

Operating Manual

for

the semi automatic

High-Tech-Tumbler

MKR 150 - 600

**User
Manual
MKRd**

Operating Instructions



RUHLE-High-Tech-Tumbler
Typ # MKR 150 PC # MKR 200 PC # MKR 220 PC# MKR 300 PC #
MKR 600 PC

Design • Manufacture • Sales • Service

Rühle GmbH

Preface

These operating instructions were elaborated by human beings and are not necessarily perfect.

We shall be pleased to accept your suggestions and recommendations for improvement and supplementation.

Table of Contents

1	Important Comments	5
2	Install and Connect	7
3	Operation	4
	3.1 Control	8
	3.5.1 Temperature control	16
	3.5.1 Moving the blending/tumbling arm	16
	3.5.2 Swivelling the processing container	16
	3.5.3 Opening and closing the container lid	16
	3.6 Mounting and removing the tumbling arm	17
	3.7 Mounting and removing the rubber stripper	17
	3.8 Mounting and removing the blending arm	18
	3.9 Mounting and removing the lid gasket	18
	3.10 Opening and closing the water separator	18
	3.11 Transporting the tumbler	19
	3.12 Charging and discharging the tumbler	19
4	Cleaning	20
	4.1 General Information	20
	4.2 Cleaning Preparations	20
	4.3 Cleaning the tumbler	20
	4.4 Machine Assembly	21
5	Application Programs	22
	5.1 Program 01: Boiled ham - Direct Program	22
	5.2 Program 02: Boiled ham - Night Program	23
	5.3 Program 03: Raw ham $\leq 3/\text{kg}$ each 1/2 +	23
	5.4 Program 04: Raw ham $\leq 3/\text{kg}$ each 2/2	24
	5.5 Program 05: Raw ham $> 3/\text{kg}$ each 1/2 +	24
	5.6 Program 06: Raw ham $> 3/\text{kg}$ each 2/2	24
	5.7 Program 07: Boiled ham (general)	24
	5.8 Program 08: Hinterschinken	24
	5.9 Program 09: Vorderschinken	25
	5.10 Program 10: Kassler, without bones	25
	5.11 Program 11: Kassler, with bones	25
	5.12 Program 12: Schweinebauch	25
	5.13 Program 13: Schweinehals	25
	5.14 Program 14: Wacholderschinken, Nuss	25
	5.15 Program 15: Rindersaftschinken	26
	5.16 Program 16: Bierschinken	26
	5.17 Program 17: Einlagefleisch	26
	5.18 Program 18: Turkey ham	26
	5.19 Program 19: Lamb ham	26
	5.20 Program 20: Blending - Feinbraet	26
	5.21 Program 21: Blending - Grobbraet	27
	5.22 Program 22: Blending - Raw sausage	27
	5.23 Program 23: Blending - Bologna sausage	27
	5.24 Program 24: Raw ham $\leq 2 \text{ kg/each } 1/2+$	27

5.25 Program 25: Raw ham <= 2 kg/each 2/2	27
5.26 Program 26: Raw ham > 2 kg/each 1/4 +	28
5.27 Program 27: Raw ham <= 6 kg/each 2/4	28
5.28 Program 28: Raw ham <= 6 kg/each 3/4	28
5.29 Program 29: Raw ham <= 6 kg/each 4/4	28
5.30 Program 30: Bacon 1/2 +	28
5.31 Program 31: Bacon 2/2	28
5.32 Program 32: Marinade - Steaks	29
5.33 Program 33: Tender - Beef	29
5.34 Program 34: Roast Pork	29
5.35 Program 35: Boiled ham over night	29
5.36 Program 36: Goulash/Geschnetzeltes/Gyros	29
5.37 Program 37: Tongue	29
5.38 Program 38: Mixing Salads	30
5.39 Program 39: Mixing Marinades	30
5.40 Program 40: Pig's Head	30
5.41 Program 41: Pre-cooling Program	30
5.42 Program 42: Pre-heating Program	30
5.43 Program 43: Bierschinken, repeated program	30
5.44 Program 44: Einlagefleisch, repeated	31
5.45 Program 45: Optional	31
5.46 Program 46: Optional	31
5.47 Program 47: Optional	31
5.48 Program 48: Optional	31
5.49 Program 49: Optional	31
5.50 Program 50: Optional	32
5.51 Program 51: Optional	32
5.52 Program 52: Optional	32
5.53 Program 53: Optional	32
5.54 Program 54: Optional	32
5.55 Program 55: Test	32
5.56 Program 56: Calibration	33
6 Service and Maintenance	34
7 Malfuntion and Repair	35
7.1 Saving programs in case of power failure	35

1 Important Comments



■ Prior to the initial tumbler operation, these operating instructions must be read, understood and observed. This applies to all persons who are going to handle the equipment.

- In the event of any malfunctions, the operation of the tumbler shall never continue.
- In no case shall the machine be technically modified. If technical modifications occurred, the tumbler shall not be commissioned.
- Prior to transportation, the tumbler shall be disconnected from mains supply.
- When the machine is transported or charged, no other person than the operator shall stay in the vicinity of the tumbler.
- Dependent on the application program, both the lid and the container will move automatically. During the program flow, nobody shall stay in front of the machine (distance from the front side at least 1.2 m on the entire machine width).
- When reselling the machine, these operating instructions must be furnished.
- The cleaning instructions must be strictly observed.
- Possible maintenance shall be performed by Rühle service department and authorized personnel only.
- The machine shall be connected to the supply voltage specified on the name plate.
- Feeder cables shall not be damaged by crossing or squeezing. Mains connection cables must be checked for signs of damage or aging periodically.
- These instructions refer to the type and model MKR, also see brochure, operating and servicing instructions.



■

Caution: Strictly follow this instruction.



■

Important note, non-observance may cause malfunctions of or damage to the machine.



