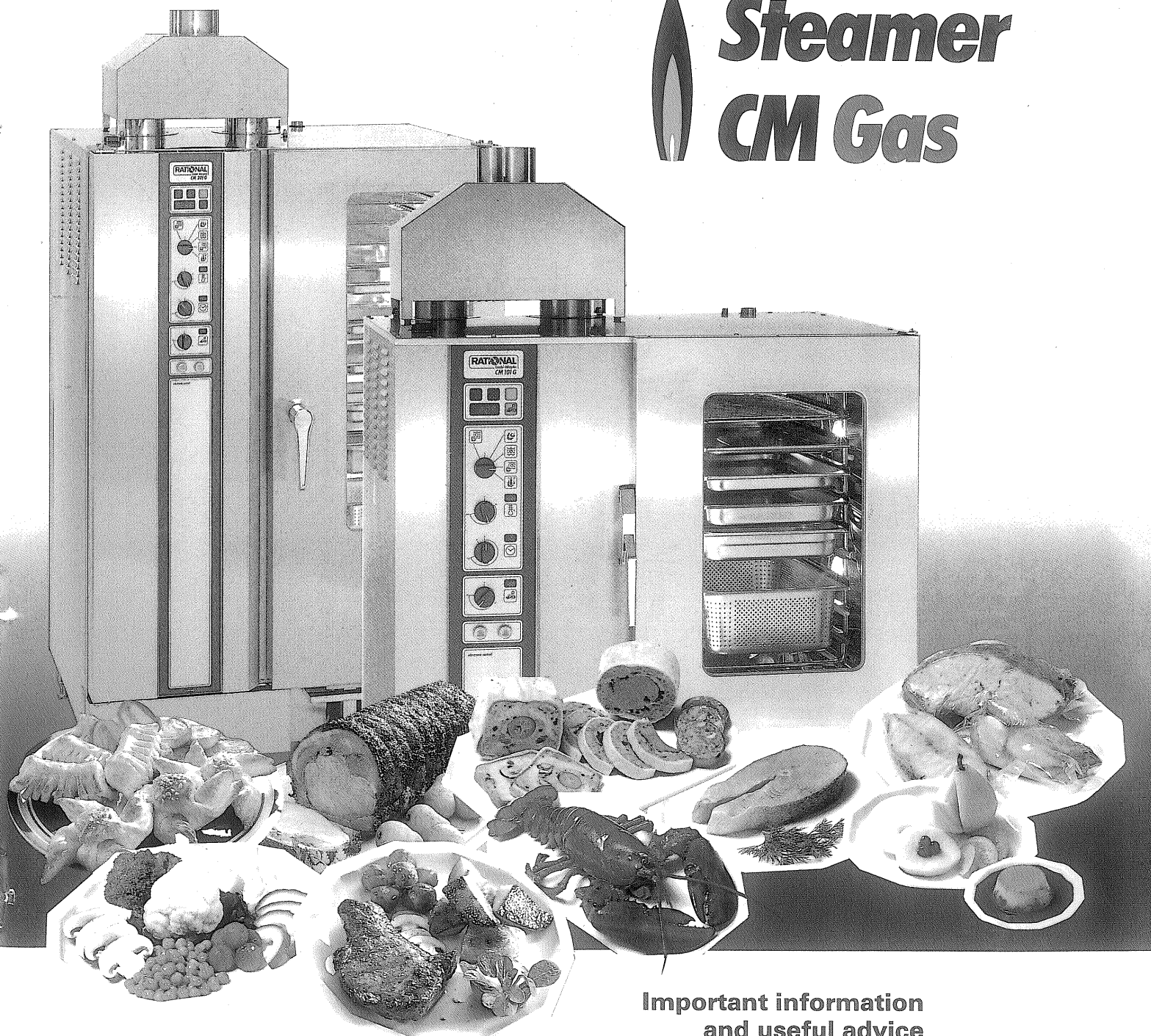


RATIONAL
Combi-Steamer

...since details make the difference

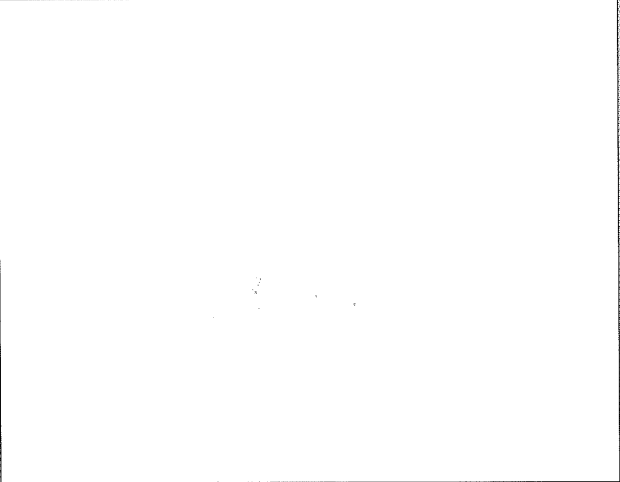
Manual Combi- Steamer CM Gas



Important information
and useful advice
for the work with the
RATIONAL Combi-Steamer CM Gas.

Your Customer Service :

We grant a 12 month guarantee valid from date of invoice, except damages caused on glass, light bulbs and gaskets.

	For enquiries please indicate the following dates of your unit :
	RATIONAL Combi-Steamer CM Gas
	Unit serial No.:
	Your unit was checked by :

In case you may need further assistance, do not hesitate to call us :

Telephone : Germany 8191/3270

Contents

Dear Customer 4

**Control Panel of the RATIONAL
Combi-Steamer CM Gas** 5

**Explanation
of Controls** 6-7

**Features
of the RATIONAL Combi-Steamer CM Gas
Loading and Removal** 8, 9

**The Cooking Method
of the RATIONAL Combi-Steamer
CM Gas** 10, 11

Steaming Mode 12, 13, 14, 15

Hot Air Mode 16, 17

Combi-Steaming Mode 18, 19, 20
Variable reheating programmes
Forced Steaming 21

Vario-Steaming Mode 22, 23

Reheating Mode 24, 25

Cooking with Core Temperature 26, 27

Examples
Beef, Veal, Pork 28, 29

Examples
**Game, Poultry, Pies,
Fish, Seafood** 30, 31

Examples
Vegetables, Side Dishes 32, 33

Examples
Desserts, Pastry 34, 35

Working with
**Original RATIONAL
Gastronorm-containers and grids** 36, 37
Accessories 38, 39, 40, 41

Cleaning 42
SC-Automatic 43

**Check up and
Interior Lighting** 44
Installation CM 101 Gas 45-48
Installation CM 201 Gas 49-52

Dear Customer,

you have just purchased a RATIONAL Combi-Steamer CM Gas. Congratulations!

You are the proud owner of the best among the Hot-Air-Steamers on the market. It has been developed out of the very close contact we have with our customers, and is a machine for the demanding cook, with almost unlimited possibilities.

Five operating modes make it possible for you to use almost all of the classic methods for preparing foods, all in one single unit.

We have placed particular attention on simple, practical operation, next to solid workmanship and maximum safety of operations.

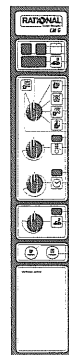
Still we recommend to study this manual for the RATIONAL Combi-Steamer CM Gas carefully. Only in this way you will really profit from the manifold possibilities and advantages of the RATIONAL Combi-Steamer CM Gas.

Please let us know about your practical experience, your suggestions and ideas to share them with our other customers.

And now enjoy your new RATIONAL Combi-Steamer CM Gas.

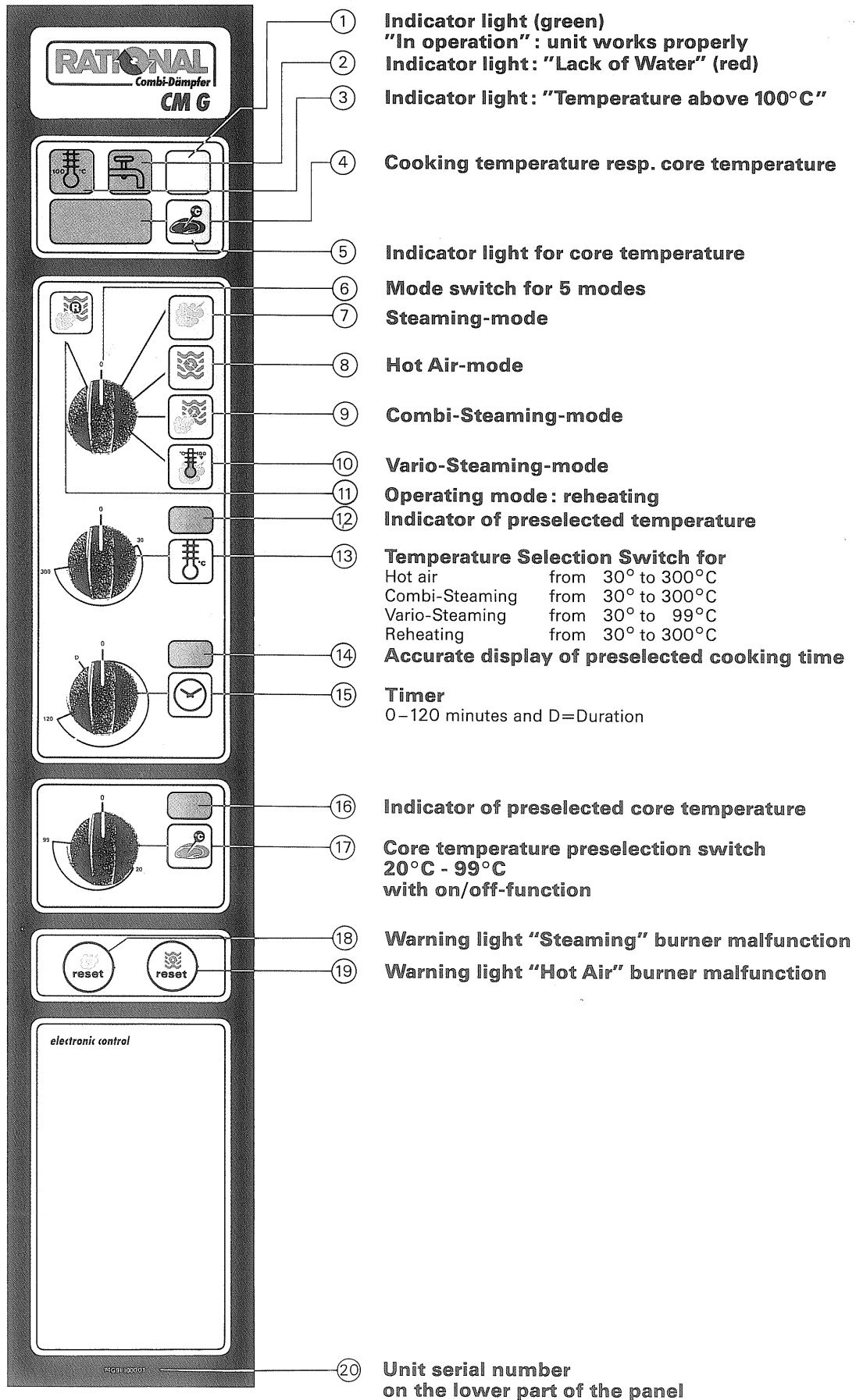
RATIONAL Großküchentechnik GmbH

Control Panel
and Description



please turn ►

Control Panel of the RATIONAL Combi-Steamer CM Gas



Explanation of Controls

① Indicator "Unit in Operation"

The RATIONAL Combi-Steamer has an automatic self-control. The indicator ① constantly lights up green, when the RATIONAL Combi-Steamer is in operation and is working properly.

② Warning light: No Water

When water supply is interrupted. This light ② will flash red and the unit will switch itself off when the water faucet connected to the unit has not been opened, for instance. The autocontrol feature of the unit blocks all steaming functions. When the lack of water has been remedied (by opening the faucet or cleaning the filter at the inlet end of the magnetic valve) the unit automatically switches itself on again. The Combi-Steamer CM Gas is ready to operate again, the green "In Operation" indicator light ① comes on. If the warning light ② continues to flash, there may be a malfunction in the automatic SC feature.

③ Warning light: Steaming Temperature Above 100° C

When you change quickly from the "Hot Air", "Combi-Steaming" or "Reheat" modes to the "Steaming" or "Vario-Steaming" modes, the temperature in the oven may still be above 100° C. When this happens, the red warning light "Steam Temperature Above 100° C" ③ comes on. The unit's operation is not influenced by this. As soon as the temperature falls to 100° C, the warning light goes out.
— Delicate food, such as rice, cauliflower, etc., especially in small quantities, should not be steamed at temperatures exceeding 100° C.

④ Display of cooking temperature resp. core temperature

The temperature inside the unit is constantly shown in this display ④.

Exception:

In the "Steaming" mode this display does not work, as the cooking temperature in this mode is fixed to 100° C. When working with the meat probe the display ④ will show the core temperature instead of the cooking temperature.

⑤ Indicator for core temperature (meat probe)

This indicator ⑤ lights up, when the core temperature function has been switched on with the core temperature selection switch ⑰.

⑥ Mode Switch

With this switch ⑥ the mode desired can be selected. During the cooking process the mode can be changed at any time.

⑦ Steaming-Mode

Set the mode switch to the "Steaming" mode ⑦. In addition the desired cooking time will be set with the timer ⑮. The display ④ is out of order, as in this mode the RATIONAL Combi-Steamer works as pressureless steamer with a fixed temperature of 100° C (see pages 12, 13, 14).

⑧ Hot-Air-Mode

Set the mode switch to the "Hot-Air" mode ⑧. In addition the desired cooking temperature is selected with the temperature selection switch ⑬ and the necessary cooking time is set with the timer ⑮. The display ④ will show the actual cooking temperature (see pages 16, 17).

⑨ Combi-Steaming-Mode

Set the mode switch to the "Combi-Steaming" mode ⑨. In addition the desired cooking temperature is selected with the temperature selection switch ⑬ and the necessary cooking time is set with the timer ⑮. The display ④ will show the actual cooking temperature (see pages 18, 19, 20).

⑩ Vario-Steaming-Mode

Set the mode switch to the "Vario-Steaming" mode ⑩. In addition the desired cooking temperature is selected with the temperature selection switch ⑬ and the necessary cooking time is set with the timer ⑮. The display ④ will show the actual cooking temperature (see pages 22, 23).

⑪ Operating mode: Reheating

Set the operating mode selector switch ⑪ to "Reheating". The desired temperature is set with the temperature select switch ⑬ and the cooking time is preset with the timer ⑮. The display panel ④ shows the temperature within the unit (o. f. pages 24, 25).

⑫ Preselected Cooking Temperature Display

This display ⑫ shows the preselected cooking temperature for the "Hot Air", "Combi-Steaming", "Vario-Steaming" and "Reheating" modes.

