1234yf	Ref. No. 8885100164

Dark red/black
Overheated oil: check the condition of the compressor, oil flush required

Orange/yellow
Oil starts to overheat: check the condition of the compressor, oil flush required

Pale yellow/white
Oil OK

Hybrid flush kit

Special flush container for ASC-series service units

- Approved according to SAE J 2843/2788/2843H
- Suitable for use with the complete ASC series (except ASC 2000RPA)
- Simple, fully automatic cleaning and flushing of the service unit for application on hybrid vehicles
- For service on all hybrid vehicles

Scope of delivery: Flush container, special software, operating instructions

Hybrid flush kit for ASC 1000	Ref. No. 8885200260
Hybrid flush kit for ASC 2000	Ref. No. 8885200261
Hybrid flush kit for ASC 2500	Ref. No. 8885200262
Hybrid flush kit for ASC 1300 G / ASC 2300 G / ASC 2500 G / ASC 3000 G / ASC 3500 G	Ref. No. 8885200270
Hybrid flush kit for ASC 5000 / ASC 5000 G / ASC 5300 G / ASC 5000RPA / ASC 5500 G RPA	Ref. No. 8885200259
USB and flush kit for ASC 3000	Ref. No. 8885200263

airconservice.eu/hybridkit

WAECO AIRCON SERVICE – EVACUATION OF AUTOMOTIVE AIR CONDITIONERS

Evacuation of automotive A/C systems has to be done with vacuum pumps designed for the purpose. Too fast an evacuation by means of over-dimensioned vacuum pumps will lead to icing of residual moisture in the air conditioning system and consequently to system malfunctions.

Today's automotive A/C systems only have a maximum volume of 3 litres of air. Therefore, only 3 litres of air per minute will flow through the service coupler during the evacuation process. The vacuum pumps shown below have been exactly designed to match the specific capacity requirements of automotive A/C systems.

4-way manifold for mobile use

- High quality connection for 3/8" SAE
- Manometer class 1
- Not damped
- Can be adjusted by the operator
- Includes safety sight glass and suspension
- Complete kit including hoses and tool

4-way manifold, **R 134a, R 404a, R 407c, R 22** Ref. No. 8885100161
4-way manifold, **R 1234yf** Ref. No. 8885100162

8885100161

8885100162

Vacuum pump, 42 l/min

Vacuum pump for use on passenger car and utility vehicle air conditioners

Specifications

Rated flow	42 l/min	Power input	125 W
End vacuum	0.5 mbar	Supply voltage	230 V/50 Hz
Speed	2.850 1/min	Dimensions	95 x 184 x 279 mm
Oil capacity	227 ml	Weight	4.5 kg

Vacuum pump Ref. No. 8885200257

Vacuum pump, 132 l/min

High-performance vacuum pump for use on automotive air conditioners with a refrigerant charging amount of more than 2 kg.

Specifications

Rated flow	132 l/min	Power input	330 W
End vacuum	0.02 mbar	Supply voltage	230 V/50 Hz
Speed	2.800 1/min	Dimensions	350 x 134 x 265 mm
Oil capacity	400 ml	Weight	11.2 kg

Vacuum pump Ref. No. 8885200256

Refrigerant recovery unit

R 134a

Automatic recovery of refrigerants
(R 12, R 22, R 134a, R 404a, R 413a (Isceon 49), R 410a)

- Recovery of refrigerant from A/C systems, transfer from one refrigerant bottle to another, disposal in a special R-bottle
- Automatic self-emptying – several recovery processes can be performed in quick sticks

Specifications

Recovery rate	gases: 16 kg/h; liquids: 22 kg/h
Supply voltage	230 volts/50 Hz
Power input	350 watts
Audits	TÜV/GS
Weight	12.6 kg

Scope of delivery: Recovery unit, red and blue service hoses with ball valves

Refrigerant recovery unit — Ref. No. 8885200276

2.0 kg charging cylinder for R 134a, R 404a and R 407c

R 134a

For stationary use in A/C workshops

- Sturdy construction
- Refrigerant can be extracted in liquid or gas form

Scope of delivery: Charging cylinder, safety valve, manometer

Charging cylinder — Ref. No. 8885200269

Refrigerant scales

Heavy-duty weighing platform with separate display unit in sturdy plastic case

- Large LCD display with setting option for kg – lb – oz
- Solenoid valve control for accurate charging
- 100 kg weighing platform
- Recovery and charging possible via solenoid valve control system
- Charging process can be repeated
- 220-volt solenoid valve control
- Mains-independent 9-volt LCD control system

Refrigerant scales — Ref. No. 8885100099

LEAK DETECTION – SEVEN METHODS TO TRACE LEAKS

Leak detection is a hot topic in every A/C workshop – and not only for service on conventional R 134a A/C systems, but also for systems charged with alternative refrigerants, such as R 1234yf or CO_2. There is an overview of the seven most commonly used methods to trace leaks, plus some recommendations from our experts.

For further information about UV leak detection, please refer to page 56.

1 UV leak detection

A special, fluorescent additive is injected into the refrigerant circuit – either via the A/C service unit or manually. Some new drier models are already fitted in the factory with such additives. When the A/C components are illuminated with a UV lamp and viewed through yellow UV protection goggles, the leak appears brightly lit up. Visibility is ensured even where oil-covered engines are concerned and even at some distance. Unlike the forming gas method, UV leak detection is also suitable for tracing ultra-fine leaks. Where vibration leaks are concerned it is the only method available.

2 Nitrogen

This method involves the production of positive pressure through nitrogen or negative pressure through vacuum by the A/C service unit. Leak detection through differential pressure is mainly suitable for the initial testing of strongly leaking or even empty systems. It only indicates that the system is leaking – not where the leak is. Testing is only possible with A/C service units that automatically stop when it is impossible to generate vacuum (e.g. all WAECO ASC service units).
If the process continues without fault warning, you can be certain that the system has no leak and may be charged with refrigerant. The requirements of the Chemicals Climate Protection Ordinance are met.

3 Tracer or forming gas

Forming gas consists of 95 % nitrogen and 5 % hydrogen. The operating principle is similar to that of electronic leak detection. The difference is that the operator has to fill the system with test gas when the refrigerant has been removed. The drawback of this method is the length of time required (after 15 minutes the hydrogen has almost completely diffused and must be replaced). Another disadvantage is the fact that testing takes place when the system is not operating. "Vibration leaks" which occur while the engine is running can therefore not be detected. (The system needs refrigerant to operate, but it cannot be recharged yet because of the leak!) Moreover, leak detection with forming gas requires clean and constant ambient conditions (for example no draughts in the workshop).

4 Electronic leak detection

Finding very small leaks is no problem for electronic leak detection systems. In some sections of the A/C system it is difficult though to apply the probe correctly, or at least very time-consuming.

5 Vacuum check

Fully automatic with A/C service units from Dometic WAECO

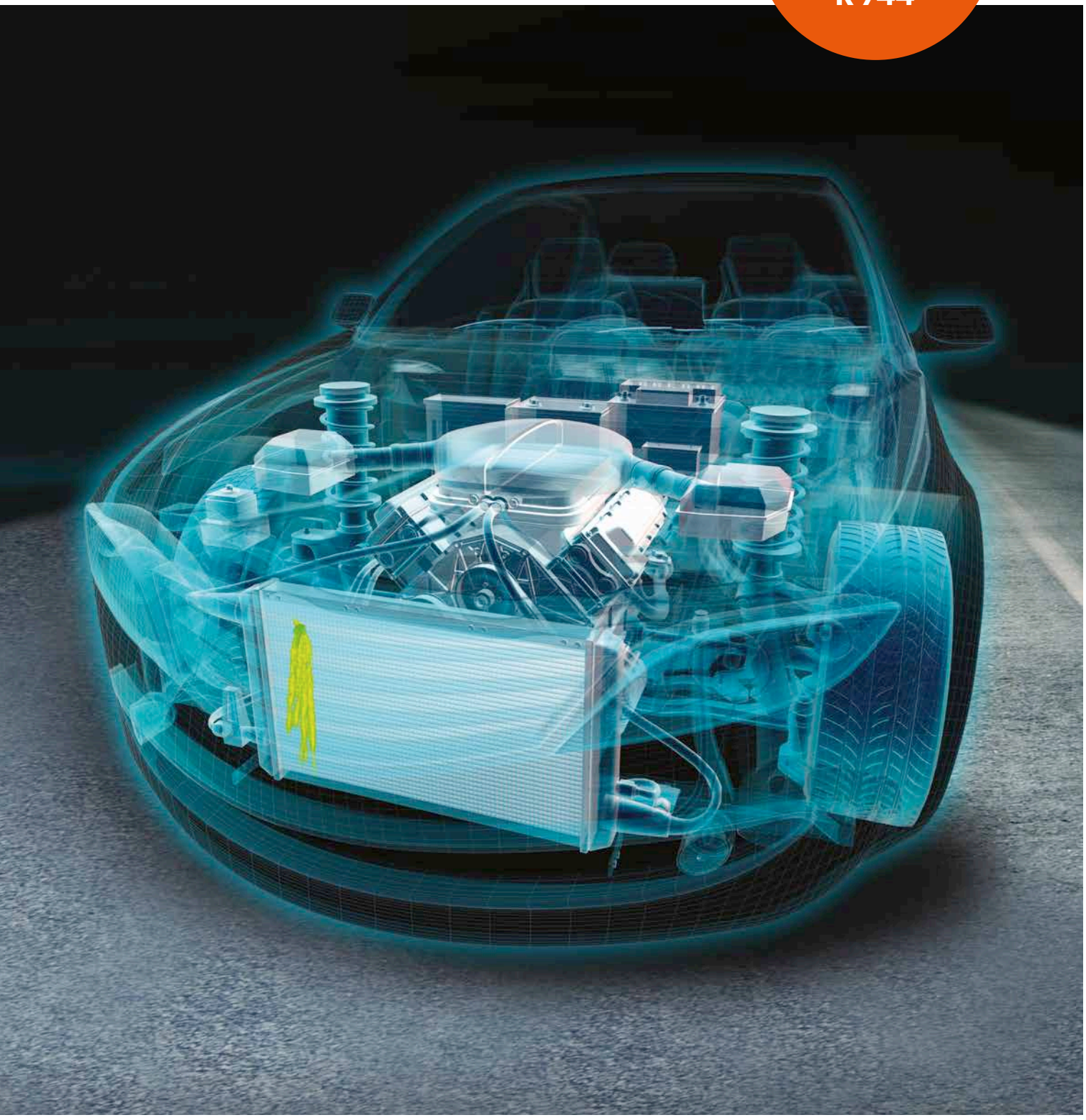
6 Simple bubble test

Looking for a leak with lather, the so-called "bubble test", belongs to the oldest methods of leak detection. It has become almost insignificant, however, as it is impossible to find very small leaks using this method.

7 Utrasonic leak detection

Tracing a leak is easy and convenient with the Marksman Ultrasonic leak detector. Fitted with an Internal Noise Control system, this tool is unaffected by ambient noise, so it is also reliable in noisy surroundings. The degree of leakage is indicated by a 5-LED display and an additional warning tone.

Suitable for R 134a, R 1234yf and R 744



LEAKAGE CONTROL – AN ABSOLUTE MUST

The utopia of a maintenance-free A/C system has been abandoned long ago. These days, A/C experts accept the fact that refrigerant losses occur with virtually every system. These losses do not always result from torn ducting or damages through accidents. Even totally intact systems lose some refrigerant – through the ducting and piping system, screw connections, sealing rings, etc. Such losses particularly affect modern systems containing far less refrigerant than former system generations.

The law forbids recharging defective A/C systems – after all, R 134a is regarded as an environmental hazard and climate killer. Regular leakage checks are in the interest of the vehicle owner to prevent compressor damage.

Decreasing refrigerant charging amounts in automotive A/C systems call for more sensitive leak detection equipment. This is where TRACER®, a quality brand, provides a convincing solution with its highly fluorescent additives and advanced LED blue light UV technology.

Left: highly fluorescent TRACER® sticks in the light of the LED blue light UV lamp – fast and reliable leak detection. With TRACER® products, the UV additive and lamp are perfectly coordinated.

Right: low fluorescence no-name additive – potential leaks can only be detected with difficulty

UV LEAK DETECTION – ALWAYS WITH THE MATCHING UV ADDITIVE!

A PAG and PAO mixture do not form a consistent oil film. As PAG is heavier, it settles below the PAOs. A phase separation is clearly visible in static condition. During the start-up operation of the A/C system inconsistencies in the mixture can occur and cause damage to the compressor.

Given the clear phase separation of the two oils, there can be no such thing as a universal UV additive. The UV-additive is contained in a carrier oil. If the different oils do not mix, the UV additive will not mix 100 % with the two oils either. The consequence is that it "sags through". If the oil and the UV additive are a perfect match, the UV additive will form a stable and uniform blend with the compressor oil.

Conclusion: Always mix the right oil with the right UV additive. There are no universal solutions.

When buying a UV additive, make sure you get a quality one! Poor quality additives may cause wear on the seals in the air conditioner as well as in the A/C service unit. Moreover, some UV additives contain solvents which may impair the refrigerant oil's lubricating ability and in the worst case, damage the compressor. Additives containing naphthalene are also dangerous because they let the seals swell. **Currently, there is only one UV additive available that was specially formulated for use with refrigerant oils and is therefore absolutely solvent-free: TRACERLINE®.** When applied properly, this additive is absolutely safe for use in vehicle air conditioners or A/C service equipment. Many automotive manufactures stipulate that leak detection additives of a certain quality must be used.

UV leak detection kit

R 134a

For leak detection on automotive air conditioners with R 134a in combination with PAG oil

Approved by automotive manufacturers

- Sturdy case in PAG oil resistant plastic
- Hand pump and cartridges can be stored mounted ready for use

Scope of delivery: hand pump incl. 2 cartridges of leak dye, low-side service hose and valve adapter, UV leak detection lamp, UV glasses, GLO-AWAY (225 ml), TRACER® underhood labels (50 pcs.)

