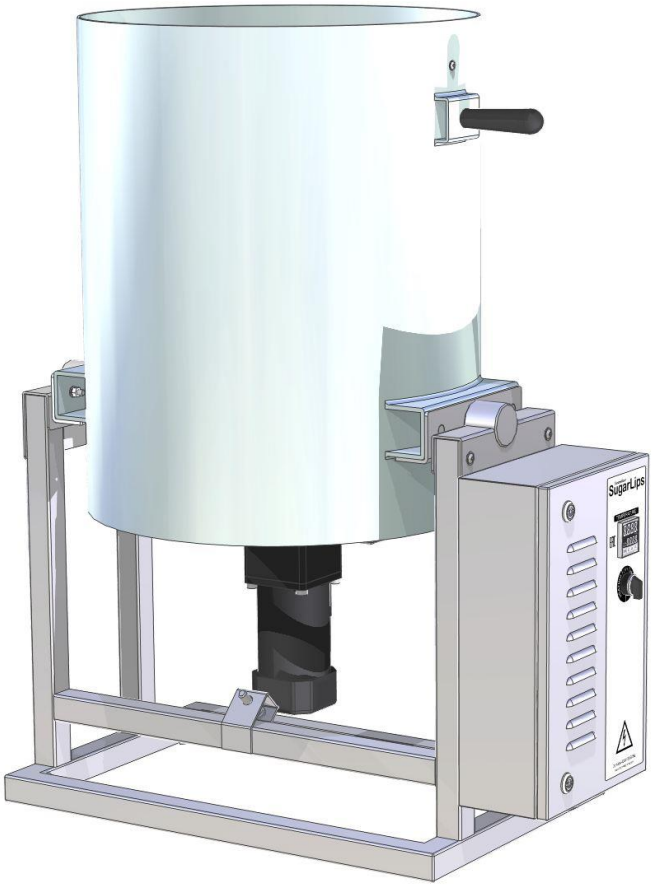
RoboLabs
Incredible machines for fastfood & funfood

OPERATING MANUAL
SUGARLIPS 20 (CP-20)



CAUTION: READ THE INSTRUCTIONS BEFORE USING THE MACHINE!

PDF version of this manual is available on www.robolabs.pro

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Safety requirements

DO NOT DISASSEMBLE CARAMELIZER OR REMOVE SEPARATE COMPONENTS WHILE EQUIPMENT IS CONNECTED TO THE MAINS!

READ CAREFULLY THE MANUAL BEFORE START!
ONLY INSTRUCTED PERSONNEL ARE ALLOWED TO OPERATE THE MACHINE!

IT IS PROHIBITED TO RUN THE MACHINE WITH EMPTY KETTLE! IT WILL LEAD TO MACHINE OVERHEATING AND FAILURE!

DO NOT USE THE MACHINE FOR MIXING HEAVY OR ABRASIVE PRODUCTS!

MANY PARTS ARE HOT WHILE IN OPERATION!
BURN HAZARD!

BEWARE OF MOVING PARTS OF THE MACHINE WHILE IN OPERATION!

1. Overview

1.1. Purpose

SugarLips CP-20 machine intended for cooking caramel and coating popped popcorn with it (hereinafter – “caramelizer” or “machine”).

1.2. Technical specifications

Productivity	up to 35 kg/hr (75 lbs/hr)
Kettle size	75 liters (20 gallons)
Rated voltage	3/N/PE AC 230/400 V, 50/60 Hz
Rated power	12.2 kW
Overall dimensions	720x900x1150 mm
Weight	100 kg
Ingress protection	IP22

1.3. Delivery set

Caramelizer	1 pc
Popcorn container 75 liters (20 gallons)	1 pc
Container for finished product	1 pc
Documentation set	1 pc
Mixer	1 pc
Deflector	2 pcs
Teflon ring	2 pcs
Silicone ring	2 pcs
Spare PTFE scraper	1 pc
Steel washer	1 pc
M6 screw-bolt	5 pcs
M6 screw-nut	5 pcs
M6 washer	5 pcs
M6 spring washer	5 pcs

1.4. Power requirements

ELECTRIC SOCKET MUST HAVE GROUNDING CONTACT!

CONNECTIONS MUST BE DONE ONLY BY QUALIFIED ELECTRICIAN!

IF SUPPLY CORD DAMAGED, IT MUST BE REPLACED BY MANUFACTURER, SERVICE AGENT, OR QUALIFIED PERSONS IN ORDER TO AVOID HAZARD!

It is necessary to periodically check electric connections, including grounding connection. Whenever any fault conditions are found, do not turn the equipment on, and call for qualified electrician!

Equipotential bonding wire (up to 10 sq.mm) shall be connected to screw terminal marked with IEC 5021 sign.

Cable plug is not included in the delivery set. Use a 32 A plug. Refer to the wiring diagram on the power cord label.