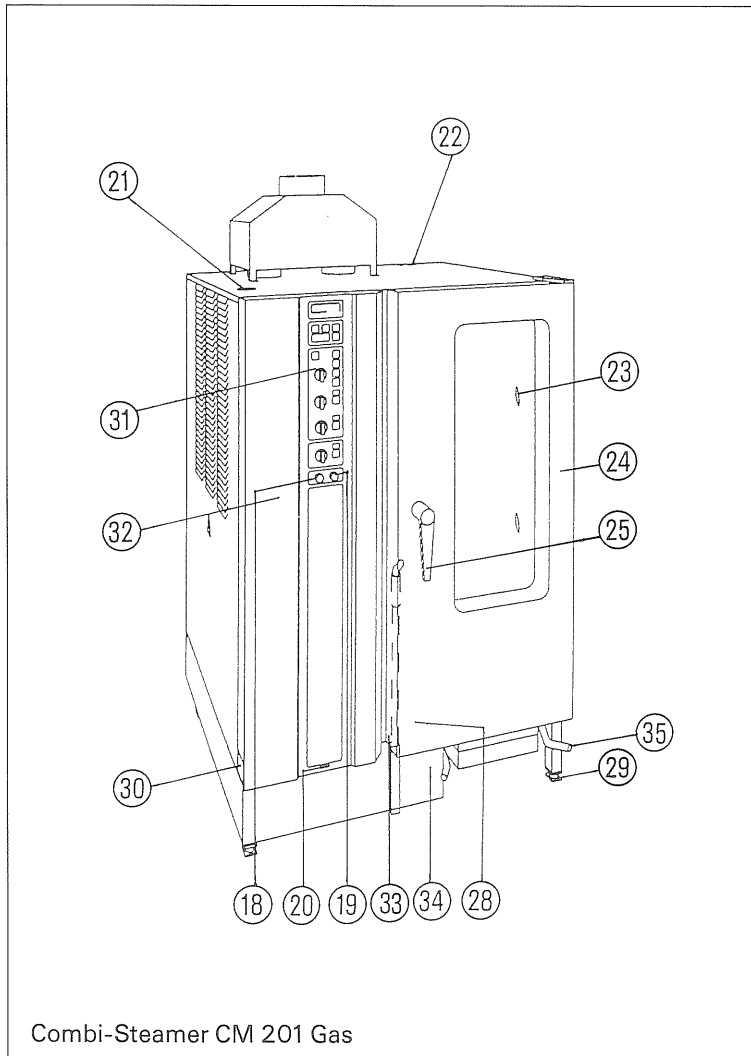
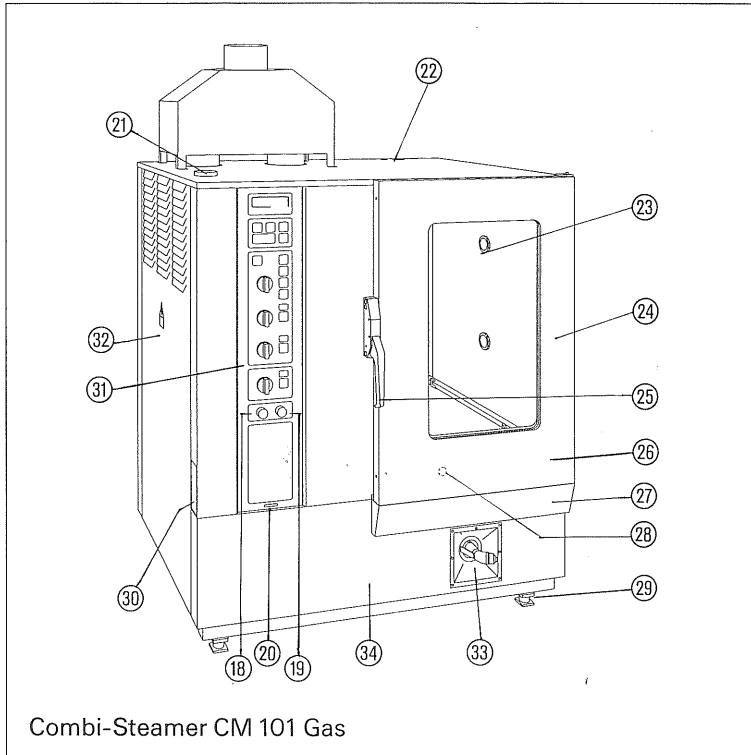
⑬ Temperature Selector Switch

The desired temperature for the "Hot Air", "Combi-Steaming", "Vario-Steaming" and "Reheat" modes is preselected by turning the temperature selector switch ⑬ clockwise.

⑭ Accurate display of preset cooking time

By turning the knob of the timer switch, the accurate display shows the desired cooking time. From the moment the timer is preset, it permanently displays the actual cooking time that is still left.

Features of the RATIONAL Combi-Steamer CM Gas



18 **Warning light "Steaming"**
burner malfunction

19 **Warning light "Hot Air"**
burner malfunction

20 **Unit serial number**

21 **Safety valve**

Attention :

Don't place anything on top of the safety valve and mind not to block it in any way. It is essential that the safety valve can move freely and thus can accomplish its safety function.

22 **Air valves**

23 **Interior light**
(with shock-resistant glasses)

24 **Unit's door**

25 **Door handle** (one-hand-operation)

26 **Integrated door drip collector**

27 **Drip collector**
directly connected to the drain

28 **Door contact switch**

29 **Adjustable legs**

30 **Data plate**
with all important technical specifications, such as power input, voltage, DVGW Number, nominal thermic load, connected load and pressure, frequency, as well as model type and serial number.

31 **Control panel**
(see inside page 5)

32 **Wiring compartment cover**

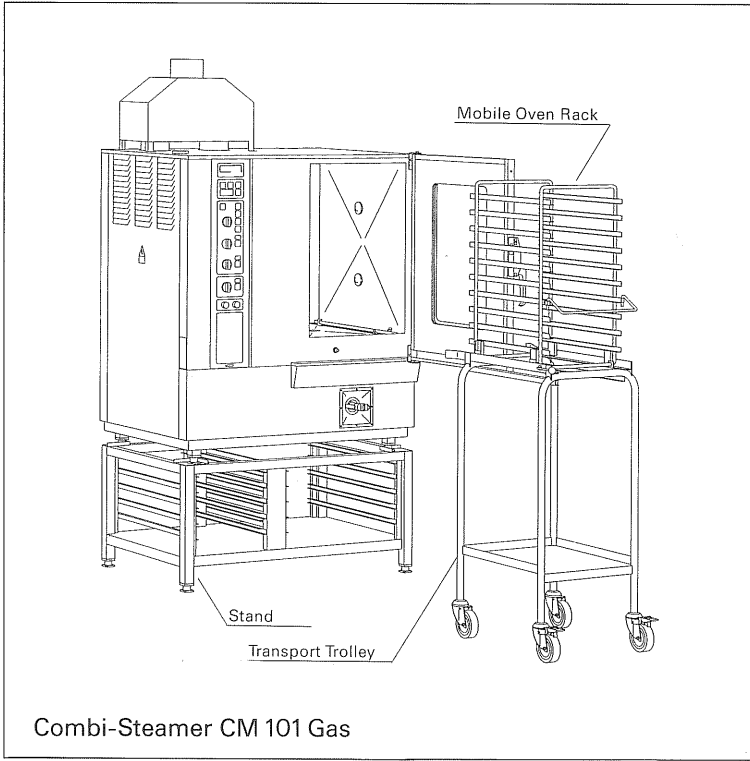
33 **Rinsing jet nozzle with automatic hose rewind**

34 **Service modul**

35 **Easier insert of mobile oven rack**



Loading and Removal



Loading

Place the food according to the handling instructions onto the Original RATIONAL GN-grids or fill it into containers and slide the mobile oven rack into the unit. Insert the mobile oven rack well until it locks into place. If a large amount of food is to be processed, it is recommended to load the mobile oven rack outside the unit. For the RATIONAL Combi-Steamer CM Gas 101 the RATIONAL transport trolley (accessories) is used. High cooking capacity (output) and better working sequence as well as quicker exchange of loads are achieved with the use of additional RATIONAL mobile oven racks and transport trolleys.

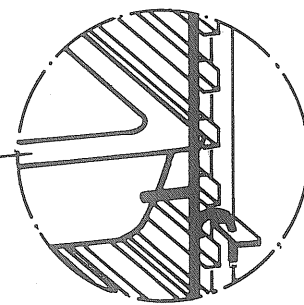
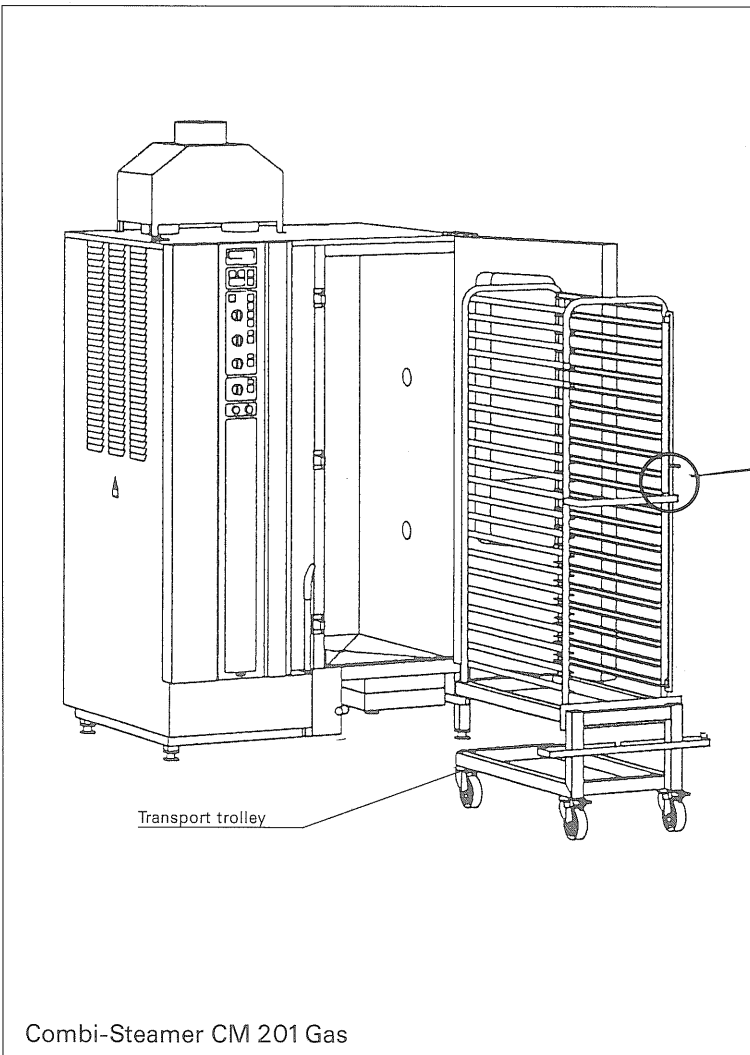
Removal

Open the door slowly.

Don't spray water into the hot cooking cabinet.

CAUTION! STEAM!

When the door is opened, the unit is switched off automatically. The fan rotates till it comes to a stop.



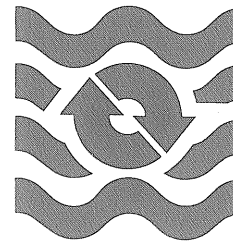
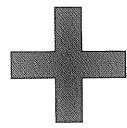
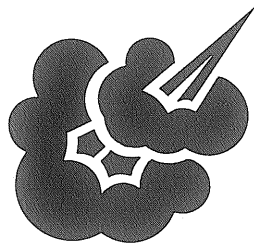
GN-container catch for safe loading



The Cooking Method CM Gas

The RATIONAL Combi-Steamer CM Gas is equipped with two cooking energies

MOIST HEAT + DRY HEAT



STEAM



HOT AIR

These two cooking media can be used either

**singly
in sequence
or combined.**

The RATIONAL Combi-Steamer CM Gas offers the possibility to operate almost all cooking methods of the traditional cuisine in only one unit.

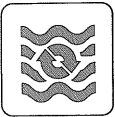


Five Modes are at Your Disposal



Steaming mode moist heat

The high capacity steam generator produces hygienic fresh steam. This is let pressureless into the interior cabinet and is circulated at high speed by the fan. The patented regulation system controls the input of steam; only as much steam is let in as the food is able to absorb. The cooking temperature is fixed at 100°C.



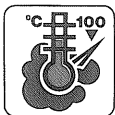
Hot Air mode dry heat

The dry air is heated with a heavy duty heat exchanger. The heat exchange is done indirectly, which means that the food being prepared never touches the exhaust fumes. The fan circulates the hot air evenly throughout the whole oven. The temperature can be set between 30°C and 300°C.



Combi-Steam mode moist heat + dry heat

The two cooking media Steam (moist heat) and Hot Air (dry heat) can be combined by a regulation system. This combination creates a hot-humid climate for a specially intensive cooking. The temperature can be selected between 30°C to 300°C. The interior cabinet continuously contains the optimum humidity, which will prevent the drying out of the food.



Vario-Steam mode moist heat in the low temperature area of 30° to 99°C.

The electronic regulation system with the temperature sensor at one degree precision keeps the preselected cooking temperature within the interior cabinet at a constant level. The sensitive control and regulation technology guarantees an optimal cooking climate, which meets the requirements of the processed food. The temperature can be selected freely between 30°C to 99°C. Temperature allowance is +/- 2°C.



Operating mode Reheating moist heat + dry heat

Both cooking methods steam (moist heat) and hot air (dry air) are specially combined in a control system tailored to the special needs of reheating. Both modes create a perfect environment in the oven that not only prevents food from drying out but also prevents the formation of water puddles and rims. The temperature can be selected from 30°C to 300°C.

**According to the preparation desired
you can choose or combine the suitable modes –
singly, in sequence or combined.**



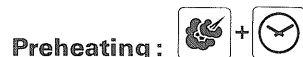
Steaming Mode = Moist Heat

instead of cooking with water in pots and kettles

Steaming means to gently cook food by using steam. The RATIONAL Combi-Steamer CM Gas operates this cooking method pressureless with an optimum constant steaming temperature of 100°C. The intensive saturated fresh steam guarantees an equal cooking within the entire interior cabinet. The food is processed without additional water (exception rice).

Operation :

Set the mode switch ⑦ to the "Steaming" mode. In addition you have to set the timer ⑤ to the desired cooking time. The display ④ is out of order, as in this mode the RATIONAL Combi-Steamer CM Gas works as a pressureless steamer with a steaming temperature of 100°C (see page 5, 6, 7).



Before loading and after more than three hours "Non-use", the RATIONAL Combi-Steamer CM Gas is to be preheated in the "Steaming" mode until the window is misted over.

Cooking methods :

Steaming, stewing, blanching, poaching, simmering, soaking, cooking in vacuum.

Additional possibilities :

Thawing, reconstituting (reheating), preserving, sterilizing.

Examples of cooking items :

Eggs, hors d'oeuvres, vegetable (frozen or fresh), side dishes (frozen or fresh), fish (frozen or fresh), meat (veal – beef – pork – lamb – game), convenience-products, fruit, various desserts, ... Preserves in jars.

Advantages :

The technical equipment of the RATIONAL Combi-Steamer CM Gas results in extremely short preheating periods. No more time consuming water reheating. Even when the unit is fully loaded, only a relatively short cooking time is necessary for various food items. As the long preheating periods (e.g. in kettles, pots etc.) no longer exist, a constant production of bigger amounts (broccoli, cauliflower, Brussels sprouts etc.) is guaranteed.

High food quality

By the processing with steam the valuable taste and flavour elements as well as the food structure are preserved. Steamed food retains its own distinct, typical taste.

Contrary to boiling in water, the food keeps its nutrients and minerals when processed in the

"Steaming" mode. If you compare boiled and steamed vegetable, you will find that steamed food impresses by its appetizing fresh colour. By using relatively shallow containers, the food items are only piled in few layers; bruising is avoided.

Conservation of vitamins

The RATIONAL Combi-Steamer CM Gas enables a specially gentle, vitamine conserving cooking process, as the usually long preheating periods do no longer exist, little liquid is used or none at all and the cooking temperature remains slightly below 100°C.

Firmness of food items

Overcooking is no longer possible (contrary to boiling in pots, kettles or pressure cookers). The grade of firmness resp. softness can be regulated individually.

Simultaneous steaming of different products

In the RATIONAL Combi-Steamer CM Gas no taste transfer takes place in the "Steaming" mode. This means, that all food can be steamed at the same time, even if they have different constitution and need different cooking times. Loading or unloading of partial amounts are possible at any time.

Application instructions and advices

Use of containers

All sorts of vegetables are steamed in perforated or unperforated Original RATIONAL containers.

Cooking times

Cooking times of vegetable depend on the individual quality. Especially when steaming fresh vegetable it is recommended to check its state after 3/4 of the initial cooking time. Steamed vegetable tends to soften afterwards. As practise shows, that there is a certain time difference between cooking and serving, it is best not to cook vegetable too soft. This is especially important for carry-out services.

Perforated containers shorten the cooking times. The approximate cooking times also vary depending on the different consumers (restaurants, old peoples homes) and traditional eating habits.

Blanching

Large amounts can be blanched in a short time. Please observe that the containers are not filled higher than 6 to 8 cm.

Seasoning

Spices can be added either to the raw or frozen products.



Steaming Mode = Moist Heat

Dry seasoning before steaming:

Prepare a mixture of dry spices and sprinkle it evenly on to the vegetable. Add butter, beurre maitre d'hotel etc. only just before service.

Thawing and steaming at the same time

Thawing means the defrosting of raw frozen food. The food is processed at the same time. The traditional thawing periods are shortened substantially and the quality of the thawed food is improved.