UV leak detection kit — Ref. No. 8885300072

LED leak detection kit

R 134a

Specially designed for all A/C service units with integrated tracer dye injection device

- Powerful UV LED lamp (50 watts, 12 volts)
- UV intensity: 5000 µW/cm²

Scope of delivery: UV LED leak detection lamp with 3 AA batteries, 236 ml refill bottle for all recycling units with integrated UV additive management. Contents sufficient for approx. 24 car applications. UV glasses, TRACER® under-hood labels

LED leak detection kit — Ref. No. TP-8651

LED violet light UV leak detection lamp OPTI-PRO™ UV

NEW

- The OPTI-PRO™ UV comes complete with a powerful violet light LED and adjustable focus lens to identify leaks with ease
- Comes complete with 3 AAA batteries and fluorescence-enhancing glasses

Scope of delivery: UV lamp and glasses

UV leak detection lamp — Ref. No. TPOPUV

LED violet light UV leak detection lamp OPTI-PRO™ UV

- Powerful, effective and full of new features, catch leaks with ease using our new OPTI-PRO™ UV Plus leak detection light
- Complete with an adjustable focus lens, high/ low lighting, strobe light and fluorescence-enhancing glasses. Leaks will glow brightly when paired with one of our Tracerline dyes

Scope of delivery: Smart charger with AC plug, fluorescence-enhancing glasses and lanyard

UV leak detection lamp — Ref. No. TPOPUVP

LED violet light UV leak detection lamp OPTI-PRO™ PLUS

- Power comporable to high-intensity 135-watt lamps
- Works with all TRACERLINE® universal/ester and PAG A/C dyes
- Provides 4 hours of continuous inspection between charges

Scope of delivery: Smart charger with AC plug, fluorescence-enhancing glasses and lanyard

UV leak detection lamp — Ref. No. TP-8655/F

LED blue light UV leak detection flashlight

Ideal for initial inspection on automotive reception

- Compact, cordless design, super lightweight
- High light output
- Powered by 3 AA batteries, 100,000-hour LED bulb
- Easy to use

Scope of delivery: UV lamp, UV glasses

UV leak detection lamp — Ref. No. TP-8640CS

TRACER® additives (right) contain 10 times more dye than other UV additives (left)

PROTECT YOUR A/C SERVICE UNIT – AND YOUR CUSTOMERS' A/C SYSTEMS!

UV leak detection additives are well proven worldwide, because they are fast and easy to use providing high leak detection accuracy at competitive costs. Caution is advised because poor quality products can cause wear on the seals in the air conditioner as well as in the A/C service unit. Moreover, leak detection additives can contain solvents that impair the refrigerant oil's lubricating ability. **Therefore, when buying a leak detection additive, make sure you get a quality one!**

For use with refrigerant oils (PAG, mineral oil, ester), there's currently only one UV additive available that contains no solvents whatsoever, features an excellent fluorescence and is based on high-quality refrigerant oils only. Its name: TRACER®. When properly applied, this additive is absolutely safe for use in all types of automotive air conditioners and A/C service units. Special TRACER® leak detection additives have already been approved for use with new refrigerants, such as CO_2 and R 1234yf. TRACER® products contain 10 times more dye than other UV additives, which makes them much more effective when it comes to tracing smaller leaks.

TRACER® UV additiv for R 744

NEW

- No profi oil system

60 ml can filled with 50 ml **(based on ND 15 oil)** Ref. No. TP-3826-050

TRACER® UV additive (in container)

Approved by automotive manufacturers

For ASC series and other manufacturers' service units

- TRACER® UV additive for approx. 71 applications (500 ml) when used in combination with ASC A/C service units

NEW

TRACER® UV additive, 500 ml for ASC series, **R 134 a** Ref. No. TP-3820-500
TRACER® UV additive, 500 ml for ASC series, **R 1234yf** Ref. No. TP-3825-500
TRACER® UV additive, 150 ml, for other manufacturers' service units, **adapter see page 44, R 134 a** Ref. No. TP-3820-150
TRACER® UV additive, 150 ml, for other manufacturers' service units, **adapter see page 44, R 1234yf** Ref. No. TP-3825-150

TRACER® bottles

R 134a

Approved by automotive manufacturers

For refrigeration and air conditioning systems (R 134a/PAG oil)

- Refill bottle for all recycling units with integrated UV additive management
- Once the system is empty the additive (TP-3820-0301) is simply fed into the component to be replaced – e.g. the dryer
- Individual quantities can be used as and when required

TP-3820-0016

TP-3820-0301

Refill bottle 475 ml, for approx. 50 car applications Ref. No. TP-3820-0016
Refill bottle 236 ml, for approx. 25 car applications Ref. No. TP-3820-0008
Sales pack: 3 bottles, for 4 car applications Ref. No. TP-3820-0301

TRACER® UV additiv for R 1234yf refrigerant

R 1234yf

- TRACER® UV additive when used in combination with AirCon Service Center

3 cartridges, 14.89 ml each **(based on original SPA2 oil)** Ref. No. TP-9825-0301
237 ml bottle **(based on original SPA2 oil)** Ref. No. TP-3825-0008

TP-9825-0301

TP-3825-0008

TRACER® sticks

R 134a

Approved by automotive manufacturers

For refrigerating and air conditioning systems, sales pack: 6 pcs.
- When recharging with refrigerant after a normal repair, the contents of the TRACER® stick is simply added to the refrigerant
- Each stick contains exactly the right quantity for the refrigerant volume of an automotive A/C system

in combination with PAG oil	Ref. No. TP-3860-0601

TRACER® cartridge for approx. 14 car applications

R 134a

Approved by automotive manufacturers

For refrigerating and air conditioning systems, sales pack: 3 pcs
- For adding to the system when already charged using the TP-9848 hand pump
- In preparation for a repair when the customer cannot leave the car in the workshop straight away
- For use with R 134a refrigerant in combination with PAG oil
- For approx. 7 Vans/small trucks applications using refrigerant charging amount up to 2.2 kg

TRACER® cartridge	Ref. No. TP-9860-0301

TRACER® cartridge for approx. 34 car applications

R 134a

For refrigerating and air conditioning systems, sales pack: 3 pcs
- For adding to the system when already charged using the TP-9741 hand pump
- In preparation for a repair when the customer cannot leave the car in the workshop straight away
- For use with R 134a refrigerant in combination with PAG oil
- For approx. 17 Vans/small trucks applications using refrigerant charging amount up to 2.2 kg

TRACER® cartridge	Ref. No. TP-9760-0304

TRACER® Dyes

For engine, gearbox and power steering oil, fuel, cooling water, sales pack: 6 pcs
- Possible applications: cooling water loss, oil leaks or smell of petrol
- Simply add to the liquid circuit concerned. The necessary quantity can be taken from the resealable bottles as and when required

for oils and fuels	Ref. No. TP-3400-0601
for cooling water	Ref. No. TP-3900-0601

TRACER® hybrid application

UV additive injection kit for hybrid vehicles
- Insulation resistance of the compressor oil won't drop
- Light-proof storage of the POE special oils in aluminium laminated bags

Scope of delivery: 3 sticks, hose, coupler, valve, charging adapter

UV additive injection kit	Ref. No. TP-3812
Spare cartridge, sales pack: 3 pcs.	Ref. No. TP-3811-0301
Adapter for using with R 1234yf	Ref. No. TP-9831CS

TRACER® GLO-AWAY

Dye cleaner/remover, for leak clean-up after repairs
- Removes traces of additive in the engine compartment/at the service ports
- Suitable for use with all TRACER® leak detection additives

225 ml spray bottle	Ref. No. TP-9000-0008
450 ml refill bottle	Ref. No. TP-9000-0016

TP-9000-0008 TP-9000-0016

Hand pump for adding leak detection additives

R 134a

For adding TRACER® leak detection additives to the suction side of charged R 134a air conditioners
- Accurate dosing via spindle adjustment
- Integrated non-return valve protects against over-pressure

Scope of delivery: Low-pressure service hose with quick coupler for R 134a A/C systems, 2 cartridges of additive, vent adapter, hand spindle, label with instructions

Hand pump	Ref. No. TP-9848
Spare spindle	Ref. No. 9103500683

Hand pump for adding leak detection additives

R 1234yf

For adding TRACER® leak detection additives to the suction side of charged R 1234yf air conditioners
- Accurate dosing via spindle adjustment
- Integrated non-return valve protects against over-pressure

Scope of delivery: Low-pressure service hose with quick coupler for R 1234yf A/C systems, 2 cartridges of additive, vent adapter, hand spindle, label with instructions

Hand pump	Ref. No. TP-9828
Spare spindle	Ref. No. 9103500683

Hand pump for injection of leak detection additives

R 134a

For adding TRACER® leak detection additives to the suction side of charged R 134a A/C systems
- Accurate dosing via spindle adjustment
- Integrated non-return valve protects against over-pressure
- **For cartridge Ref. No. TP-9760-0304**

Scope of delivery: Low-pressure service hose with quick coupler for R 134a A/C systems, 1 cartridge of additive, vent adapter, hand spindle, label with instructions

Hand pump	Ref. No. TP-9741

Safety gloves / Standard full-view goggles / UV glasses

Safety gloves for working with refrigerants and UV additives	Ref. No. 8885400065
Standard full-view goggles for working with refrigerants	Ref. No. 8885400066
UV glasses for leak detection	Ref. No. TP-9940

Nitrogen pressure gauge and leak detector

R 134a

For inspections on A/C evaporators and complete A/C systems in installed condition
- Manometer block with vent valve and safety valves, 36 bar opening pressure
- Nitrogen pressure reducer, adjustable from 0 to 35 bar
- Test manometer 0 to 40 bar, calibration: 1 bar, class 1.0

Scope of delivery: pressure reducer, service quick coupler, 1.8 m service hose for low side, 1/4" SAE x 1/2" ACME adapter, cylinder trolley with manometer block

Pressure gauge and leak detector	Ref. No. 8885400092
Extension kit HP for R 134a	Ref. No. 8885400124
Extension kit for R 1234yf	Ref. No. 8885400165

Cylinder trolley

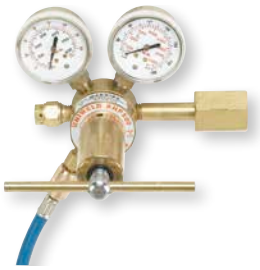
For safe transport and storage of 10-litre cylinders
- Handy and sturdy cylinder trolley
- With hose suspension
- Integrated storage box for accessories

Cylinder trolley	Ref. No. 8885400057

Nitrogen pressure reduce

R 134a

Approved by automotive manufacturers



For controlled and safe admission of nitrogen to A/C systems (pressure test)
- Adjustment range from 0 to 35 bar, so also suitable for flushing
- High quality design

Scope of delivery: Pressure reducer, service quick coupler, 1.8 m service hose for low-pressure side, 1/4" SAE x 1/2" ACME adapter

Pressure reducer	Ref. No. 8885400058

Nitrogen / forming gas pressure reducer

R 134a

8885400135

Hose set

8885400172

For controlled and safe admission of nitrogen to A/C systems (pressure test)
- Adjustment range from 0 to 20 bar, ideal for air conditioner inspections (§ 5 of the German Chemicals Climate Protection Ordinance)

Hose set for safe connection to vehicle A/C system
Scope of delivery hose set: service quick coupler, 1.8 m service hose for low-pressure side, 1/4" SAE x 1/2" ACME adapter

Nitrogen pressure reducer	Ref. No. 8885400135
Forming gas pressure reducer	Ref. No. 8885400172
Hose set for nitrogen and forming gas pressure reducer	Ref. No. 8885400136

Leak detection spray

Leak detection by formation of foam on leaky spots in the refrigerant circuit
- Suitable for fast detection of larger leaks (e.g. on threaded joints or press fits), easy to use

Leak detection spray, 500 ml	Ref. No. 8887300018

Electronic R 134a/R 1234yf leak detector

Senses refrigerant concentrations in the ambient air
- Responds to R 134a/R 1234yf refrigerant only, therefore no interference by other gases (plastic emissions) or air movement
- Measuring head on flexible neck to reach hard-to-access places
- Sensitivity: up to 5 g/year

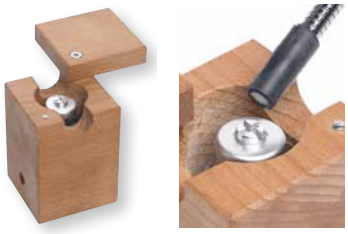
R 134a/R 1234yf leak detector	Ref. No. TP-9360
Sensor	Ref. No. 9103500684
Filter, sales pack: 20 pcs.	Ref. No. 9103500685

Multi-gas leak detector, suitable for forming gas

Microprocessor controlled sensor electronics with multi-channel signal recognition
- Consistent sensitivity throughout the sensor's lifetime
- Can also be set for heavily contaminated environments (e.g. engine compartment)
- Complies with all international standards relevant for vehicle applications: SAE J2913 for R 1234yf, SAE J2791 for R 134a, EN14624:2005. Identifies all FC- and CFC-based refrigerants and blends as well as SF6.

Multi-gas leak detector	Ref. No. 8885100124

R 134a and R 1234yf reference leak



For checking the functioning and sensitivity of electronic leak detectors
- Suitable for all electronic refrigerant leak detectors sensitive to fluorinated hydrocarbons
- Approved for use with leak detectors that respond to both R 134a and R 1234yf

Reference leak	Ref. No. 8885100095

Marksman II Ultrasonic leak detection tool

Utrasonic leak detector for pinpoint of refrigerant leaks of A/C or air leaks
- Convenient, easy-to-use, touch-control sensitivity pad and power switch
- 5-LED signal-intensity indicator and audible alarm easily pinpoint the exact problem source
- Laser pointer to help pinpoint the source of pressurized leaks
- Internal Noise Control (INC) ensures tool is unaffected by ambient noise. Ideal for use in extremely noisy environments.
- Self-adjusting Automatic Gain Control (AGC) circuitry enhances sensitivity and simplifies operation
- Precision-engineered hollow air probe helps isolate leak sources in cramped areas
- Solid contact probe quickly pinpoints wear or damage to internal components – without disassembly!

Scope of delivery: Ultrasonic receiver, ultrasonic emitter, hollow air probe, contact probe, headphones and rugged carrying case, 2 batteries (Type D, mono cells)

Marksman II	Ref. No. TP-9367L

SERVICE ON HYBRID VEHICLES – 100 % CLEAN AND SAFE

The market offers many A/C service units with a hybrid option, but not all of them are suitable for hybrid application. Although everyone in the industry agrees that thorough flushing of the complete system is required when changing from one refrigerant to another.