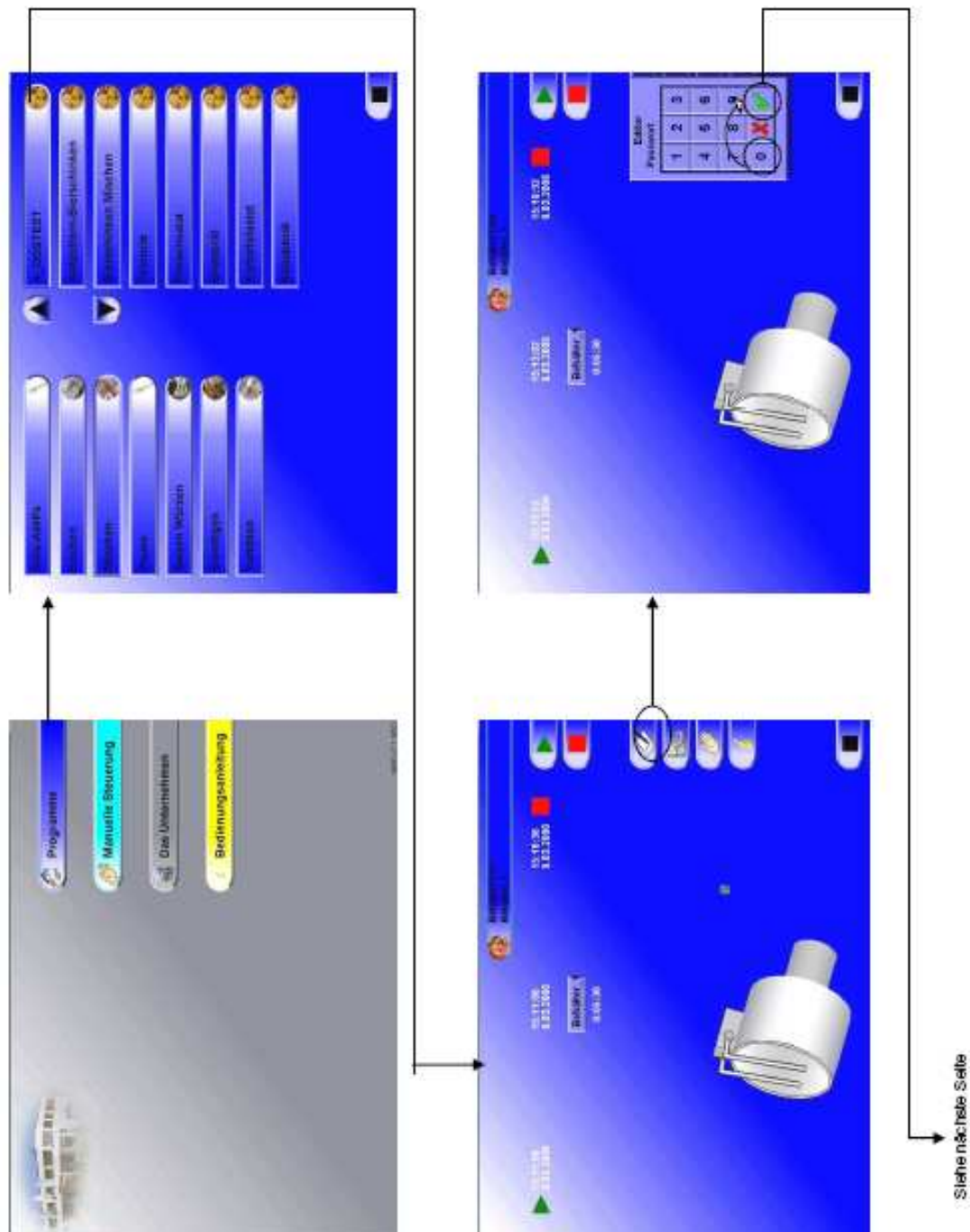
Important note, helpful when operating and using the tumbler.