Reheating

Reheating means the warming up of precooked food, which was stored either in frigerators or deepfreezers.

You can reheat: potatoes, noodles, rice, dumplings, fruit, fruit preserves, vegetable, cooked meat, portioned roasts. The use of steam causes an even heat distribution. This results in better appearance, taste and the conserving of nutrients.

Reheating periods depend on the size and the content of the containers. Food is reheated in the same unperforated containers, in which they were already precooked (smaller containers, never place GN-containers on to grids). The reheated food can be given to service immediately in one single operation. This means an enormous saving of time and at the same time improves creativity of food preparation.

Even vegetables such as broccoli, Brussels Sprouts and cauliflower can be served in large amounts (banquets).

Tips:

Oil seasoning after cooking:

Mix oil with dry spices and add it to the vegetable. This seasoned oil spreads evenly and gives the dishes an appetizing, aromatic taste. If necessary steam again for another two minutes.

Stocks for sauces (vegetable)

When unperforated containers are used for cooking, usually there is enough stock for the preperation of sauces.

When you prefer to use perforated containers, insert a container in the bottom rail of the mobile oven rack to collect the stock.

Frozen Vegetable

Do not process frozen vegetable in blocks, but take care to scatter them into the containers. Frozen as well as fresh vegetable can be processed in one operation. Frozen vegetable should not be thawed.

Tomates Concasses:

(skinned tomatoes)

Remove stalk – place tomatoes in perforated or

shallow unperforated containers – steam the tomatoes for approx. 30 to 60 sec. according to their ripeness – chill the tomatoes with cold water and skin them.



Side Dishes:

Potatoes

Always cook potatoes in perforated containers. Salt and mix them thoroughly just before steaming. Quarter the potatoes through the width and not through the length (improved steam penetration).

Rice

Add water according to the type of rice. In the RATIONAL Combi-Steamer CM Gas all types of rice preparation turn out excellently and within a short time. Please remember that rice continues to swell after cooking. Let the rice soak before steaming, this will shorten the cooking time.

Potatoe Dumplings

Prepare dough as usual, place the dumplings in shallow containers (not too close to each other) and steam them. In case of a longer preparation period cover the dumplings with a damp cloth to avoid that their surface begins to dry. When using convenience-products, the manufacturer's instructions regarding soaking time and adding of water are to be observed.

Preparation of Fish

Containers

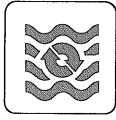
Fish can be steamed gently in containers without extra stock etc. For fresh fish (fillets) use 20 mm containers. For bigger pieces or frozen fish use 40 mm containers.

Trout "au bleu"

Salt the inside of the fish slightly, if wanted use "bouquet garni". Place the fish (with the grills and belly flattened out) in a shallow container. Steam without stock. Prepare entire crustaceans (e.g. lobster) as show-pieces. The gentle steaming prevents the loss of valuable protein.

A la Carte Preparation

In the RATIONAL Combi-Steamer CM Gas you can use 1/1, 1/2, 1/3, 2/3 and 2/8 GN-containers, so even small amounts can be cooked and prepared. This guarantees a more rational and flexible a la carte preparation. The kitchen ranges are no longer blocked. Less pots and pans mean less washing-up.



Hot Air Mode = Dry Heat

instead of roasting in convection ovens, in pots and pans, baking in ovens.

This mode cooks the food by permanently circulating hot air. With the indirect heat exchanger, the hot air is circulated at high speed, surrounding the food items from all sides and immediately closing the pores, so that the meat stays juicy. The temperature range is between 30°C and 300°C and can be set variably.

Operation :

Set the mode switch ⑥ to the "Hot air" mode ③. In addition the desired cooking temperature is selected with the temperature selection switch ⑬ and is shown in the display ⑫. Set the timer ⑬ to the desired cooking time. The display ④ shows the actual cooking temperature inside the interior cabinet (see pages 5, 6, 7),

Preheating + +

When the unit is fully loaded or when preparing grilled meat, always preheat the unit at 300°C – not for baking. Load the unit quickly, then select the desired cooking temperature.

Attention

Before opening the unit's door wait until the fan stops rotating (heat loss).

Cooking methods :

Toasting, grilling, baking, gratinating ...

Examples of food items :

Grilled meat, hamburges, steaks, cutlets, medallions, scallops, chicken legs.

Poultry, lamb, hare, saddle of venison, fish frozen or fresh, stuffed vegetable, different sorts of doughs and batters.

Application instructions and advices

Loading capacity

The performances stated in the charts are calculated for maximum capacity.

Oiling

The quality of some dishes can be improved by oiling the surface with either oil or a paprika-oil-mixture (e.g. steaks and poultry). Depending on the amounts this will be done with a brush, spray pistol or by dipping in oil.

Containers or grids

This is a question of your individual decision. Grids have the advantage, that the top and the bottom sides of roasts etc. will show an even browning. In containers the bottom side of roasts may turn out paler than the top side when the unit is fully loaded.

Take care that fillet steaks, sirloin steaks, medallions and tenderloins have the same thickness and the cuts of similar sizes are placed on the same grid.

Do not overload grids or containers in order to ensure an even air circulation.

Cooking times

Cooking times depend on quality, weight and size of the product. The flatter the piece, the shorter its cooking time.

Rule of thumb: every 1 cm meat cut needs approx. 8 to 10 minutes cooking time. Meat cuts of 1,5 to 2 cm thickness show excellent results. Do not beat or flatten the meat.

Meat covered in bread crumbs

Generally, every conventional type of bread crumbs can be used. It is obvious that the grade of browning is also influenced by the ingredients of the breading. To intensify the browning you may use special browning aids.

Press breading firmly to the meat, cover with oil and do not overload the unit. For some dishes it is preferable to use eggs and bread crumbs only. The flouring of grilled meat is disadvantageous.

Preparation of fish

The flouring of fish fillets is not recommended. For the preparation of fried fish, the granite enamelled containers should be preheated as well.

When preparing large entire fish (pike, perch-pike), wrap the tail in aluminium foil and support it from underneath with raw potatoes.

Gratinating

Gratinating is done at high temperature.

Which dishes will be gratinated ?

Some examples of many possibilities :

Soups, white and dark meat, fish and mussels, asparagus, chicory, broccoli, fennel, tomatoes, toasts.

How to gratinate ?

Always preheat the RATIONAL Combi-Steamer CM Gas at 300°C for gratinating. Load the unit quickly, then select the desired cooking temperature. Use grids and containers (20 mm 1/1 GN) to gratinate toasts, steaks and soups.



Combi-steaming mode

= Moist Heat
and Dry Heat

**instead of
roasting in the oven with basting,
baking in the oven with damping**

The "Combi-Steamer" mode combines all advantages of hot steam (short cooking time, low weight loss) and hot air (intensive aroma, appetizing colour). The two cooking media steam and hot air are circulated at high speed, surround the cooking item from all sides; in this way an intensified cooking process is achieved.

The "Combi-Steamer" mode can be used (like the "Vario-Steamer", the "Steaming" and the "Hot

Air" mode) for one complete cooking process from the beginning to the end. It is also possible to use the "Combi-Steamer" mode only for a part of the total cooking process.

For individual preparations the modes can be changed at any time during the cooking process. The temperature ranges from 30° to 300° C and can be regulated variably.

This means in practise:

the two cooking media



Steam (moist heat) and



Hot Air (dry heat)

can be used

either singly, in sequence or combined.

You as the expert will know immediately when and for how long you will use the different modes.

It will be easy for you to transfer the conventional cooking methods to the modern

RATIONAL Combi-Steamer CM Gas techniques.

Some examples of the manifold application possibilities:



Steaming +



Hot Air

First cook with steam, then with the hot air mode you can gratinate, brown resp. roast, e.g. gratinated vegetable, cauliflower, fish, roasts for buffet, casseroles etc.

Advantage: Less work, quicker service. This applies for all sorts of vegetable preparation. Also fresh or frozen fish can be prepared variably.

Menu example: garnish steamed fillet of turkey with pineapple and cheese - gratinate with hot air.



Hot Air +



Combi-Steamer

Start with the hot air mode to dry the surface of the cooking item or to close the pores, then change to the steaming mode, e.g. heavy poultry, shoulder of lamb, french pastry etc.



Combi-Steamer +



Hot Air

Start with the Combi-Steamer mode, then switch to the hot air mode for final intensive browning (crunchy crust), e.g. stuffed peppers, stuffed turnips, Fillet Wellington, roastbeef, leavened doughs.



Steaming +



Hot Air +



Combi-Steamer

Meat:

First close the pores with steam, then cook by changing from hot air to combi-steaming, e.g. pork roasts with crackling, beef rolls, minced meat etc.

Stuffed vegetable:

First steam shortly, then cook by changing from hot air to combi-steaming, e.g. cabbage rolls, cucumbers, zucchini etc.

This combined cooking process is also used for every type of pastry, which need damp and dry heat during the baking process.



Vario-Steamer +



Hot Air +



Combi-Steamer

First gently steam the cooking item, then change from the hot air mode to the combi-steaming mode to intensify the aroma and the crust, e.g. truffled forcemeat, different sorts of pies and patés, stuffed chicken breasts etc.



Combi-steaming mode

= Moist Heat
and Dry Heat

Operation:

Set the mode switch ⑥ to the "Combi-Steaming" mode ⑨. In addition the desired cooking temperature is selected with the temperature selection switch ③ and shown on the display ⑫. Select the desired cooking time with the timer ⑬. The display ④ shows the actual cooking temperature (see pages 5, 6, 7).

Preheating:



The preheating depends on the first selected mode. See preheating for the "Steaming" mode (page 12) and the "Hot Air" mode (page 16).

Cooking methods:

"Combi-Steaming", "Combi-Roasting", "Combi-Baking", glazing, gratinating.

Examples of cooking items:

All big roasts (veal, beef, pork, lamb, game), poultry, chicken, pork legs, beef rolls, meat loafs, minced meat, pies, stuffings, casseroles, roastbeef, Fillet Wellington, vegetable preparations, french pastry, different types of doughs and batters.

Advantages of the "Combi-Steaming" mode

Rationalization

For quite a number of food preparation methods it is absolutely necessary to cook with high temperatures as well as with steam. This way the cooking items will keep their typical own taste. Previously two or three different units in several working sequences were needed for this kind of preparation.

Now all these cooking methods can be combined without time wasting interruptions in only one unit, the RATIONAL Combi-Steamer CM Gas.

Less weight loss

The usual weight loss when roasting in conventional ovens can be reduced by half (on an average).

When cooking a 100 kg roast, this means a profit of 80 to 100 meat portions!

From the budget point of view this is a convincing argument for this mode.

Juiciness and individual crusts

By steaming the cooking item, the pores on the surface are closed immediately, due to the quickly congealed protein. This keeps nutrients and juices inside the roasts. The combination of hot air and steam enables an intensive cooking process.

Even for big roasts (e.g. entire pork legs) an intensive cooking to the bone is guaranteed.

By steaming the meat shortly at the beginning, it will be penetrated by steam and achieves a bigger size. Through the constant exchange between "Hot Air" and the "Combi-Steaming" mode, the roasts will develop a pleasing brown colour as well as an appetizing brown crust.

The meat will have a pronounced roasted taste.

An encrusting (burning) of the surface is excluded. Especially pork legs and pork roasts show that the cracklings have an excellent elasticity and juiciness.

When preparing roast beef, the moisture during the Combi-Steaming mode prevents the drying out of the meat.

Generally big roasts stand for their special juiciness and consistency.

The excellent consistency of roasts guarantees optimum portioning.

Dietary preparation

The preparation of roasts for the dietary kitchen always required a great deal of effort and special care. The RATIONAL Combi-Steamer CM Gas solves this problem in no time. All preparations for the different types of diets can be realised.

Application instructions and advice

Loading

Use grids for the loading with big roasts. The grids enable an even cooking of the roasts from all sides. A turning of the cooking item is no longer necessary.

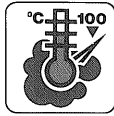
Temperatures

Rule of thumb: The longer the cooking time, the lower the cooking temperature. This results in less weight loss. The core temperature of cooking items should be observed during preparation.

Cooking times

The cooking times depend on the quality, the weight and the height of the roasts. The flatter the roasts, the shorter the cooking time. Therefore the values indicated in the charts can vary in practise.





Vario-steaming mode = Low temperature cooking steam

**instead of
cooking in pots, casseroles,
kettles and bain maries**

The free temperature selection enables to cook with variable cooking temperatures from 30° C to 99° C. The temperature tolerance is +/- 2° C. The sensible control and regulation technology provides a cooking climate that meets the needs of the processed food. The electronic regulation system with the temperature sensor at 1° C precision guarantees, that the preselected cooking temperature is kept constant in the entire cooking cabinet.

Operation

Set the mode switch ⑥ to the "Vario-Steaming" mode ⑩. In addition the desired cooking temperature is selected with the temperature selection switch ③ and is shown in the display ⑫. Set the timer ⑬ to the desired cooking time. The display ④ shows the actual cooking temperature inside the unit (see pages 5, 6, 7).



Preheating

Before loading and after more than three hours non-use, the RATIONAL Combi-Steamer CM Gas is to be preheated in the "Vario-Steaming" mode until the window is misted over.

Cooking methods:

Scalding, simmering, soaking, poaching, blanching, cooking in vacuum, thawing, reconstituting (reheating), preserving.

Examples of cooking items:

Egg royale, fillet of salmon-trout, turbot, crustaceans, pies, galantines, patés, fricassée of veal, brisket of beef, poultry, pork, game, lamb, ham, crème caramel, different fruits, preserves in jars (vegetable, meat, fruit).

The gentle cooking

The gentle cooking in the "Vario-Steaming" mode results in excellent consistency and elasticity for the different sorts of meat and fish preparations. This guarantees a better handling during service. Even delicate preparations such as half a salmon, which tends to dry when prepared the conventional way, can be "vario-steamed" without problem. When "vario-steamed", the preparations of forcemeat, patés, galantines etc. show an enormously improved quality.

The constant coagulation at a precisely controlled

temperature guarantees that the development of big pores (bubbles) along side the container's rims and forms are avoided; no more curdling, crumbling and forming of flakes.

This results in fine pores and totally smooth surfaces and easy portioning.

When preparing big roasts and show-pieces the optimum cooking process right to the core of the individual cooking item guarantees, that the original size is kept.

Practical findings:

Simply by changing the cooking temperature, completely new tastes can be achieved, such as poaching of salmon trout fillets at 75° or 80° C. Just try yourself! Also in the dietary food preparation you can offer new taste experiences.

The advantages of the "Vario-Steaming" mode

Until now in the traditional kitchen it was quite a difficult task, if not impossible to cook gently sensitive food in quality and quantity.

The "Vario-Steaming" mode offers for the first time the practical possibility, to achieve this task. Even large amounts can be produced easily and space saving without the manipulation of pots and pans or the blocking of the kitchen range.

By using a lower temperature as in the "Steaming" mode, a whole range of raw materials receives an improvement of their typical own taste, intensified colour and a specific food related cooking.

Cooking times in the "Vario-Steaming" mode:

During the traditional preparation (bain marie/ casseroles) the cook paid more attention to the cooking temperature than to the actual cooking time. The same principle applies for the "Vario-Steaming" mode. As recommendations of approximate cooking times you can use the chart of the "Steaming" mode (see pages 26 - 33). Generally for the "Vario-Steaming" mode you have to observe:

The lower the cooking temperature, the longer the cooking time.

Recommendations of cooking temperatures in the "Vario-Steaming" mode

Soup trimmings: 75°-90° C

Fish, crustaceans: 75°-90° C

Pies, galantines, patés: 65°-90° C

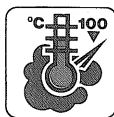
Sausages: 72°-75° C

White meat: 75°-85° C

Dark meat: 80°-90° C

Poultry: 80° C

Desserts: 65°-90° C



Vario-steaming mode = Low temperature cooking steam

Cooking in vacuum

The development of cooking in vacuum was based on the method of vacuum preserving. The most important requirement for the cooking in vacuum is, that the raw material is absolutely 100% vacuum-packed. The cooking item is sealed in special sealing and/or vacuum bags. After the cooking in vacuum the products are cooled down quickly to + 2° C.

