General information on cooker hood ventilation technology

Küppersbusch

THE HEART OF A GOOD KITCHEN

GB

Service Manual: H5-00-01

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Contents

1. Safety 4

2. General Information 5

3. Safety 6

3.1 Extraction mode and fireplaces 6
3.2 Risk of fire 6
3.3 Repairs 6

4. Operating modes 7

4.1 Outgoing air 7
4.2 Recirculation mode 7

5. Air flow rate /extraction 8

5.1 Generally effective air flow rate 8
5.2 Air flow rate in the extraction mode 8
5.3 Complaint: Steam passes the hood 12
5.4 Complaint: Condensation below the cooker hood 14
5.5 Features of the recirculation mode 14
5.6 Grease filters 15
5.7 Complaint: Grease drips out of the hood 16

6. Noises 18

6.1 Noise measurement / noise data 18
6.2 Noise complaints 19

7. Surface problems and care 22

7.1 General instructions for stainless steel 22
7.2 General instructions for the care of aluminium surfaces 23
7.3 Corrosion on stainless steel surfaces 24
7.4 Causes of corrosion 24
7.5 Marks or scratches on new appliances 26

8. Charcoal filters 26

8.1 Charcoal filter assembly problems 26

9. Halogen lamps with dimmer controls 27

9.1 Error diagnosed for the lamp control 27

1. Safety

Danger!

Repairs may only be carried out by a qualified electrician!
Improper repairs can be extremely dangerous for the user.

It is essential that you observe the following instructions in order to prevent electric shocks:

- The casing and the frame may be live in the event of faults!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Disconnect the appliance from the mains prior to carrying out any repair work!
- When inspecting live parts, a residual current circuit breaker must always be used!
- The earthed conductor resistance may not exceed the resistance specified in the standard! It is vital for ensuring the safety of persons and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or the corresponding regulations for your country!

Attention!

It is essential that you observe the following instructions:

- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current circuit breaker.

Sharp edges: use protective gloves.

Components may be electrostatic!
Observe handling regulations!

2. General Information

These are general instructions for repairing cooker hoods. Other items are in progress; they will be included one after the other and distributed with new pictures.

Ideas and comments welcome!

Instructions specific to appliances may still be found in the instructions for repair that can be called up for each appliance.

Changing the specification or attempting to modify the product are dangerous. For your own safety spare parts should be installed by an authorised, qualified specialist. The manufacturer accepts no liability for damage which occurs as a result of improper installation or failure to observe currently-valid regulations for this type of application. Please read through the installation instructions carefully prior to commencing with work.

With the help of cooker hoods steam and odours that arise during the cooking procedure are extracted out of the kitchen through a special discharge device. Fresh air is drawn into the kitchen through an air opening to the outside to replace the extracted air.

This effect is generated in the suction module in the hood which extracts the air under the hood and leads it to the outside through the air opening. The hood is also fitted with a control panel for the extraction modes and a functional lighting system for the hob. If the hood is installed professionally, regularly maintained and the safety regulations are closely observed, it will provide long years of reliable service.

3. Safety

3.1 Extraction mode and fireplaces

A chimney sweep will need to determine whether it is safe to operate a cooker hood in the extraction mode when the room or the combustion air compound also contains an open fireplace connected to a chimney.

Reason: A cooker hood operating in the extraction mode gives rise to a vacuum in the room, which may mean that the chimney draft is impeded or even that it is reversed. Fuel will no longer burn perfectly and toxic fumes (CO) may get into the ambient air.

Comment: This mechanism does not apply for gas ranges and gas hobs (these are not connected to a chimney and the routing of extraction air even has a positive effect on air quality).

The chimney sweep will check to make sure that the vacuum which arises in the room does not exceed the limit of 0.04 mbars. If it does, additional measures (e.g. inlet air lock or locking the hood with a snap switch when the window is closed) must be used to ensure that an additional source of air admission into the room is provided when the hood is in operation.

Comments: The additional fresh air opening will need to have a relatively large cross section. The inlet air lock of an inlet / exhaust air wall sleeve is generally not sufficient. (rule of thumb for estimating: An exhaust air flow of 600m³/h requires an inlet air opening of approx. 0.5m²).

3.2 Risk of fire

- Over-saturated filters mean a risk of fire (grease may drip down and ignite.
  Clean/replace grease filters in good time.
- Observe minimum clearances (suspension height above the cooking area).
  Clearances specific to hoods in some cases!
  Special minimum clearances above gas hobs!
- Do not flambe under cooker hoods!
  Deep-frying must be supervised!
- Only operate gas hob flames that are covered (cookware)!
- Above solid-fuel fireplaces (coal cookers): observe limitations!

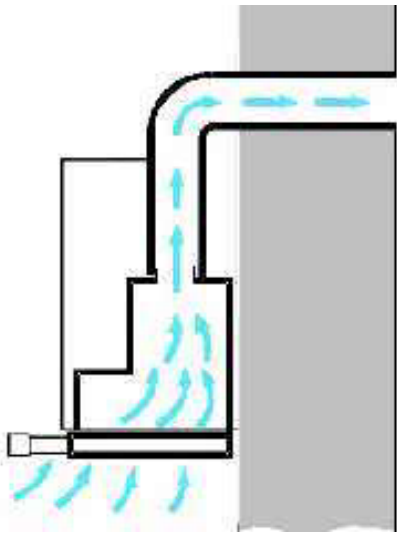
3.3 Repairs

The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current circuit breaker. A functional test and a VDE 0701 (Association of German Electrical Engineers) test must be carried out on completion of repair work.

4. Operating modes

4.1 Outgoing air

Extraction mode: The air is cleaned with grease filters and transported out of the room through air outlets.



Advantages:

- Vapours with negative substances are removed.
- Fresh air flows in, i.e. the level of efficiency is greater than for the recirculation mode.