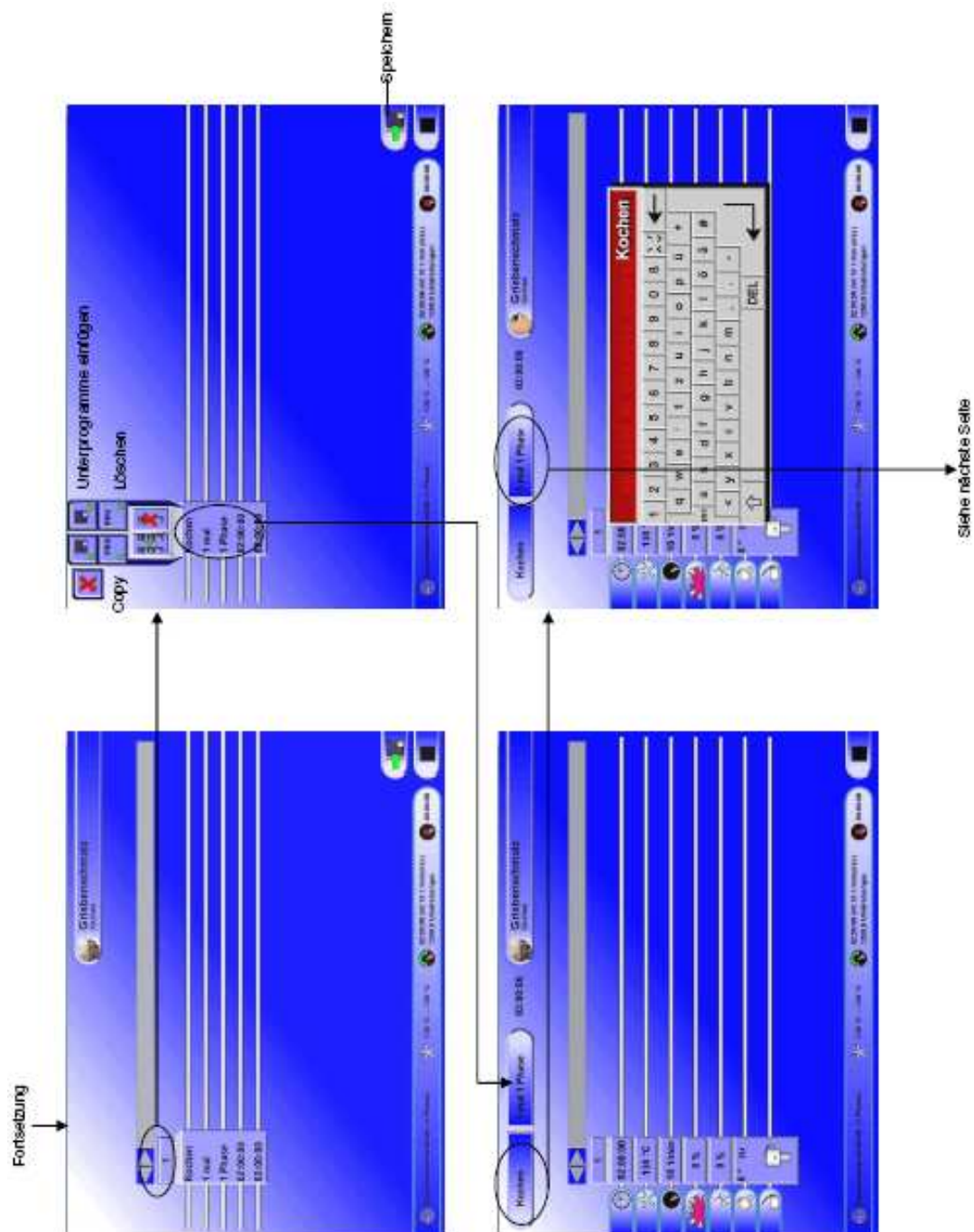
2 Install and Connect

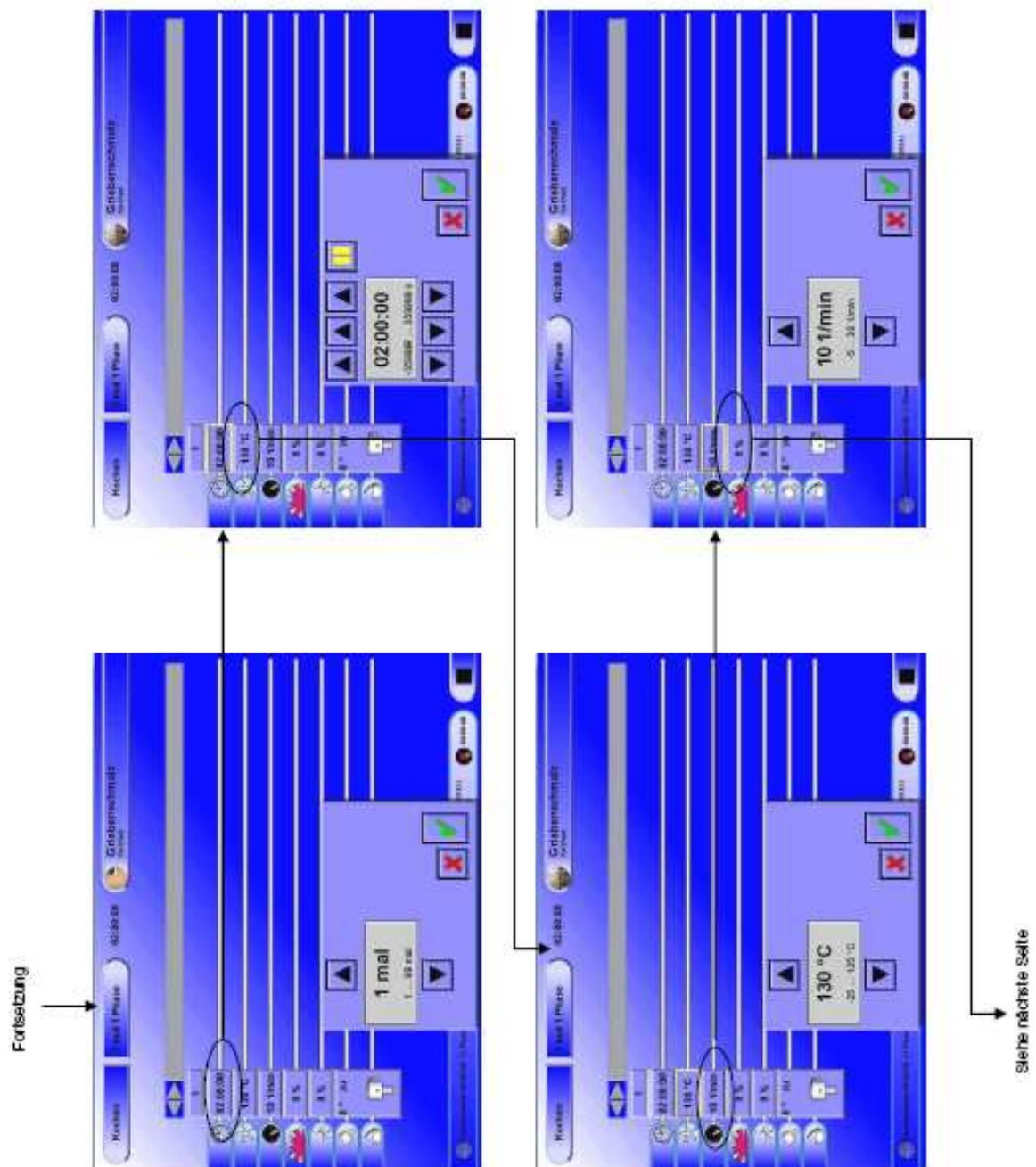
- Push the tumbler to the desired location with the help of a lifting truck
- Check the minimum distance required to other machines and the building.
- Then put the mains plug into a power outlet which matches the supply voltage specified on the name plate.
- When starting the program check if the direction of rotation is correct; when the rotary field is incorrect, no indication will appear in the display field.
 - In this case, the two black cables in the mains plug must be switched over by an electrician.
 - Power supply for the tumbler must be protected by a 16 AT fuse (whereas 35 AT are required for the model equipped with heating), at which safety cutouts will be inadequate.
- Check the minimum safe distance to other machines and the building again.