As recommendations for cooking times see the cooking times in the "Steaming" mode chart.

Practical findings:

The better vacuumed (complete vacuum), the shorter the cooking time.

Application methods:

Fish, meat, poultry, vegetable, side dishes and fruits are to be prepared the conventional way. Different garnishes and special stuffings can be prepared with special attention.

For the cooking in vacuum place the food items on to the grids!

Cooking in vacuum:

Fish, stuffings, goose liver: 70° C

White meat: 80° C

Vegetable, mushrooms, fruits: 90° C

Dark meat, side dishes: 100° C

Scalding:

In the RATIONAL Combi-Steamer CM Gas the scalding is especially gentle and will be used mainly for the production of sausages.

Advantages compared with the cooking in kettles

- Firm structure of stuffings
- Intensified aroma and intensified taste of the products
- When processing fat material, the weight loss is very low
- Bursts are avoided, especially when using skins with damaged surfaces

Recommended approximate temperature:

72° C – 80° C

Preserving:

The cooking temperature depends on the type of the product (grade of ripeness, cut). According to the firmness of the raw material and the desired preserving result, the cooking item will be covered with hot or cold water. The diameter of the used preserving containers (jars) should not exceed 100 to 120 mm.

Recommended approximate temperature:
74° – 100° C.

Application instructions

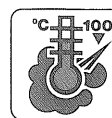
and advice:

The use of differently sized GN-containers depend on the individual amount and size of the equivalent cooking item. Perforated and unperforated containers can be used individually according to the cooking method.

In addition all sorts of forms can be used, such as ramekins, ring tins, pie trays etc. The material (glass, clay, porcelain, chrome-nickel-steel) is of no importance. The forms are placed on grids or shallow GN-containers (20 mm).

Seasoning:

Simply by choosing a lower cooking temperature, the typical own taste is intensified. Therefore, quite a number of products do not need any more taste improving seasonings, especially salting! Measure the added alcohol and the use of different fumets, essences etc. carefully. Season the dishes individually.



Notes



Reheating mode

Instead of heating up and keeping food warm

Starting up :

Preheating :  +  + 

Preheat the RATIONAL Combi-Steamer CM Gas until the selected reheat temperature is reached.

Advantages :

In the reheating program the humidity of the interior of the RATIONAL Combi-Steamer CM Gas is automatically adapted to your reheating requirements on plates and platters by an electronically controlled steam supply. Thus an ideal environment is created, preventing products that were arranged on the plates beforehand (in a cold state) from leaving dry rims or unwanted puddles (of condensed water).

The cooking time and the temperature are set individually, according to the product being processed, and setting high quality standards. The preset values are shown as actual values on the digital displays.

Temperature selection range :

30° - 300° C

Instructions and hints

Loading

Open the unit door and roll in the mobile oven racks loaded with portioned cold plates on grids. Use the RATIONAL Special Mobile Oven Rack for extra wide serving trays.

For **serving platters up to 375 mm** use the RATIONAL special mobile oven rack.

Reheating time :

Set to approx. 5 - 8 minutes. Reheating time varies according to product, product temperature, number of plates/platters and load.

Reheating temperature :

Generally, temperatures between **140°** and **160° C** have given the best results, but the temperature can be set individually according to the consistency of the product to be processed.

Some advice for the use of this mode :

For quick and thorough reheating of the foods, make note of the following items:

- Arrange/spread the components of the meals evenly on the plates and/or platters.
- Sauces/Gravies : Always cover or pour over the product or pour a small amount on the plate after reheating.
- Large components like, for instance, potato dumplings and other convenience products, beef rolls, turkey legs, pork leg, soufflé (65 mm), etc., require more time to heat up than ready-cut roast beef, portioned poultry, vegetable side dishes, rice, pastry on serving china, quartered potatoes, various fruits and precooked food.

A very good idea for smooth operations with reheating/warming up is to make tests of the different products/combinations in order to find the ideal conditions for reheating and write reports for future reference.

- The possibility of using the core temperature probe anytime you wish to determine the ideal serving temperature represents the highest degree of safety.
- For variable reheating in any other operating mode please refer to page 21.



Cooking with core temperature (meat probe)

1. Introduce the clean and cold temperature probe tip into the thickest part of the food item avoiding the bone.
2. Set the mode switch ⑥ to "Steaming" ⑦, "Hot Air" ⑧, "Combi-Steamer" ⑨ "Vario-Steamer" ⑩ or "Reheating" ⑪ (the buzzer comes on).
3. Preselect the desired core temperature with the core temperature selection switch ⑰ (buzzer stops). The display ⑱ shows the preselected core temperature. The core temperature display ④ shows the actual core temperature. The core temperature indicator light ⑤ signals that the meat probe is in operation.
4. Set the temperature selection switch ⑬ in a clockwise direction to the desired cooking temperature (not working in the "Steaming" mode). The display ⑫ shows the preselected cooking temperature.
5. The timer ⑮ remains at „0“.
6. The cooking process is operating automatically.
7. When the preselected core temperature is reached, the buzzer sounds. The unit is switched off automatically.
8. During the cooking process the preselected cooking temperature as well as the preselected mode can be altered at any time.
9. The unit is switched off completely by setting all switches to „0“.
10. If a higher core temperature is desired, once the preselected one is reached, the core temperature selection switch ⑰ is to be set to „0“ first, then the new core temperature can be selected.

Core temperature measurement

The possibility to measure the core temperature of big roasts is very advantageous. Especially in cases of cooking items, that need a lot of care and control, such as roastbeef etc. it is essential to achieve the precise core temperature.

Practise shows, that consequent working with the meat probe results in lower weight losses. Every degree exceeding the optimum core temperature means a substantially higher weight loss. In addition, a constantly equal cooking result helps you to guarantee a high quality standard, especially where meat is concerned.

The following chart will show you some indications of core temperatures.

General information concerning core temperature for meat

Meat	Core temperature	Colour of meat core
Beef		
Rare	15°C	dark blood red
Medium rare	50°C	red meat blood red juice
Medium	55 - 60°C	light pink fading into greyish-brown towards the outside
Well done	75 - 85°C	uniformly grey-brown throughout
Veal		
Fully cooked	over 77°C	reddish-brown greyish-white meat juice
Pork		
Medium	65°C	light pink
Fully cooked	75 - 80°C	yellowish-brown greyish-white meat juice
Pickled	65°C	pale red brownish or nearly colour- less juice
Lamb		
Fully cooked	79°C	grey, lightly pale red
Mutton		
Fully cooked	82°C	grey, lightly pale red juice
Poultry		
Fully cooked	85°C	yellowish-white nearly colour- less juice



Cooking with core temperature (meat probe)

Core temperature values

	State	Core temperature
Beef		
Fillet of Beef	medium-rare	55–58°C / 130–135° F
Roastbeef	medium-rare	55–60°C / 130–140° F
Beef Rose	well done	85–90°C / 185–195° F
Roast Beef Joint	well done	80–85°C / 175–185° F
Aitchbone	well done	90°C / 195° F

Pork		
Leg	well done	75°C / 165° F
Leg	underdone	65–68°C / 150–155° F
Saddle	just right	65–70°C / 150–158° F
Pork neck	well done	70–75°C / 158–165° F
Pork shoulder	well done	75°C / 165° F
Belly/stuffed	well done	70–75°C / 158–165° F
Knuckle, roasted	well done	80–85°C / 175–185° F
Ham	juicy	64–68°C / 145–155° F
Smoked pork chops (Mixed cold meat-buffet)		65–70°C / 150–158° F
Ribs	well done	65°C / 150° F
Ham (in bread crust)		65–70°C / 150–158° F
Tongue	well done	85–90°C / 185–195° F
Pig's Head		75–82°C / 165–180° F

Veal		
Saddle of veal	just right	65–70°C / 150–158° F
Leg, Top-side, Fricandeau	well done	78°C / 172° F
Loin of veal	well done	75–80°C / 165–175° F
Roast/Shoulder	well done	75–80°C / 165–175° F
Breast (often often stuffed or boned)	well done	75–78°C / 165–170° F

	State	Core temperature
Mutton		
Saddle	just right	70–75°C / 158–165° F
Saddle	well done	80°C / 175° F
Leg	just right	75–78°C / 165–170° F
Leg	well done	82–85°C / 180–185° F

Lamb
When the meat is well done, the core temperature varies between 79° to 85°C (173–185°F). The colour of the core is grey, slightly pink. The gravy is clear.

Poultry		
Chicken	well done	85°C / 185° F
Goose	just right	75–80°C / 165–175° F
Goose	well done	90–92°C / 195–198° F
Turkey, Duck	well done	80–85°C / 175–185° F

Pies, Pates etc.		
Pies		72–74°C / 160–165° F
Meat Puddings		70°C / 158° F



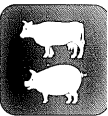


Examples Beef, veal and pork

Food	State	Hints and Advices	Proper GN-container/ grid	Amount per container/ grid
Fillet Steak	fresh, approx. 3 cm high, medium	season, oil lightly	1/1 grid	12 pcs.
Sirloin Steak	fresh, approx. 2 cm high, medium	season, oil lightly don't flatten	1/1 grid	10 pcs.
Scallops	fresh, approx. 130g	season, oil lightly	1/1 grid	10 pcs.
Pork Chops	fresh	rub in seasoning well, don't flatten	1/1 grid	10 pcs.
Beef liver	portioned	cut in equal slices	1/1 grid 20mm granit.	10 pcs.
Roastbeef		season, oil lightly	1/1 grid 20mm granit.	6 kg
Beef joint	mature	choose flat pieces ø 80–100mm	1/1 grid 65 mm unperf.	6–8 kg
Veal joint	tie if necessary	season, lard lean parts (fricandeau)	1/1 grid 65 mm unperf.	8 kg
Pork neck Pork roast	boned	season well, use spice mixture	1/1 grid 65 mm unperf.	8 kg
Dark meat	fresh	add "bouquet garni" if necessary	65 mm unperf.	6–8 kg
Fricassée of veal	fresh	add spices and vegetable to the meat	65 mm unperf.	3–4 kg
White Meat	fresh	add "bouquet garni" if necessary	65 mm unperf.	6–8 kg
Salted and Smoked Neck	fresh	boned, place similar sized pieces on same grid	1/1 grid	6–8 kg
Pork Knuckle	fresh		1/1 grid 65 mm unperf.	7–9 pcs.
Pork Leg	fresh 900–1200 g	steam first, cut the crackling, season, don't oil	1/1 grid	6–8 pcs.
Hamburger	fresh	oil lightly if necessary preheat to 300°C	20 mm granit.	10–12 pcs.
Meat Loaf Minced Meat	fresh, approx. 2 kg per form	smooth surface, possibly fill in forms	40 mm granit.	6 kg
Beef Rolls	convenience fast food	season, add some red wine	65 mm unperf.	20–25 pcs.
Ragout Fin	gratinate	fill the warm ragout fin in forms cover with sauce hollandaise	1/1 grid	gratinate acc. to size
Meat Pudding	fresh, approx. 2 kg	fill in aluminium containers	1/1 grid	4–6 kg

CM 101 Gas, CM 201 Gas

Accessories per load	Mode switch	Temp. °C °F	Cooking time in min.	Approximate load capacity		Approximate amount per hour	
				CM 101 Gas	CM 201 Gas	CM 101 Gas	CM 201 Gas
10 x 1/1 grid	20 x 1/1 grid	250-270 480-515	7	120 pcs.	240 pcs.	720 pcs.	1440 pcs.
10 x 1/1 grid	20 x 1/1 grid	250-270 480-515	8-10	100 pcs.	200 pcs.	600 pcs.	1200 pcs.
10 x 1/1 grid	20 x 1/1 grid	250 480	10	100 pcs.	200 pcs.	500 pcs.	1000 pcs.
10 x 1/1 grid	20 x 1/1 grid	250-270 480-515	15	100 pcs.	200 pcs.	400 pcs.	800 pcs.
10 x 20 mm 10 x 1/1 grid	20 x 20 mm 20 x 1/1 grid	250 480	10	100 pcs.	200 pcs.	600 pcs.	1200 pcs.
5 x 1/1 grid 5 x 20 mm	10 x 1/1 grid 10 x 20 mm	140-200 285-390	25-30	30 kg	60 kg	60 kg	120 kg
4 x 1/1 grid 1 x 65 mm	9 x 1/1 grid 1 x 65 mm	140-160 285-320	90-120	30 kg	80 kg		
4 x 1/1 grid 1 x 65 mm	9 x 1/1 grid 1 x 65 mm	160-180 320-355	90-100	30 kg	60 kg		
4 x 1/1 grid 1 x 65 mm	9 x 1/1 grid 1 x 65 mm	160-180 320-355	85-100	30 kg	70 kg		
5 x 65 mm	10 x 65 mm	80 175		40 kg approx.	80 kg approx.		
5 x 65 mm	10 x 65 mm	75-85 165-175		20 kg	40 kg		
5 x 65 mm	10 x 65 mm	80 175		40 kg approx.	80 kg approx.		
5 x 1/1 grid	10 x 1/1 grid	50		35-40 kg	80 kg		
5 x 1/1 grid 5 x 65 mm	10 x 1/1 grid 10 x 65 mm	70-100		35-45 pcs.	70-90 pcs.		
5 x 40 mm	10 x 40 mm	180 355	70	30 pcs.	80 pcs.		
10 x 20 mm	20 x 20 mm	230 445	15	120 pcs.	240 pcs.	480 pcs.	960 pcs.
5 x 1/1 grid	10 x 1/1 grid	150-170 305-335	90	30 kg	60 kg		
5 x 65 mm	10 x 65 mm	160-180 320-355	70	125 pcs.	250 pcs.		
5 x 1/1 grid	10 x 1/1 grid	250 480	6	according to size			
5 x 1/1 grid	10 x 1/1 grid	130-160 280-320	90	30 kg	60 kg		





Examples Game, poultry, pies, fish, crustaceans

Food	State	Hints and Advices	Proper GN-container/ grid	Amount per container/ grid
English Ham		Let the baker wrap it in bread dough	20mm or 40mm granit.	according to size
Whole Ham	fresh	slightly cured, add some cloves	1/1 grid	1
Saddle of Hare	fresh larded	season, wrap with bacon or oil slightly	20 mm unperf. or 1/1 grid	6–8 pcs.
Saddle of Venison	fresh larded	skewer spine, season, oil	20mm unperf. or 1/1 grid	2 pcs.
Leg of Venison	fresh larded	season, bond, tie	1/1 grid 1/1, 65 mm unperf.	5–6 kg
Larded leg of hare		season	1/1, 65 mm unperf.	12 pcs.
Whole Chicken	fresh or thawed approx. 1000g	dry well, rub in seasoning well, oil	1/1 grid	6 pcs.
Chicken Legs	fresh or thawed	brush with liquid seasoning or oil mixture	1/1 grid	10–12 pcs.
Goose	fresh	season, possibly stuff, don't oil	1/1 grid 40mm granit.	2 pcs.
Turkey breast	fresh	season, possibly lard	1/1 grid 40mm granit.	2 pcs.
Duck breast vacuum cooked	fresh	boned, roast well, vacuum well	1/1 grid	10 pcs.
Poultry	fresh		20/40 or 65 mm	6 kg
Leg of Lamb	boned tied	season, possibly stuff, don't oil	1/1 grid	6–7 kg
Leg of Lamb vacuum cooked	fresh	bone, observe exact vacuum, season acc. to preparation	1/1 grid	6–7 kg
Home-made Sausage	fresh	stuff the skin evenly, don't bind too tight	20mm 1/1 grid	approx. 30 pcs.
Farcenockerl	fresh	mis-en-place cover with foil	20mm	50 pcs.
Paté à la Maison	fresh	fill the forms well	pie trays/ paté forms	6–8 kg
Perch	fresh	season, possibly with wine or court-bouillon	40mm unperforated	10–12 pcs.
Trout au bleu	fresh	bend out belly-lobes	20 or 40mm unperforated	8–10 pcs.
Sole rolls	fresh	season, add wine, roll with the skin to the outside	40mm unperforated	30 pcs.
Flounders	fresh	cook with the pale bottom side up	20mm granit.	4–5 pcs.
Fried Trout	fresh	season, oil slightly	20mm granit.	8–10 pcs.
Salmon Trout Salmon Steak	fresh	natural, prepare in serving dishes with fumets	20mm 1/1 grid	approx. 20/15 pcs.
Mussels	fresh	when adding julienne, blanch shortly	40 or 65 mm	1–2 kg approx.
Salmon Soufflée	fresh	observe the material of the used forms	cocottes, pie trays, forms	10–20 forms

CM 101 Gas, CM 201 Gas

Accessories per load		Mode switch	Temp. °C °F	Cooking time in min.	Approximate load capacity		Approximate amount per hour	
CM 101 Gas	CM 201 Gas				CM 101 Gas	CM 201 Gas	CM 101 Gas	CM 201 Gas
			170 340	90-120	according to size and height of the cooking item			
2 x 1/1 grid 1 x 65 mm	5 x 1/1 grid 1 x 65 mm		140 295	180	2 pcs. approx.	5 pcs.		
5 x 20 mm 5 x 1/1 grid	10 x 20 mm 10 x 1/1 grid		220 430	15-20	40 pcs.	80 pcs.	120 pcs.	400 pcs.
5 x 20 mm 5 x 1/1 grid	10 x 20 mm 10 x 1/1 grid		220 430	25	10 pcs.	20 pcs.	20 pcs.	40 pcs.
5 x 1/1 grid 5 x 65 mm	10 x 1/1 grid 10 x 20 mm		160-180 320-355	60-70	30 kg	60 kg		
5 x 65 mm	10 x 65 mm		180 355	45	60 pcs.	120 pcs.		
5 x 1/1 grid	10 x 1/1 grid		220 430	35	30 kg	60 kg	60 pcs.	120 pcs.
10 x 1/1 grid	20 x 1/1 grid		220 430	18	120 pcs.	240 pcs.	360 pcs.	720 pcs.
3 x 1/1 grid 3 x 40 mm	6 x 1/1 grid 6 x 40 mm		170 340	100-120	6 pcs.	12 pcs.		
3 x 1/1 grid 3 x 40 mm	6 x 1/1 grid 6 x 40 mm		180 355	90-110	6 pcs.	12 pcs.		
10 x 1/1 grid	20 x 1/1 grid		70 155		100 pcs.	200 pcs.		
5 x 1/1 grid	10 x 1/1 grid		85 175		30 kg	60 kg		
5 x 1/1 grid	10 x 1/1 grid		160-180 320-355	70-80	30 kg	70 kg		
5 x 1/1 grid	10 x 1/1 grid		70 155		30 kg	60 kg approx.		
10 x 20 mm	20 x 20 mm		72 158		300 pcs. approx.	600 pcs. approx.		
10 x 20 mm	20 x 20 mm		80 175		500 pcs.	1000 pcs.		
5 x 1/1 grid	10 x 1/1 grid		79 172		40 kg acc. to size	80 kg acc. to size		
10 x 40 mm	20 x 40 mm			10-15	120 pcs.	240 pcs.	480 pcs.	960 pcs.
5 x 20 mm 5 x 40 mm	10 x 20 mm 10 x 40 mm			10-15	40-50 pcs.	80-100 pcs.	120-150 pcs.	400-500 pcs.
10 x 40 mm	20 x 40 mm		75 163		300 pcs.	600 pcs.		
10 x 20 mm	20 x 20 mm		250 480	15	40-50 pcs.	80-100 pcs.	120-150 pcs.	320-400 pcs.
5 x 20 mm	10 x 20 mm		250 480	15	40-50 pcs.	80-100 pcs.	120-150 pcs.	320-400 pcs.
10 x 20 mm	20 x 20 mm		75-85 163-175		150-200 pcs. approx.	300-400 pcs. approx.		
10 x 40 mm 5 x 65 mm	20 x 40 mm 10 x 65 mm		78 170		10 kg approx.	20 kg approx.		
5 x 1/1 grid	10 x 1/1 grid		75 163		100 forms	200 forms		























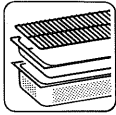
Examples Vegetable, side dishes

Food	State	Hints and Advices	Proper GN-container/ grid	Amount per container/ grid
Cauliflower	fresh	quartered, remove or crosscut stalks	65 mm unperf. or perforated	approx. 4 heads
Brussels Sprouts	frozen	season while frozen, add butter just before serving	65 mm unperf. or perforated	3–4 kg
Broccoli	frozen	season while frozen, add butter just before serving	65 mm unperf. or perforated	3–4 kg
French Carrots	frozen	season while frozen, add butter just before serving	65 mm unperf. or perforated	3–4 kg
Mushrooms	fresh	sprinkle with lemon juice before processing	65 mm unperf.	2 kg
Spinach	fresh		65 mm perforated	2 kg
Asparagus	fresh	sprinkle with lemon juice before processing	40 or 65 mm unperforated	2 kg
Vegetable Plates	prepared	glaze just before serving	1/1 grid or 20mm	4 pcs.
Gratinated Cauliflower	precooked	use every second rail	1/1 grid	30 port.
Cabbage rolls	fresh	cook cabbage leaves well, possibly wrap with bacon	65 mm unperf.	25 pcs.
Stuffed peppers	fresh	place in containers with the opening downwards	65 mm unperf.	20 pcs.
Vegetable Preserves	fresh or frozen	observe diameter of jars and tins	40 or 65 mm perf. or unperforated	3–4 kg
Potatoes	fresh	Quarter by the width, salt evenly	95 or 105 mm perforated	8–14 kg
Rice	Longgrain Parboiled	water, stock or broth: Rice proportion 2 : 1	65 mm unperf.	2 kg
Dumplings	Convenience-Product	Observe adding of water and soaking time, see instructions on pack.	20mm unperf.	30 pcs.
Noodles (reheated)	prepared	add liquid butter or similar just before serving	65 mm unperf.	25 port.
Eggs		Set timer only after the window is misted over, no pricking	65–95 mm perforated	50–100 pcs.
Egg Royale	fresh		40 or 65 mm unperforated	3–5 l
Fried Potatoes	precooked	Cube, season, possibly add bacon, scatter in container	20 mm granit. 40mm granit.	1–2 kg
Baked Potatoes	200 g	Wrap in aluminium foil	1/1 grid	18 pcs.

CM 101 Gas, CM 201 Gas

Accessories per load		Mode switch	Temp. °C °F	Cooking time in min.	Approximate load capacity		Approximate amount per hour	
CM 101 Gas	CM 201 Gas				CM 101 Gas	CM 201 Gas	CM 101 Gas	CM 201 Gas
5 x 65 mm	10 x 65 mm			18	13-15 kg	30-40 kg	39-45 kg	90-120 kg
5 x 65 mm	10 x 65 mm			15-18	20 kg	40 kg	60 kg	120 kg
5 x 65 mm	10 x 65 mm			15-20	20 kg	40 kg	60 kg	120 kg
5 x 65 mm	10 x 65 mm			20	20 kg	40 kg	60 kg	120 kg
5 x 65 mm	10 x 65 mm			12	10 kg	20 kg	50 kg	100 kg
5 x 65 mm	10 x 65 mm			8	10 kg	20 kg	70 kg	140 kg
10 x 40 mm 5 x 65 mm	20 x 40 mm 10 x 65 mm			15	20 kg	40 kg	80 kg	160 kg
10 x 1/1 grid 10 x 20 mm	20 x 1/1 grid 20 x 20 mm			10	40 pcs.	80 pcs.	200 pcs.	400 pcs.
5 x 20 mm	10 x 20 mm		250 480	6	150 port.	300 port.	1200 port.	2400 port.
5 x 65 mm	10 x 65 mm	 	160-180 320-365	50	125 pcs.	250 pcs.		
5 x 65 mm	10 x 65 mm	 	160-180 320-365	45	100 pcs.	200 pcs.		
10 x 40 mm 5 x 65 mm	20 x 40 mm 10 x 65 mm		90 195		20 kg approx.	40 kg approx.		
3 x 150 mm	6 x 150 mm 10 x 95 mm			25-30	42 kg	80-90 kg	84 kg	160-180 kg
5 x 65 mm	10 x 65 mm			25	10 kg	20 kg	20 kg	40 kg
10 x 20 mm	20 x 20 mm			15	300 pcs.	600 pcs.	1200 pcs.	2400 pcs.
5 x 65 mm	10 x 65 mm			10	125 port.	250 port.	625 port.	1250 pcs.
5 x 65 mm 5 x 95 mm	10 x 65 mm 10 x 95 mm			soft 7 hard 12			800 pcs. 400 pcs.	
10 x 40 mm 5 x 65 mm	20 x 40 mm 10 x 65 mm		80 175		25 l approx.	50 l approx.		
10 x 20 mm 5 x 40 mm	20 x 20 mm 10 x 40 mm		230 445	15	10-20 kg	20-40 kg	60 kg	60-120 kg
10 x 1/1 grid	20 x 1/1 grid		180-200 355-390	30-40	180 pcs.	360 pcs.		





Original RATIONAL Gastronorm Containers and Grids

For the RATIONAL Combi-Steamer CM Gas you can use all GN-containers in different sizes ($1/1$, $1/2$, $1/3$, $2/3$, $2/8$) for preparing and reheating. Therefore even the loading with small portions enables a flexible and rational production.

Containers 20 mm

for fried potatoes, hamburgers, saddle of hare, potato dumplings, gratinating, thawing.

Containers 40 mm

for meat loaf, meat balls, hamburgers, fried, steamed and poached fish, pastry, vegetable casseroles, duck, goose.

Containers 65 mm

for stuffed cabbage, stuffed peppers, stews, rice, egg royale, vegetable, sauerkraut, different fruit, stewed fruit.

Containers 65 mm and 100 mm

for collecting stock, preparation of sauces, baked ham etc.

Perforated containers 65 mm

for vegetable without stock, side dishes, e.g. dumplings, etc.

Perforated containers 95 mm

for vegetable (blanching e.g. spinach), potatoes, eggs.

Perforated containers 150 mm

for potatoes.

Granite enamelled containers 20 mm, 40 mm, 65 mm

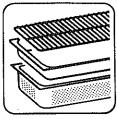
for baking of different pastry, roasting, gratinating (meat, fish, vegetable), casseroles, stews.

Compared with the CNS-containers the granite enamelled containers provide **decisive advantages**:

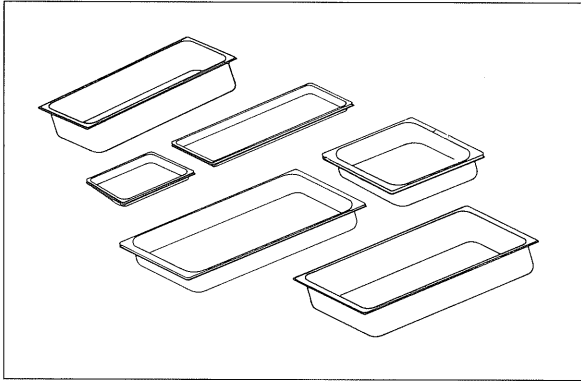
- better heat conductivity
- better baking quality
- no sticking
- minimum fat consumption
- no loss in portioning – edges are well formed

Pastry rises better in granite enamelled containers. The bottom of cakes are better baked through and browned in its total surface than in comparable stainless steel containers.

The higher the batters, the more important it is to use granite enamelled containers. The frying result of grilled meat (such as hamburgers) turn out similar – even at the bottom – to the conventional frying in pans.

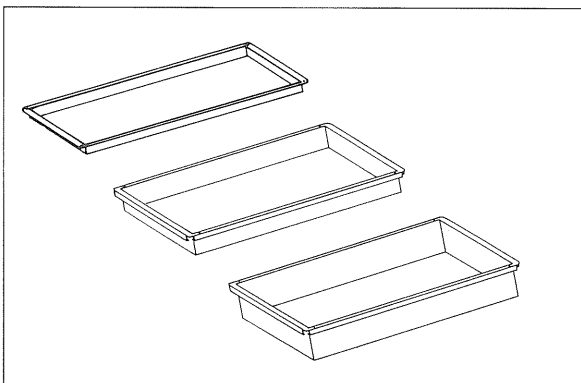


Original RATIONAL Gastronorm Containers and Grids



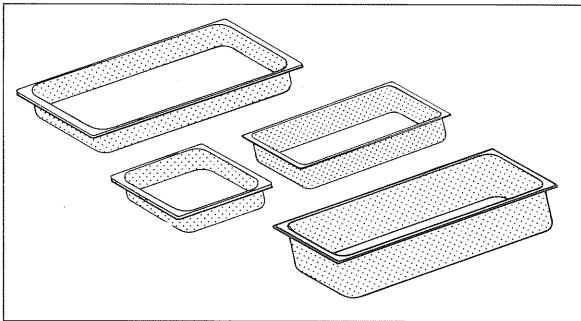
RATIONAL Containers Stainless steel

- $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{1}{1}$ GN 20 mm deep
- $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{1}{1}$ GN 40 mm deep
- $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{1}{1}$ GN 65 mm deep
- $\frac{1}{2}$ and $\frac{1}{1}$ GN 100 mm deep



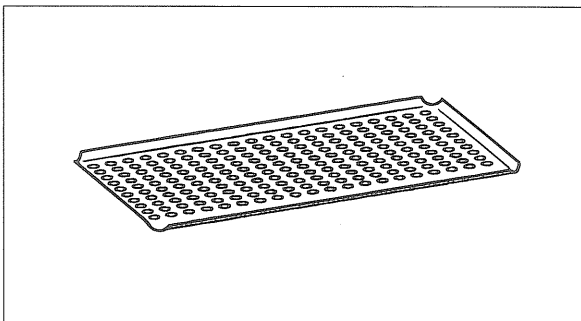
RATIONAL Containers Granite enamelled

- $\frac{1}{1}$ GN 20 mm deep
- $\frac{1}{1}$ GN 40 mm deep
- $\frac{1}{1}$ GN 65 mm deep



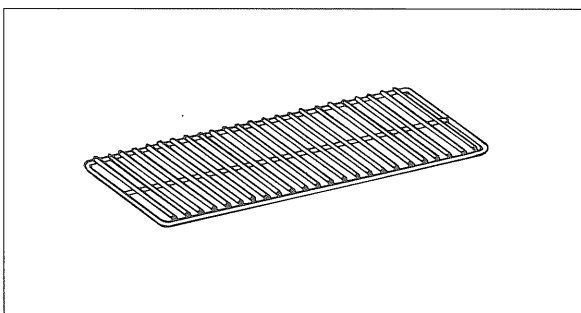
RATIONAL Perforated Containers Stainless steel

- $\frac{1}{1}$ GN 65 mm deep
- $\frac{1}{2}$ and $\frac{1}{1}$ GN 100 mm deep
- $\frac{1}{2}$ and $\frac{1}{1}$ GN 150 mm deep



RATIONAL Baking Tray perforated, aluminium

$\frac{1}{1}$ GN



RATIONAL Grids High gloss nickel plated Stainless steel

$\frac{1}{1}$ GN

Grids

for big roasts (pork, veal, beef, game, lamb),
grilled meat, toasts, gratinating, chicken, duck,
goose, cooking in serving dishes, thawing,
baking in moulds, cooking in vacuum,
preserving.





The high operational performance of the RATIONAL Combi-Steamer CM Gas is completed by an efficient coordinated accessory line. Therefore the RATIONAL Combi-Steamer CM Gas can be adjusted perfectly to the individual requirements. The RATIONAL stands and cabinets are made of stainless steel. They guarantee a stable and practical installation of the RATIONAL Combi-Steamer CM Gas.

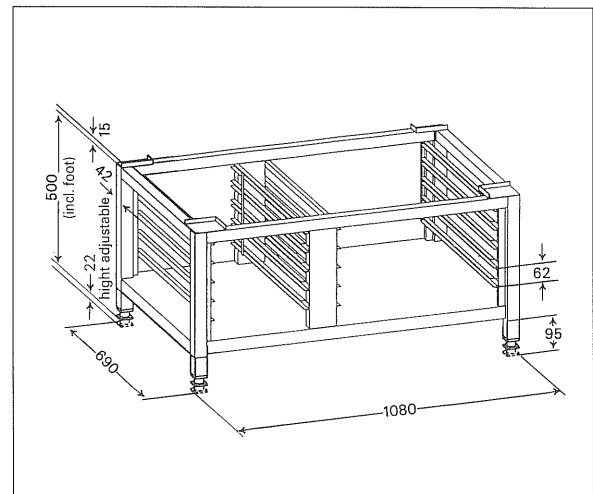
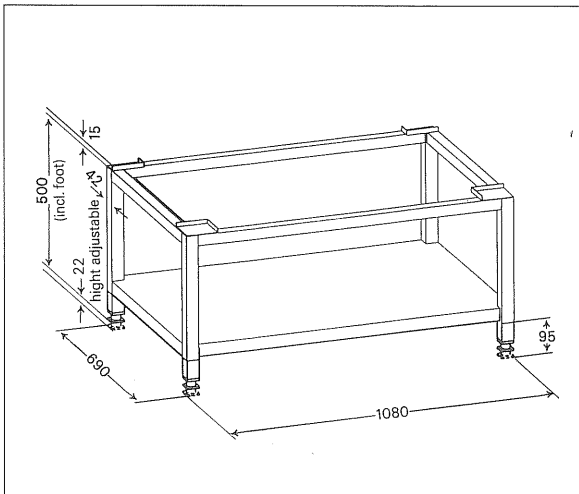
All RATIONAL floor stands, cabinets and mobile oven racks have U-shaped rail profiles to prevent GN containers from tipping over. Easy loading and unloading is guaranteed by locks.

RATIONAL Stand UG I

Frame completely made of stainless steel with shelf and adjustable feet.

RATIONAL Floor Stand UG II

Frame completely made of stainless steel with shelf and adjustable feet; in addition 10 pairs of rails for 5 x 1/1 GN-containers lengthways and 10 x 1/1 GN-containers sideways.

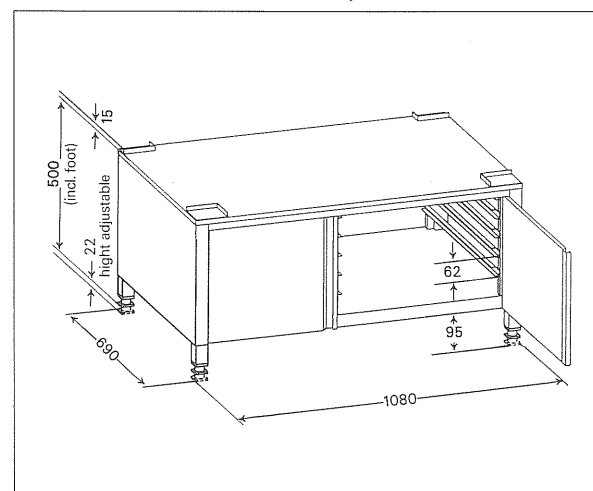
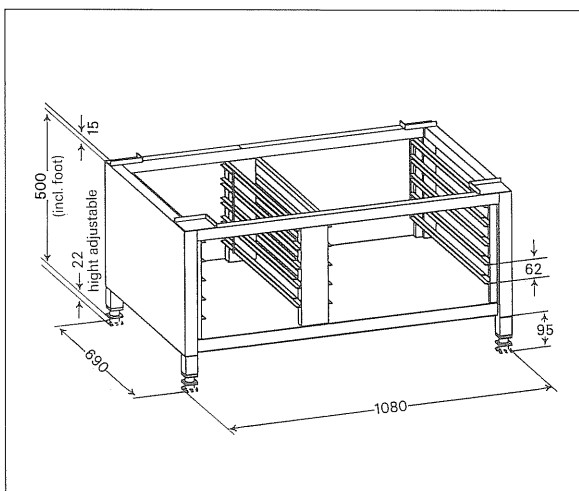


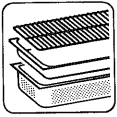
RATIONAL Cabinet US III

Frame completely made of stainless steel with shelf, adjustable feet, closed at three sides, with 10 pairs of rails for 5 x 1/1 GN-containers lengthways and 10 x 1/1 GN-containers sideways.

RATIONAL Closed Cabinet US IV

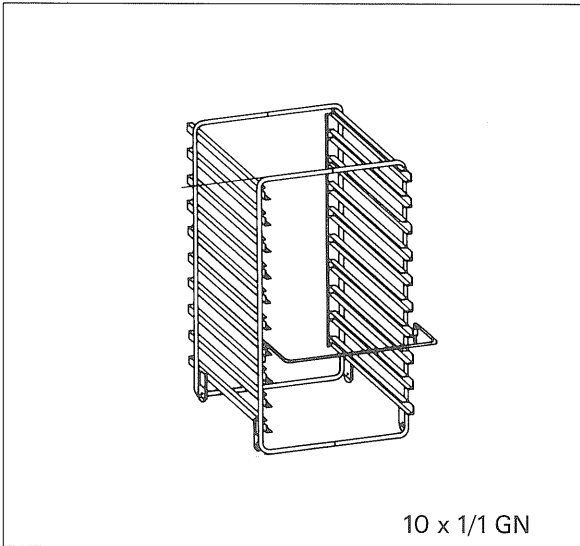
The stand frame is made entirely of stainless steel; shelf base, adjustable feet, enclosed on all sides, fitted at the front with two double-walled swing doors. Fitted with 10 pairs of support rails for 5 x 1/1 GN-containers lengthways and 10 x 1/1 GN-containers sideways.





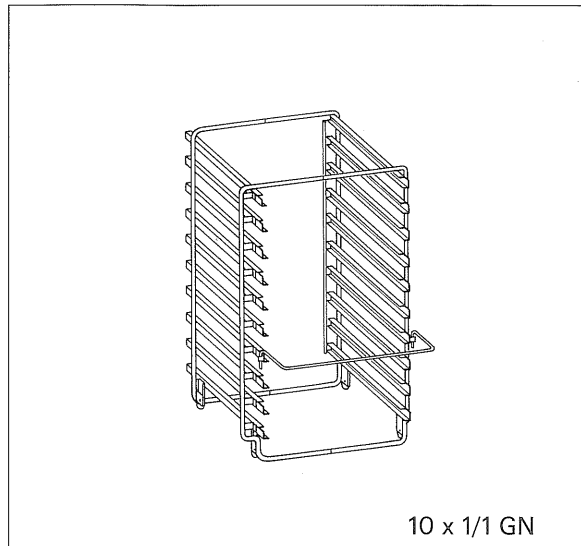
RATIONAL Mobile Oven Racks

As an additional equipment an important rationalization factor. Completely made of stainless steel with 10 pairs of rails and casters.



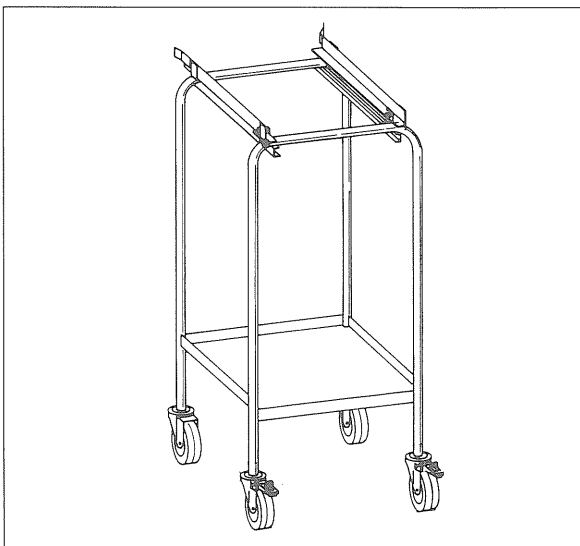
RATIONAL Special tray frame trolley for over-wide serving plates

As an additional item of equipment with a significant rationalizing effect. Made entirely of chromium-nickel steel, with 10 pairs of rails and casters.



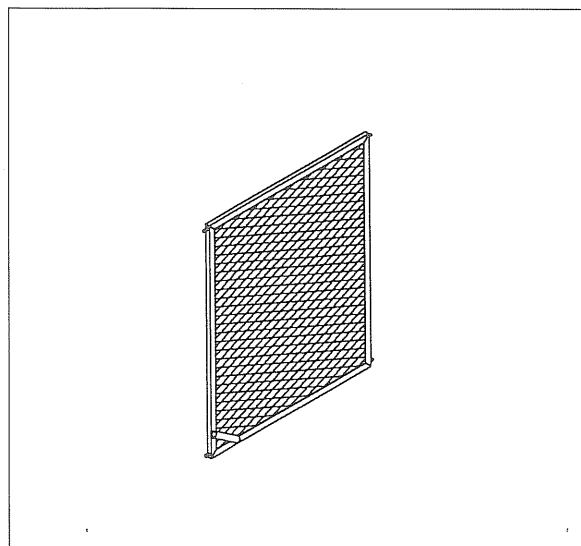
RATIONAL Transport Trolley

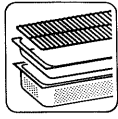
Facilitates easy transport and quick load changes. Made completely from a chrome-nickel-steel alloy, can be locked to the unit, includes four revolving-type casters (two of them with brakes), drip pan and mobile oven rack arrests. Includes one set of U-rails for a 1/1 GN drip container.



RATIONAL Fat Filter

An extra fat filter for changing is advantageous. The fat filter is made of stainless steel.





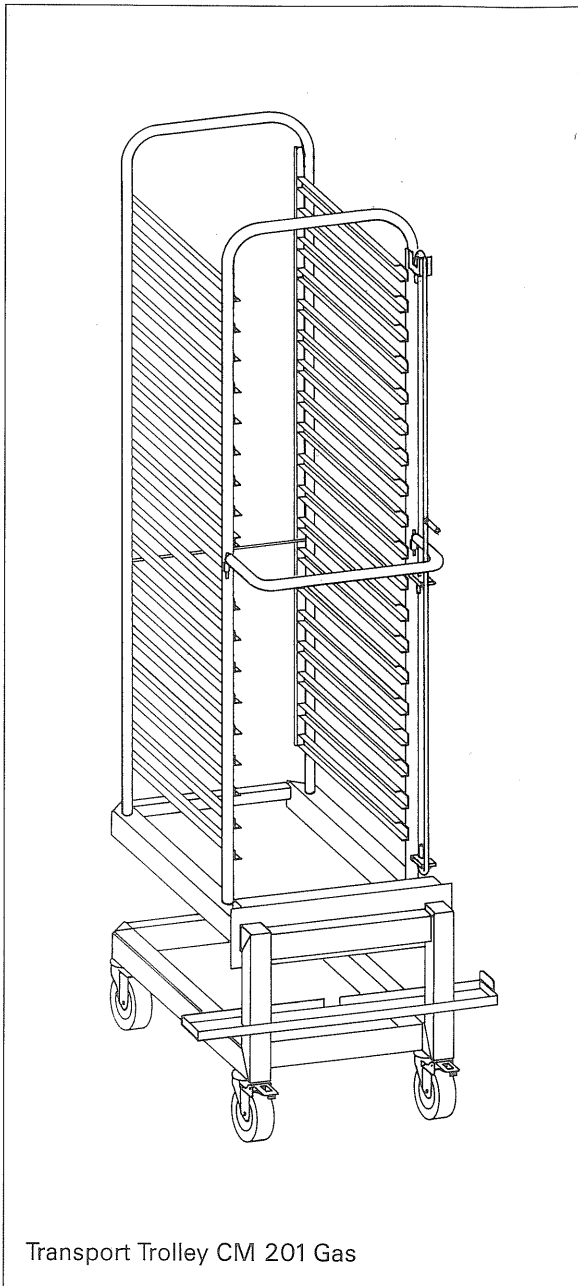
The high operational performance of the RATIONAL Combi-Steamer CM is completed by an efficient coordinated accessory line. Therefore the RATIONAL Combi-Steamer CM can be adjusted perfectly to the individual requirements.

RATIONAL Mobile Oven Racks

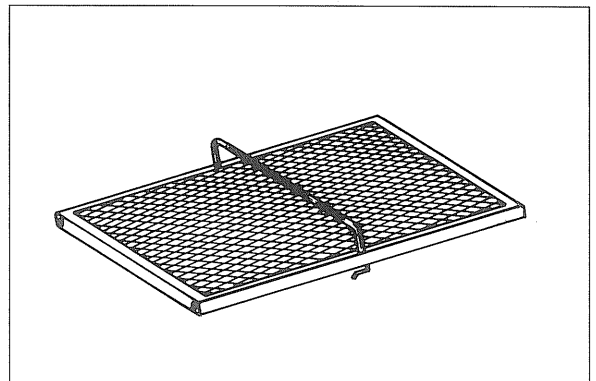
As additional equipment an important rationalization factor. Completely made of stainless steel with twenty pairs of rails and castors.

RATIONAL Fat Filter for CM 201 Gas

An extra fat filter for changing is advantageous. The fat filter is made of stainless steel.



Transport Trolley CM 201 Gas





Cleaning

Daily cleaning of the unit is absolutely essential for hygienic reasons and to prevent operating problems. Please use the RATIONAL Special Cleaner and the RATIONAL Spray Gun.

Cleaning procedure

- Allow the cooking cabinet to cool down (below 60°C).
- Spray with RATIONAL Special Cleaner and allow it to act (possibly overnight if intensely soiled).
- Clean with steam.
- Rinse thoroughly.

Cleaning procedure in detail:

Spray the inside of the cooking cabinet, the tray frame trolley, and the used containers and grids, thoroughly with RATIONAL Special Cleaner.

Allow it to act for about 20 minutes.

1. Adjust the mode key Ⓢ "Steaming".
2. Set the timer to approx. 15 minutes.
3. Cleaning is finished when the adjusted time has elapsed. The cleaning procedure (points 1 and 2) should be repeated if parts are intensely soiled.

The cooking cabinet must be thoroughly rinsed with clear water after each cleaning process.

Rinsing is made very easy with the built-in RATIONAL hose shower. Never use a high-pressure cleaner! Ensure that the grease filter is carefully rinsed. The cooking cabinet is quickly dried by switching on the "Hot Air" mode. The external surfaces are best cleaned with a damp cloth.

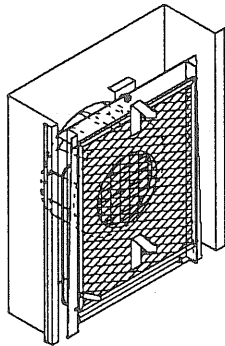
Please ensure that no food particles or remains of cleaner are left on or in accessories and cooking cabinet after cleaning. If there is still residual matter on grids and containers, they should be washed again (e.g. in dishwasher).

Warning!

Do not clean the outside parts of the unit with a jet of water!

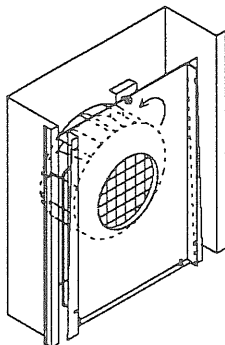
The handshower should only be used when the unit is disconnected from the power supply.

Removal of fat filter



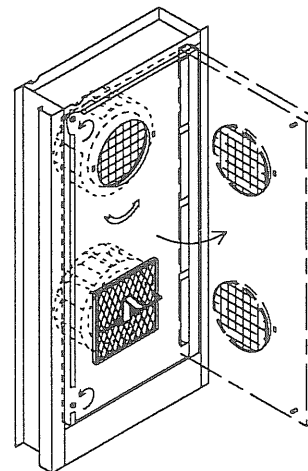
CM 101 Gas

Removal of air baffle



CM 101 Gas

Removal of fat filter



CM 201 Gas



Check up and Interior Lighting

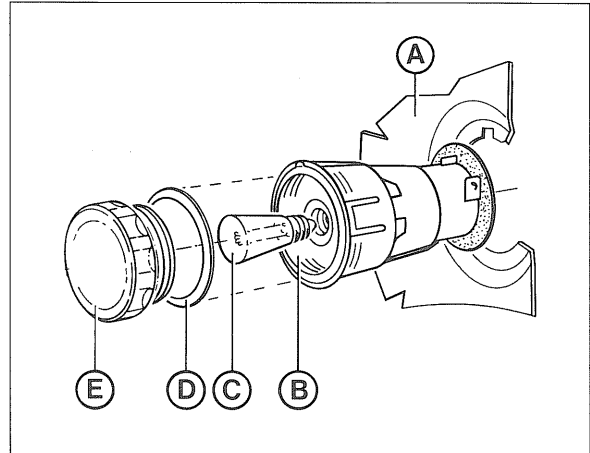
Changing of light bulbs inside the interior cabinet

The diagram shows the exchange of the light bulb. Only the RATIONAL heat resistant special light bulbs are to be used.

When replacing the lamp cover please use a **new gasket** ④ .

- ① Side wall
- ② Lamp socket
- ③ Light bulb
- ④ Gasket*
- ⑤ Lamp cover

*Handle with care, do not fold.



Check before starting the appliance

Check for any hidden shipping damage.

The gas supply and flue gas connection of the Combi-Steamer must be approved by the responsible local authority.

The drain connection is installed correctly.

The water supply is on, and the water connections are leak tight.

The air baffle and fat filter are inserted correctly.

Push the mobile oven rack back against the rear stop in the cooking cabinet.

The following must only to be checked by either the relevant approved local authority or by an approved competent installer!

Electrical safety measures have been completed and have been checked.

The gas tap is on and that all gas connections are leak tight.

Check that the glass shades are not damaged and are firmly screwed in.

Reset all manual safety thermostats.

Check all electrical connections for tightness.

Check all water connections for tightness.

Switch on the appliance and check polarity.

Check that the interior lights operate.

Please note!

When switching on for the first time to either the "Steam", the "Combi-Steam", "Vario-Steam" or "Reheating" mode, the red "lack of water" indicator light may light up. This is to indicate that the correct water level in the steam generator has **not** been reached.

On reaching the correct water level the red "lack of water" indicator light goes out automatically.

Should the red "lack of water" indicator light continues to operate after several minutes, the water supply has to be checked. Check that there is no obstruction in the water pipes and/or filters and check the working water pressure. This can be done by removing the service panel at the front of the appliance.

In the event of a gas failure the relevant push button lights up and an alarm sounds.

The self-cleaning steam generator system (SC) eliminates the need for constant descaling. However, we do recommend a yearly basic clean/service check by an approved RATIONAL Service agent.

All components should be regularly maintained in compliance with the specified standards.



Installation and Connection

- Place on an original RATIONAL stand
or
- on a level, sturdy surface that is not flammable (recommended height 500mm)
- minor unevenness can be compensated by adjusting the metal legs on the stand and/or the appliance
- **Weight:** 219 kg
- **Minimum space**
left side: 350 mm
right/rear side: 60 mm
do **not** install any heat sources such as ranges, fryers, tilting pans etc., next to the left-hand side of the appliance
- installation planning should envisage sufficient space for the transport trolley on the left-hand side of the unit (550 mm)

Installation room

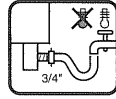
- closed rooms must be adequately ventilated (fresh air/exhaust air)
- flammable materials in the immediate vicinity of the appliance should either be covered with fire retarding materials or be replaced with fire retarding materials according to DVGW-TRGI '86 or local regulations

Prior to using the RATIONAL Combi-Steamer for the first time and/or if the appliance has been disconnected and/or if there has been any change in the exhaust conditions, the installation has to be checked by either the approved local authority or by an approved competent gas fitter/installer.

- valid standards
Installation: DVGW-TRGI '86
Gas- and exhaust connection: DVGW-TRGI '86/TRF 1988/G 634

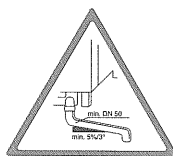
Please observe and comply with your local regulations.

Water Supply Connection WZ



- connect only to cold water with drinking water quality
- 1/2" flexible pressure hose with R 3/4" thread fittings
- a shut-off valve must be provided for each appliance
- **water pressure:**
150 – 600 kPa
recommended water pressure: 300 kPa
- **average water consumption**
at 300 kPa: 0,5 l/min
- **original treated water supply**
(for steam generator only)
 - water temperature below 60°C
 - maximum theoretical water consumption of the steam generator: 0,36 l/min
 - **Minimum conductivity:**
20 µS [micro Siemens]
(Parameters for the water treatment plant)
- valid standard: DIN 1988, T 4

Drain Connection WA



- only steam temperature resistant pipe must be used – no flexible hose!
- as the appliance has an integral vented drain system, it can be connected directly over syphon to the house drain system
- please refer to your local regulations
- **DN 50** (ø 50 mm) pipe with constant slope (min 5% resp. 3°)
- waste water temperature approx. 65°C
- ensure a sufficient drain size: the pumped discharge rate of the steam generator is: 0,7 l/sec.
- valid standard: DIN 1986, T 1.

Power Connection EA

Meeting VDE Standard Requirements, or your local authority requirements.

The appliance must only be connected, by the approved local authority or by an approved competent person.

Connected load: 0,5 kW
Voltage: 1N AC 230 V, 50 Hz
Fusing: 10 A

- special voltages on request or see electrical diagram in unit
- 2 m flexible connection cable without plug
- main isolator with min 3 mm contact clearance for all phases
- check the polarity of the electrical connection!

as the colours of the wires in the mains lead of this appliance may not correspond with the colour markings identifying the terminals in your plug, proceed as follows:

- the wire which is coloured **green and yellow** must be connected to terminal in the plug which is marked with the letter E or by the **earth** symbol ⊕, or coloured green or green and yellow
- the wire which is coloured **blue** must be connected to the terminal which is marked with the **letter N** or coloured black or blue
- the wire which is coloured **brown** must be connected to the terminal which is marked with the **letter L** or coloured red or brown
- connect the Combi-Steamer to an equipotential bonding system

Attention!

Burner will not work if the polarity is incorrect!
Reset button lights up and the alarm buzzer sounds.

Change polarity!

Please observe and comply with your local regulations.





Exhaust Fan

Vapours are automatically condensed by the vapour quenching system, an extraction hood is not necessary.

However, the following points must be observed if an extraction hood is installed:

- the hood should protrude by 300 to 500 mm beyond the front of the appliance
- a grease filter should be fitted inside the protruding section of the hood
- latent heat load: 3.830 kJ/h
- sensible heat load: 5.000 kJ/h

Exhaust Escape (AG)

- exhaust pipes leak proofed installed according to DVGW-TRGI '86 resp. TRF 1969
- draft diverter exhaust pipe: **DN 130** (ø 130 mm)
- steam generator and heat exchanger exhaust pipes: **DN 113** (ø 113 mm)

Installation to comply with DVGW and/or your local regulations.

Examples as per DVGW-worksheet G 634:

1. directly into chimney:

only with standard back diverter

2. into extractor hood:

- without draft diverter
- install exhaust pipes 140 mm to 150 mm below grease filters

Specification of

Appliance:

Gas appliance type B

- atmospheric burners with draft diverter
- 2 burners steam/hot air, without fan, with open atmospheric chamber
- three settings per burner (0 kW, 11 kW, 18 kW)
- automatic direct ignition with flame monitoring

Nominal heat load: 29 kW

Full load per burner: 18 kW

Partial load per burner: 11 kW

Gas Connection (GA)

observe standard requirements of your local gas regulations

Observe the installation instructions and, if necessary, the adjustment instructions.

- determine the pipe diameter according to DVGW-TRGI '86 resp. TRF 1969 and local regulations
- gas connection: R 1/2" external thread
- gas tap before each appliance
- gas connection is also possible with a **quick release gas outlet socket**
- **all installation material must comply with your local regulations**
- when placing the appliance on a RATIONAL stand or a suitable surface, it must be securely fixed by means of the supplied fixing brackets
- restraining chains or an acceptable alternative must be used, if required by your local regulations
- the gas supply line must be checked for leaks

Connection to the gas supply can only be carried out by either the approved local authority or by an approved competent gas fitter/installer.

Gas Setting

Check that the specified type of gas corresponds with the supplied gas by referring to the Data plate on the appliance. The Combi-Steamer has to be modified accordingly where this is not the case, and must be calibrated to the local Wobbe-Index.

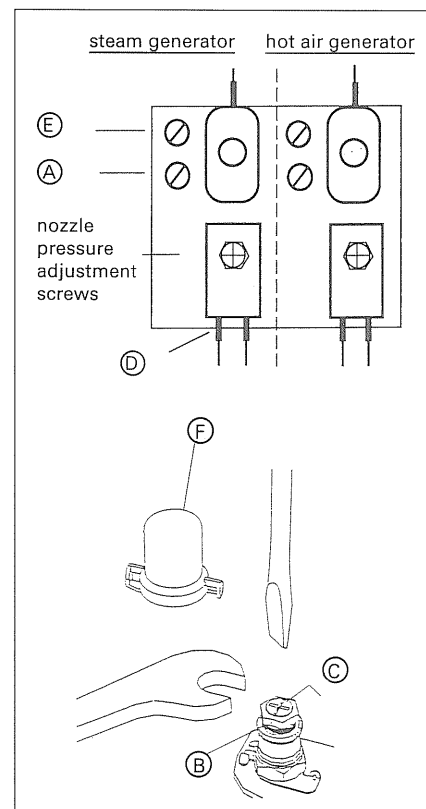
Calibrate the burner pressures according to the nozzle pressure method (U-pipe manometer) – see table.

Please note that burner pressures are factory pre-set and the adjustment screws are factory sealed.

Conversion of Gas Supplies

Modifying liquid gas appliances to natural gas appliances is possible, or vice versa by changing the appropriate burners.

After every gas modification the Combi-Steamer has to be recalibrated – see table!





Installation and Connection

Checking the Connected Line Pressure

- close the gas tap
- remove hexagonal head capping screw (E)
- connect U-pipe manometer hose onto test nipple (E)
- open the gas tap
- check the line pressure registered on the U-pipe manometer
- close the gas tap
- remove U-pipe manometer hose from test nipple (E)
- replace hexagonal head capping screw (E)
- open the gas tap
- check for leaks

Please note :

If the connected line pressure is below 15 mbar do **not** switch on the appliance.

Checking Burner Pressures

Observe the testing sequence for the

- Steam generator burner and/or
- Hot air burner
- close the gas tap
- remove hexagonal head capping screw (A)
- connect U-pipe manometer hose onto test nipple (A)
- open the gas tap
- switch on the appliance (select the required mode "Steam" or "Hot Air") and wait until the relevant burner is in operation

- compare the registered value on the U-pipe manometer with the nozzle pressure table below. (Should the burner need recalibrating, then first test "Full Load" followed by "Partial Load")

Calibrating "Full Load"

- Remove protective cap (F)
 - Adjust the pressure setting nut/screw (B) with a spanner (10 mm)
- Rotation direction :**
- + ↑ => clockwise to increase pressure
 - ↓ => anticlockwise to decrease pressure

Calibrating "Partial Load"

- disconnect the supply cable from solenoid valve coil (D)
 - hold the pressure setting nut/screw (B) with a spanner firmly and adjust the cross head screw (C) to the corresponding pressure with a screw driver
- Rotation direction :**
- + ↑ => clockwise to increase pressure
 - ↓ => anticlockwise to decrease pressure
- reconnect the supply cable to solenoid valve coil (D)
 - on completing "Partial Load" calibration, re-check "Full Load" pressure
- and then :**
- switch off the appliance by selecting "O"

- close the gas tap
- remove the U-pipe manometer hose
- replace hexagonal head capping screw (A)
- open gas tap
- check for leaks
- replace protective cap (F) and reseal

Checking the Connected Line Flow Pressure

- close the gas tap
- remove hexagonal head capping screw (E)
- connect U-pipe manometer hose onto test nipple (E)
- switch on appliance to "Steam" mode until the required burner operates on "Full Load"
- check the flow pressure registered on the U-pipe manometer
- switch off the appliance
- close the gas tap
- remove the U-pipe manometer hose from test nipple (E)
- replace hexagonal head capping screw (E)
- open the gas tap
- check for leaks

Please note : (for natural gas only)

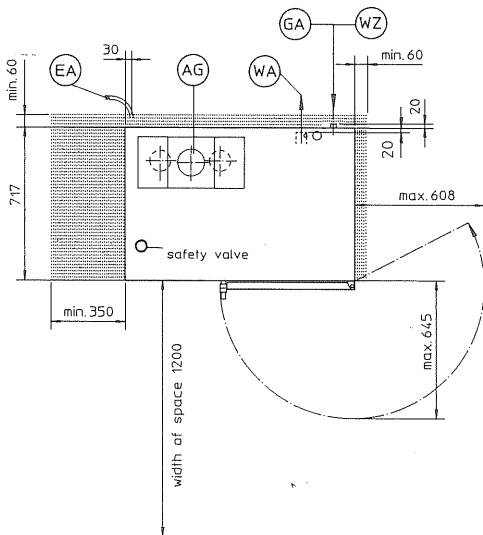
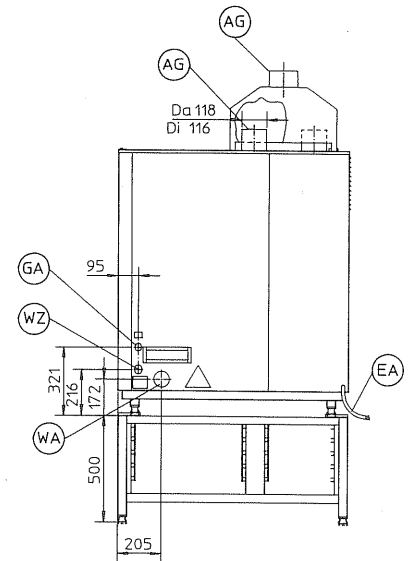
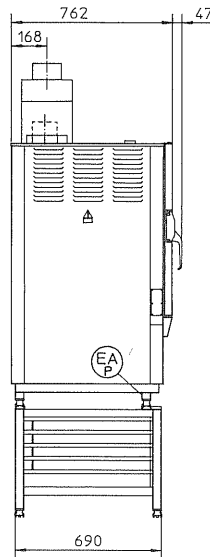
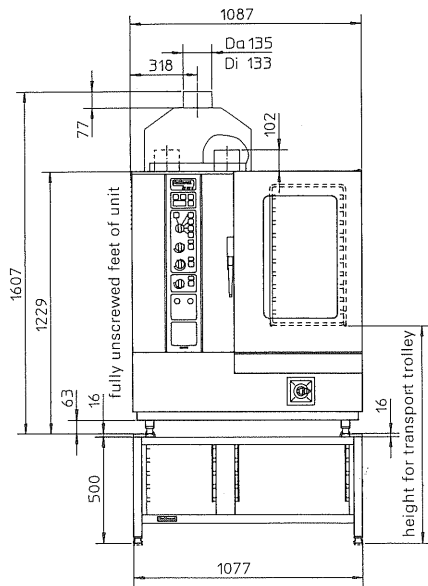
The necessary connected flow pressure for natural gas is between 18 and 25 mbar. If the connected flow pressure is below the minimum requirement, please contact your local gas authority.

Should the connected flow pressure be below 15 mbar do **not** allow the appliance to be put into operation. Disconnect and isolate the appliance from the services.

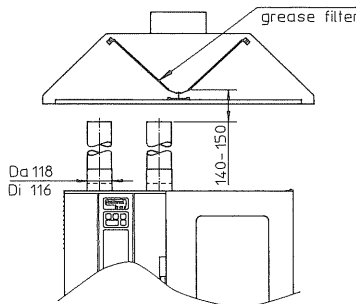
Gas category	Wobbe-Index				Number of nozzles diameter of nozzle [mm]	Code number of nozzle	Pressure of nozzle steam/hot air		Max. consumption heat stress 29 kW	Nominal connection pressure [mbar]
	BTU cu ft	kcal/m ³	kWh/m ³	MJ/m ³			18 kW [mbar]	11 kW [mbar]		
Natural gas L	1106	9800	11,4	41	18 x 1,1	110	12	4,6	3,42 m ³ /h	20
	1139	10100	11,7	42,3			11,3	4,4		
	1173	10400	12,1	43,5			10,6	4,1		
	1196	10600	12,4	44,8			10,1	3,9		
	1241	11000	12,8	46,1			9,5	3,7		
	1275	11300	13,1	47,3			9	3,5		
Natural gas H	1275	11300	13,1	47,3	18 x 1,1	110	9	3,5	3,1 m ³ /h	20
	1309	11600	13,5	48,6			8,5	3,3		
	1343	11900	13,8	49,8			8,1	3,1		
	1377	12200	14,2	51,1			7,7	3		
	1428	12600	14,72	53			7,2	2,8		
	1456	12900	15	54			7	2,7		
	1478	13100	15,2	54,8			6,7	2,6		
	1501	13300	15,5	55,7			6,5	2,5		
Liquid gas	2483	22000	25,6	92,1	18 x 0,65	65	14,3	6,1	2,3 kg/h	50
	2185	19360	22,5	81,1			18,5	7,9		

The nozzle pressures apply to annual averages of 15°C and 1013 mbar.

The values printed on grey for natural gas H, natural gas L and liquid gas are adjusted and sealed by the manufacturer.



AG Alternative with exhaust fan



- Water supply
- Drain connection
- Electrical connection
- Equipotential bonding
- Gas connection
- Exhaust escape
- Minimum space

Valid Standards

- DVGW-TRGI '86
- TRF 1988
- DVGW worksheet G 634
- DIN 1988, T 4
- DIN 1986, T 1

Services Required

- water isolating tap
- drainage pipe with constant slope
- electrical power point
- main isolator with min. 3 mm contactor clearance for all phases
- equipotential earth bonding system
- gas isolating tap
- means of removing exhaust fumes
- adequate fresh air space

Technical variation reserved!

Safety Instructions

Ensure that the electrical supply is switched off at the appliance prior to using the retractable hand shower hose.

The temperature of the door glass can exceed 60 Kelvin.

If the appliance is left unused for a long period of time, isolate the water supply.

When opening the door, steam and fumes are allowed to escape.

Damage and faults resulting from incorrect installation or misuse are not covered by our warranty.



Installation the unit/ Space requirements

- Place on a flat and sturdy surface that is not flammable
- minor unevenness can be compensated by adjusting the metal legs on the appliance
- **weight:** 418 kg
- **Minimum space:**
left side: 350 mm
recommended
right/rear side: 100 mm
do **not** install any heat sources such as ranges, fryers, tilting pans etc., next to the left hand side of the appliance
- fix the unit to the floor by means of the locators supplied.

Installation room

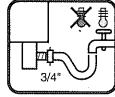
- closed rooms must be adequately ventilated (fresh air/exhaust air)
- flammable materials in the immediate vicinity of the appliance should either be covered with fire retarding materials or be replaced with fire retarding materials according to DVGW-TRGI '86 or local regulations

Prior to using the RATIONAL Combi-Steamer for the first time and/or if the appliance has been disconnected and/or if there has been any change in the exhaust conditions, the installation has to be checked by either the approved local authority or by an approved competent gas fitter/installer.

- valid standards
installation: DVGW-TRGI '86
Gas and exhaust connection: DVGW-TRGI '86/TRF1988
DVGW-Worksheet G 634

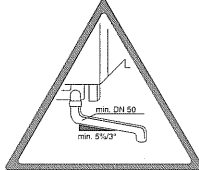
Please observe and comply with your local regulations.

Water Supply Connection (WZ)



- connect only to cold water with drinking water quality
- 1/2" flexible pressure hose with R 3/4" thread fittings
- a shut-off valve must be provided for each appliance
- **water pressure:** 150-600 kPa
recommended water pressure: 300 kPa
- **average water consumption** at 300 kPa: 0,9 l/min
- **minimum conductivity:** 20µS [micro Siemens] (Parameters for the water treatment plant)
- valid standard: DIN 1988, T4
optional soft water supply for steam generator only on request
- water temperature below 60 °C
- maximum theoretical water consumption of the steam-generator: 0,60 l/min

Drain Connection (WA)



- only steam temperature resistant pipe must be used – no flexible hose!
- as the appliance has an integral vented drainsystem, it can be connected directly over syphon to the house drain system
- please refer to your local regulations.
- **DN 50** (50 mm) pipe with constant slope (min 5% resp. 3°)
- waste water temperature approx. 65 °C
- ensure a sufficient drain size: the pumped discharge rate of steam generator is: 0,7 l/sec
- valid standard: DIN 1986, T 1

Power Connection (EA)

Meeting all VDE standard requirements, or your local authority requirements.

The appliance must only be connected by a qualified electrician, by the approved local authority or by an approved competent person.

Connected load: 1,0 kW
Voltage: 1N AC 230 V, 50 Hz
Fusing: 10 A

- special voltages on request or see electrical diagram in unit
- 2 m flexible connection cable without plug
- check the polarity of the electrical connection!

as the colours of the wires in the mains lead of this appliance may not correspond with the colour markings identifying the terminals in your plug, proceed as follows:

- the wire which is coloured **green and yellow** must be connected to terminal in the plug which is marked with the letter **E** or by the **earth** symbol, ⊕ or coloured green or green and yellow
- the wire which is coloured **blue** must be connected to the terminal which is marked with the **letter N** or coloured black or blue
- the wire which is coloured **brown** must be connected to the terminal which is marked with the **letter L** or coloured red or brown
- connect the Combi-Steamer to a earth bonding system
- main isolator with min 3 mm contact clearance for all phases

Attention!

Burners will not working if the polarity is incorrect! Reset button lights up, and the alarm buzzer sounds.

Change polarity!

Please observe and comply with your local regulations.



Exhaust Fan

Vapors are automatically condensed by the vapour quenching system, an extraction hood is not necessary.

However, the following points must be observed if an extraction hood is installed:

- the hood should protrude by 300 to 500 mm beyond the front of the appliance
- a grease filter should be fitted inside the protruding section of the hood.
- latent heat load: 7.670 kJ/h
- sensible heat load: 9.600 kJ/h

Exhaust escape (AG)

- exhaust pipes leak proofed installed according to DVGW-TRGI '86 resp. TRF 1988
- draft diverter exhaust pipe: **DN 180** (180 mm)
- steam generator and heat exchanger exhaust pipes: **DN 130** (130 mm)

Installation to comply with DVGW and/or your local regulations.

Examples as per DVGW-worksheet G 634

- 1. directly into chimney**
only with standard draft diverter
- 2. into extractor hood:**
 - without draft diverter
 - install exhaust pipes 160 mm to 170 mm below grease filters

Specification of Appliance:

Gas appliance type B

- atmospheric burners with draft diverter
- 3 burners steam/hot air, without fan, with open atmospheric chamber
- three settings per burner
- automatic direct ignition with flame monitoring

Nominal heat load: 50 kW

	I	II Part load	III Full load
Steam	0	18	30 kW
Hot air	0	20	32 kW

Gas connection (GA)

observe standard requirements of your local gas regulations **observe the installation instructions and, if necessary, the adjustment instructions.**

- determine the pipe diameter according to DVGW-TRGI '86 resp. TRF '88 and local regulations
- gas connection: **R 3/4"** external thread
- gas tap before each appliance
- **all installation material must comply with your local regulations.**
- fix unit with the supplied fixing brackets
- restraining chains or an acceptable alternative must be used, if required by your local regulation
- the gas supply line must be checked for leaks.

Connection to the gas supply can only be carried out by either the approved local authority or by an approved competent gas fitter/installer.

Gas Setting

Check that the specified type of gas corresponds with the supplied gas by referring to the Data plate on the appliance. The Combi-Steamer has to be modified accordingly where this is not the case, and must be calibrated to the local Wobbe-Index.

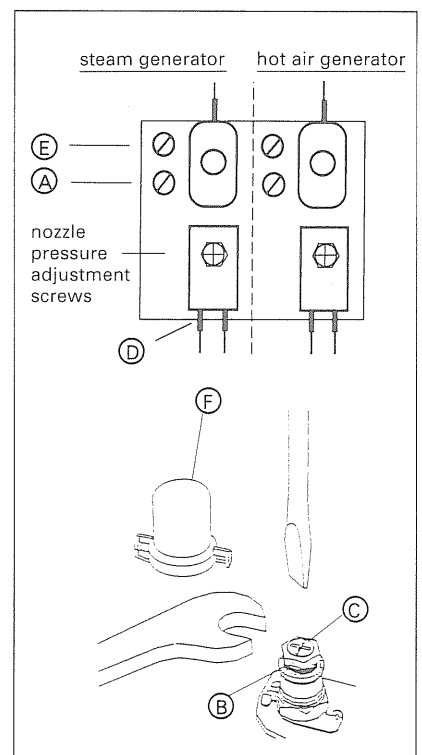
Calibrate the burner pressures according to the nozzle pressure method (U-pipe manometer)- see table

Please note that burner pressures are factory pre-set and the adjustment screws are factory sealed.

Conversion of Gas Supplies

Modifying liquid gas appliances to natural gas appliances is possible, or vice versa by changing the appropriate burners.

After every gas modification the Combi-Steamer has to be recalibrated - see table!





Checking the Connected Line Flow Pressure

- close the gas tap
- remove hexagonal head capping screw (E)
- connect U-pipe manometer hose onto test nipple (E)
- open the gas tap
- switch on appliance to "Steam" mode until the required burner operates on "Full Load"
- check the flow pressure registered on the U-pipe manometer
- switch off the appliance
- close the gas tap
- remove the U-pipe manometer hose from test nipple (E)
- replace hexagonal head capping screw (E)
- open the gas tap
- check for leaks

Please note: (for natural gas only)
The necessary connected flow pressure for natural gas is between 18 and 25 mbar. If the connected flow pressure is below the minimum requirement, please contact your local gas authority. Should the connected flow pressure be below 15 mbar do **not** allow the appliance to be put into operation. Disconnect and isolate the appliance from the service.

Checking Burner Pressures

- Observe the testing sequence for the
- Steam generator burner and/or
 - Hot Air burner
 - close the gas tap
 - remove hexagonal head capping screw (A)
 - connect U-pipe manometer hose onto test nipple (A)
 - open the gas tap
 - switch on the appliance (select the required mode "Steam" or "Hot Air") and wait until the relevant burner is in operation
 - compare the registered value on the U-pipe manometer with the nozzle pressure table below. (Should the burner need recalibrating, then first test "Full Load" followed by "Partial Load")

Calibrating "Full Load"

- Remove protective cap (F)
- Adjust the pressure setting nut/screw (B) with a spanner (10 mm)

Rotation Direction:

- + ↑ = > clockwise to increase pressure
- ↓ = > anti clockwise to decrease pressure

Calibrating "Partial Load"

- disconnect the supply cable from solenoid valve coil (D)
- hold the pressure setting nut/screw (B) with a spanner firmly and adjust the cross head screw (C) to the corresponding pressure with a screw driver

Rotation Direction:

- + ↑ = > clockwise to increase pressure
- ↓ = > anti clockwise to decrease pressure

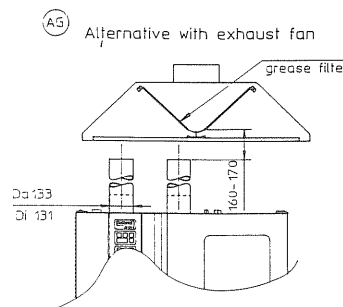
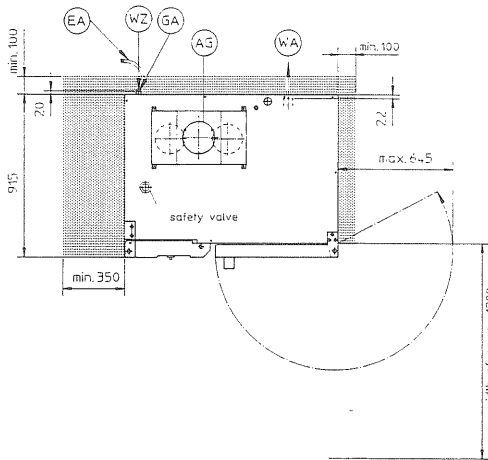
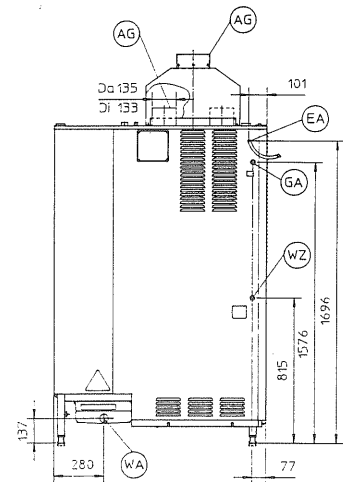
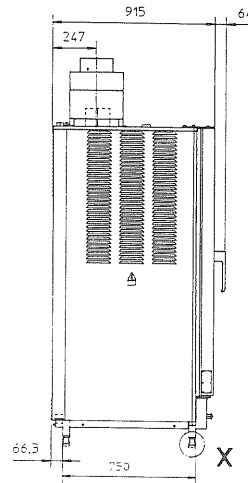
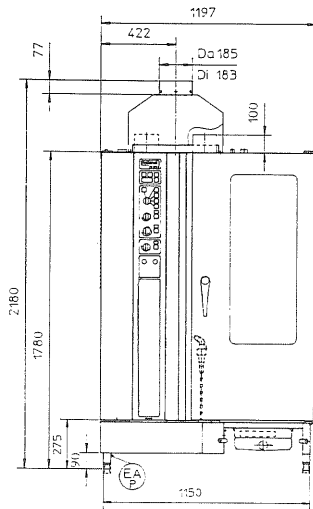
- reconnect the supply cable to solenoid valve coil (D)
- on completing "Partial Load" calibration, re-check "Full Load" pressure.


and then:

- switch off the appliance by selecting "0"
- close the gas tap
- remove the U-pipe manometer hose
- replace hexagonal head capping screw (A)
- open gas tap
- switch on the appliance
- check for leaks
- replace protective cap (F) and reseal

Gas category	Wobbeindex [15°C, 1013 mbar]		Number of nozzles diameter of nozzle, steam [mm]	Number of nozzles diameter of nozzle, hot air [mm]	Code-number of nozzle	pressure of nozzle steam		pressure of nozzle hot air		max. consumption at nominal heat stress 50 kW	nominal inlet pressure [mbar]
	Wi [MJ/m³]	Ws [MJ/m³]				full load 30 kW [mbar]	partial load 18 kW [mbar]	full load 32 kW [mbar]	partial load 20 kW [mbar]		
Natural Gas H (G20)	45,67	50,72	28 x 1,1	32 x 1,1	110	11,2	4,1	11,4	4,4	5,30m³/h	18/20
Natural Gas L (G25)	37,38	41,52	28 x 1,1	32 x 1,1	110	16,7	6,1	17,0	6,6	6,10m³/h	20/25
Liquid Gas (G30) B/P	80,58	87,33	28 x 0,62	32 x 0,62	62	22,1	8,0	22,4	9,1	3,90kg/h	28/30/37/50
Liquid Gas (G31)	70,69	76,84	28 x 0,62	32 x 0,62	62	28,3	10,2	28,8	11,0	3,90kg/h	28/30/37/50

The nozzle pressures apply to annual averages of 15°C and 1013 mbar.
The values for natural gas H, natural gas L and liquid gas are adjusted and sealed by the manufacturer.



-  Water supply
-  Drain connection
-  Electrical connection
-  Earth bonding
-  Gas connection
-  Exhaust escape
-  Minimum space

Valid Standards

- DVGW-TRGI '86
- TRF 1988
- DVGW worksheet G 634
- DIN 1988, T 4
- DIN 1986, T 1

Safety Information

Ensure that the electrical supply is switch off at the appliance prior to using the retractable hand shower hose.

The temperature raise of the door glass can exceed 60 Kelvin.

If the appliance is left unused for a long period of time, isolate the water supply.

When opening the door, steam and fumes are allowed to escape.

Damage and faults resulting from incorrect installation or misuse are not covered by our warranty.

Services Required

- water isolating tap
- drainage pipe with constant slope
- electrical power point
- main isolator with min 3 mm contact clearance for all phases
- earth bonding system
- gas isolating tap
- means of removing exhaust fumes
- adequate fresh air space



...since details make the difference

RATIONAL Großküchentechnik GmbH
Iglinger Straße 62
D-86899 Landsberg a. Lech
Germany
Telefon 08191/3270 · Telefax 08191/21735
Telex 527223 leratd

**RATIONAL Singapore
Representative Office**
58 Tanjong Pagar Road
SINGAPORE 0208
Telephone 2272236
Telefax 2271281

RATIONAL Japan Co., Ltd.
Bell Five Bldg., 1F
34-13, Sendagaya, 2-Chome
Shibuya-Ku
Tokyo 151, Japan
Telephone 03-5411-5882
Telefax 03-5411-5036