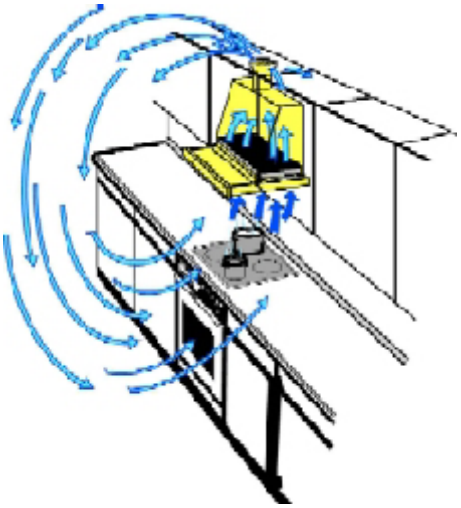
Disadvantages:

- It is essential for the exhaust air duct to be precisely dimensioned and planned and produced by a specialist.
- A sufficient supply of inlet air must be ensured.
- A vacuum occurs in the room (operation of open fireplaces connected to chimneys must be inspected and authorised or special measures are required).

Comment: Items 1 and 2 are frequently not complied with in practice!

4.2 Recirculation mode

Air is not extracted; instead it remains in the room and is filtered with grease filters and odour filters (charcoal).



Advantage:

No exhaust air ducts need to be installed.

Disadvantages:

- Additional charcoal filters are essential since they need to be replaced when saturated, approx. every 1 to 2 years.
- Vapours are not removed but only filtered (odourants cannot be completely absorbed).
- It is advisable to allow the fan to run when cooking has been completed to make sure no „old“ odourants are transported into the room the next time the hood is used.
- The air flow rate is reduced by the air resistance of the charcoal filter.

5. Air flow rate /extraction

5.1 Generally effective air flow rate

Research on indoor climate and air cleaning has shown that air is effectively replaced in kitchens at ventilation rates of 6 to 12, which means that the air extraction rate of a cooker hood must be dimensioned so that the room volume of a kitchen* is transported 6 to 12 times.

- 12-fold ventilation: maximum fan speed
- 6-fold ventilation: minimum fan speed

Example:

* Kitchen of 4 x 4 x 2.5 m = 40m³

Cooker hood:

Max. speed (briefly): 12 x 40m³ = 480m³

Setting 1 or 2 (continuous operation): 6 x 40m³ = 240m³

Comments:

- The cooker hood should also achieve this air flow rate when air conduction is changed in each case (the rating for the cooker hood in the sales documents refers to a defined air outlet = “DIN pipe“, see “Handling a complaint about noise” on page 20.)
- * Only use the cooking area as the size of the room for open-plan kitchens.
- Ventilation rates must be higher for island cookers.
- In the recirculation mode the air flow rate may be reduced by approx. 0 –30% and in exceptional case by up to 50% (compared to a “DIN pipe“).
- Ventilation or air purification will not be sufficient when the air exchange rates are low.
- Increasingly loud noises and unpleasant draughts will occur in the room when air exchange rates are higher.

5.2 Air flow rate in the extraction mode

The volume of air that is actually transported in the extraction mode will depend strongly on the type and design of the air outlets. Information on the air flow rate in the sales documents or technical data always refers to a defined air outlet (DIN / EN61591). Air outlets used in practice are normally not as good as a “DIN pipe“ for achieving the required flow rates, and in some cases they are not good at all.

5.2.1 Exhaust air extraction rate according to DIN/EN 61591

DIN pipe

The standard basis for indicating air extraction rates is a DIN pipe.

This pipe is a smooth round pipe of 1.3 m in length and with a 90° bend.

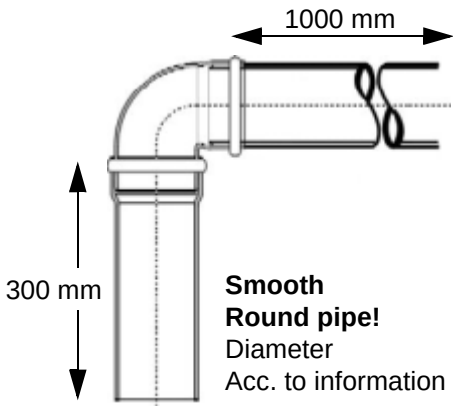
The diameter of the pipe is not specified; instead it is indicated with the flow rate (standard 100, 200 or 1500mm; in this case, if there is no information, the diameter will be 120mm).

IEC15 Pa, IEC 30Pa:

Another possibility to define the measuring pipe is to indicate the drop in pressure caused by the measuring pipe. IEC 15Pa means that the information on the air extraction rate is based on a pipe system that gives rise to a loss in pressure of 15Pa for a defined flow rate of 200m³/h.

This information is currently only given in test certificates/ measured curves.

IEC 5 Pa ~ DIN pipe of 150mm
IEC 15 Pa ~ DIN pipe of 120mm
IEC 30 Pa ~ DIN pipe of 100mm

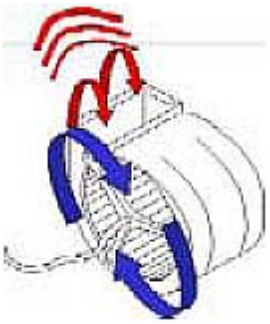


5.2.2 Exhaust air extraction rate for real pipe systems

The air extraction rate of a hood will be lowered in the case of pipe systems with a greater level of air resistance than a DIN pipe. If the air resistance is great enough, the air extraction rate may drop so far that operating the extraction mode is no longer effective, e.g. when the air extraction rate falls to below 60% of the DIN air extraction rate.