SAE J 2843 H stipulates a maximum permissible oil cross contamination of 0.1 % on the total oil volume. For 150 ml of PAG oil this translates to a mere 0.15 ml (i.e. less than a drop of oil). That said, it won't be enough to just hook on the service hoses and flood the system with refrigerant, as is common practice with some service units available in the market. Refrigerant lines, magnetic valves and service hoses will always contain residual oil, which can lead to cross contamination and dangerous high-voltage exposure.

Dometic WAECO's hybrid concept works as effectively as a high-pressure cleaner. An additional flush container is installed in the service unit and put under vacuum. The refrigerant required for cleaning the unit's internal components is forced through the system several times, under high pressure and in alternating direction.

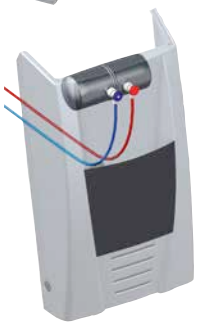
The result: service hoses, magnetic valves and the lines are compliant with SAE J 2099 (approved by ILK Dresden).

Flushing performance approved by ILK Dresden

Hybrid flush kit

Special flush container for ASC-series service units

- Approved according to SAE J 2843/2788/2843H
- Suitable for use with the complete ASC series (except ASC 2000RPA)
- Simple, fully automatic cleaning and flushing of the service unit for application on hybrid vehicles
- For service on all hybrid vehicles



Scope of delivery: Flush container, special software, operating instructions

Hybrid flush kit for ASC 1000	Ref. No. 8885200260
Hybrid flush kit for ASC 2000	Ref. No. 8885200261
Hybrid flush kit for ASC 2500	Ref. No. 8885200262
Hybrid flush kit for ASC 1300 G / ASC 2300 G / ASC 2500 G / ASC 3000 G / ASC 3500 G	Ref. No. 8885200270
Hybrid flush kit for ASC 5000 / ASC 5000 G / ASC 5300 G / ASC 5000RPA / ASC 5500 G RPA	Ref. No. 8885200259
USB and flush kit for ASC 3000	Ref. No. 8885200263

High-voltage gloves

High-voltage-resistant safety gloves

- Comply with EN 60903 and CE 0333
- For professional and safe work on hybrid vehicles
- Supplied in light-proof safety packaging

High-voltage gloves	Ref. No. 8885400173

TRACER® hybrid application

UV additive injection kit for hybrid vehicles

- Insulation resistance of the compressor oil won't drop
- Light-proof storage of the POE special oils in aluminium laminated bags

Scope of delivery: 3 sticks, hose, coupler, valve, charging adapter

UV additive injection	Ref. No. TP-3812
Spare cartridge, sales pack: 3 pcs.	Ref. No. TP-3811-0301

Compressor oil

- Special compressor oil for high-voltage hybrid applications

WAECO DHO 1234yf, 250 ml	Ref. No. 8887200062
WAECO DHO 1234yf, 500 ml profi oil system	Ref. No. 8887200063
ND11, 100 ml	Ref. No. 8887200035
SPA2, 500 ml	Ref. No. 8887200039
SPA2, 250 ml	Ref. No. 8887200048

Oil injector for manual injection of oils and/or UV additives

R 134a

- Injector for manual injection of oils and/or UV additives
- Easy-to-use, sturdy design, ideal for workshop use
- With ml and oz scales for oil and an extra scale for additive
- Supplied with hose and couplers (R 134a and R 1234yf) for use with different refrigerants and oils
- Sight glass with crash protection device for enhanced safety
- Ideal for hybrid applications, where cross-contamination of oils is not allowed (SAE J 2843H)

Oil injector	Ref. No. 8885300132

NEW

FRESH CLIMATE

AIRCON CLEANER ON PROBIOTIC BASIS

Fresh air in the vehicle
Unpleasant odours in the vehicle can have a multitude of causes. In many cases the bad smell comes directly from the air vents, because bacteria, fungi and other microorganisms have settled in the air conditioning. The new AirCon Ready Refresh A/C cleaner tackles the problem at the source – on a probiotic basis.

Unlike commonly used A/C disinfectants, AirCon Ready Refresh works with microorganisms. The advantages are obvious:

- No use of aggressive cleaners or disinfectants
- No problems with resistant germs
- Extremely easy application
- No additional technology required – all that is needed comes with the can

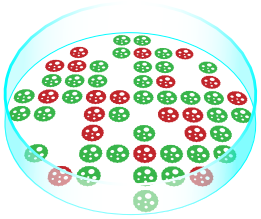
What does "probiotic" actually mean?
Probiotic means the use of microorganisms such as bacteria, fungi or yeasts. This method has been applied for thousands of years in food manufacturing, for example the production of yoghurt, cheese or sauerkraut. Probiotic liquids designed to boost intestinal flora levels are a more recent application. The same principle may be applied in the field of cleaning, where the probiotic germs have the welcome effect of repressing the harmful germs.

What is the difference to common cleaners?
Common cleaning or disinfection processes imply that all microorganisms are eliminated or killed. Since we live in a world full of microorganisms, however, this effect can only be a temporary one. New microorganisms will settle and may even multiply to a larger extent than before, all competition being extinct.

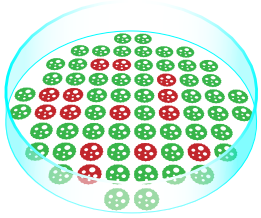
"GOOD" VERSUS "BAD" MICROORGANISMS HOW AIRCON READY REFRESH WORKS

Probiotic cleaners such as AirCon Ready Refresh work with probiotic microorganisms. They create a healthy microflora that represses pathogen (disease-causing) microorganisms. The undesired organisms are not immediately killed, but prevented from multiplying. Once the probiotic cleaner has been used several times the pathogen germs die of old age, so to speak.

The result: The probiotic microorganisms gain the upper hand in the A/C system and bad odours stand no chance.



Prior to application:
Excess of harmful germs (red) in the A/C system cause unpleasant odours



After application:
Excess of healthy microorganisms (green) – clean air in the vehicle

Aircon Ready Refresh

Aircon cleaner on a probiotic basis

- Extremely easy application
- Handy spray can – no other equipment required
- Represses pathogen (disease-causing) germs
- Removes the course of bad odours from the A/C system

Aircon Ready Refresh, box with twelve cans Ref. No. 8887400018

NEW

AIRCON READY REFRESH

SIMPLE AND CLEAN TO USE

You don´t need any special knowledge or expensive equipment for the application of AirCon Ready Refresh. The handy spray cans are simply placed on the floor on the passenger´s side. Please note our instructions so you know exactly what to do:

1. Remove vehicle's interior filter
2. Open the air vent
3. Set fan to circulating air
4. Push passenger seat back
5. Turn ignition on so that the fan starts
6. Close the window and door on the driver´s side
7. Shake AirCon Ready Refresh can
8. Activate and eject cleaner by pressing the spray head down hard
9. Close the window and door on the driver´s side
10. Wait for the complete contents of the can to be ejected (about 5 min.)
11. Refit the vehicle's interior filter

AIR CONDITIONER DISINFECTION

FRESH AND HEALTHY AIR IN THE CAR

It only takes minimal effort to effectively remove harmful micro-organisms from automotive A/C systems. **WAECO's ultrasonic atomiser Refresh-o-mat HD** takes care of that service. The high performance, professional unit has been **designed inside out for workshop use:** robust stainless steel housing, power supply with IEC input filter, microprocessor controlled programme code. The unit has the capacity to atomise up to 400 ml of cleaner fluid, which makes it suitable for disinfecting larger A/C systems on buses or trucks. Using the optional adapter kit, the atomiser can even be connected to the vehicle's air ducts to give them a thorough clean-up.

Refresh-o-mat heavy-duty ultrasonic atomiser

For professional use in workshops: Ultrasonic technology eliminates bacteria and smells

- Robust stainless steel housing
- Integrated power transformer
- Atomises up to 400 ml of cleaner fluid (also suitable for large vehicles such as buses)

Specifications:

Power supply:	230 volts AC/50 Hz
Atomiser capacity:	approx. 383 l/h
Dimensions (WxHxD):	150 x 280 x 400 mm (incl. outlet tube)

Optional extra: Adapter kit for treatment of air ducts

Refresh-o-mat HD	Ref. No. 8885300096
Hose set	Ref. No. 8885300097

AirCon Refresh air conditioner cleaner

For professional use in workshops: Ultrasonic technology eliminates bacteria and smells

- Ideal for air conditioner cleaning and maintenance
- Eliminates mould, bacteria and other harmful micro-organisms from evaporators, air-vent channels and condensation drains
- Effectively prevents odour
- Can also be used with other manufacturers' equipment
- Also available in practical single-portion bottle.
  This ensures that only the required quantity is applied.
  Saves material and hence costs!

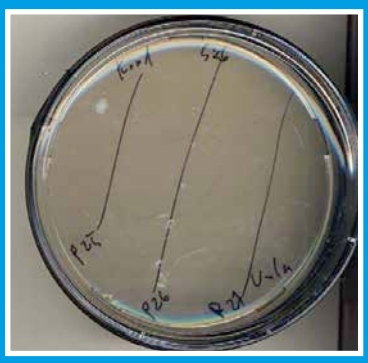
Effectiveness approved according to EN 1040*

* Certification to the EN 1040 standard means that the product has a bactericide effect on a strictly defined type of test bacteria when applied undiluted at a certain product concentration over a certain period of time.

Air conditioner cleaner, 1 litre capacity, sufficient for approx. 10 applications	Ref. No. 8887400008
Air conditioner cleaner, 100 ml capacity, sales pack: 20 pcs.	Ref. No. 8887400016

Audi A6 prior to disinfection

Report: mould, Aspergillus, Penicilium, yeasts



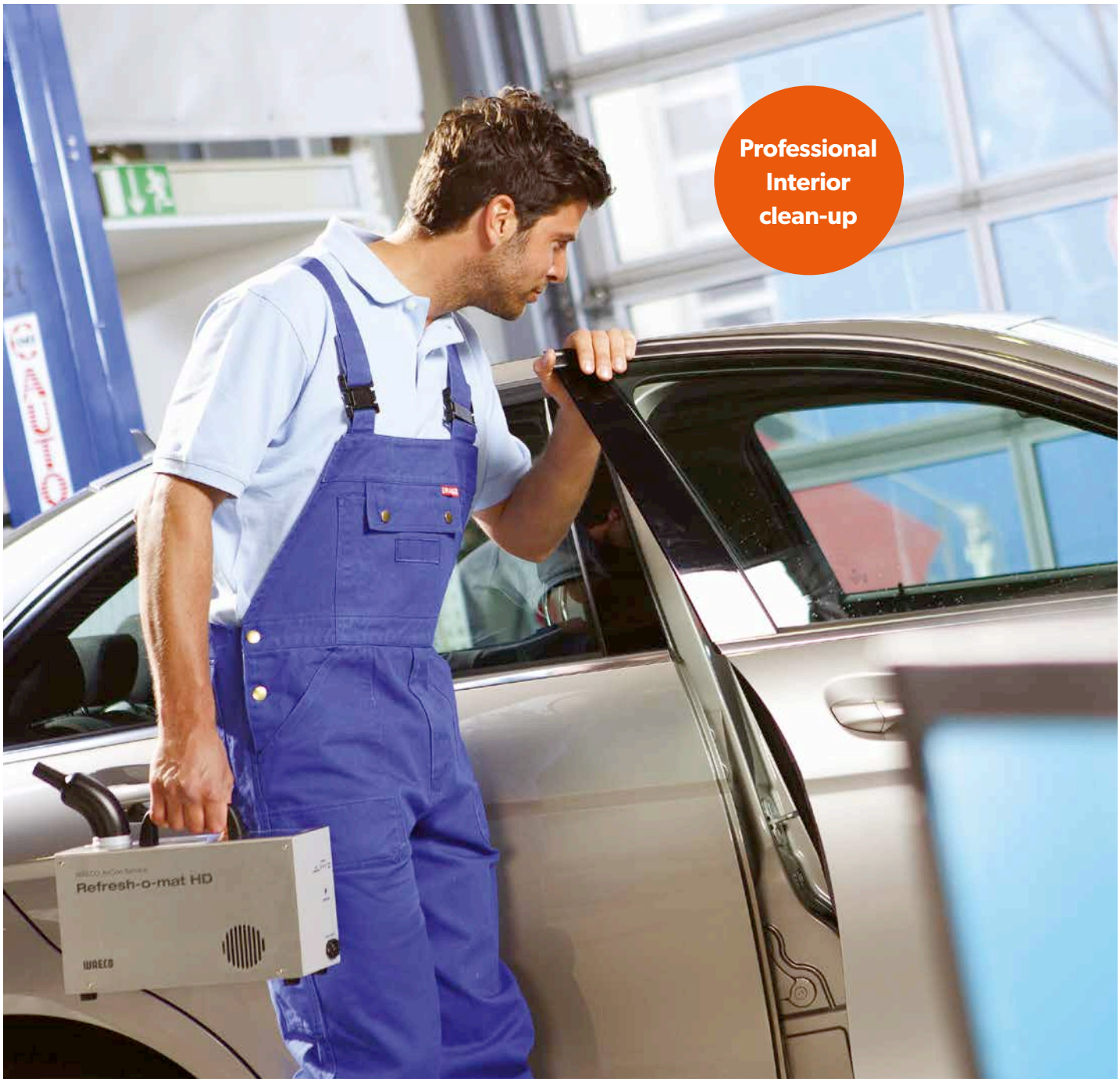
Audi A6 after disinfection

PROFESSIONAL CLEAN-UP

ELIMINATES BACTERIA AND SMELLS

When fixing used cars for resale or giving customer cars a professional clean-up you often have to deal with persistent odours. The **ozone generator** eliminates smells effectively and without any chemical substances. The handy unit (now also available as a heavy-duty version in a stainless steel housing) forces ozone into in the vehicle's air duct. The highly reactive, triple-bonded oxygen has the ability to oxidise organic substances. In the process it neutralises bacteria, mould, viruses and other microorganisms – which are the source of the smell. The method is also effective against fungal spores, bacteria and virus strains that have become resistant to certain active substances.

A proven tool to neutralise smells in passenger compartments is the **WAECO Refresh-o-mat.** The ultrasonic atomiser is available in two different versions: as a **compact unit in a practical workshop case** or as a **heavy-duty model** enclosed in a robust stainless steel housing.



Ozone generator

Effectively eliminates unpleasant odours through oxidation with ozone

- Suitable for odour decontamination in vehicles and other interiors
- Effectively eliminates intensive odours (e.g. nicotine, mould and animal smell, lactic acid, vomit, diesel or fuel oil)
- Compact unit in a sturdy stainless steel housing
- Supplied with a flexible tube for blowing the ozone into the air duct
- Connection to the vehicle battery with 12-volt cigarette lighter plug and adapter plug

Specifications: Power supply 12 volts DC, Output approx. 500 mg/h
Scope of delivery: Ozone generator, 12-volt cigarette lighter plug, adapter plug, blow-off tube

Ozone generator — Ref. No. 8885300105

Heavy-duty ozone generator

Effectively eliminates unpleasant odours through oxidation with ozone

- Suitable for odour decontamination in vehicles and other interiors
- Effectively eliminates intensive odours (e.g. nicotine, mould and animal smell, lactic acid, vomit, diesel or fuel oil)
- Compact unit in a sturdy stainless steel housing
- Supplied with a flexible tube for blowing the ozone into the air duct
- Connection directly to 230 volts

Specifications: Power supply 230 volts AC, Output approx. 1000 mg/h
Scope of delivery: Heavy-duty ozone generator, 230 volt connection cable, blow-off tube

Heavy-duty ozone generator — Ref. No. 8885300140

Refresh-o-mat heavy-duty ultrasonic atomiser

For product details please refer to page 69

Car Refresh smell stopper

Saver tip: 100 ml single portion

Smell eliminator for use with the Refresh-o-mat

- Ideal for eliminating intensive odours in vehicle interiors, e.g. cigarette smoke, plastic emissions and animal scent
- Works chemically to give a lasting result rather than just covering up
- **Can also be used with other manufacturers' equipment**
- **Also available in practical single-portion bottle. This ensures that only the required quantity is applied. Saves material and hence costs!**

Car Refresh, 1 litre capacity, sufficient for approx. 10 applications — Ref. No. 8887400009
Car Refresh, 100 ml capacity, sales pack: 20 pcs. — Ref. No. 8887400015

INDISPENSABLE TOOLS:

THE SPECIALISTS FOR PERFECT WORKMANSHIP

Service quick couplers (see page 74)
Space is often in short supply in today's engine compartments. Therefore, automotive manufacturers are also using concealed areas to accommodate air conditioner components. On some models (e.g. 5-Series BMW, Ford, Volvo, Mercedes-Benz SLK) the high-pressure-side service port is mounted near the bonnet lock bracket, inaccessible with a standard A/C service coupler. WAECO AirCon Service has developed a matching service tool for easy access to the port.

Spring lock repair set (see page 75)
Factory-fitted automotive air conditioners, especially those made by **Ford, Volkswagen and Opel,** come with spring lock couplers for quick fitting of refrigerant lines. To release these couplers you will need special tools, which WAECO supply.

Workshop kits (page 80 ff.)
Repair work on automotive air conditioning systems often involves the replacement of **small parts, such as valve cores and O-rings.** To have everything ready at hand, you need a well organised storage system with parts for specific vehicles. WAECO workshop kits include all essential parts, clearly arranged and handily organised in metal cases. The spectrum ranges from plugs to prevent moisture and contaminants from entering an open A/C system to O-ring sets for factory-fitted and retrofit A/C systems.

Miniature identifier

The identifier helps you to check the quality and presence of R 134a or R 1234yf in vehicle A/C systems and storage bottles

- Handy unit for simple and fast application; automatically guides the user is step by step through the application
- Shows the test result within a short period of time
- Protects your valuable A/C service unit from damage by contaminated refrigerants
- Designed for mobile use with batteries, independent of the mains
- Checks the refrigerant for illegal mixtures (imports)
- Detects non-condensable gases in the refrigerant
- Impact-resistant casing, for workshop use

Miniature identifier, **R 134a**	Ref. No. 8885100135
Miniature identifier, **R 1234yf**	Ref. No. 8885100165

Dual diagnostic thermometer

For diagnosis on two-zone air conditioners

- Ideal for measuring the air outlet temperature at the air vents
- Digital thermometer with 2 sensors and suction cup holder for the windscreen
- Sensors: 3 m long
- Measures and displays the minimum, maximum and average temperatures

Specifications:

Display	dual, with 5-digit LCD display
Operating temperature	5 °C to 40 °C at 80 % air humidity
Measuring range	–200 °C to +1050 °C

Dual diagnostic thermometer	Ref. No. 8885100127
Accessories:	
Surface sensor	Ref. No. 8885100128
Temperature probe	Ref. No. 8885100129

LCD digital thermometer

For the exact measurement of air temperatures

- Extra-large, easy-to-read digital display
- Long probe (213 mm), excellent measuring accuracy

LCD digital thermometer — Ref. No. 8885100072

Digital pocket temperature meter

For reception testing of automotive A/C systems

- Extremely compact design allows measuring of air outlet temperature directly at the Center air vents
- Easy-to-read display

Digital pocket temperature meter — Ref. No. 8885100059

Infrared laser thermometer

Contact-free temperature measurements for automotive uses

- Ideal for measuring the air outlet temperature at the air vents
- Quick temperature checks on condenser surface or heat exchanger
- Integrated laser pointer for precise positioning of the measuring beam – exact measurements even over longish distances

Infrared laser thermometer — Ref. No. 8885100062

Pressure meter R 134a (low pressure side)

R 134a

Pressure meter for measuring the pressure in the A/C system

- Ideal for quick check at service reception
- High-quality, impact protected housing
- Easy-grip coating for optimum handling in the workshop

Pressure meter — Ref. No. 8885100096

Pressure meter R 1234yf (low pressure side)

R 1234yf

Pressure meter for measuring the pressure in the A/C system

- Ideal for quick check at service reception
- High-quality, impact protected housing
- Easy-grip coating for optimum handling in the workshop

Pressure meter — Ref. No. 8885100146

Service quick coupler HP

R 134a

For **hard-to-access** service ports

- Suitable for BMW E60 and others; Volvo S80, S60 and younger models; Mercedes M-Class; all Chrysler (USA) models and all Asian vehicles

Service quick coupler HP — Ref. No. 8885400227

Service quick coupler LP

R 134a

For **hard-to-access** service ports

- Suitable for Jaguar XJ (new) and all Asian vehicles

Service quick coupler LP — Ref. No. 8885400228

Service quick coupler HP

R 1234yf

For **hard-to-access** service ports

- For Ford, Volvo and other vehicles

Service quick coupler HP — Ref. No. 8885400340

Service quick coupler LP

R 1234yf

For **hard-to-access** service ports

Service quick coupler LP — Ref. No. 8885400345

Service quick coupler HP

R 134a

For Mercedes-Benz SLK

- For connection of A/C service units to the high-pressure service port in the SLK (R171)
- For extending the vehicle's high pressure port

Service quick coupler HP — Ref. No. 8885400117

Approved by automotive manufacturers

Service quick coupler HP to LP

R 134a

Custom-made service quick coupler for various Renault vehicles, e.g. Laguna

- Adapter HP to LP

Service quick coupler HP to LP — Ref. No. 8885400098

Spring lock repair and disconnect set, 8 items

For service work on spring lock connections

- Spring lock connections can be released or repaired to ensure durable leak protection
- Suitable for Audi, VW, Citroën, Chrysler, Ford, Hyundai, Peugeot, PSA, Renault, Opel, GM, Vauxhall, Seat and Skoda cars

Disconnect tool set for releasing spring lock connections. Can also be supplied separately. Not suitable for GM, Opel and Vauxhall cars.

SK44, spring lock disconnect set	Ref. No. 8885300126
Disconnect set	Ref. No. 8885300044

Adjustable spanner

Spanner (adjustable from 0 – 30 mm)

- Spanner and ratchet all in one, simply move a lever to change between functions
- Convenient and durable
- Excellent torque. Ergonomic, soft-grip handle

Adjustable spanner	Ref. No. 8885300133

Solenoid valve opener, 17 – 20 mm

Tool for opening solenoid valves. For use on buses.

- Opens locked refrigerant circuits
- Can be used for 17 – 20 mm solenoid valve coils

Solenoid valve opener	Ref. No. 8885300259

Flash-Memory-Card

Update of service unit software and charging amount database. 6,000 vehicle data entries. For all ASC service units built until 2014.

- Also includes charging amount data for truck air conditioners

ASC 1000 up to serial nr. 109999	Ref. No. 4441000041
ASC 2000 up to serial nr. 209999	Ref. No. 4441000042
ASC 1000 from serial nr. 110000	Ref. No. 4441000090
ASC 2000 from serial nr. 210000	Ref. No. 4441000091
ASC 3000 up to serial nr. 309999	Ref. No. 4441000043
ASC 3000 from serial nr. 310000	Ref. No. 4441000144
ASC 2500	Ref. No. 4441000120
ASC 5000 RPA / ASC 5500 RPA	Ref. No. 4441000139

USB stick with software update for the new ASC G-series

Software updates for the new ASC G-series by USB stick

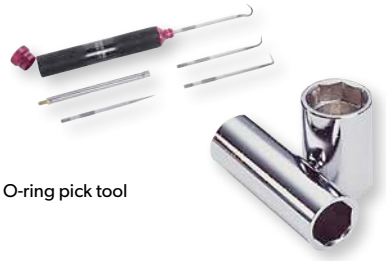
USB stick	Ref. No. 4441000174

Octagon sockets for fitting service valves / O-ring pick tool

Thin-walled sockets for exchanging 8-sided service ports (R 134a)

- Special tool for picking O-lock gaskets on refrigerated vehicles or standard O-rings

For low-pressure side	Ref. No. 8885300032
For high-pressure side	Ref. No. 8885300033
O-ring pick tool	Ref. No. 8885300094



O-ring pick tool

Valve fitting tools

Fitting tool for Schrader valves used in R 134a A/C systems,
e.g. on Ford or Japanese vehicles

- For high- and low-pressure side; connection diameters: 6.3 and 4.5 mm

For Ford or Japanese vehicles	Ref. No. 8885300037
For Ford, French or Japanese vehicles	Ref. No. 8885300035

8885300037 8885300035

Hose cutter

Hose cutter Ref. No. 8885300002

Easy repair set for aluminium refrigerant pipes

All you need for repairing refrigerant pipes in a single set!

- Universal set for mobile repairs on original pipes
- Easy, fast and low-cost repair of original pipes – no need to wait for spares
- Simple adaptation to hose connections
- Compact solution – complete with matching tools
- 5 sets in a sturdy transport box, perfect for mobile use
- Sets can be taken out individually
- Fast access to various parts, no need to search around for matching parts
- Spare connectors and pipes can be ordered individually

100 items

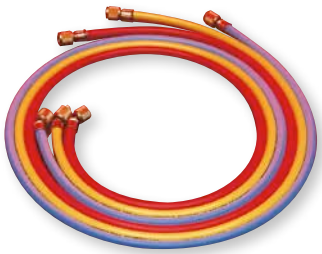
Easy repair set, 100 items Ref. No. 8885300150

WAECO EASY REPAIR SETS FOR ALUMINIUM REFRIGERANT PIPES

Replacing a damaged refrigerant pipe is a time-consuming task, and it's costly for the customer, too. A much faster alternative in most cases is to repair the defective pipe. Simply cut out the defective section with a saw, insert the matching connection sleeve from the WAECO Easy Repair Set, tighten it and you are done! There's no need for any special tools. You save precious time, and your customer is happy about the much lower bill. Treat your customers to this practical and cost-efficient alternative to a complete replacement!

Charging hoses and vacuum hoses

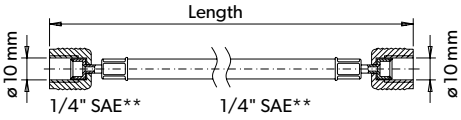
R 134a



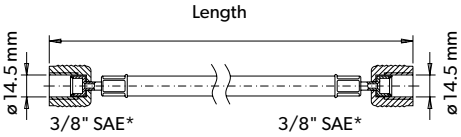
Service hoses in various colours for all applications in A/C fitting and service

- Suitable for all commonly available refrigerants
- Highly flexible material allows use even in hard-to-access areas of automotive A/C systems
- Connection thread as per SAE standard

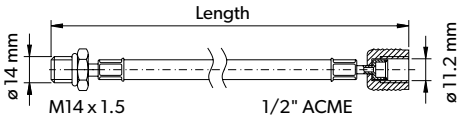
Red hose, 1800 mm	Ref. No. 8885100005
Blue hose, 1800 mm	Ref. No. 8885100006
Yellow hose, 1800 mm	Ref. No. 8885100007
Spare seal	Ref. No. 8885400022



Red hose, 1800 mm	Ref. No. 8885100008
Red hose, 5000 mm	Ref. No. 8885100024
Blue hose, 1800 mm	Ref. No. 8885100009
Blue hose, 5000 mm	Ref. No. 8885100023
Yellow hose, 1800 mm	Ref. No. 8885100010
Spare seal, sales pack: 10 pcs.	Ref. No. 8881500037
Seal	Ref. No. 8885400023



Red hose, 1800 mm	Ref. No. 8885100011
Red hose, 3000 mm, standard ASC	Ref. No. 8885100065
Red hose, 5000 mm	Ref. No. 8885100026
Red hose, 8000 mm	Ref. No. 8885100028
Blue hose, 1800 mm	Ref. No. 8885100012
Blue hose, 3000 mm, standard ASC	Ref. No. 8885100064
Blue hose, 5000 mm	Ref. No. 8885100025
Blue hose, 8000 mm	Ref. No. 8885100027
Spare seal	Ref. No. 8881500034

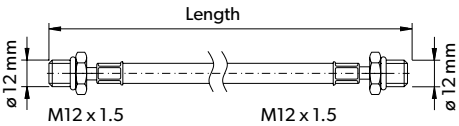


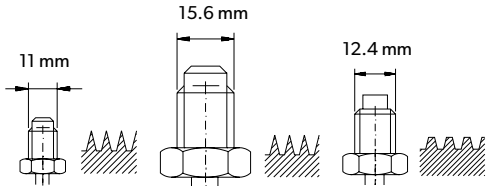
For connection to A/C service units RHS-910, RHS-950 and RHS-1050, the adapter 8885400038 is required.

Charging hoses and vacuum hoses

R 1234yf

Red hose, 3000 mm	Ref. No. 4440600175
Blue hose, 3000 mm	Ref. No. 4440600176
Red hose, 5000 mm	Ref. No. 8885100154
Blue hose, 5000 mm	Ref. No. 8885100153





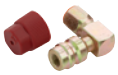
Sharp thread 1/4" SAE**

Sharp thread 3/8" SAE*

Trapezoid thread 1/2" ACME

* 3/8" SAE = 5/8" UNF,
** 1/4" SAE = 7/16" UNF

Ref. No.	Description	
8885400129	Connection adapter for reusable refrigerant bottle with seal	
4440600244	Seal for connection adapter 8885400129	
8885400024	Service quick coupler, low pressure, for R 134a with 3/8" SAE outside thread	
8885400025	Service quick coupler, high pressure, for R 134a with 3/8" SAE outside thread	
8885400089	Service quick coupler, low pressure, for R 134a with 1/4" SAE outside thread	
8885400090	Service quick coupler, high pressure, for R 134a with 1/4" SAE outside thread	

Ref. No.	Description	
8885400026 8885400027	Service quick coupler, low pressure, for R 134a with M14 x 1.5 inside thread Service quick coupler, high pressure, for R 134a with M14 x 1.5 inside thread	
8881500090 8881500088	Service port low pressure, R 134a, with outside thread, for Mercedes-Benz, Porsche, BMW, MAN, Opel Service port low pressure, R 134a, with inside thread, for VW, Audi, Ford, Chrysler	
8881500087 8881500089	Service port, high pressure, R 134a, with outside thread, for Mercedes-Benz, Porsche, BMW, MAN, Opel Service port, high pressure, R 134a, with inside thread, for VW, Audi, Ford, Chrysler	
8881500007 8881500006	Sealing cap for service port, R 134a, low pressure Sealing cap for service port, R 134a, high pressure	
8881500038 8881500039	Sealing cap for service port, R 134a, high pressure, for Japanese A/C systems Sealing cap for service port, R 134a, low pressure, for Japanese A/C systems	
8885400033 8885400082	Connection adapter with 1/4" SAE inside thread and connection for R 134a service quick coupler, low-pressure side Connection adapter with 1/4" SAE inside thread for high-pressure side	
8885400037	Connection adapter with 3/8" SAE inside thread and connection for R 134a service quick coupler, low-pressure side	
8881500013 8881500014	90° retrofit adapter for the high-pressure side with 1/4" inside thread 90° retrofit adapter for the high-pressure side with 3/16" inside thread	
8881500015	90° retrofit adapter for the low-pressure side with 1/4" inside thread	
8885400036	Retrofit adapter, straight, comprising one high-pressure and one low-pressure adapter, each with 1/4" inside thread	
8885400038	Adapter 1/4" SAE inside thread x 1/2" ACME outside thread	
8885400050	Adapter 1/4" SAE inside thread x 3/8" SAE outside thread	
8885400051	Adapter 3/8" SAE inside thread x 1/4" SAE outside thread	
8885400034 8885400035	Adapter 1/4" x low-pressure side Adapter 1/4" x high-pressure side	
4440600148	Adapter for R 1234yf refrigerant bottles, for large bottle valves -> HP	
8885400238	Adapter for R 1234yf refrigerant bottles, ½" ACME left -> HP	

Set of chip filters, 60 items

Filter catches contaminants coming from the system to protect the compressor

- Keeps the compressor free from chips, recommended e.g. when a new one was fitted
- Easy to fit; no need to cut pipes or insert fittings
- Choice of sizes to suit different A/C systems

Scope of delivery: 60 filters in 20 different sizes, SK47 including tools

SK47, with tools	Ref. No. 8885300128
Filter for Audi A3, VW Golf V and VW Touran	Ref. No. 8887300038
Chip filter 22 mm, set of 3 items	Ref. No. 8887300019
Chip filter 23 mm, set of 3 items	Ref. No. 8887300020

Set of valve cores, 70 items

Set of valve cores – avoids time-consuming search and procurement

Scope of delivery:
10x Valve cores R 134a, 10x Valve cores R 134a for Japanese make A/C systems, 10x Valve cores R 134a for Ford/Opel, 5x Sealing caps for service port R 134a high pressure, 5x Sealing caps for service port R 134a low pressure, 5x Sealing caps for service port R 134a high pressure for Japanese make A/C systems, 5x Sealing caps for service port R 134a low pressure for Japanese make A/C systems, 5x Service ports high pressure R 134a with outside thread or Mercedes-Benz/Porsche BMW/MAN/Opel, 5x Service ports low pressure R 134a with inside thread for VW/Audi/Ford/Chrysler, 5x Service ports high pressure R 134a with inside thread for VW/Audi/Ford/Chrysler, 5x Service ports low pressure R 134a with outside thread for Mercedes-Benz/Porsche/BMW/MAN/Opel

SK25, set of valve cores	Ref. No. 8885300116

Set of plugs for refrigerant lines, 179 items

Prevent moisture and contaminants from entering the A/C system during servicing work

Scope of delivery:
20x MF 9/16" (Ref. No. 8881500022), 15x MF 5/8" (Ref. No. 8881500023), 10x MF 3/4" (Ref. No. 8881500024), 10x MF 7/8" (Ref. No. 8881500025), 20x FF 9/16" (Ref. No. 8881500027), 10x FF 5/8" (Ref. No. 8881500028), 10x FF 3/4" (Ref. No. 8881500029), 10x FF 7/8" (Ref. No. 8881500030), 20x 7.6 – 9.4 mm (Ref. No. 8881500180), 20x 8.4 – 10.2 mm (Ref. No. 8881500181), 20x 11.3 – 13.1 mm (Ref. No. 8881500182), 14x 20.7 – 23.5 mm (Ref. No. 8881500183)

SK33, set of plugs	Ref. No. 8885300120

Orifice Tubes, 41 items

Set of orifice tubes for automotive A/C systems with accumulator

- The SK set of orifice tubes allows the user optimum, cost-saving working because it avoids time-consuming search and procurement

Scope of delivery:
5x Orifice tube (red, Ref. No. 8881100003), 5x Orifice tube (white, Ref. No. 8881100004), 5x Orifice tube (brown, Ref. No. 8881100005), 5x Orifice tube (blue, Ref. No. 8881100007), 5x Orifice tube (orange, Ref. No. 8881100008), 5x Orifice tube (grey, Ref. No. 8881100038), 5x Orifice tube (violet, Ref. No. 8881100039), 5x Orifice tube (yellow, Ref. No. 8881100040), 1x Orifice tube tool (Ref. No. 8885400040)

SK26, set of orifice tubes — Ref. No. 8885300117

Original replacement O-rings, 654 items

R 1234yf R 134a

For all common types of cars

- To save you from time-consuming procurement processes, we have put together a professional set of O-rings to replace virtually all O-ring connections on original A/C systems of the following makes: Alfa-Romeo, Audi, BMW, Citroën, Fiat, Ford, Honda, Hyundai, Jaguar, Mazda, Mercedes-Benz, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Renault, Rover, Saab, Subaru, Suzuki, Toyota, Volkswagen, Volvo

SK31, set of O-rings for cars, R 134a + R 1234yf — Ref. No. 8885300118

Original replacement O-rings, 330 items

R 134a

For all common types of trucks and vans

- Workshop kit for all servicing and repair works on A/C systems in trucks and vans, 17 different O-rings (330 items)

SK32, set of O-rings for trucks — Ref. No. 8885300119

Universal oil for the coating of O-rings in vehicle A/C systems

For all common types of trucks and vans

- Small and compact can (100 ml) with brush in the cap
- New O-rings need to be coated with oil so that they achieve a good sealing effect when sliding. The threads must also be coated
- Compatible with nearly all lubricants
- Suitable for all kinds of refrigerants
- Does not absorb moisture (non-hygroscopic)

Universal oil for the coating of O-rings in vehicle A/C systems — Ref. No. 8887200047

O-rings for R 134a refrigerant on retrofit A/C systems, 200 items

This workshop kit contains all the O-rings needed for servicing work on retrofitted A/C systems

Scope of delivery:

10 Valves R 134a	Ref. No. 8881500001
5 R 134a charging valves for Japanese make units	Ref. No. 8881500002
30 O-rings 6 R 134a	Ref. No. 8881500008
30 O-rings 8 R 134a	Ref. No. 8881500009
30 O-rings 10 R 134a	Ref. No. 8881500010
30 O-rings 12 R 134a	Ref. No. 8881500011
10 O-rings 6-6/16“	Ref. No. 8881500012
2 O-rings for compressor	Ref. No. 8881500020
10 O-rings for compressor	Ref. No. 8881500130
3 Seals for charging hose 1/4"	Ref. No. 8885400023
10 O-ring pressure switches, outside thread	Ref. No. 8881500055
10 O-ring pressure switches, inside thread	Ref. No. 8881500033
3 Seals R 134a for service hose	Ref. No. 8881500034
10 Seals OR	Ref. No. 8881500036
10 Seals for charging hose	Ref. No. 8885400037
5 O-rings for charging hose R 134a	Ref. No. 8881500041

SK06, set of O-rings — Ref. No. 8885300114

Original replacement special O-rings for various French make car A/C systems, 44 items

12 different designs / dimensions. The ideal supplement to the SK 31 basic set.

SK39, set of special O-rings — Ref. No. 8885300109

Original replacement special O-rings for various German make car A/C systems, 84 items

7 different designs / dimensions. The ideal supplement to the SK 31 basic set.

SK40, set of special O-rings — Ref. No. 8885300110

Universal oil for the coating of O-rings in vehicle A/C systems

For all common types of trucks and vans

- Small and compact can (100 ml) with brush in the cap
- New O-rings need to be coated with oil so that they achieve a good sealing effect when sliding. The threads must also be coated
- Compatible with nearly all lubricants and suitable for all kinds of refrigerants
- Does not absorb moisture (non-hygroscopic)

Universal oil for the coating of O-rings in vehicle A/C systems — Ref. No. 8887200047

ONLINE CATALOGUE:

WAECOPARTS.COM

Don't search, find! The WAECO AirCon Parts online catalogue is as quick and easy to use as your TecDoc search engine.
It provides detailed vehicle descriptions with all vehicle-specific parameters included on a clearly structured platform.

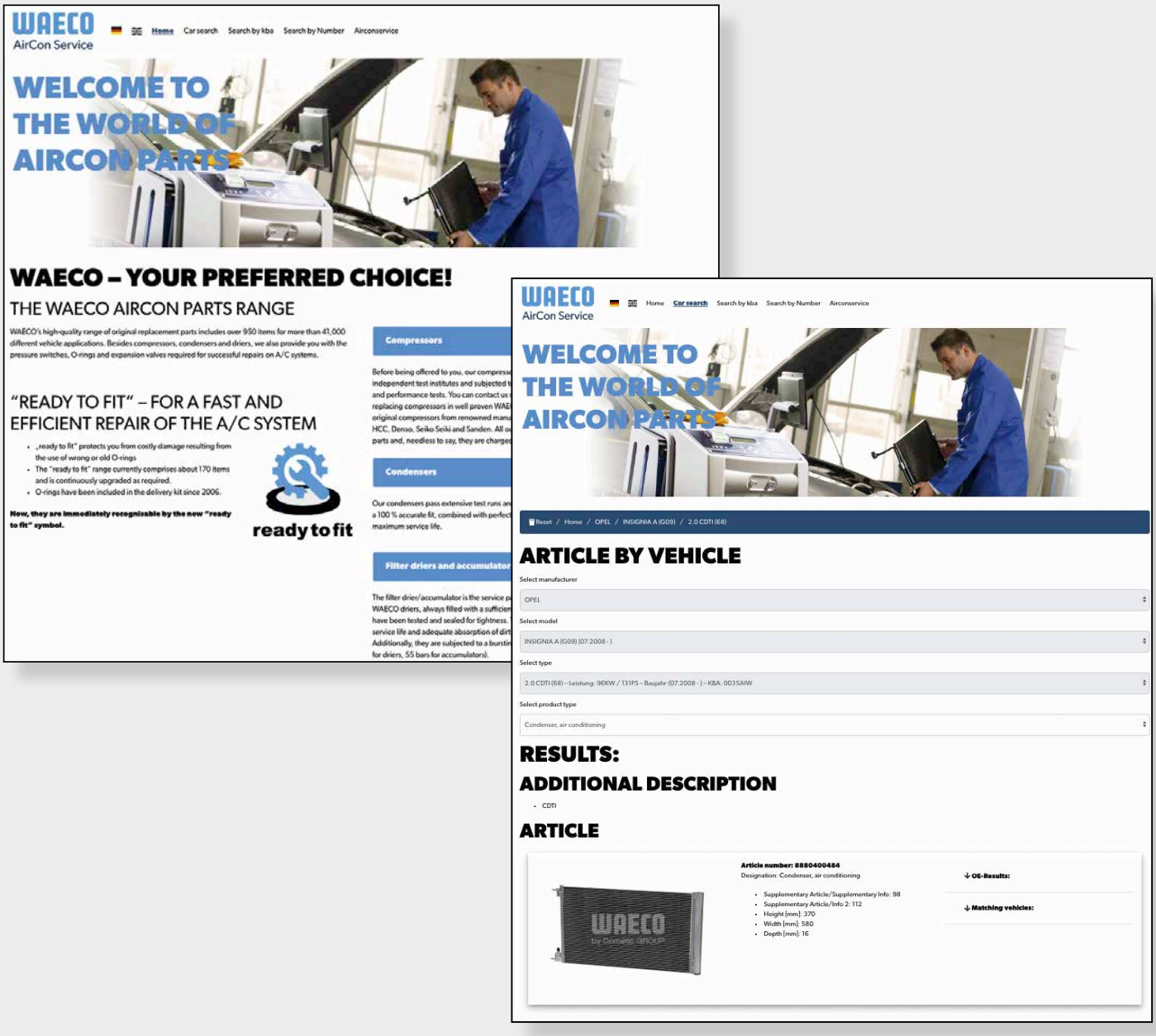
CROSS REFERENCE LISTS

The number of air conditioned cars on European roads is steadily increasing, and so is the demand for spares. With a virtually complete range of A/C spare parts Dometic WAECO offers profitable business opportunities for quality-conscious workshops.