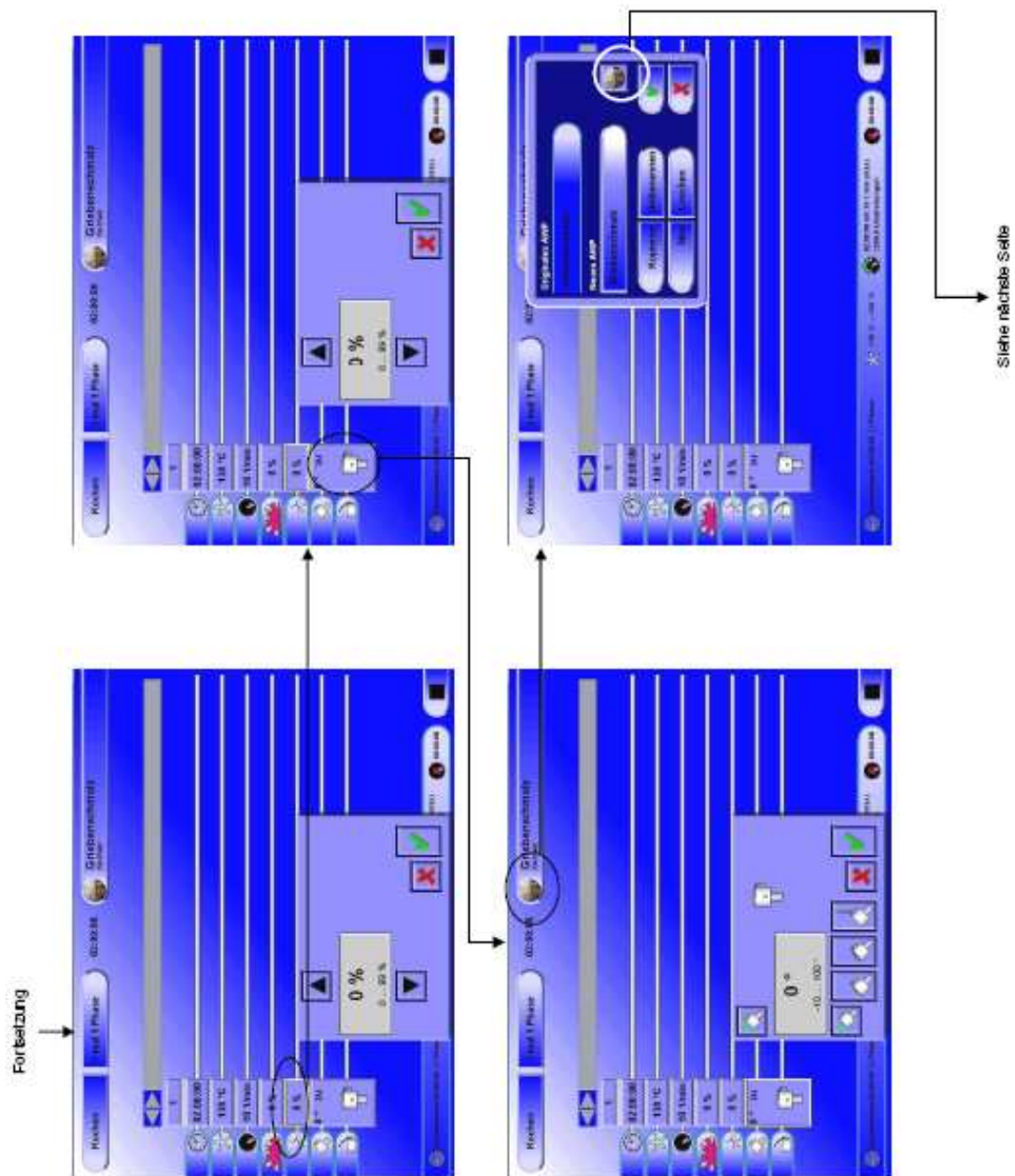
3 Operation

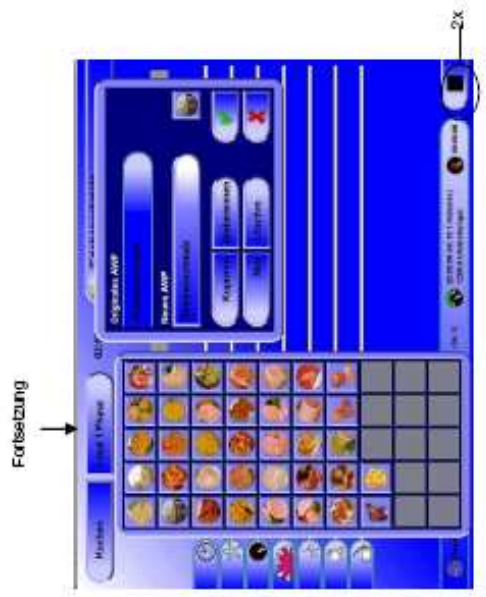
3.1 Control

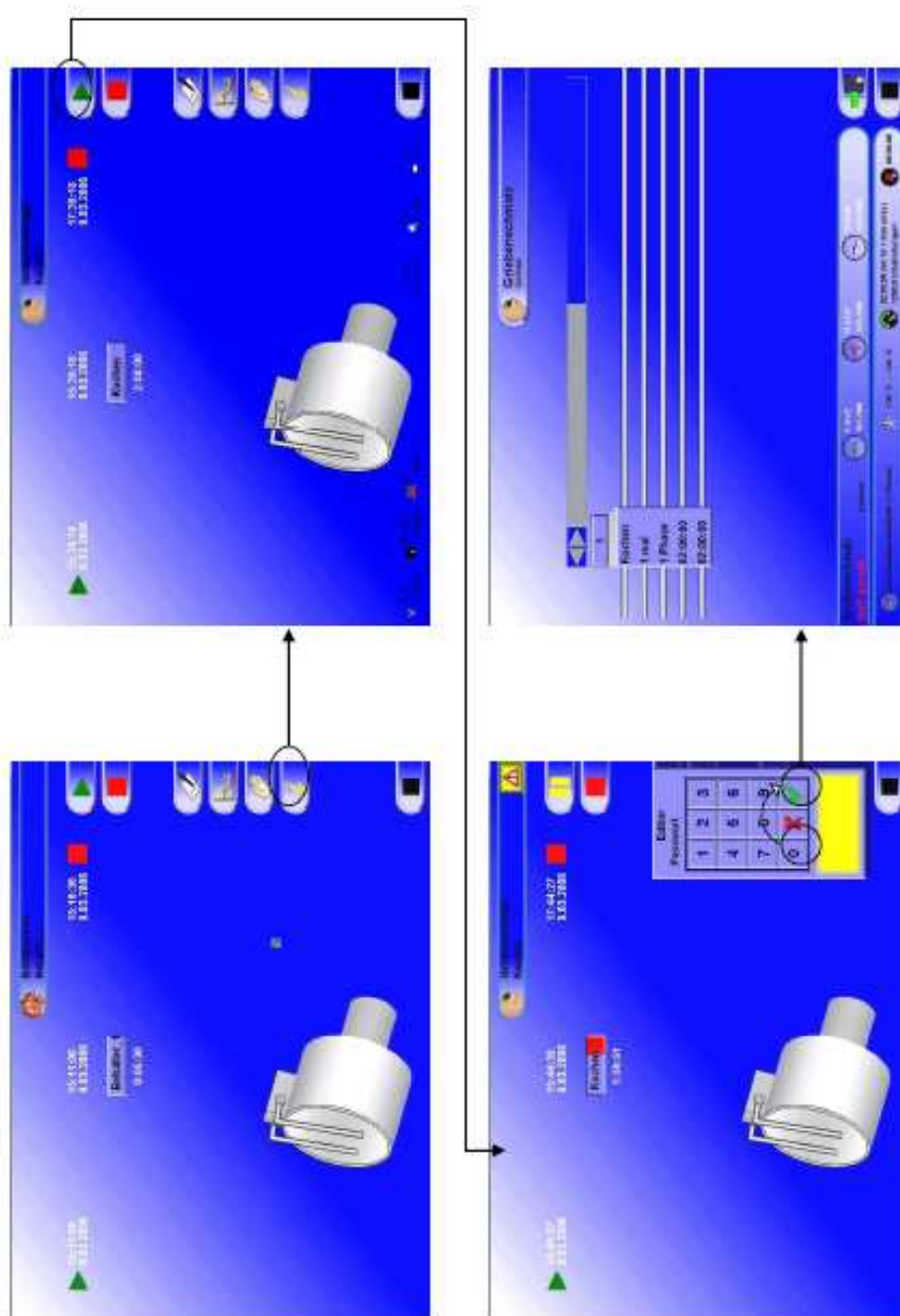


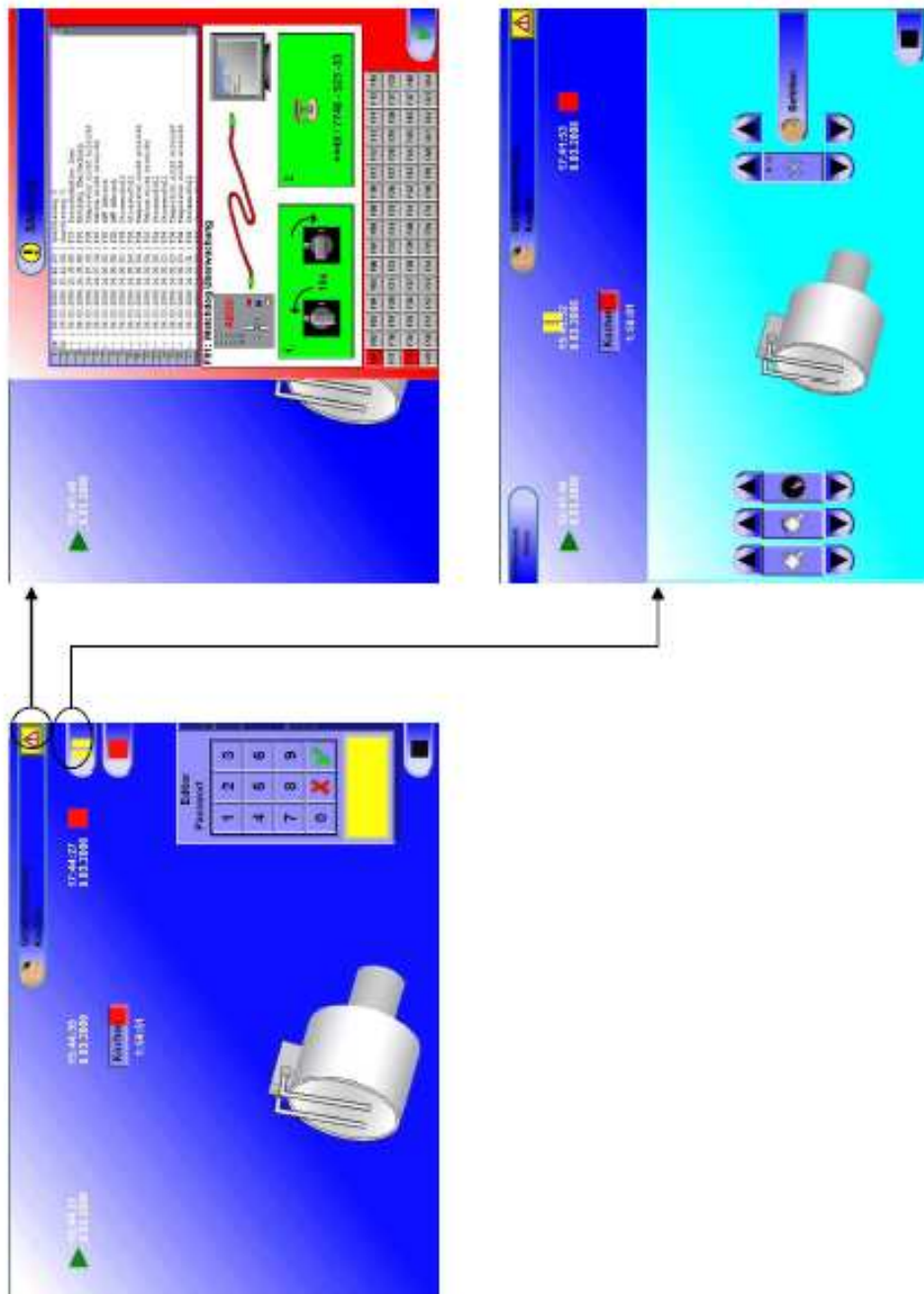


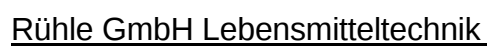












3.5.1 Temperature control



- **Caution:** High temperatures can arise on the inside of the container during heating. Don't touch the inside of the container.
- The arrow buttons are used to adjust the set value (upper display). The lower display indicates the actual value.

3.5.2 Moving the blending/tumbling arm



- **Caution:** When the blending/tumbling arm moves, do not touch it with the hands or any objects.
- As long as the closing-lid key is pushed, the blending/tumbling arm will move in a clockwise direction.



- **Note:** For safety reasons, the rotation speed is limited to about 10 Rpm in manual mode while the lid is open.

3.5.3 Swivelling the processing container



- **Caution:** Nobody shall stay within the swivelling range of the container.



- **Caution:** Precautions have to be taken when discharging boiling goods to avoid scalding.
- The processing container can be adjusted to any position from -10° to 110° (= emptying position) to accomplish any working process.

3.5.4 Opening and closing the container lid



- **Caution:** Nobody shall stay within the swivelling range of the lid.



- **Caution:** When cooking goods, hot steam will escape from the container when opening the lid.
- For safety reasons, the lid has to be closed when working with speeds higher than 10 RpM. Should the lid be in an open position, the machine will automatically adjust to 10 RpM until the lid is closed.
- The machine ventilates automatically when the lid has to be opened.
- When interrupting a program with „Pause“ and actuating the lid symbol, automatic vent will start. After the container is aerated, the lid can be opened by actuating the symbol key again.



- **Caution:** The lid cannot be opened while the container stays under vacuum or is not completely ventilated.

3.6. PC-Network

- All machines can be connected with each other and with a CPU (e.g. in the supervisor's office). This CPU has the following functions:
 - Preparing programs and sending them to the relevant machines.
 - Scanning process datas (e.g. what program is running at the moment, how long will it take ?).
 - Evaluation of datas.
 - Input of new software.

3.7 Mounting and removing the tumbling arm

- Turn the processing container to a 75° position.
- To release the tumbling arm without strenuous efforts, let the tumbling arm move from the top to the bottom side of the container.
- Now move the tumbling arm into the rotating direction with a jolt until it is released from the bolt.
- Then pull the complete tumbling arm towards you.