5.2.3 Effects of high air resistance levels

High unmatched air resistance levels may cause the following:



- Air extraction rate (flow rate) drops
- A higher volume of steam is not extracted by the hood
- Much higher noise levels
  Louder air noises and rise in the fan speed
- Fan “hums“
  and no longer operates at a consistent speed
- Fan wears more quickly (greater strain / wear of the bearings)
- Less grease is deposited in the metal filters.
  See here “Poor grease filtering” on page 17.
  In the case of special, precisely defined causes of a higher level of air resistance in the pipe system, such as a bent hose or angular diversion, grease will typically only be deposited here and may under certain circumstances also flow back into the hood.

Customers normally do not consider this negative effect to be caused by the air outlet; instead they make a complaint about the functioning of the cooker hood.

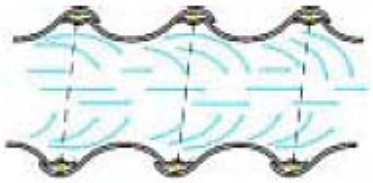
A lack of inlet air into the room may also result in the same effect, so that a noticeable vauum will occur in rooms that are very well insulated (see also “Safety” on page 6).

5.2.4 Causes of high air resistance levels

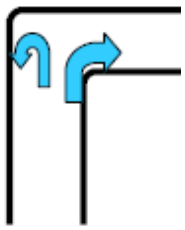
The longer the pipe system, the higher will be the level of air resistance. However, in addition to the length of the system, there are a number of other vital factors that influence the suitability of the pipe system and the exhaust air extraction rate of the hood. Particularly serious circumstances are summarised here in the term “air extraction rate killers“.

Air extraction rate killers:

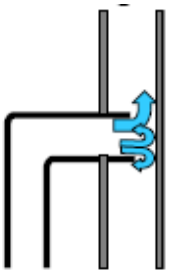
- **Narrow cross sections in the pipe system**
  Air resistance rises quadratically with the cross section, i.e. cubed by the diameter (1 metre of pipe D = 100mm generates the same resistance as 3m of D = 120mm or 9m at D = 150).
- **Reductions in cross sections**
  Reductions in cross sections result in impingement effects, turbulence and jams => air resistance levels rise disproportionately; the smaller diameter should be used for the full length here for the purpose of making estimations or calculations.
- **Soft hose instead of a smooth pipe**
  The roughness of the inside of the tube results in a strong reduction of the flow cross section that actually remains. This effect is particularly pronounced when hoses are strongly pushed together and for plastic hoses that are very crimped.



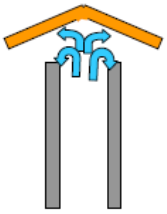
- **Rectangular channels with a flat cross section**
  Rectangular channels generally do not make optimal use of the cross section. This is particularly noticeable with flat rectangular channels (lower height and greater width).
- **Irregular bends (corner)**
  Impingement effect and turbulence (see chart).



- Irregular openings in the channels with an impingement effect.

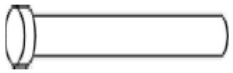


- Outlow through the roof with an impingement effect.
- Wall sleeves with rigid slats or thick fly screens.



5.2.5 Estimation of air resistance

This chart can be used to roughly estimate the effect of various types of pipes on air resistance.

Component drawings	Component	Comment / explanation	Air resistanceequivalent to x metre of PVC piping, smooth sides, D=100mm (approximate standard value) 
	1 metre of flexible hose	D= 100mm (depending on extension)	1.3 – 2.5 metres
	1 bend, smooth	D = 100mm, Bend radius 100mm Bend radius 300mm	2.5 metres 1.5 metres
	1 bend, corrugated	D = 100mm, Bend radius 100mm Bend radius 300mm	3.2 metres 1.8 metres
	1 knee bend, smooth	D= 100mm	3.5 metres
	1 knee bend, corrugated	D= 100mm	4.7 metres
	1 square knee bend	D = 100mm	7.0 metres
	1 metre of PVC piping (smooth walls)	D= 120mm	0.33 metres
	1 metre of PVC piping (smooth walls)	D = 150mm	~ 0.11 metres

5.2.6 Demonstration of the effect of the air outlet device

Complaints:

- Weak air extraction rate
- Poor suction
- Loud noises

and suspicions that these occur because of a high level of air resistance in the air outlet. The proper functioning of the hood can be demonstrated by removing the air outlet (free-blowing operation).

Removing the air outlet may however be quite complicated (stainless steel chimney with a built-in flue).

On the other hand, there is hardly any other possibility to demonstrate that the hood functions properly (apart from checking/measuring in the factory lab).

5.3 Complaint: Steam passes the hood

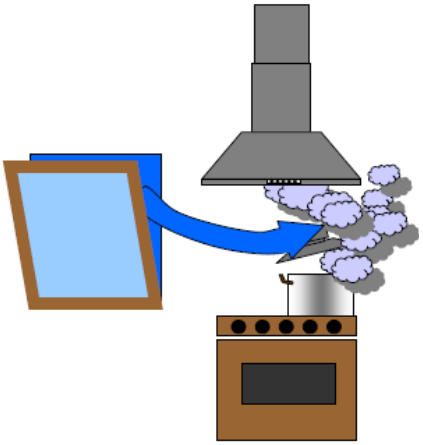
In addition to the air outlet, natural flows of air in the room and the positioning of the hood and the air inlet also have a decisive influence on optimal ventilation in the kitchen.

5.3.1 Outgoing air needs incoming air

In order to ventilate the kitchen well, the extraction mode must have a sufficient, effectively placed air inlet system.

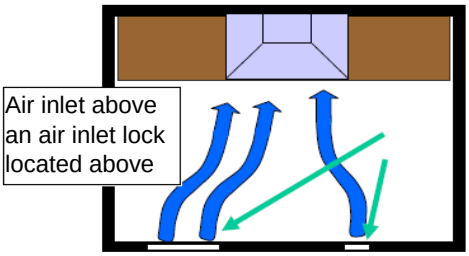
Unfavourable:

- An insufficient supply of fresh air (vacuum in the room).
- Fresh air inlet at the bottom (e.g. a cut-out at the bottom of the door; a blanket of steam remains suspended under the ceiling).
- Air is let in through an open window right next to the hood (risk of steam being blown).