Under www.waecoparts.com you can also find cross references to the A/C parts of original equipment manufacturers and other suppliers. Using these cross reference lists you can easily replace any commonly used A/C part with a WAECO AirCon part.

Check it out for yourself!

TecAlliance
Certified Data Supplier



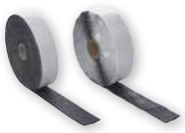
Ref. No.	Description	
8887300008 R 134a 8887300043 R 1234yf	**Click Lock service quality seal**	
8887300007	**Service stickers** Sales pack: 5 pcs.	
8887100007	**Refillable steel bottle** R 134a Refill only	
8887100019	**Refillable steel bottle** R 1234yf Refill only	
8887200058 8887200060 8887200059 8887200061 8887200021	**R 134a original oils** PAG ISO 46, 250 ml PAG ISO 100, 250 ml PAG ISO 46, 500 ml PAG ISO 100, 500 ml ND 8, 500 ml	
8887200001 8887200002 8887200008	**R 134a aftermarket** PAG ISO 46, 250 ml PAG ISO 100, 250 ml PAG ISO 150, 250 ml	
8887200013 8887200014 8887200019 8887200017 8887200028	**R 134a aftermarket** PAG ISO 46, 500 ml PAG ISO 100, 500 ml PAG ISO 150, 500 ml Universal PAO, 500 ml POE oil SE 55, 500 ml	
8887200035 8887200031 8887200046 8887200039	**R 1234yf original oils** ND 11, 100 ml ND 12, 100 ml VC 200yf, 500 ml SPA 2, 500 ml	

Ref. No.	Description	
8887200062 8887200063 8887200048	**R 1234yf original oils** PAG ISO 46yf, 250 ml PAG ISO 46yf, 500 ml SPA2, 250 ml	
8887200067 8887200068 8887200069	**Prof. oil system for third-party service units*** WAECO DHO PS-F, 150 ml WAECO DHO PR, 150 ml WAECO DHO 1234yf, 150 ml	
8887200006	**POE compressor oil** for R 134a and R 404, 1000 ml	
8887200009	**Universal PAO ISO 68 compressor oil** 1000 ml	
8887200047	**Universal oil for the coating of O-rings in vehicle A/C systems** 100 ml	
8887200018	**Vacuum pump oil** HT 32, 1000 ml	
8887300018	**Leak detection spray** 500 ml	
TP-9000-0008 TP-9000-0016	**TRACER® GLO-AWAY** Spray bottle, 225 ml Refill bottle, 450 ml	

* Adapter see page 44

Ref. No.	Description	
TP-3400-0601 TP-3900-0601	**TRACER® dyes** for oils and fuels, sales pack: 6 pcs. for cooling water sales pack: 6 pcs.	
TP-3860-0601	**TRACER® sticks** for R 134a in combination with PAG oil sales pack: 6 pcs.	
TP-9860-0301, 3 cartridges of 14 ml TP-9760-0304, 3 cartridges of 118 ml	**TRACER® cartridge** for R 134a in combination with PAG oil	
TP-3820-0008	**TRACER® bottle** for R 134a in combination with PAG oil, 236 ml	
TP-3820-0016	**TRACER® bottle** for R 134a in combination with PAG oil, 475 ml	
TP-3820-0301	**TRACER® bottle** for R 134a in combination with PAG oil, sales pack: 3 pcs.	
TP-9825-0301, 3 cartridges of 14.8 ml TP-3825-0008, 237 ml	**TRACER® UV additive** UV tracer dye for R 1234yf refrigerant	
TP-3820-500 TP-3825-500	**UV TRACER® dye** Profi oil system, 500 ml, R 134a Profi oil system, 500 ml, R 1234yf	

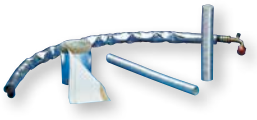
* Adapter see page 44

Ref. No.	Description	
TP-3820-150 TP-3825-150	**UV TRACER® dye** Profi oil system*, 150 ml, R 134a Profi oil system*, 150 ml, R 1234yf	
TP-3826-050	**TRACER® UV additiv for R 744** no profi oil system, 60 ml can filled with 50 ml (based on ND 15 oil)	
TP-3812 TP-3811-0301	**UV additive injection kit for hybrid vehicles** Spare cartridge	
8887400008 8887400016	**Air conditioner cleaner** 1000 ml 100 ml, sales pack: 20 pcs.	
8887400009 8887400015	**Car Refresh smell eliminator** 1000 ml 100 ml, sales pack: 20 pcs.	
Tar tape 8887300001 Neoprene tape 8887300002	**Insulating material** Application temperature: –29 °C ~ + 93 °C Application temperature: –40 °C ~ + 105 °C	

Heat protection pipe [1]
For fitting on refrigerant lines, aluminium coated on one side, highly extendable and flexible, suitable for temperatures up to 600 °C

Heat protection hose with Velcro fastener [2]
For fast retrofitting on refrigerant lines, suitable for temperatures up to 600 °C

[1] 8887300003,
Length: 425 mm, Ø inside 26,5 mm
[1] 8887300004,
Length: 240 mm, Ø inside 36,5 mm
[2] 8887300005,
Length: 1000 mm, Ø inside max. 30 mm



WHAT ARE THE THINGS TO NOTE WHEN DEALING WITH R 1234YF?

The “new” R 1234yf refrigerant has a different chemical composition and thus other properties than R 134a. The service unit’s pressurised containers, hoses, gaskets and manometers have to be adapted accordingly. R 1234yf may never be processed in service units designed for use with R 134a. Refrigerant storage conditions are also different from those formerly applicable. Workshop operators must provide for proper ventilation and ensure operating safety regulations are met.

WHAT ARE THE THINGS TO NOTE WHEN BUYING AN A/C SERVICE UNIT FOR R 1234YF?

A/C workshops are most likely to have at least two different service units in the future, because R 134a and R 1234yf must not be mixed. To avoid confusion, the units should be clearly recognisable. R 1234yf service units are subject to special safety regulations, because the “new” refrigerant must not escape into the atmosphere.

Therefore, a suitable R 1234yf service station should perform a fully automatic self test prior to every start-up to check if the unit is tight and trace potential leaks. Service couplers should also be different from those used for R 134a units to avoid the risk of confusion when connecting the service equipment. R 1234yf service couplers should have what is called a “ventilated clearance” to ensure that no refrigerant escapes from the air conditioner even when you have a defective Schrader valve. Last but not least, the use of refrigerant analysis tools is mandatory. The analysis tool checks the purity of the refrigerant to prevent dangerous cross contamination. Ideally, it is already integrated in the service station.

WHY SHOULD WORKSHOPS NOT INVEST IN A COMBO SERVICE UNIT?

Combo service units suitable for both refrigerants are more complex and therefore more expensive. This is because two separate refrigerant circuits need to be integrated into a single unit. If one of the circuits fails, the complete service unit is useless. Costly downtimes are the result. You can only do one service job at a time, while the unit’s second function remains unused. Apart from that many workshops already have at least one service unit for R 134a.

ARE THERE SPECIAL PAG OILS AND UV ADDITIVES FOR R 1234YF A/C SYSTEMS?

R 1234yf A/C systems require special, perfectly coordinated compressor oils and UV additives, which must be stored in moisture-free conditions. We recommend the bottle system from WAECO.

HOW WILL PRICES FOR R 1234YF REFRIGERANT DEVELOP?

As it looks today the price for R 1234yf refrigerant will be way above that of R 134a. The workshop selling price will be about 130 euros per kilogram, which means any refrigerant lost will cost a pretty penny. A conventional service unit losing 100 grams of refrigerant per service means you are losing a total of 25 euros every time. Things are different with the ASC 5500 G RPA from WAECO. This service unit uses a Low Emission concept which guarantees a refrigerant loss rate of close to zero percent.

TROUBLESHOOTING CHART
FOR VEHICLE AIR CONDITIONING SYSTEMS

Introduction

The professional tips chart provides help and support when troubleshooting the air conditioning systems.
This clearly arranged diagnosis guide will help you find the typical functional errors that may occur in air conditioning systems for vehicles.

Legend

AC = air conditioning

LP = suction pressure

HP = high pressure

V = compressor with suction pressure regulator

F = compressor with constant displacement

How to use the chart

Professional tips can only be performed properly if the appropriate workshop equipment is available. The required equipment can be found in our workshop catalogue. Follow the operations listed on the following pages step by step. Only then can you be certain to achieve a good result from your troubleshooting efforts.

Step 1 Test conditions/preparations

Step 2 Performance test air conditioning system

Step 3 If a malfunction occurs, it must be grouped into one of the three specific types of errors, which are summarised in three standard worksheets.

Base table A	The air conditioning system does not cool
Base table B	The air conditioning system produces an inappropriate noise
Base table C	The air conditioning system produces an odour

Step 4 The fault can then be diagnosed using the relevant worksheets.
The specific worksheets provide useful assistance for troubleshooting.

Worksheet 1	Insufficient heat dissipation via the condenser
Worksheet 2	The refrigerant quantity is incorrect and non-condensible gases or moisture occur in the system
Worksheet 3	Faulty expansion valve
Worksheet 4	Fault in the suction pressure regulator (V5)
Worksheet 5	Fault in the compressor's electrical magnetic coupling, i.e. the coupling slips or does not engage
Worksheet 6	The suction and pressure lines on the compressor are reversed
Worksheet 7	Stoppage in the refrigerant circuit
Worksheet 8	Ice formation in the evaporator
Worksheet 9	Faulty compressor
Worksheet 10	Penetration of hot air into the compartment/circulation of hot water in the heating system's heat exchanger

Table

STEP 1

TEST CONDITIONS/PRELIMINARY STEPS

Connect the WAECO filling station to the low pressure side (L.T.) and the high pressure side (H.T.) on the air conditioner's service connection.

On vehicles with mechanical a thermostat, it must be ensured that the thermostat setting is correct and it should be adjusted if necessary (setting values: final position clockwise, 1/4 turn back, then adjustment).

Start the engine and set the engine speed at 1500 – 2000 rpm.

Start the air conditioning system by pressing air conditioning button.

Select fan level 2 or 3.

Measure the temperature in the vehicle and in the workshop with the thermometer.

If the cabin temperature is lower than the room temperature.

Let the air conditioner work under these conditions for 5 – 10 minutes.

Then carry out a performance check on the air conditioner.

If the cabin temperature is higher than the outside temperature.

Open windows and doors. Wait until the indoor and outdoor temperatures have levelled off (or until a fairly even temperature level is achieved).

Close windows and doors.

NOTE

For outside temperatures above 28°C, the recirculation function must be selected (refer also to the vehicle manual) in order to prevent hot air from entering from the outside.

STEP 2

PERFORMANCE VERIFICATION OF AIR CONDITIONERS

The execution must follow the settings for the test conditions described in step 1.

Measure the air inlet temperature with the temperature measurement instrument. For this purpose, the measuring instrument's sensor must be exactly in the middle nozzle.

Start the engine and set the engine speed at 1500 – 2000 rpm.

Temperature table

Outside temperature at the vehicle/ ambient temperature	20°C	25°C	30°C	35°C
Exhaust-temperature at the Center nozzle	6 – 8°C	7 – 10°C	8 – 12°C	10 – 14°C

NOTE

Compare the obtained values with the data specified according to the temperature table.

The measured value obtained is higher than the value that is specified in the temperature table. → For problem-solving, use base table A.

Does the air conditioning system have an abnormally loud noise? → For problem-solving, use base table B.

Does the air conditioner cause an unpleasant smell? → For problem-solving, use base table C.

The air conditioning unit works flawlessly.

STEP 3 – BASE TABLE A

THE AIR CONDITIONING SYSTEM DOES NOT COOL

The table below shows the normal operating pressure values for the air conditioning system, which occur when the aforementioned initial conditions are configured. If the pressure values are not achieved, it must be assumed that there is an error in the air conditioning system.

Outdoor temperature °C	Compressor with suction pressure regulator (V) (Example: Harrison V5)				Compressor constant displacement (F) (Example: SD 7H15, SS121DS1, etc.)							
	R134A				R134A				R134A			
	LP (bar_e)		HP (bar_e)		LP (bar_e)		HP (bar_e)		LP (bar_e)		HP (bar_e)	
	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
15.5	1.5	2.3	9.5	13.0	0.5	3.0	9.5	13.0	0.5	3.0	8.5	12.0
21.0	1.5	2.3	12.5	17.5	0.5	3.0	12.5	17.5	0.5	3.0	10.5	17.5
26.5	1.5	2.3	14.0	20.5	0.5	3.0	14.0	20.5	0.5	3.0	12.5	19.0
32.0	1.5	2.5	16.0	24.0	0.5	3.5	16.0	24.0	0.5	3.5	14.0	22.0
38.8	1.5	2.5	18.5	25.5	0.5	3.5	18.5	25.5	0.5	3.5	16.0	23.0
43.0	1.5	2.5	22.0	28.0	0.5	3.5	22.0	28.0	0.5	3.5	19.0	25.0

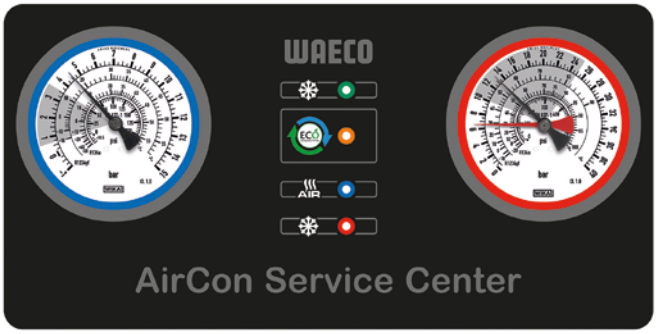
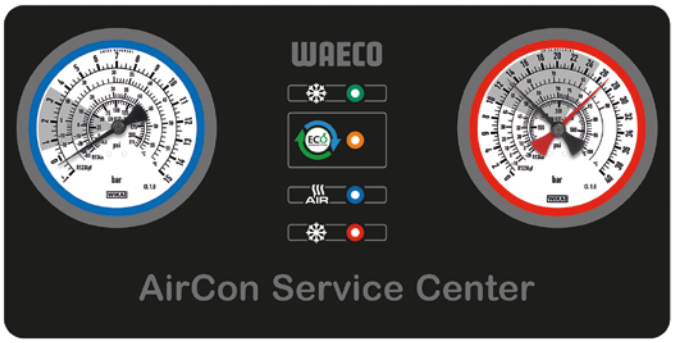
If the pressure values are not within the specified limits, the reason for this must be determined. The basis of the considerations when troubleshooting is the measurement of the values for the air conditioning system's suction pressure and high pressure using a manometer. Please bear in mind that in a depressurised condition (ambient pressure), the manometers should indicate "0".

EXAMPLE OF USING THE DIAGNOSIS SHEET

For a clear explanation, the manometer is illustrated below in an enlarged scale with the largest deviation in relation to the normal value.

The information listed on the following pages could be possible causes.
Under certain conditions, other causes of error could be present.
Symbol (V) – only for compressors with a suction pressure regulator
Symbol (F) – only for compressors with a fixed displacement

PROFESSIONAL TIPS

Error	Possible cause
 Low pressure too high High pressure normal (l) or too low (s)	• The suction and pressure lines on the compressor are reversed (see Worksheet 6) • The compressor magnetic coupling slips or does not engage (see Worksheet 5) • The expansion valve is blocked in the open position. If the air conditioner is equipped with a compressor with a suction pressure regulator, small but rapid changes in pressure occur on the low pressure side (see Worksheet 3). • (V) The compressor's suction pressure valve is defective or the factory setting is not suitable (see Worksheet 4) • The compressor is damaged (see Worksheet 9)
 Low pressure too low High pressure high (H) or normal (l)	• (F) The thermostat is defective (see Worksheet 8) • (F) The expansion valve is closed, i.e. blocked or clogged (see Worksheet 3) • The drying filter is saturated with moisture (see Worksheet 2) • (V) The compressor's suction valve is blocked for the largest transport volume (see Worksheet 4) • (F) Stoppage in the refrigerant line between the filter and the expansion valve (see Worksheet 7)
 Low pressure normal (l) or too low (s) High pressure normal	• Inflow of warm air in the evaporator or in the compartment (see Worksheet 10) • Inflow of warm water in the heating system's heat exchanger (see Worksheet 10) • Icing in the evaporator unit (see Worksheet 8)

PROFESSIONAL TIPS

Error	Possible cause
 Low pressure high (H) or normal (I) High pressure too high	• Possible normal operating pressure at high ambient temperature (> 43°C) • Excessive refrigerant filling (30-35% more than the prescribed amount, see Worksheet 2) • Impurities in the condenser • (V) Defective suction pressure regulator on the compressor (see Worksheet 2) • Stoppage on the high pressure side between the compressor, condenser and filter. Important – the stoppage can only be in the area around the service connection for high pressure, not on the low pressure side.
 Low pressure normal (I) or too low (s) High pressure too low	• Possible normal operating pressure at low ambient temperatures (> 5°C) • Possible normal operating pressure at low ambient temperatures • Low refrigerant volume, 70-75% below normal amount (see Worksheet 2) • (V) The expansion valve is closed (blocked) or clogged (see Worksheet 3) • (V) Stoppage on the low or high pressure side between the filter and evaporator (see Worksheet 7) • Stoppage between the compressor and condenser or the condenser and filter, however on the high pressure side (see Worksheet 7)
 Low pressure and high pressure manometers show the same value.	• Defective compressor (see Worksheet 9) • One possible cause of error is improper alignment of the pulleys (see installation instructions), the drive belt slips • The compressor magnetic coupling slips or is defective (see Worksheet 5) • Defective compressor (see Worksheet 9) • (V) Defective suction pressure regulator on the compressor (see Worksheet 4)

STEP 3

BASE TABLE B – THE AIR CONDITIONING SYSTEM PRODUCES AN INAPPROPRIATE NOISE

Noises heard when the air conditioning system is switched on are not necessarily a sign of a fault. However, if the noise remains after a few minutes, check whether one of the following reasons is causing an operating fault and test the proposed solution.

Cause	Solution
The V-belt is slipping or worn.	Check that the belt is sufficiently tensioned and that it is positioned straight on the pulley.
The ball bearing in the belt tensioner causes noise.	Replace the bearing.
Compressor magnetic coupling slips.	Check the distance between the belt pulley and the drive plate. It must be configured to between 0.4-0.6 mm (refer also to "Technical documentation for AC systems in vehicles").
Vibration noise from the compressor base.	Check that all nuts and bolts are properly tightened. Check that the belt pulley is even (see installation instructions).
The expansion valve "makes noise".	If the noise continues: Replace the valve (see Worksheet 3).
Noises from the drain hose for the condensate.	Equip the drain hose for condensate with a "check valve". In this way the condensate is lead out and is not sucked return, which would otherwise cause a gurgling sound.

IMPORTANT

In the following circumstances, malfunctions cause abnormal suction and high pressure on some of the air conditioner's components. This phenomenon causes noise at the compressor, which is not caused by the compressor. The following reasons cause the noise.

Cause	Solution
The refrigerant volume is not correct (30 – 35% too much or 70 – 75% too little).	See Worksheet 2.
The expansion valve is closed, blocked or clogged	See Worksheet 3.
The compressor's suction pressure regulator is defective (only for compressors with a suction pressure regulator (V)).	See Worksheet 4.
Stoppage in the air conditioner system's refrigerant circuit.	See Worksheet 7.
The filter is saturated with moisture.	See Worksheet 2.

If the noise continues, despite inspection and possible rectification of the possible causes listed above, contact WAECO's technical service department.

STEP 3

BASE TABLE C – THE AIR CONDITIONING SYSTEM PRODUCES AN ODOUR.

Cause	Solution
Under specific conditions, bacteria can form on the surface of the evaporators and cause an "unpleasant odour" inside the vehicle.	Treat the evaporator with any of WAECO's cleaning products, such as Refresh-o-mat. **Recommendation for customers:** Turn off the air conditioner for a few minutes before the vehicle is stopped. Allow the compartment ventilation to run for a few minutes (which will dry the evaporator, which is otherwise a breeding ground for bacteria). If the "unpleasant odour" continues to persist after implementation of the above steps, contact WAECO's technical service department.

Did you know …

… it is important to change the dryer when the system has been opened

STEP 4

WORKSHEET 1

FOR HIGH CONDENSER PRESSURE

Cause	Solution
Insufficient air flow caused by the accumulation of dirt on the condenser or radiator (probably only after about 25 – 30,000 km).	Cleaning of the radiator and condenser.
The pressure switch and the temperature switch are not engaged at the relevant pressure and temperature values.	Control of the contact points on the pressure switch and thermostat. If necessary, replace the defective component (refer also to "Technical documentation for AC systems in vehicles").
The switch for the radiator fan is not working.	Power supply directly to the electric fan. If the fan does not work, replace it.
Fault in the functioning of the electric fan. (Wrong direction of rotation.)	The electric fan should operate in such a manner that it sends air into the engine compartment.
Overheating of the cooling water.	Check the vehicle's own cooling system.
Improper condenser installation.	Check if the distance between the radiator and the condenser is about 15 – 20 mm and that the air hose, where relevant (see the assembly instructions), is correctly positioned (see also "Technical documentation for AC systems in vehicles").

WORKSHEET 2

INCORRECT REFRIGERANT VOLUME – INAPPROPRIATE GAS, NON-CONDENSIBLE GAS OR MOISTURE IN THE SYSTEM.

Cause	Solution
Improper refrigerant volume, 30 – 35% too much or 70 – 75% too little filling quantity. **Note** When correcting filling quantity, it is not necessary to replace the air conditioner's drying unit.	Extraction of refrigerant from the air conditioning system.
The evacuation time is not sufficient.	Replace the desiccant container.
Contaminated refrigerant.	Removal of the non-condensible gas and moisture in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes.
The filter is saturated with moisture.	Checking the vacuum sealing using a drying manometer (see "User instructions for the waste station" for details).
	New filling of the air conditioning system with the recommended refrigerant. The amount of oil sucked out must be replenished again (refer to the assembly instructions or the table of refrigerant quantities).

WORKSHEET 3

THE EXPANSION VALVE IS DEFECTIVE

NOTE: The expansion valves bulb is always installed on the evaporator's outlet tube (suction pipe) (1/2" pipe). On expansion valves with external pressure equalization, the following test must be performed while the system is running:

- **Allow the temperature sensor to cool. You should be able to note a reduction in the high and low pressure.**
- **Allow the temperature sensor to warm up. You should be able to note an increase in the high and low pressure.**

If the expansion valve does not respond to the load described, there is a fault. Check the expansion valve further in the manner described below.

Cause	Solution
The expansion valve's bulb filling is defective.	Draining the refrigerant from the air conditioning system.
The mechanism in the expansion valve is blocked	Replacing the expansion valve.
	Removal of the non-condensible gas in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes. Important: Check the degree of evacuation!
	New filling of the air conditioning system with the recommended amount of refrigerant and oil, if there has been an evacuation of the refrigerant (see the assembly instructions or the refrigerant table).

WORKSHEET 4

THE COMPRESSOR'S SUCTION PRESSURE REGULATOR IS DEFECTIVE

Cause	Solution
The valve is blocked because of dirt (the evaporator has a tendency to icing).	Draining the refrigerant in the air conditioning system.
The spring in the compressor's control valve is defective.	Replace the control valve, which is located in the rear section of the compressor.
	Removal of the non-condensible gas in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes. Important: Check the degree of evacuation!
	New filling of the air conditioning system with the recommended refrigerant. The amount of oil sucked out must be replenished again (refer to the assembly instructions or the table of refrigerant quantities).

Did you know …

… the cabin filter has influence on the cooling capacity?

WORKSHEET 5

THE COMPRESSOR'S MAGNETIC COUPLING „SLIPS" OR DOES NOT ENGAGE

Cause	Solution
For a small amount of refrigerant.	Checks regarding leaks in the cooling circuit (see Worksheet 2).
Interruption of the power supply to the compressor magnetic coupling.	Remove the power cable to the magnetic coupling. Connect it directly to the vehicle's battery using a 7.5A fuse.
	If the magnetic coupling does not engage, it must be replaced. If the magnetic coupling engages, check the functioning of the following components: Pressure switch, thermostat, the air conditioner' switch, electrical connections (see also "Technical documentation for the AC installations in vehicles".)
Incorrectly configured clearance on the compressor's magnetic coupling.	The magnetic coupling's clearance must be configured between 0.4 – 0.6 mm (see also "Technical documentation for AC installations in vehicles").

Did you know …

… that you must never pressure test at more than 12 bar?

WORKSHEET 6

THE HIGH AND LOW PRESSURE LINES ON THE COMPRESSOR ARE REVERSED

Cause	Solution
Error with connection of the refrigerant lines to the compressor.	Check if the suction pipe (1/2") is connected to "SUC" on the compressor and the high pressure line (13/32") on "DIS" on the compressor.
	If the above lines are reversed, perform an evacuation of the refrigerant from the air conditioner.
	Correct connection of the refrigerant lines on the compressor.
	Removal of the non-condensible gas in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes. Important: check the degree of evacuation!
	New filling of the air conditioning system with the recommended refrigerant. The amount of oil sucked out must be replenished again (refer to the assembly instructions or the table of refrigerant quantities).

If the air conditioning system is equipped with a compressor with constant displacement (F), it shall be possible to determine that the compressor only connects on rare occasions and for a few seconds. If the air conditioning system is equipped with a compressor with a suction pressure regulator (V), it shall be possible to determine that the compressor is switched rapidly on and off.

WORKSHEET 7

STOPPAGE IN THE AIR CONDITIONER SYSTEM'S REFRIGERANT CIRCUIT.

Cause	Solution
Dirt or twisting causes a stoppage in the refrigerant circuit.	Locating the stoppage by looking for an abnormal temperature change along the refrigerant circuit (warm on front of the stoppage, cold after the stoppage). Draining the refrigerant from the air conditioning system. Replacing the clogged component. Checking the refrigerant circuit regarding several dirt accumulations. Removal of the non-condensible gas in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes. Important: check the degree of evacuation! New filling of the air conditioning system with the recommended refrigerant. The amount of oil sucked out must be replenished again (refer to the assembly instructions or the table of refrigerant quantities).

Did you know ...

... that you should never recycle a pressureless air-conditioner, but always test it with nitrogen before filling? **See page 62**

WORKSHEET 8

ICE FORMATION ON THE EVAPORATOR

Cause	Solution
Malfunction of the thermostat or icing protection probe (if one has been installed).	Check whether electrical connections on the thermostat or the icing protection probe is correct and whether the bulb is firmly touching the evaporator coil. If necessary, replace the component (see also "Technical documentation for AC installations in vehicles").
Malfunction of the compartment ventilation fan.	When the air conditioner is turned on, at least the first fan level must be active. Checking the compartment ventilation fan's electrical connection (see wiring diagram).
The compressor's suction pressure regulator is defective (only for compressors with adjustable displacement (V)).	Functional check of the control valve for displacement (see Worksheet 4 and "Technical documentation for AC systems in vehicles"). If the pressure control valve is defective, replace the component.

When the air conditioning system has been in operation for a few minutes, it is already possible to notice a significant reduction in the air flow at the air intake grille.

WORKSHEET 9

DEFECTIVE COMPRESSOR

Cause	Solution
The suction pressure regulator in the compressor (V) is defective.	Draining the refrigerant from the air conditioning system.
The compressor has cut out.	Disassembly of the compressor.
	Draining the compressor oil and checking for any mechanical wear on the compressor. If shavings (wear) can be seen in the compressor oil, please contact WAECO's service technician.
	Installing a new compressor.
	Installing a new drying unit.
	Removal of the non-condensible gas in the air conditioning system, which means that the vacuum pump is kept running for at least 30 minutes. Important: Check the degree of evacuation!
	New filling of the air conditioning system with the recommended refrigerant. The amount of oil sucked out must be replenished again (refer to the assembly instructions or the table of refrigerant quantities).

WORKSHEET 10

PENETRATION OF WARM AIR INTO THE COMPARTMENT. INFLOW OF HOT WATER INTO THE HEATING SYSTEM.

Cause	Solution
The heating system's water valve (if any) does not close properly.	Verification of the arm and/or position motor on the heating ventilation box. If necessary, switch off the power supply to the vehicle's heating system.
The damper for air mixture (heating air damper) and/or the damper system for the recirculation air does not close properly.	Verification of the arm and/or position motor on the heating ventilation box. Checking the damper system for the circulation air.
Poor insulation of the transitions to the air distributor box or the open air.	Checking the transitions between the evaporator and the air distributor box regarding tightness, which means that hot air cannot penetrate in from the outside.

Did you know …

… it is important to adapt the oil amount when repairing the system?

LOW-PRESSURE

HIGH

- The suction and pressure side on the compressor are reversed (see Worksheet 6)
- The compressor's magnetic coupling slips or does not engage (Sheet 5)
- The open expansion valve is blocked (Worksheet 3). If the compressor has a suction pressure regulator, small but rapid pressure fluctuations occur on the low pressure side
- (V) The suction pressure regulator functions incorrectly or is defective (Worksheet 4)
- Defective compressor (Worksheet 9)

LOW

- (F) The thermostat is defective (Worksheet 8)
- (F) The closed expansion valve is blocked or clogged (Worksheet 3)
- The drying filter is saturated with moisture (Worksheet 2)
- (V) The suction pressure regulator is blocked at maximum capacity (Worksheet 4)
- (F) Stoppage in the air conditioner's LP or HP area (Worksheet 7)

HIGH-PRESSURE

HIGH

- Normal situation with very high ambient temperature (> 43°C)
- Excessive quantity of refrigerant, 30-35 % excess refrigerant (Worksheet 2)
- Error with heat exchange in the condenser (Worksheet 1)
- Gases that are difficult to condense in the air conditioning system (Worksheet 2)
- (V) The compressor's suction pressure regulator is defective (Worksheet 4)
- Stoppage in the air conditioner's HP area, between compressor and condenser, condenser and filter, but after the high-pressure connection

LOW

- Normal situation with very low ambient temperature (< 5°C)
- Insufficient quantity of refrigerant, 70 – 75% too little refrigerant. Possible refrigerant loss (Worksheet 2)
- (V) The closed expansion valve is blocked or clogged (Worksheet 3)
- (F) Stoppage on the LP or HP side between the filter and evaporator (Worksheet 7)
- Defective compressor (Worksheet 9)

LOW PRESSURE OR HIGH PRESSURE

NORMAL

- Inflow of warm air to the interior of the evaporator group or the passenger compartment (Worksheet 10)
- Icing in the evaporator (Worksheet 8)

EVEN

- The compressor drive belt slips. One possible reason could be a displacement of the uniform direction on the belt pulleys (see installation instructions).
- The compressor's magnetic coupling slips or does not engage (Sheet 5)
- Damaged compressor (Worksheet 9) (V) The compressor's suction pressure regulator is defective (Worksheet 4)

FUNCTIONAL TEST FOR AC SYSTEMS WITH NON-VARIABLE COMPRESSORS (E.G. SANDEN, SEIKO-SEIKI)

CHECK THE THERMOSTAT:

Turn on the AC system and let it run for a few minutes with maximum cooling effect so that the ventilation system cools down. Configuration must occur at a speed of approx. 2500 rpm and with the fans in the lowest position 1: configure the thermostat so that the air temperature in the middle exhaust valve is approx. 6 °C. Important! Make sure the sensor is securely attached in the evaporator and has good surface contact.

CHECK THE PRESSURE IN THE AC SYSTEM:

Approximate valuesat a speed of 2500 rpm and the fan in position 1: the low pressure side 0.5 – 1.5 bar, the high pressure side 10 – 15 bar.

FUNCTIONAL TEST FOR AC SYSTEM WITH VARIABLE COMPRESSORS (e.g. Harrison)

Vehicles with variable compressors have no thermostat. The

suction pressure in the system for such vehicles is regulated automatically and is always 2 bar.

GENERAL CHECKS OF THE AC SYSTEM

- Check that the condenser fan is working flawlessly and that it rotates in the right direction
- Check that the pressure switch/trinary switch works. (On/off switch for the condenser fans. "On" at approx. 15 bar, "Off" at approx. 13 bar).
- Check that the recirculation cover works flawlessly
- Check that the car's ventilation system works flawlessly
- Check other equipment, if available (e.g. heating faucet or valve for vacuum regulator)
- Check that the idle boost functions, if this function is available
- Check that the protective circuit works (the compartment ventilation fan must either be on for the AC system to be able to start, or start automatically when the AC system is turned on)
- Check that the drain hose for condensed water is correctly installed and is operating flawlessly
- Check all parts of the AC system, ensure that everything is installed correctly and the components are securely in place and that there are no leaks.

GENERAL ASSEMBLY INSTRUCTIONS

CHECKS THAT MUST BE CARRIED OUT BEFORE ASSEMBLY

Since the AC system works in conjunction with the car's various parts, the following settings and functions must be checked before installation:

1. The idle speed must be the preconfigured speed
2. The output voltage from the generator must be 14-15 V
3. The heater fan must perform flawlessly in all operating modes
4. The heating valves must function flawlessly
5. All electrically operated components in the car must be checked to ensure that they are functioning properly

Any errors or discrepancies must be corrected before the work begins.

COMPRESSOR OIL

Note! Only synthetic oil may be used with R134a refrigerant, never mineral oil.
Most compressors are already filled up with the correct quantity from the beginning. Check the oil level during maintenance and repair and replenish if necessary.

INSTALLATION OF AC SPARE PARTS

- Before fitting the component, check that all connectors, fasteners and other details are the same as on the part to be replaced
- When the hoses and connections are loosened, they must be immediately sealed with protective caps or similar so that moisture or dust cannot enter the AC system. The spare part's protection should be removed just before installation.
- When connections are tightened or loosened, two wrenches should always be used so the hoses are not twisted around
- Before assembly, ensure that the O-ring is properly in place
- O-rings may not be reused
- Drip some compressor oil on the O-ring before connecting the refrigerant hose
- All O-ring connections should be tightened with a torque wrench because excessive force can damage the seal and cause leaks
- Lay electrical wiring, refrigerant tubing and other tubes such that they are at least 15 mm from rotating parts, 150 mm from parts that become very hot, 20 mm from the ignition system's wires and 20 mm from the fuel lines
- Attach the cables with cable ties or similar
- Route all cables ensuring that they cannot be damaged by sharp edges
- Push all contacts firmly so that they sit securely in place
- Protect connections that may be splashed with water (e.g. in the engine compartment) with protective spray, insulation tape or similar

O-ring couplings: sizes	Maximum values (in Nm) for O-ring couplings
5/8" (6)	15.4 – 17
3/4" (8)	15.4 – 17
7/8" (10)	24.4 – 27

TURN ON THE AC SYSTEM

(The AC system must be filled up)

- Rotate the compressor five revolutions by hand to distribute the oil in it
- Start the engine, let it idle and turn the AC system quickly on and off a few times
- Turn on the AC system and let the engine idle for a few minutes

IS R 1234yf DANGEROUS?

R 1234yf can be flammable when it is present in certain quantities and comes in contact with oxygen. Therefore, keep the A/C service unit away from open flames or other sources of ignition in case of damage. The refrigerant itself is nontoxic. However, like any other gas, it replaces the oxygen needed for breathing. Should refrigerant escape, keep your calm, leave the building and make sure there is sufficient supply of fresh air. As usual, you should wear suitable protective clothing and equipment (goggles and gloves) when dealing with refrigerant. These are included with each service station.

WHAT ARE THE THINGS TO DO DURING INITIAL START-UP?

During the operator training our technician will, among other things, make you familiar with the following issues:

- Switch the unit on and let it start up. Do not connect the service station to a bottle of fresh refrigerant at the start! This would cause error messages during the software test and the leak check. During the initial start-up the display will occasionally show Error Code 12, which means there is no refrigerant in the internal tank. Quit this error message by pressing the STOP button.
- Open the lid of the oil compartment on the left-hand side of the unit and hook all three oil bottles in place.
- There are two different sizes of oil bottles, 250 ml (open plastic containers) and 500 ml (professional oil system, closed metal containers). As the containers will be included in the weighing, it is important to set the right bottle size on the service unit. This is because the two differently sized containers have different empty weights and capacities. The factory setting is 250 ml.
  If you want to use large bottles, please use the arrow keys to go to "Other menus" > press ENTER > then go down right to the bottom to "Service" > press ENTER > key in Code 2688, and select 500 ml. To get back to the basic menu press the STOP button several times.
- The pressure sensor should be calibrated, especially if the service station is used at a higher altitude above sea level where the atmospheric pressure is lower. To calibrate the sensor use the arrow keys to go to "Other menus"
  > press ENTER > then go down right to the bottom to "Service" > press ENTER > key in Code 2224, and follow the instructions on the display. For balancing the unit with the atmospheric pressure, the service couplers have to be unscrewed and removed from the hoses, so that you can look into the hoses.

THE SERVICE UNIT ONLY BEEPS, BUT THE DISPLAY STAYS DARK – WHAT DOES THIS MEAN?

The safety concept takes care that the service station can only be put into operation when is it closed all around and fresh air from the blower is flowing through it. This is why the front cover and the rear cover of the drier filter are fitted with contact switches, which are activated when the lids are opened. Simultaneously, the system monitors the blower speeds of the rear housing fan and the vacuum pump fan on the side of the unit. If the housing is opened, or if one of the fans fails, the voltage supply to the unit is automatically interrupted and an alarm sounds from the external box on the rear.

WHY DOES IT TAKE MORE THAN HALF A MINUTE BEFORE THE DISPLAY COMES ON AFTER I HAVE ACTIVATED THE MAIN SWITCH?

For safety reasons, the unit, after having been switched on, is flooded through with fresh air for 35 seconds before voltage is passed on to the system. Should a flammable mixture have formed anywhere in the housing – which may have been caused by a leak for example – this precaution makes sure the mixture won't be ignited by an electric spark.

WHY DOES IT TAKE SO LONG FOR THE A/C SERVICE UNIT TO DO THE "SOFTWARE TEST"?

During the software test almost all possible operations of the unit are subjected to a test run. At the same time all components are preheated to get them to their ideal working temperature. This will, among other things, improve the charging and recovery accuracy of the machine. Additionally, the system performs a daily internal leak check whereby several components and connecting pipes are checked for tightness, first using vacuum, then with refrigerant. If pressure drops are detected in the process the unit won't start operation.

WHY DOES THE UNIT DISPLAY ERROR CODE 12 DURING THE INITIAL START-UP?

Our A/C service units are supplied without refrigerant. Error Code 12 means that there is too little pressure (i.e. refrigerant) in the unit to perform the daily leak check and the subsequent software test. Please fill up the internal tank with refrigerant. To do this connect a bottle of fresh refrigerant (shake before use), select "Other menus" using the arrow keys and confirm with ENTER, then select "Int. bottle filling", press the ENTER button and key in the desired quantity of refrigerant.

Note: The ASC 5500 G RPA fills refrigerant by pressure difference. It is therefore technically impossible to charge 500 g of refrigerant into an A/C system if the service unit contains only 500 g of refrigerant. The more refrigerant is contained in the internal tank the faster and easier the charging process will go. We recommend a minimum quantity of 5 kg to be contained in the unit.

HOW MUCH REFRIGERANT SHOULD I CHARGE INTO THE INTERNAL TANK?

The ASC fills refrigerant by pressure difference. It is therefore technically impossible to charge 500 g of refrigerant into an A/C system if the service unit contains only 500 g of refrigerant.

The more refrigerant is contained in the internal tank the faster and easier the charging process will go. We recommend a minimum quantity of 5 kg to be contained in the unit.

CAN I ACCIDENTALLY CONFUSE R 134A A/C SYSTEMS WITH R 1234yf A/C SYSTEMS?

The A/C systems have different connection ports. R134a service couplers won't fit R1234yf service ports and vice versa. Likewise, it is impossible to connect an R134a service coupler to R1234yf service hoses, etc.

WHAT DO I HAVE TO DO IF I HAVE RECOVERED WRONG REFRIGERANT (E.G. R 134a)?

The ASC features an integrated refrigerant analysis module, which checks the purity of the existing refrigerant prior to every recovery process. If the purity is below 95%, the service unit will refuse acceptance.

WHAT DO I HAVE TO DO IF THE ANALYSIS FAILS?

To prevent measuring errors the analysis can be repeated up to three times. If the analysis keeps reporting failure, the connected A/C system does not contain pure refrigerant. The refrigerant must be disposed of. For the purpose, the ASC 5500 G RPA has a connection on the rear to which you can connect a separately available disposal system. Once the disposal is complete you can do a cross check by connecting a bottle of fresh refrigerant (shake before use) to the service station and repeat the original process. The analysis should read "OK" now.

WHY DOES THE REFRIGERANT CHARGING PROCESS TAKE SO LONG?

According to the risk analysis of the German TÜV the service unit may only be used for charging A/C systems that have no leaks. To meet this requirement the A/C system is first put under vacuum (negative pressure) and checked for pressure changes for a certain period of time. Then a little amount of refrigerant is added to generate positive pressure, and the system is again monitored at a constant pressure level. If the pressure rises or falls in either of the two phases you will know that the A/C system leaks. In that case the service unit will interrupt the process and display an error message.

To guarantee accurate charging at all times it is then necessary to recover the pre-charged amount of refrigerant and completely evacuate the A/C system before. Once this has been done you can go ahead and charge the required amount of refrigerant.

HOW DO I SET ANOTHER LANGUAGE?

The service units are set to English in the factory settings. To set another language simply use the arrow keys to go up/down to menu item "Other Selections" and confirm with ENTER to access the next menu. Then use the arrow keys to go down right to the bottom to "Service", again confirm with ENTER and key in the code 5264. You can select the desired language with the arrow keys and confirm with ENTER. By pressing the STOP button several times you get back to the basic menu.

WHO IS THE PERSON TO CONTACT IF I HAVE FURTHER QUESTIONS?

Simply select your country to see the responsible Dometic Sales Company including the corresponding contact information.

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