- The tumbling arm is mounted by shifting it on to the drive shaft and turning it until it is situated on the container floor.

- Then move the tumbling arm against the normal rotating direction with a jolt until it catches with the bolt.

3.8 Mounting and removing the rubber stripper

- The rubber stripper is removed from the tumbling arm by simply pulling it off the holding pins.
- The rubber stripper is attached to the tumbling arm by simply pressing the holes in the stripper into the corresponding holding pins.
 - Take care that every hole is seated on and entirely concealed by the fitting pin.
 - The easiest way to do this is starting with the holes at the 90° bend of the tumbling arm and proceeding towards both sides.

3.9 Mounting and removing the blending arm

- The blending arm is attached to the tumbling arm with a bayonet catch since blending is ensured in cooperation with the tumbling arm only.
 - Consequently, the blending arm can be installed only after the tumbling arm has already been mounted.
 - Take care that the rubber pins on the bottom side of the blending arm fastener are placed in the matching grooves.
- Now the blending arm can be attached to the tumbling arm fastener and fixed with a jolt against the running direction.
- The blending arm is released by moving it in the running direction with a jolt and pulling it towards you.

3.10 Mounting and removing the lid gasket

- 10 clamps are attached to the lid to fasten the gasket
- Start by fixing the rubber gasket between one clamp and the inside rim of the lid. Make sure that the smooth side of the gasket lies against the lid and that the rounded side has contact with the container when closing the lid.
- Then you can proceed from clamp to clamp until the entire gasket is firmly attached to the inside rim of the lid.
- The lid gasket is removed by simply pulling it off the inside of the lid.



- **Important Note:** At the beginning of a process check for the proper fixing of the rubber gasket by looking for a pressure drop on the manometer. Should this be the case is the gasket properly installed. Otherwise the gasket must be checked.

3.11 Transport of the Tumbler

- The models MKR 300'96 and MKR 500'96 are equipped with rollers in the left base only. To move the tumbler, a commercial lift truck must be attached under the center of the right base.
- Then the tumbler must be lifted about 2 cm from the floor and transported by pulling the lift truck.
- Take note of „Install and Connect“

3.12 Chargeing and dischargeing a machine with Thermo-System

- To charge the machine the fork has to be in the upper position and is secured with the safety bolt. The carriage has to be over the feeder inlet. Now the container can be filled by manual operation.