Favourable:

- Inlet air is supplied at the top of the room.
- Fresh air inlet opposite the cooking unit.



5.3.2 Steam passes the hood

Customer's expectation

Customers frequently expect all the steam that rises to be directly extracted by the hood so that it disappears in the hood canopy. The hoods cannot meet these expectations – **not even when conditions are ideal.**

Reason: Air velocities that arise when air is extracted into the hood drop quickly when the air reaches the canopy and are frequently lower than the velocity of other air flows in the room (e.g. a draught through the window, people moving or turbulence caused by air that has been warmed above the cooking area).

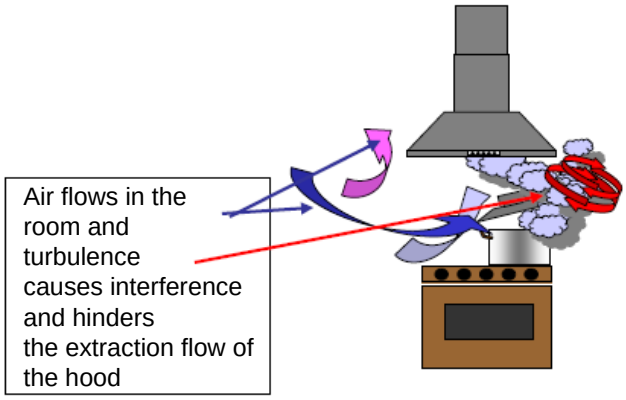
The result: Part of the steam will pass the hood canopy - steam is blown.

In ideal conditions, the steam will nevertheless be lead back to the extraction flow and will be extracted or filtered.

Island cookers (island meals) are particularly susceptible to steam being blown.

The extraction conditions and air velocities are generally not uniform above the filter area.

Canopy hoods with an extractable filter only reach low air velocities in the front filter area, so that some of the steam can pass by here.



Cause and remedy for this problem:

- **Customers' expectations are very high**
  (steam must all be immediately extracted)
  Reasoning:
  Extraction can only be perfect when the conditions in the room are ideal; a little steam passing by the hood is quite normal in practice, but the steam is returned to the extraction area as the hood operates and is then extracted or filtered.
- **Air inlet insufficient or unfavourably positioned** (see here “Outgoing air needs incoming air” on page 12.)
  Remedy:
  Improve the planning, reason.
- **Steam blows due to cross flows**
  (cooking island, air inlet, impingement effects when the recirculation mode is operated, cross flows when people move).
  Remedy: Air inlet positioning, avoid cross flows, reason).
- **Cooking area insufficiently covered**
  Planning measures and reasoning (the hood should be at least as wide as the hob that is under it, ideally it should be a little wider; the cooker hood should, if possible, also be installed so that the front is virtually flush with the hob.
- **The hood has a large vertical clearance to the hob**
  Planning measure -smaller clearance will improve extraction (however, observe minimum clearances, poorer access above the cooking area).
- **Insufficient air flow rate**
  See here “Causes of high air resistance levels” on page 10, adjusted air extraction rate

5.4 Complaint: Condensation below the cooker hood

The formation of condensation below the hood or on it is a physical process. The moisture-saturated, warm air that arises during the cooking process cools down strongly when it makes contact with the cooler surfaces of the cooker hood and the back wall, so that the moisture condenses on these surfaces.

Temperatures and the dimensions of the condensation areas of the appliance will also determine how strong this process is. In pricniple, two counter-acting processes are involved here:

- Condensation on cool surfaces - stronger when the surfaces are cold (e.g. when cooking is commenced) or an increased occurence of moisture on these surfaces (a lot of cooking activity, unfavourable conditions for extraction, small clearance above the hob).
- Dry the condensation by bringing in dry inlet air (delay stopping operation of the hood after completion of cooking, hang the cooker hood higher above the cooking area, high air extraction rate).

Possible remedy:

Advance operation of the fan (warming the surfaces) and delayed switch-off of the fan (drying up residual moisture) will improve the situation.

A greater clearance between the hood and the cooker would also improve this situation, but would at the same time impair effective steam extraction. Also see here “Complaint: Steam passes the hood” on page 12.

5.5 Features of the recirculation mode

In the recirculation mode, grease is filtered with grease filters (paper or metal grease filters) and odourants are bound in a charcoal filter. The volume of air in the room remains consistent.

Advantages:

- No limitations during operation with a fireplace
- No loss of heat in winter

A disadvantage is that the charcoal filter has a higher level of air resistance so that the air flow rate is reduced (approx. 20 - 30% less than for a DIN pipe).

On the other hand, the excessively high air velocity in the charcoal filter is detrimental to the binding of odourants in the charcoal filter.

The charcoal filter should be exchanged after a certain number of hours of operation, since the charcoal will be saturated and will no longer be able to bind odourants.

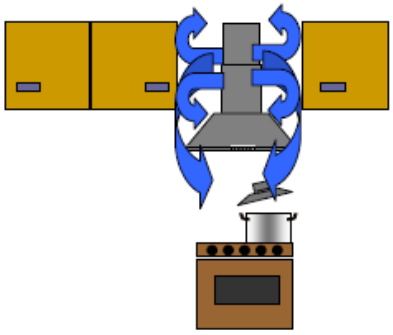
It is generally recommended that the charcoal filter be replaced after 240 - 360 hours of operation, since this is approximately equivalent to a service life of up to one year for the charcoal filter.