It is necessary to check electric wires and ground connection of the machine periodically. In case of faults found, an electrician must be called. It is allowed to turn the machine on only after all the issues are resolved.

1.5. Safety components

The machine can be turned off in any time with the main switch on the front panel.

There is an emergency temperature regulator located in heating elements area. In case of excessive or uncontrolled heating it will cut off power supply to the heaters.

1.6. Ambient conditions

The equipment must be operated at the ambient temperature from +5° to +40°C and relative humidity not more than 45% at 40°C. The temperature decreasing related to RH increasing, for example, 90% of RH at 20°C. Altitude above sea level should not exceed 1000 m. Ingress protection rating IP22 (IEC 60529).

During the operation, machine emits a lot of steam and heat. It is essential to provide exhausting hood (800x800 mm, 1000 cu.m/hr or more) installed over the kettle.

Ambient conditions have strong impact on the end product quality. See section

2.3 for more details.

1.7. Main components

Caramelizer has following components: 1 – Kettle with heaters; 2 – Control unit; 3 – Mounting base, 4 – Deflectors; 5 – Mixer, see Fig.1:

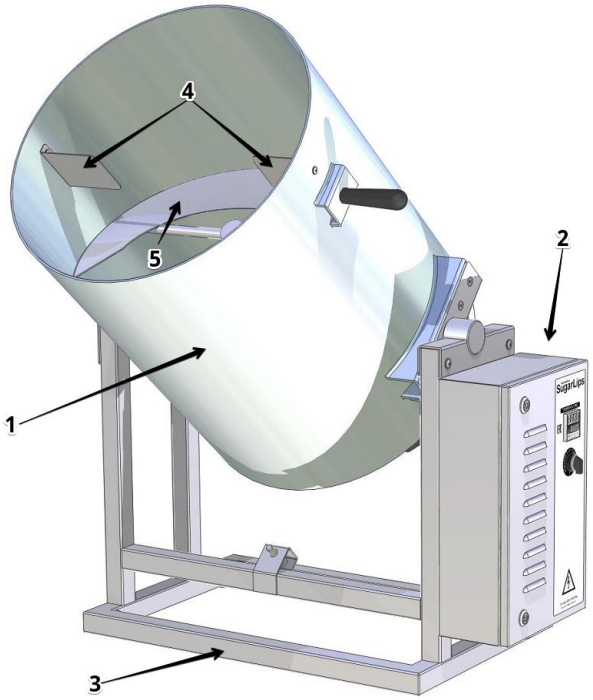

Fig. 2 Main components

1.8. Getting started

Unpack machine carefully, check delivery set, and remove protective film from all surfaces. Put the machine on special table (not included in the delivery set).

Install the mixer inside the kettle, using rubber and PTFE sealing rings, as shown in Annex C.

Mount two metal deflectors inside the kettle using fasteners from the delivery set.

2. Intended use

2.1. Caramel recipes

Below are few caramel recipes to start with. Depending on customer's needs, those recipes may be modified or substituted with your own recipes. Feel free to experiment with different recipes to get the best results.

Recommended[1] Recipe

By default, it is recommended to use the following recipe for caramel mixture (per 70 liters of popped 'Mushroom' popcorn):

- Caramel premix or similar — 2800 g
- Sugar (beet or cane) — 2000 g
- Coconut oil or butter — 240 g
- Water — 1000 g

To avoid excessive stickiness it is recommended to use Free-N-Easy liquid lecithin from Gold Medal Co. Lecithin should be sprayed on popcorn already coated with caramel, in the ending of mixing stage, before cooling.

2.2. Machine operation

Machine controls has following items on control panel:

- Temperature regulator
- Main switch 3-pos.

The main switch has three positions: HEATING, OFF, MIXING.

Heating Stage

The switch is in HEATING position. The mixture in the kettle is being heated and periodically stirred with the mixer, to provide proper mixing of all ingredients. Once temperature set point is reached, operator will hear the sound alarm.

[1] You are welcome to experiment with different ratios of ingredients, or even with different ingredients. This way you will be able to get the result that suits your needs in the best way!

Mixing Stage

The switch is in MIXING position. Heaters are not energized, mixer operates continuously.

Operation Order

To make caramel coated popcorn, do the following:

1. Apply liquid lecithin on the kettle sidewall, to minimize caramel stuck.

2. Put caramel ingredients into the kettle. Put popped popcorn into popcorn container.

3. Turn the main switch to HEATING position; adjust the temperature set point if necessary.

4. Wait for sound signal.

5. Once temperature is reached, set the switch in MIXING position and dump prepared popcorn in the kettle.

6. Apply liquid lecithin during mixing, to help popcorn being separated.

7. Once popcorn is properly coated with caramel, tip the kettle with handle, discharging popcorn onto a cooling table[2].

8. Once kettle is empty, get the kettle back to straight position and set the switch to OFF position.

2.3. Product quality

Temperature Adjustment

Due to constructive features, temperature value set on the thermoregulator may be different, depending on recipes used. The goal is to get good taste rather than reach some temperature value.

The following recommendations will help you to find out the right temperature that should be set on the thermoregulator.

Make a batch of caramelized popcorn with default temperature setting (180°C) and give it a try.

[2] Cooling table is not included in the delivery set and must be purchased separately.

If caramel is sticky to the tooth, it means that caramel is *undercooked*; therefore, the temperature value must be *increased*.

If caramel has bitter taste with hint of burnt, it means that caramel is *overcooked*; therefore, the temperature value must be *reduced*.

Caramel that cooked with normal temperature and properly cooled is crunchy and doesn’t stick to the tooth.

Popcorn Crunchiness

Crunchiness of caramel coated popcorn comes mostly from caramel layer. To be crispy, caramel should be properly cooked, which means that there is virtually no water left in the mix.

However, even if caramel is cooked properly, the result may be not so good. Popcorn is highly hygroscopic product. It is very important to make sure that popcorn you put into the machine has not more than 1.0—1.5% of moisture. Otherwise, excessive moisture will ingress into caramel layer after coating and make it sticky.

Except providing proper ambient conditions (see section 1.5), some additional equipment may be required in order to keep popcorn in good condition at intermittent stages as well as finished product.

3. Technical maintenance

The maintenance purpose is to keep the machine operable during the entire service life. The recommended[3] maintenance schedule with types of actions is presented below:

PROCEDURE	PERIOD
Kettle cleaning	once a day
Outer surface cleaning	once a day

DISCONNECT THE MACHINE FROM THE MAINS BEFORE TECHNICAL MAINTENANCE!

DO NOT USE SHARP TOOLS OR ABRASIVES!

DO NOT LET ALL WATER TO BOIL OUT!

DO NOT PUT MORE THAN 2 LITERS OF WATER INTO THE KETTLE!

DO NOT REMOVE THE LID WHILE KETTLE IS HOT!
HOT STEAM INSIDE! BURN HAZARD!

Kettle cleaning[4]

Pour *not more than* 2 liters of water in the kettle, close the kettle with lid provided in the delivery set, and turn the main switch in ON position. Wait until water is started to boil; let it boil for a few minutes, so hot water steam will be able to fill the kettle properly. Turn off the machine and let the kettle to cool down.

In case of severe carbon build ups, use special cleaning product (Heet-N-Kleen or similar).

DURING MACHINE OPERATION SOME AMOUNT OF DARK-COLOURED CONDENSATE MAY BE FOUND BELOW THE KETTLE, ON MIXER MOTOR HOUSING AND AROUND. IT SHOULD BE REMOVED AS NECESSARY!

[3] Period may be different. Maintenance procedures must be done as necessary.
[4] The machine must be turned on for kettle cleaning procedure.

4. Troubleshooting

Problem	Possible cause	Possible remedy
Caramel coated popcorn is not crunchy	Popcorn is still too hot Too low temperature set value Improper recipe Popcorn had excessive moisture before coating. Extreme ambient conditions.	Make sure that popcorn is properly cooled down Increase the temperature set value Use proper recipe Make sure that moisture content of popped popcorn being put in the machine does not exceed 1.5% Provide proper ambient conditions and purge ventilation.
Caramel coated popcorn is too dark and/or has bitter taste.	Too high temperature set value Improper recipe	Decrease the temperature set value Use proper recipe
Dark thick liquid appears under the kettle (next to the motor and the shaft)	Irregular outer surface cleaning Mixer sealing rings are worn out. Mixer sealing rings are not in proper order.	Perform cleaning as necessary, on regular basis Replace the sealing rings, see Annex related. Make sure that sealing rings are put in proper order, see Annex related.

5. Transportation and storage

The equipment may be transported by any kind of covered vehicle, in accordance with transportation rules for this kind of vehicle.

Ambient temperature during the transportation and storage must be between minus 25°C and +55°C.

6. Acceptance certificate

ACCEPTANCE CERTIFICATE

Product Name _____ Serial No. _____

The equipment is made with accordance to mandatory requirements of the state standards, actual technical documentation, and approved for use.

QC Engineer

STAMP HERE

Signature _____ Full Name _____

DD.MM.YYYY _____

7. Warranty obligations

The manufacturer guarantees trouble-free operation of the equipment during 12 months from the date of receiving the equipment by dealer (in accordance with transport documentation); or, in case of purchase directly through Trapeza LLC, from the purchase date, given that terms of using, transportation, and storage are met.

The warranty repair is performed upon presentation of this manual and filled warranty card with the seller's seal and the date of sale.

Technical specifications of the equipment can be changed by manufacturer at any time due to improvements and/or other reasons. Technical specifications stated in this document are intended to act as a reference point, which is necessary to evaluate suitability of the equipment for the customer's needs, and are not the subject of warranty policy.

The information stated in this document has been thoroughly checked and considered as accurate one; nevertheless, the manufacturer is not responsible for any typographical errors or misprints.

Due to constant improvement of the equipment, technical specifications are subject to change without prior notice!

8. Manufacturer details

NPO Tvertorgmash LLC

11 Industrial Street, Tver, 170000 Russia

Technical support:

Email: support@robolabs.pro

Phone: +7 495 956 4000

Annex A. Electric component list

SIGN	DESIGNATION	MODEL	SPECS
AT	Safety limiter	NT-353LF, Tecasa	360°C
BT	Temperature sensor	ДТПК124-00.32/4 Owen	Type K
BZ	Buzzer	SC235B, Sonitron	24 Vdc
C	Capacitor	CBB61	450 Vac, 8 uF
DC1	Temperature regulator	TCN4S-24R, Autonics	230 Vac
DC2, DC3	Timer	AT8N, Autonics	230 Vac
	DC2, DC3 sockets	PS-08, Autonics	—
EK1, EK2, EK3	Heater	1GIK3ED30001, IRCA	4 kW, 230 Vac
FV	Voltage control relay	RM17UBE15, Schneider Electric	5 A, 250 Vac
K	Electromechanical relay	G2RV-SR700, Omron	Contact: 6 A, 250 Vac Input 24 Vdc
KM	Contactor	LC1D32M7, Schneider Electric	32 A, 690 Vac
M	AC motor with gearbox	Y100-140F 104JB30G1542, Linix	140 W, 230 Vac
PSU	Power supply unit	DVP-PS02, Delta	Output: 2 A, 24 Vdc
QF1	Main circuit breaker	S203-C32, ABB	32 A, 400 Vac
QF2	Motor circuit breaker	S201-C2, ABB	2 A, 400 Vac
SA	Switch	B101S30, Emas	4 A, 250 Vac
	Contact block	B1, Emas	4 A, 250 Vac
VS	Solid state relay	SA842070, Celduc	25 A, 600 Vac, input 24 Vdc

Annex B1. Temperature regulator settings

Parameter	Value	Description
In-t	TCA	Temperature sensor — K type thermocouple
L-Su	90	SV low-limit value
H-Su	220	SV high-limit value
C-nd	PId	Control type
oUt	rLY	Control output
t	20.0	Control cycle
AL-1	An 1.□ An□.A	AL1 alarm operation mode
AHYS	5	Alarm output hysteresis
AL 1	-5	AL1 alarm temperature
P	100	Proportional band
I	0	Integral time setting
d	0	Derivative time setting
LoC	LoC2	Lock setting

Default temperature set value (SV) is 170°C.

Annex B2. Timers settings

DC2: mode B, 3 sec.

DC3: mode B, 30 sec.

Annex C. Replacing sealing rings

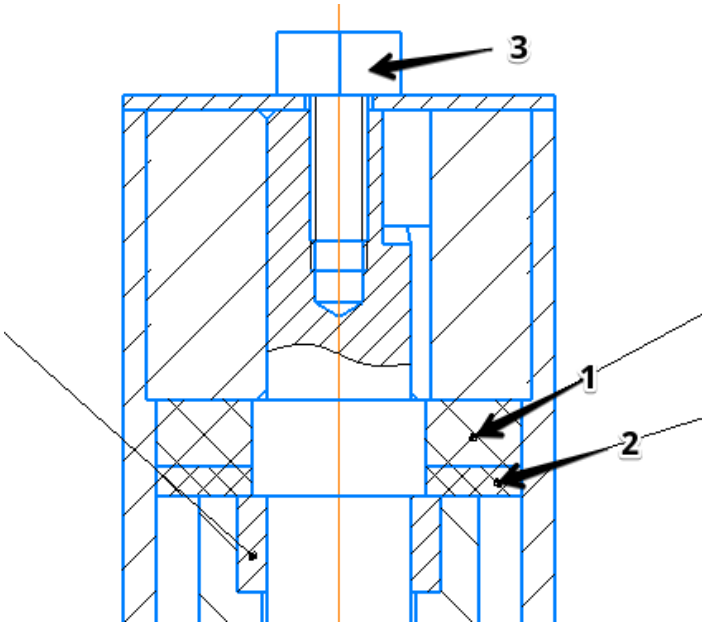

Fig. 1 Mixer sealing rings: 1 – PTFE ring; 2 – Rubber sealing ring; 3 – Fixing screw bolt

To replace the rings, loose the fixing bolt, take off the mixer from the shaft, replace old rings with new ones, note the correct disposition order – rubber sealing ring must be under PTFE ring.