- **Caution:** To discharge hot goods follow these instructions:

To discharge the machine, the fork has to be in the lower position and is secured with the safety bolt. The carriage is below the feeder inlet. Now the goods can be discharged by manual operation.



- **Note:** When working with the carriage system, the carriages may be filled up to the maximum fill weight.

4 Cleaning

4.1 General Information

The tumbler was designed for the highest hygienic requirements and you will be able to easily and quickly clean that machine.

To achieve the highest possible degree of hygiene it is further necessary to thoroughly clean the tumbler after every working process and after longer work breaks.

4.2 Cleaning Preparations

- To accomplish the best possible tidiness it is necessary to remove some components of the tumbler.
- Close the control panel by folding up the keyboard.
- Remove both the blending arm and the tumbling arm from the working container (see Chapter 3.7 and 3.9).
- The rubber stripper on the tumbling arm can be easily pulled from outside to inside.
- Remove the rubber gasket from the flange of the blending arm.
- Pull the rubber gasket off the inside of the container lid.
- Remove the suction filter from the holding device in the lid rim.

4.3 Cleaning the tumbler

- The tumbler can be cleaned with a high-pressure cleaning apparatus without hesitation, provided that the following cleaning and preparing instructions are strictly observed.
- When cleaning with a water jet the machine has to be switched off !!!
- Start with the cleaning of the working container and the inside of the lid, but take care that the high-pressure nozzle is held at least 30 cm away from the surfaces to be cleaned.
- For thorough cleaning of the pipe, hold the high-pressure nozzle directly to the opening of the air intake pipe in the drum.
- Then you can clean all outside surfaces.
 - Take care that the water jet is applied in an angle of 45° from top to bottom, when cleaning the rear side of the base with the high-pressure cleaning apparatus.
- Then the bottom side of the tumbler can be cleaned.
- **The control board must be cleaned manually and may not be exposed to a water jet.**
- The cleaning process must be started with a rough cleaning, followed by the intense cleaning with a detergent and then by flushing the tumbler after the prescribed reaction time.
- The removed components must be cleaned either by hand or in a rinsing machine.

- After all high-pressure cleaning work is finished, the control board must be folded up to clean the operation panels with a wet cloth separately.
- After all components and the machine have been cleaned, all cleaned surfaces must be sprayed with a disinfecting agent.

4.4 Machine assembly

- After cleaning, fasten the lid gasket to the inside of the lid again.(smooth side facing the lid)
- Insert the filter sieve in the intake pipe of the working container.
- Fasten the rubber stripper to the tumbling arm and set the complete arm into the container.
- After placing the rubber ring on the fastening flange, attach the tumbling arm to the blending arm.

5 Application Programs

Overview:

- Explanations are based on the „Boiled Ham - Direct Program“:
- Phase 1 and 2 are for degermination: Air is drawn out of the vessel. The following aeration happens with degerminated air.
- Phases 1...3 contain the preliminary program: 1h permanent tumbling (12 rpm) and vacuum.
- Phases 4...17 show running times of 20 min. and break times of 5 min., a total of 2:55.
- Phase 18 is needed to make up the 3h total time

Overview of the programs

- The programs are divided into five groups:
- Mixing
- Tumbling
- Salting/Spicing
- Others

The free programs are named „Others“.

5.1 Program 01: Boiled Ham - Direct Program

Drum: with tumbling arm, without blending arm

Phase	Duration hrs:min:sec	Temp. °C	Rotat. 1/min	Vacuum %	Degerminate %	drumpos. degree	Lid open/close
1	00:07:00	-4	18	90	0	80	close
2	00:01:00	-4	18	0	90	80	close
3	00:56:00	-4	18	90	0	80	close
4	01:00:00	-2	14	90	0	70	close
5	01:00:00	0	8	90	0	60	close
6	01:00:00	2	4	90	0	50	close
7	00:00:01W	4	0	90	0	0	close

5.2 Program 02: Boiled Ham - Night Program

Drum: with tumbling arm, without blending arm

Phase	Duration hrs:min:sec	Temp. °C	Rotat. 1/min	Vacuum %	Degerminate %	drumpos. degree	Lid open/close
1	00:07:00	-4	18	90	0	80	close
2	00:01:00	-4	18	0	90	80	close
3	00:41:00	-4	18	90	0	80	close
4	00:15:00	2	16	90	0	80	close
5	00:01:00	2	0	40	90	80	close
6	00:59:00	2	0	40	0	80	close
7	00:45:00	-2	14	90	0	80	close
8	00:15:00	2	12	90	0	80	close
9	00:01:00	2	0	40	90	80	close
10	00:59:00	2	0	40	0	80	close
11	00:45:00	0	8	90	0	70	close
12	00:15:00	2	6	90	0	70	close
13	00:01:00	2	0	30	90	70	close
14	00:59:00	2	0	30	0	70	close
15	00:45:00	0	8	90	0	60	close
16	00:15:00	2	6	90	0	60	close
17	00:01:00	2	0	30	90	60	close
18	00:59:00	2	0	30	0	60	close
19	00:45:00	0	6	90	0	60	close
20	00:15:00	2	4	90	0	60	close
21	00:01:00	2	0	30	90	60	close
22	00:59:00	2	0	30	0	60	close
23	00:45:00	0	4	90	0	50	close
24	00:15:00	2	2	90	0	50	close
25	00:01:00	2	0	20	90	50	close
26	00:59:00	2	0	20	0	50	close
27	00:45:00	0	2	90	0	50	close
28	00:15:00	2	2	90	0	50	close
29	00:01:00	4	0	60	90	50	close
30	00:59:00	4	0	60	0	50	zu
31	00:00:01W	4	0	90	0	0	zu

5.3 Program 03: Raw Ham <= 3 kg/each 1/2 +

The program includes two phases: the main program (P 03) and the succeeding program (P 04), running successively ("+")

■ General data:

- Temperature = 2°C, except for the first phase (= 0°C)
- Lid closed
- Simultaneous ventilation and degerminating
- Drum: position = 80°, with tumbling arm, without blending arm

■ Course of program

- 4 min with a rotation speed of 4 1/min
- Then 5 times:
 - for 170 min: break, 10 min 90% vacuum, 10 min 20% vacuum, alternating with degerminating during ventilation
 - for 30 seconds: rotation speed = 2 1/min

5.4 Program 04: Raw Ham <= 3 kg/each 2/2

Drum: position = 80°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 33:05:30		
	Running time = 3 (2/min)	Vacuum = 33:05:30, 90%	Temp. = 4 °C
	Break time = 30 sec	Ventilation = 0 min	

5.5 Program 05: Raw Ham > 3 kg/each 1/2 +

The program includes two phases: the main program (P 05) and the succeeding program (P 06), running successively ("+")

The programs 03 and programs 05 are identical.

5.6 Program 06: Raw Ham > 3 kg/each 2/2

Drum: position = 80°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 72:36:00		
	Running time = 3 h (2/min)	Vacuum = 72:36:00, 90%	Temp. = 4 °C
	Break time = 30 sec	Ventilation = 0 min	

5.7 Program 07: Boiled Ham (general)

Drum: position = 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 3 h		
Vacuum = 90%	Running time = 20 min (12/min)	Vacuum = 4 h, 90%	Temp. = 0 °C
Speed = 12/min	Break time = 5 min	Ventilation = 0 min	

5.8 Program 08: Hinterschinken

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 3 h		
Vacuum = 90%	Running time = 15 min (12/min)	Vacuum = 3 h, 90%	Temp. = 0 °C
Speed = 12/min	Break time = 6 min	Ventilation = 0 min	

5.9 Program 09: Vorderschinken

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 3 h		
	Running time = 3 h (14/min)	Vacuum = 3 h, 90%	Temp. = 0 °C
	Break time = 0 min	Ventilation = 0 min	

5.10 Program 10: Kassler, without bones

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 2 h		
	Running time = 2 h (6/min)	Vacuum = 2 h, 90%	Temp. = 0 °C
	Break time = 0 min	Ventilation = 0 min	

5.11 Program 11: Kassler, with bones

Drum: Position 30°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 1 h		
	Running time = 5 min (5/min)	Vacuum = 1 h, 90%	Temp. = 0 °C
	Break time = 10 min	Ventilation = 0 min	

5.12 Program 12: Schweinebauch

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 2 h, 20 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h (8/min)	Vacuum = 0 h 90%	Temp. = 0 °C
Speed = 8/min	Break time = 0 min	Ventilation = 0 min	

5.13 Program 13: Schweinehals

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 3 h		
	Running time = 15 min (8/min)	Vacuum = 3 h, 90%	Temp. = 0 °C
	Break time = 8 min	Ventilation = 0 min	

5.14 Program 14: Wacholderschinken, Nuss

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 2 h	Total time = 1 h		
Vacuum = 90%	Running time = 1 h (14/min)	Vacuum = 1 h, 90%	Temp. = 0 °C
Speed = 14/min	Break time = 0 min	Ventilation = 0 min	

5.15 Program 15: Rindersaftschinken

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 3 h		
Vacuum = 90%	Running time = 15 min (12/min)	Vacuum = 3 h, 90%	Temp. = 0 °C
Speed = 14/min	Break time = 5 min	Ventilation = 0 min	

5.16 Program 16: Bierschinken

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 20 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = +4 °C
Speed = 14/min	Break time = 0 min	Ventilation = 0 min	

5.17 Program 17: Einlagefleisch

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 20 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = +4 °C
Speed = 14/min	Break time = 0 min	Ventilation = 0 min	

5.18 Program 18: Turkey ham

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 2 h		
Vacuum = 90%	Running time = 2 h (10/min)	Vacuum = 2 h, 90%	Temp. = +2 °C
Speed = 10/min	Break time = 0 min	Ventilation = 0 min	

5.19 Program 19: Lamb ham

Drum: Position 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 2 h		
Vacuum = 90%	Running time = 2 h (10/min)	Vacuum = 2 h, 90%	Temp. = -2 °C
Speed = 10/min	Break time = 0 min	Ventilation = 0 min	

5.20 Program 20: Blending - Feinbraet

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 2 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -2 °C
Speed = 12/min	Break time = 0 min	Ventilation = 0 min	

5.21 Program 21: Blending - Grobbraet

Drum: Position 75°, with tumbling arm, with blending arm

Prelimin. = 6 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 4 h, 90%	Temp. = -2 °C
Speed = 12/min	Break time = 0 min	Ventilation = 0 min	

5.22 Program 22: Blending - Raw sausage

Drum: Position 75°, with tumbling arm, with blending arm

Prelimin. = 4 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -15 °C
Speed = 14/min	Break time = 0 min	Ventilation = 0 min	

5.23 Program 23: Blending - Bologna sausage

Drum: Position 75°, with tumbling arm, with blending arm

Prelimin. = 3 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -8 °C
Speed = 16/min	Break time = 0 min	Ventilation = 0 min	

5.24 Program 24: Raw ham <= 2 kg/each 1/2 +

This phased program necessitates the following alterations:

- Separation into 2 programs, automatically running successively ("+")
- Break time 89 min 50 sec instead of 90 min
- Vacuum for 27 min instead of 30 min

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 3 min	Total time = 36 h		
Vacuum = 90%	Running time = 10 sec. (4/min)	Vacuum = 27 min, 90%	Temp. = +4 °C
Speed = 4/min	Break time = 89 min 50 sec.	Ventilation = 3 min	

5.25 Program 25: Raw ham <= 2 kg/each 2/2

2nd phase of the raw ham program <= 2 kg/piece

5.26 Program 26: Raw ham > 2 kg/each 1/4 +

This phased program necessitates the following alterations:

- Separation into 4 programs, automatically running successively ("+")
- Break time 89 min 50 sec instead of 90 min
- Vacuum for 27 min instead of 30 min

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 3 min	Total time = 70 h		
Vacuum = 90%	Running time = 10 sec. (4/min)	Vacuum = 27 min, 90%	Temp. = +4 °C
Speed = 4/min	Break time = 89 min 50 sec	Ventilation = 3 min	

5.27 Program 27: Raw ham <= 6 kg/each 2/4

2nd phase of the raw ham program <= 6 kg/piece

5.28 Program 28: Raw ham <= 6 kg/each 3/4

3rd phase of the raw ham program <= 6 kg/piece

5.29 Program 29: Raw ham <= 6 kg/each 4/4

4th phase of the raw ham program <= 6 kg/piece

5.30 Program 30: Bacon 1/2 +

This phased program necessitates the following alterations:

- Separation into 2 programs, automatically running successively ("+")
- Break time 89 min 50 sec instead of 90 min
- Vacuum for 27 min instead of 30 min

Drum: Position 75°, with tumbling arm, without blending arm

Prelimin. = 3 min	Total time = 24 h		
Vacuum = 90%	Running time = 10 sec (4/min)	Vacuum = 27 min, 90%	Temp. = 4 °C
Speed = 5/min	Break time = 89 min 50 sec	Ventilation = 3 min	

5.31 Program 31: Bacon 2/2

2nd phase of the bacon program

5.32 Program 32: Marinade - Steaks

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 1 h		
	Running time = 10 min (5/min)	Vacuum = 1 h, 90%	Temp. = -4 °C
	Break time = 50 min	Ventilation = 0 min	

5.33 Program 33: Tender - Beef

Drum: Position = 75°, without tumbling arm, without blending arm

Preliminary = 0 h	Total time = 14 h		
	Running time = 0 h	Vacuum = 20 min, 90%	Temp. = 4 °C
	Break time = 14 h	Ventilation = 3 min	

5.34 Program 34: Roast Pork

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary = 0 h	Total time = 1 h		
	Running time = 15 min (8/min)	Vacuum = 1 h, 90%	Temp. = 4 °C
	Break time = 5 min	Ventilation = 0 min	

5.35 Program 35: Boiled ham over night

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 14 h		
Vacuum = 90%	Running time = 8 min (10/min)	Vacuum = 14 h, 90%	Temp. = 0 °C
Speed = 10/min	Break time = 22 min	Ventilation = 0 min	

5.36 Program 36: Goulash/Geschnetzeltes/Gyros

Drum: Position = 75°, with tumbling arm, without blending arm

Prelimin. = 40 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -2 °C
Speed = 10/min	Break time = 0 min	Ventilation = 0 min	

5.37 Program 37: Tongue

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 3 h		
Vacuum = 90%	Running time = 3 h (18/min)	Vacuum = 3 h, 90%	Temp. = -2 °C
Speed = 18/min	Break time = 0 min	Ventilation = 0 min	

5.38 Program 38: Mixing Salads

Drum: Position = 75°, with tumbling arm, without blending arm

Prelimin. = 5 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -15 °C
Speed = 16/min	Break time = 0 min	Ventilation = 0 min	

5.39 Program 39: Mixing Marinades

Drum: Position = 75°, with tumbling arm, without blending arm

Prelimin. = 6 min	Total time = 0 h		
Vacuum = 90%	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -15 °C
Speed = 18/min	Break time = 0 min	Ventilation = 0 min	

5.40 Program 40: Pig's Head

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary = 1 h	Total time = 2 h		
Vacuum = 90%	Running time = 15 min (12/min)	Vacuum = 2 h, 90%	Temp. = -2°C
Speed = 12/min	Break time = 5 min	Ventilation = 0 min	

5.41 Program 41: Pre-cooling Program

Drum: Position = 75°, without tumbling arm, without blending arm

Preliminary = 0 h	Total time = 1 h		
	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = -15 °C
	Break time = 1 h	Ventilation = 1 h	

5.42 Program 42: Pre-heating Program

Drum: Position = 75°, without tumbling arm, without blending arm

Preliminary = 0 h	Total time = 10 min		
	Running time = 0 h	Vacuum = 0 h, 90%	Temp. = 70 °C
	Break time = 10 min	Ventilation = 10 min	

5.43 Program 43: Bierschinken, repeated

First, the regular program is running (see Program 16), which is then automatically repeated for 10 minutes the following day.

Phase	Duration Hrs:min:sec	Temp. °C	Rotat. 1/min	Vacuum %	Degerminate %	Drumposition Degree	Lid open/close
1	00:07:00	4	14	90	0	75	close
2	00:01:00	4	14	0	90	75	close
3	00:16:00	4	14	90	0	75	close
4	00:01:00	4	0	0	90	75	close
5	23:40:00	4	0	0	0	75	close
6	00:10:00	4	14	90	0	75	close
7	00:00:01W	4	0	90	0	0	close

5.44 Program 44: Einlagefleisch, repeated

First, the regular Bierschinken-program is running (see Program 16), which is then automatically repeated for 10 minutes the following day.

Phase	Duration Hrs:min:sec	Temp. °C	Rotat. 1/min	Vacuum %	Degerminate %	Drumposition Degree	Lid open/close
1	00:07:00	4	14	90	0	75	close
2	00:01:00	4	14	0	90	75	close
3	00:16:00	4	14	90	0	75	close
4	00:01:00	4	0	0	90	75	close
5	23:39:00	4	0	0	0	75	close
6	00:10:00	4	14	90	0	75	close
7	00:00:01W	4	0	90	0	0	close

5.45 Program 45: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.46 Program 46: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.47 Program 47: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.48 Program 48: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.49 Program 49: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.50 Program 50: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.51 Program 51: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.52 Program 52: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.53 Program 53: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.54 Program 54: Optional

Drum: Position = 75°, with tumbling arm, without blending arm

Preliminary =	Total time =		
Vacuum =	Running time =	Vacuum =	Temp. =
Speed =	Break time =	Ventilation =	

5.55 Program 55: Test

Automatic test of all tumbler functions

Phase	Duration Hrs:Mi:Se	Temp °C	Rot. 1/min	Vac %	Degerm %	drum pos. °	Lid open/close	Note
1	00:00:30	50	0	0	0	-10	close	Limit switch -10°
2	00:00:10	50	0	0	0	-10	open	Lid function
3	00:00:10	50	0	0	0	-10	close	ok?
4	00:00:02	50	0	0	90	-10	close	Degermination
5	00:00:02	50	0	0	0	-10	close	contactor ok?
6	00:00:02	50	0	0	90	-10	close	
7	00:00:02	50	0	0	0	-10	close	Cooling-

8	00:00:02	-15	0	0	0	-10	close	heating contactor
9	00:00:02	50	0	0	0	-10	close	ok?
10	00:00:02	-15	0	0	0	-10	close	
11	00:00:10	50	0	0	0	0	close	Drumposition
12	00:00:15	50	0	0	0	45	close	
13	00:00:15	50	0	0	0	90	close	
14	00:00:10	50	0	0	0	110	close	End switch 110°
15	00:00:10	50	0	0	0	90	open	
16	00:00:15	50	10	0	0	90	open	Rotation speed
17	00:00:10	50	0	0	0	90	open	
18	00:00:45	50	0	-30	0	90	close	Vacuum removal
19	00:00:30	50	0	-10	0	90	close	Ventilating
20	00:00:30	50	0	-30	0	90	close	Vacuum removal
21	01:00:00	50	0	-90	0	90	close	Pump capacity

5.56 Program 56: Calibration

Drum: Position = 75°, with tumbling arm, without blending arm

Phase	Duration hrs:min:sec	Temp. °C	Rot. 1/min	Vacuum %	Degermination %	Drumpos. Degree	Lid open/close
1	00:00:30	-4	0	0	0	90	open
2	00:01:00	-4	10	0	0	90	open
3	24:00:00	-4	0	90	0	90	close

6 Service and Maintenance



Important Note: To avoid problems with the equipment and production, it is mandatory to have the tumbler inspected by the RÜHLE service department or an authorized dealer at least once a year.

The following items should be included in the service:

- Check lid gasket for hygienic condition and function
- Check water separator for function and tightness
- Check bayonet catches at tumbling and blending arms for proper function
- Check rubber stripper on tumbling arm for hygienic condition
- Change oil in vacuum pump
- Check air and vacuum filter and replace if necessary
- Check degerminating tube and replace if necessary
- Check cooling capacity of cooling unit, repair if necessary and clean the condenser
- Check heating system efficiency, repair if necessary
- Check pressure transmitter and temperature sensor for proper function
- Thoroughly clean the air intake pipe
- Container positioning
- Lid mechanism
- Holder for standardized carriage (for MKR 300 and MKR 500 only)
- Container lid holding device

7 Malfunction and Repair

Before calling the service department, you can detect and repair smaller deficiencies yourself.

7.1 Saving programs in case of power failure

In the event of power supply failures in the course of program, the tumbler will continue operation as soon as power is restored. The expired program time will be displayed and will start with zero after power failure.



Caution: While the program is running, nobody shall stay in front of the tumbler (distance from the front side at least 1.2 m on the entire machine width)