5.5.1 Charcoal filter odour removal in general

The level of odour reduction and the time it takes for odours to disappear are determined in a complex process of measurement in a lab under precisely defined conditions according to IEC61591 and are 80 to 95% for all our appliances.

5.5.2 Air conduction in the recirculation mode

When planning, it should be ensured that outflowing air does not impede the extraction flow through impingement effects.



5.5.3 Complaint: Odours not sufficiently filtered

Even brand new charcoal filters cannot fully bind the odours that arise when food is being cooked or roasted. This is particularly the case when odours are very intense (when fish is being quick-fried).

Two points should be observed in order for filters to function best:

- **Start the hood up beforehand!**
  A lead time of approx. 5 minutes will bring the charcoal up to operating temperature and circulation will be optimal.
- **Delay switching off the hood!**
  Delaying switch-off by approx. 10 minutes will guide the remaining odourants through the filter several times, so that odours can be absorbed.

5.5.4 Complaint: Smells like a restart!

If switch-off is not delayed (see above), when the fan is started, the odourants which have remained in the charcoal filter but have not been bound will escape into the ambient air again (particularly noticeable when fish dishes were last cooked).

Remedy: Observe recommendations for delayed switch-off!

5.5.5 Complaint: Hood does not extract well

Exhaust air that is unfavourably positioned (e.g. when a chimney is located between two tall kitchen units) may cause an impingement effect of the air flow and resulting strong turbulence and blowing in the extraction flow.

5.6 Grease filters

There are currently three methods of filtering grease with our household cooker hoods:

5.6.1 Mat filters (paper filters)

Filter method: Capillary and adhesion (sticking). Must be disposed of when saturated.

5.6.2 Metal filters made of wire mesh

Filter method: Impingement separation.

Cleaned by rinsing by hand with hot soapy water or in the dishwasher. When cleaning in the dishwasher please note:

- The metal surface may become irregularly discoloured (instructions available in the instructions for use).
- Filters which are very saturated should be cleaned alone, since the other dishes will otherwise not be sufficiently cleaned.

Sufficient air velocity is required in the filter for these popular metal flters made of wire mesh in order to optimally bind the particles of grease in the grease filter.

Three to ten layers of mesh are used. The number of mesh layers has been optimised in line with the design of the fan and the arrangement/size of the filters.

5.6.3 Baffle filters

Filter method: Impingement separation and swirling air/centrifugal forces.

5.6.4 Level of grease seperation

The level of grease separation is determined in a complex process of measurement in a lab under precisely defined conditions according to IEC61591 and are 80 to 95% for all our appliances. Until now there are no indications that any minor differences in the filter material (composition of the mesh) have a significant effect on the level of grease separation.

However, negative effect in the outgoing air system may strongly reduce the level of grease separation.

5.7 Complaint: Grease drips out of the hood

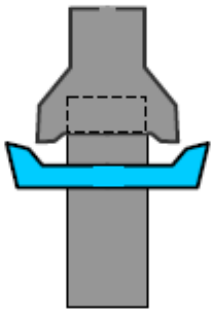
The reason for this complaint is frequently two mechanisms which are both located outside the appliance.

5.7.1 Mixture of condensation water and grease returns

The outgoing air naturally contains a lot of moisture, of which a large proportion is not precipitated due to the relatively high air temperatures above the hob. However, when this outgoing air flows through a relatively cool air route, the moisture will be condensed.

For this reason, a pipe system that is almost horizontal should always be provided with a slight slope to the outside (2-3°) as the condensed moisture will otherwise flow back into the hood with the residual grease in the air duct.

A condensed water separator may need to be provided for a vertical pipe system.



5.7.2 Poor grease filtering

Air in the filter will need to have a certain velocity for grease to be optimally separated in metal filters. If this speed is not reached, the level of grease separation will drop and more grease will get into the hood and into the outgoing air system.

This is triggered in many cases by an inferior air outlet with a high level of air resistance or air extraction rate killers.

This will typically result in strong grease separation at a specific obstacle (e.g. narrowing of the pipe, bends, obstacle in the air flow). The grease can then flow back into the hood and drip out of the fan or the filter.

6. Noises

6.1 Noise measurement / noise data

The requirements and methods for measuring noise emission from a cooker hood are specified in DIN EN 60704-2-13. Here the conditions for operating the hood when taking a measurement are indicated, since they may significantly influence readings. Cooker hoods are generally measured when operating with a DIN pipe.

There are two different methods for measuring how much noise an object emits. The result is accordingly two different dimensions, units and readings.

Sound intensity level: Unit dB(A)

Sound power level: Unit dB (re1pW)

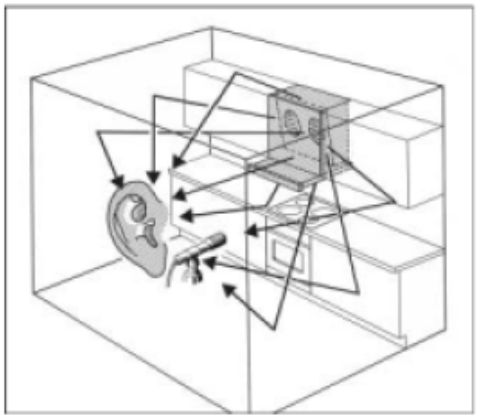
The sound power level is indicated in the sales documents. Only the sound power level is suitable for assessing how much noise an appliance emits.
The sound intensity level is suitable for determining a local noise level, but it is not suitable for comparing appliances. More information in the following sections.

6.1.1 Sound intensity level

Sound intensity can be measured locally and results in a dimension for the volume at the measuring point (point where the sensor has been set up).
This reading is not only determined by the acoustic power of the source of noise.

The measured parameter also strongly depends on the conditions in the room, mainly the distance to the source, **and also the size and the reflection properties of the room**.
The sound intensity level would therefore only be suitable for comparing appliances when test assemblies and conditions in the room were absolutely identical. **These requirements cannot be met in practice.** Appliance specifications used to include the sound intensity level. This was determined according to specified instructions (distance/position of the microphone, room acoustics) and only allowed for a comparison when these requirements were fully complied with (lab).

In accordance with this test assembly, the same source of noise will result in a sound intensity level several decibels lower than DIN sound intensity levels. Comparisons must thus distinguish between information on acoustic power and sound pressure (units: dB(re1pW) and dB(A)).

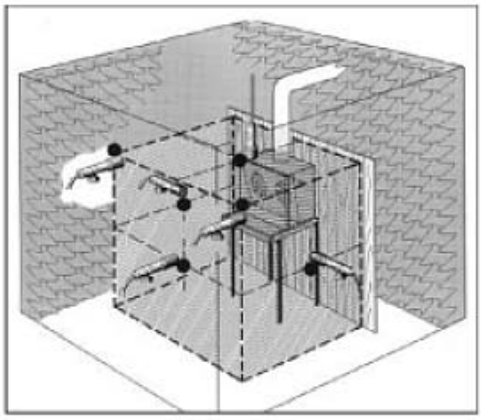


Assembly for measuring sound intensity level

6.1.2 Sound power level

This is an appliance dimension, irrespective of spatial conditions. Sound power can only be ascertained in a lab. Theoretically, several measuring points across an (imaginary) enveloping space around the source of noise would have to be measured and integrated. Readings are therefore not contingent on the distance to the appliance.

In laboratories, measurements are made at specifically defined measuring points around the appliance in a special sound room and converted to the enveloping space. This method of measuring cannot be carried out locally by Customer Service. **Sound power data can be recognised by the unit "dB(re1pw)"**, meaning: compared with the output of 1 picowatt.



Assembly for measuring sound power

6.2 Noise complaints

Noise made by the cooker hood is mainly generated by:

- Flow noises in air conduction
- Air noise in the fan
- Running noises caused by the fan motor.

6.2.1 Flow noises in air conduction

Flow noises become much louder as the air velocity in the air route rises. Here it must be observed that when the air flow rate is consistent, the air velocity in the pipe will rise quadratically with the reduction in diameter when the cross-section of the pipe is narrowed.

Example: Reduction in diameter from 150mm to 120mm (factor 1.25) means that the air velocity has increased 1.6-fold.

Besides, the higher velocity of air may also tend to raise turbulence and this will cause a disproportional rise in the noise level. Part of pipes with an uneven surface or other unfavourable flow properties are particularly at risk here (flexible hose, plastic spiral hose, sharp change in direction, sharp reductions in cross sections, squashed hoses or dirty transitions, see also "Causes of high air resistance levels" on page 10.)

6.2.2 Fan noises

Fan noises will depend on the speed of the fan. This also applies for bearing noises and motor noises and particularly for the fan noises that are generated by the slats.

When the fan is operated at high speed, the noise level will rise noticeably and the sound will also be different and more unpleasant. This is mainly triggered by an unfavourable air outlet (see also “Causes of high air resistance levels” on page 10) and there are two problems here:

- **Operator:** Air flow rate appears to be too low => a higher speed is selected for the fan.
- **Appliance:** A high level of air resistance means that the fan will “stew in its own grease“ and will run much faster. This may also result in the fan running irregularly (“humming“) and increase wear and tear on the bearings. (see also “Effects of high air resistance levels” on page 9).

6.2.3 Noise caused by electrical vibration (motor)

Sometimes noises from the fan motor may also be heard.

- **Humming at the slowest fan setting**
  This occurs when the fan speed is controlled in phases, since the “narrow“ blocks of mains voltage that pass through cause harmonics which may lead to resonance humming in the fan winding. -> No remedy.
- **High-frequency buzzing in the fan**
  Mains harmonics (ripple control signals) and similar effects may sooner result in high-frequency buzzing noises for certain types of fans (with winding taps). -> No remedy.

Replacing the fan will not result in any improvement in both cases.

6.2.4 Handling a complaint about noise

Wide experience has shown that the main reason for complaints about noise is not the appliance itself, but how it is installed.

Technical defects to the appliance are the exception (for example, possibly the fan may be poorly arranged on bearings or the slats or the housing opening may be damaged and cause whistling noises).

There are currently no measuring methods or limits as evidence of the proper functioning of the appliance in relation to this problem! (See information on measuring noise.)

This does, however, make it difficult to deal with these complaints. If there is a justified suspicion that an unfavourable air outlet has been installed, the customer will need to be persuaded to understand that the cause of the problem does not lie with the appliance itself. In addition to sound reasoning, a demonstration of the reduction in the level of noise when the the appliance is operated with the air outlet removed may be especially convincing.

It is only possible to measure an appliance to ensure that noise limits are maintained in extreme cases in a lab.

In some cases it may also be possible to improve the outlet air conditions that give rise to noise with minor measures (e.g. free a crushed hose, make a rounded bend, adjust the joints connecting pieces of pipe). In other cases however, major, perhaps even constructional measures may be necessary to optimise air conduction (enlarging a cross section, making an opening in the wall, etc.). If this cannot be done, converting the appliance to the recirculation mode may result in improvement.

Apart from this, the instructions contained in sections “Exhaust air extraction rate according to DIN/EN 61591” on page 8 and “Exhaust air extraction rate for real pipe systems” on page 9 and the assistance with planning a system for outgoing air shown there will also apply here.

6.2.5 Whistling in the recurculation mode at high settings

Inreased extraction resistance in the recirculation mode with charcoal filters will result in a vacuum in the space around the fan. This may mean that air is sucked in through the openings in the housing or behind the charcoal filter and causes whistling noises.

Typically, this noise only occurs when charcoal filters have been installed and when the fan setting is high. Beating or vibrating noises may also be heard if a cover on one of the openings (adhesive strip) has partly come loose.

Remedy: Cover the openings (adhesive tape) and/or use a sealing strip such as microcellular rubber sealing.

6.2.6 Noise due to moisture in the charcoal filter

Charcoal filters that are strongly saturated with moisture (swelling charcoal) also mean that air resistance will be much higher and this could result in louder noises.

Higher air resistance means higher fan speeds and stronger vacuum in the fan assembly.

Remedy: Replace the charcoal filter, let the fan run before cooking and delay switching it off after cooking.

6.2.7 Humming noises caused by the transformer

Some cases have become known in which humming noises are caused by transformers that have been installed for halogen lighting or for providing a supply of power. The humming in the appliance may also occur when it is switched off, due to:

- The mechanical connection of the component in the housing (e.g. fastening screw on the sheet metal casing).
- Component tolerances (greater tendency of the coil to oscillate).
- Loose, resonant housing parts.

Improvement:

1. Find out as exactly as possible what the cause of the noise might be. (Are loose parts resonant? Are screws touching the sheet metal?)
2. Reduce the mechanical connection by putting sealant underneath.
3. If the humming cannot be stopped the transformer will need to be replaced.

Since the complaint may be influenced through a customer perceiving noise quite differently, through different sound levels in the surroundings and reflection properties of the room, an unfavourable combination means that no guarantee can be given that the situation will be significantly improved.

7. Surface problems and care

The use of high-quality surface materials (stainless steel or aluminium) for cooker hood chimneys which catch the eye in any kitchen means that requirements are related to these surfaces themselves and also to caring for these parts and for handling them.

7.1 General instructions for stainless steel

7.1.1 Composition of stainless steel for hoods

For stainless steel, we always distinguish between chromium steel (magnetic) and chrome nickel steel (not magnetic).

However, according to valud standards, both of these steels are resistant to rust and acids, ie. they are stainless steels.

For our stainless steel chimneys we use stainless steel (chromium steel) according to specification 1.4016 (with an MCD polish), since this stainless steel has very good properties for welding, grinding and polishing, and this is very important when producing chimneys. More instructions in section “Corrosion on stainless steel surfaces” on page 24.

7.1.2 Surface/polish/shine

Most of our appliances are produced with a polished surface, e.g.

MCD 240 / 280, i.e. grain 240 is used for polishing and then grain 280 is used for brushing. Even when the material and the finish are identical (graining), certain differences on the surface are normal, since differences in the downtime of the abrasive belt are sufficient to cause differences in the degree of shine.

More instructions on stains and inconsistent colour effects at “Marks or scratches on new appliances” on page 26.

7.1.3 Cleaning stainless steel

Instructions for customers as well:

- Clean the surface in accordance with information in the instructions for use
- Do not use abrasive sponges
- Do not use steel wool (causes extraneous rust)
- Do not use any chloric detergents (cause rust)
- Always clean in the direction of polish of the stainless steel
- Use clean cloths for cleaning (otherwise extraneous rust may be transferred, such as particles from earthed hobs)
- Use lint-free cleaning cloths
- Keep the surface clean
- Make sure the surface is well ventilated
- Avoid contact with rusting components (rust film)
- Clean and care for the surface after the hood has been installed

7.1.4 Rectifying minor irregularities

Instructions for Customer Service only!

- Always clean in the direction of polish of the stainless steel
- For large areas, work over the entire surface (for a uniform appearance)
- After covering the entire area, clean the hood and treat it with a care product
- Further instructions (care products) in the following section

7.1.5 Recommended care products / detergents for stainless steel

These detergents are classified as gentle cleaning detergents and aggressive cleaning properties (abrasive cleaning).s

- Commercially available detergent (cleaning agent)
  Use for a basic clean and then rub the surfaces dry. Warm water is of help here.
- VSR Ultra Clean, spare-part no. 507139
  For heavy staining, also recommended for grease filters. Allow to take effect and then wipe with a wet cloth or rinse.
- VSR stainless steel set, spare part no. 535854 (detergent and care product)
  Apply smoothly and repolish with a clean cloth or kitchen roll. Do not wipe again with a damp cloth. Protects the surface from becoming stained again.
- Chromol spare-part no. 409004 (care product)
  Care product, results in a dark, oily surface, very uniform appearance on a large area covers irregularities. Protects the surface Apply sparingly! **Do not use on warm surfaces (cooker fronts)!**
- Stahlfix matt (detergent and care product)
  Source of supply: Commercially available for slight staining, use on a large area, repolishing essential. Protects the surface.
- Stahlfix classic (detergent)
  Source of supply: commercially available or stainless steel cleaning set “Wiener Kalk“ spare-part no. 340640. Slightly abrasive effect (scouring agent), removal of rust film, observe the direction of polish, use on large areas then rewipe with a damp cloth and rub dry. For severe staining which cannot be removed with other detergents.

7.2 General instructions for the care of aluminium surfaces

- Always use a neutral detergent (no acidic or alkaline solutions).
- Do not use abrasive sponges.
- Do not use steel wool.
- Use a soft window cloth or a soft fuzz-free microfibre cloth.
- Do not clean with dry cloths.
- Keep the surface clean.
- Clean and care for the surface after the hood has been installed.

7.2.1 Recommended care / detergents for aluminium

- Commercially available detergent (cleaning agent)
  Use for a basic clean and then rub the surfaces dry. Warm water is of help here.
- VSR Ultra Clean, spare-part no. 507139
  For heavy soiling, also recommended for grease filters. Allow to take effect and then wipe with a wet cloth or rinse.
- Transparent eraser (cleaner)
  For removing small areas of dirt that has been deposited. Clean the surface of the eraser beforehand.
- VSR Alurein spare-part no. 565468
  For cleaning and caring for aluminium surfaces

7.3 Corrosion on stainless steel surfaces

7.3.1 Definition of stainless steel, magnetisable stainless steel

The requirements for steels, in particular for alloyed, rust-free stainless steels, are specified in the DIN EN 10020. In order to be entitled to bear the marking “rustproof stainless steel,“ the content of chromium (Cr, at least 10.5%) and carbon (C, not more than 1.2%) has been specified in addition to other properties.

The “magnetisable“ property does not depend on the „rustproof“ property. Approximately 50% of all the standard types of steel are magnetisable, including those that are used for our appliances.

Reservations about the “magnetisable“ property in terms of resistance to corrosion may arise quite frequently, but there is no valid physical reason for such reservation.

7.4 Causes of corrosion

Even high-quality stainless steel may become corrosive under certain circumstances.

Until now only two causes are known for this occurence:

- Corrosion caused by rusting metal dust
- Corrosion caused by aggressive, chloric chemicals

7.4.1 Corrosion caused by metal dust deposits.

Tests on appliances which have rusted have shown that the cause is generally metal dust. This may be caused as follows:

- Metal work that is carried out when the kitchen is assembled (swarf)
- Metal particles that are applied when fitters carry out installation work (palms of their hands)
- Metal particles that are applied through using cleaning cloths, with which other metalllic objects were cleaned (e.g. solid hotplates, water pipes, etc.)
- Application of the metal particles in some paints

7.4.2 Aggressive chemicals corrode the surfaces

Aggressive chemicals, mainly those that contain chlorine or acid (e.g. detergents) may also change the surface and result in corrosion.

Aggressive chemicals may be applied to the surface through touch when work is carried out with cement or when plastering work is done.

7.4.3 Avoiding corrosion

It is essential to clean the surface and then protect it with a care product each time work or processes are carried out that could give rise to the occurences named above.

The VSR stainless steel set, spare-part no. 535854, can also be recommended here. These agents are used to clean the surface and at the same time coat it, i.e. make it far more resistant to traces when contact is made with hands (fingerprints) and ensure that these marks can be easily removed.

These instructions apply in particular for:

- Installing a new product (particular risk in the case of new buildings that netal particles are applied to the surface when installation work is being carried out.
- Repair work

When cleaning, special care must always be taken that a cleaning cloth that is free of metal particles is used.

7.4.4 Handling complaints about corrosion

Surfaces can be permanently restored if traces of corrosion have not progressed too far.

Procedure:

- Clean away the rust film, use abrasive agents if necessary. VSR stainless steel set, spare-part no. 535854 (“Wiener Kalk“ or Stahlfix classic); observe the cleaning instructions!
- Care for the surface with the VSR stainless steel set spare-part no. 35854 or Chromol.
- Discuss possible causes and give advice on how to avoid renewed corrosion.

Corrosion will occur in particular when the appliance is not cleaned for several weeks after it has been installed. (installation in house/apartments which are only occupied on a later date!)

Frequently the error pattern is sufficient to indicate what is causing corrosion.

Example 1: Partial corrosion in the area where a dirty cleaning cloth was used for cleaning.

Example 2: Extensive corrosion; frequently other stainless steel surfaces (cooker fronts) are also affected.

7.5 Marks or scratches on new appliances

7.5.1 Marks on the surface of new appliances

For new appliances, customers may complain that the surface shows different colour effects or different degrees of shine.

This is visible on parts on which the surface was covered with polystyrene form the packaging material.

Cause:

Surfaces which are exposed to ambient air are subject to a natural process of oxidation which makes them gradually turn darker.

Areas which were covered by the packaging padding material so that no air could access them will not be affected here, i.e. once the packaging and the protective plastic sheeting has been removed these areas will appear to be lighter. These differences in colour and brightness will however automatically disappear when the entire surface is exposed to air after the appliance has been installed. It may take from 1-3 months for these differences to disappear completely.

Applying care products may cover up these differences with new appliances, but at the same time the oxydation process and the darkening of the light sections will be delayed.

7.5.2 Scratches on the surface (knife used to cut the sheeting)

Most of the surface of new appliances or spare parts will be protected by adhesive sheeting. Many areas will however need to be uncovered for some work processes so that the sheeting will be cut open with a copper knife.

These copper knives definitely do not scratch the stainless steel surface!

However, along the cut, some sheeting adhesive may remain behind and this is frequently mistaken for scratches. It is quite easy to remove this residual adhesive by cleaning it.

8. Charcoal filters

Instructions for problems with filtering odours can be found in Section “Recirculation mode” on page 7.

However, problems frequently occur when charcoal filters are to be installed or replaced.

8.1 Charcoal filter assembly problems

8.1.1 General

Customers quite frequently ask about this problem. Complaints are frequently quite categorical here “doesn't fit or is wrong“. Yet the cause is usually failure to read the instructions for assembly or that assembly has changed somewhat from the original status.

When getting complaints of this nature it is important to ask about the dimensions of the charcoal filter that was actually delivered and to compare these with the required dimensions.

9. Halogen lamps with dimmer controls

9.1 Error diagnosed for the lamp control

Over the past few years the appliances have frequently been fitted with low-voltage halogen lamps with a dimmer function (soft light controls). Because of this dimming function, the lamp transformer are not activated by means of a relay, but with an electronic terminal which only picks up the load (resistance) of the terminal and the voltage when it does not recognise any open terminal here. This may under certain circumstances result in an error diagnosis.

Measuring the output voltage between the poles of the output line will supply 0 volts (or 0V when earthed or a 230-volt output, depending on the position of the mains plug):

- When cables have been pulled out of the transformer input
- When the transformer has a primary or secondary interrruption
- When halogen lamps have been disconnected
- When all the lamps have been interrupted

For all these errors / conditions an examination of the output voltage on the control module and the measurement of 0V appears to indicate that the controls are defect.

This is however, not the case!

Example: