



RoboLabs

Incredible machines for fastfood & funfood

OPERATING MANUAL

ROBOSUGAR 10 AUTO / ROBOSUGAR 10 (CPA-10A, CPA-10)



**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!

	WARNING RISK OF FIRE OR ELECTRIC SHOCK DO NOT OPEN	
WARNING, TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER-SERVICEABLE PARTS INSIDE REPAIR SHOULD BE DONE BY AUTHORIZED SERVICE PERSONNEL ONLY		

1. Overview

1.1. Purpose

RoboSugar CPA-10A and RoboSugar CPA-10 are machines intended for cooking caramel and coating popped popcorn with it (hereinafter – “caramelizer” or “machine”).

1.2. Technical specifications

Productivity	up to 14 kg/hr (30 lbs/hr)
Kettle size	38 liters (10 gallons)
Ampacity	25 A
Rated voltage	1/N/PE AC 230 V 50/60 Hz
Rated power	5.5 kW
Dimensions ¹ (LxWxH)	(CPA-10) 1650x810x1500 mm (CPA-10A) 1800x810x1650 mm
Weight	(CPA-10) 160 kg (CPA-10A) 170 kg
Ingress protection	IP22

1.3. Delivery set

RoboSugar machine	1 pc
Popcorn container 38 liters (10 gallons)	1 pc
Container for finished product	1 pc
Kettle lid	1 pc
Scrap pad	1 pc
Kettle safety clamp	1 pc
Spares kit (PTFE mixer pad, PTFE and rubber sealing rings)	1 set
Documentation	1 set

¹ See Annex A for more details

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.



1.5. 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, 500 cu.m/hr or more) installed over the kettle. See Annex A for more details.

Ambient conditions have strong impact on the end product quality. See section 2.7 for more details.

1.6. 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.

1.7. Main components

RoboSugar 10 Auto and RoboSugar 10 semi-auto have minimal difference in design. The only difference is that the semi-automatic machine doesn't have pulling mechanism for popcorn container.

Main components of caramelizer are: 1 – Kettle; 2 – Popcorn container; 3 – Cooling belt; 4 – Controls; 5 – Container for ready-to-eat product; 6 – Scrap tray, see Fig.3:

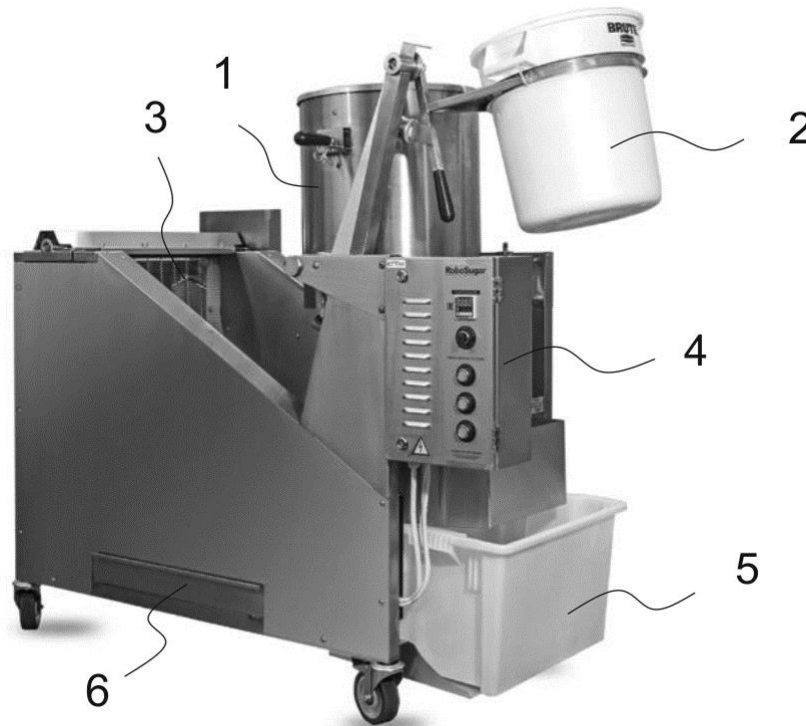


Fig. 1 Main components

1.8. Getting started

Unpack machine carefully, check delivery set, and remove protective film from all surfaces. Put the machine on even floor. Once machine is placed, lock all four swivel casters to avoid unexpected machine roaming.

Dumping mechanism for popcorn container must be set up for RoboSugar CPA-10A machine (see Annex A). Put popcorn container into the cradle and fix it with two plastic ties. Put protective safety clamp as shown on Fig.1:



Fig. 2 Safety clamp

Insert scrap pad under the belt from the kettle's side. During operation, small particles of caramel and popcorn will be accumulated on the pad, this will make cleaning easier.

Install support plate for discharge box.

In the upper part of conveyor belt drive shaft is located. Unscrew four wing nuts and remove protective shroud. There is a silicone scraper under the shroud. Check the clearance between scraper and conveyor belt, it should be minimal; but without touching each other, see Fig.2:

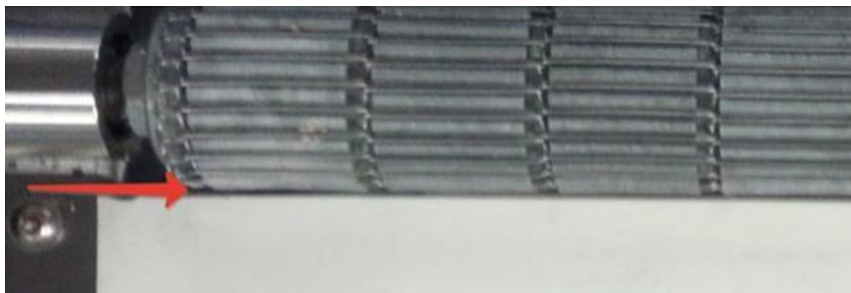


Fig. 3 Silicone scraper clearance

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.

Caramel recipe no. 1:

Super Caramel Premix or similar – 1300 g

Sugar (beet or cane) – 1200 g

Coconut oil or butter – 200 g

Water – 500 g

Lecithin Free-N-Easy²

Caramel recipe no. 2:

Super Caramel Premix or similar – 1050 g

Sugar (beet or cane) – 750 g

Coconut oil or butter – 150 g

Water – 375 g

Caramel recipe no. 3:

Super Caramel Premix or similar – 1100 g

Sugar (beet or cane) – 1000 g

Coconut oil or butter – 200 g

Water – 300 g

² Free'N'Easy lecithin helps popcorn not to stick to each other. Lecithin should be applied onto popcorn in the middle of mixing stage.

2.2. Machine operation

Machine controls has following items on control panel:

- Temperature regulator
- ON/OFF switch
- HEATING push button with backlight
- MIXING push button with backlight
- COOLING push button with backlight

Each button actuates one of the named stages. Corresponding backlights indicates current stage of operation. While in operation, the machine turns on the stages automatically; however, any stage may be actuated manually by pressing the button.

Common operation has following stages.

Heating stage

The mixture in the kettle is being heated till caramel is ready. Kettle mixer operates occasionally at this stage, providing proper blending of all ingredients. Almost all water will be evaporated at this stage. Once caramel is ready, popcorn will be automatically dumped into the kettle. Upon completion of heating stage machine will give an audible audio alarm.

Mixing stage

Once popcorn is dumped into the kettle, the mixer operates continuously for 1.5 minutes, providing smooth coating. Once time is expired, coated popcorn will be dumped to the cooling belt automatically. Upon completion of mixing stage machine will give an audible audio alarm.

IMPORTANT! See 'Starting Next Batch' section below!

Cooling stage

Caramel coated popcorn needs to be cooled down and separated. Cooling conveyor belt operates continuously, providing popcorn cooling down and separation.

Once cooling is completed, ready-to-eat product will be discharged automatically into RTE product container. Upon completion of cooling stage

machine will give an audible audio alarm.

It is possible to finish cooling before time. To do this, press and hold COOLING button for 5 seconds, then the belt will stop and the product will be dumped to the container.

Manual Operating Mode

Next operation may be initialized in manual mode. For example, if machine is in cooking mode, one can initialize mixing stage by pressing MIXING button. While machine is in mixing stage, it is possible to initialize cooling stage by pressing COOLING button. When machine is in cooling stage, it is possible to stop cooling and discharge the product. To do so, press and hold COOLING button for few seconds. The belt stops, and then automatically discharges the product into the box.

Starting next batch



GET THE NEXT BATCH INGREDIENTS PREPARED IN ADVANCE!

Once the first batch of caramel coated popcorn went to the cooling conveyor belt, and the kettle got back to initial position, the machine is ready for the next batch. HEATING button will be blinking.

Since the kettle is quite hot, it is strictly required to put all ingredients at the same time; put oil first, then dry ingredients and then water. Once you put all ingredients, press blinking HEATING button immediately, to actuate the mixer, thus avoiding burning of ingredients or early evaporation of water.

Starting next batch before finishing previous one will maximize overall productivity.

Operation order

RoboSugar CPA-10 (semi-automatic)

To make caramel coated popcorn, do the following:

1. Put caramel ingredients into the kettle. Put popped popcorn into popcorn container.
2. Turn the main switch to ON position, set temperature if needed, and press

HEATING button.

3. Audible alarm means that caramel cooking is completed. Dump popcorn container into the kettle and press MIXING button.

4. Audible alarm means that mixing is completed. Press COOLING button, the conveyor will be activated. Tilt the kettle and dump popcorn onto the belt. Once cooling stage is done, popcorn will be discharged into container automatically.

RoboSugar CPA-10A (automatic)

1. Remove safety clamp that interlocks kettle and popcorn container handles:

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

3. Turn the machine on with the main switch. Set the temperature if needed.

After this, machine will do the rest automatically.

4. Upon completing, put safety clamp back.

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 (165°C) and give it a try.

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 2.2), some additional equipment may be required in order to keep popcorn in good condition at intermittent stages as well as finished product.

2.4. Settings

Some aspects of machine operation may be adjusted. To adjust settings do the following:

Turn the machine off, then press and hold HEATING and COOLING pushbuttons together and turn the main switch in ON position. You will see flashing buttons and hear buzzer signals.

Default values are the following:

1 – mixing frequency during heating stage – 5 s;

2 – mixing stage duration – 90 s;

3 – cooling stage duration – 300 s.

Buttons are flashing in cyclic way. Count of flashes per single cycle points current value:

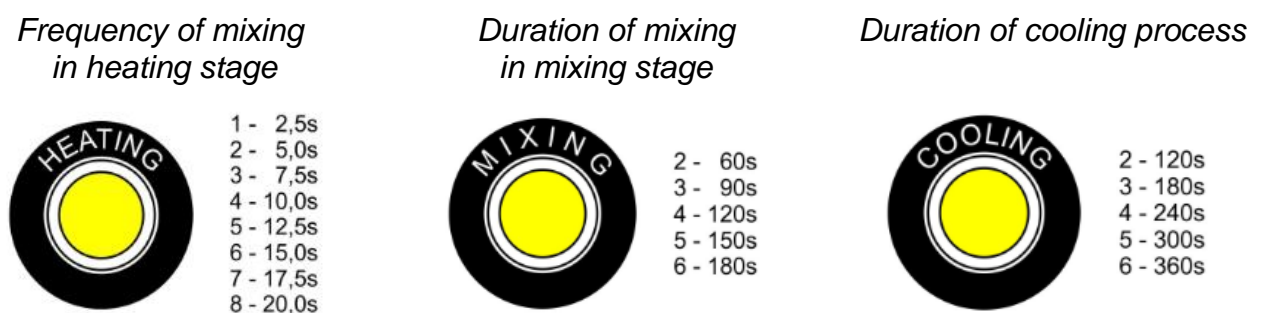


Fig.4 Settings

Thus, with default settings, HEATING, MIXING, COOLING backlights are flashing 2, 3 and 5 times per cycle, respectively.

To adjust any value, corresponding button must be pressed. Each stroke increases the value by one point. Once maximum value is reached, further stroke will set minimum value.

For example, let's suppose that cooling time should be changed from 300s to 240s. Pressing COOLING button four times we'll make changes like this: 360s – 120s – 180s – 240s.

To exit adjustment mode and save the changes, turn the machine off.

3. Maintenance

The maintenance purpose is to keep the machine operable during the entire service life. The recommended³ maintenance schedule with types of actions is presented below:

PROCEDURE	PERIOD
Kettle cleaning	once a day
Scrap tray cleaning	once a day
Outer surface cleaning	once a day
Conveyor drive shaft cleaning	once a week
Conveyor belt cleaning	once a week



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 cleaning⁴

Pour *not more than* 2 liters of water in the kettle, close the kettle with lid

³ Period may be different. Maintenance procedures must be done as necessary.

⁴ The machine must be plugged in for kettle cleaning procedure.

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).

Scrap tray cleaning

Take out scrap tray, remove scrap, then wash the tray with warm water.

Scrap pad cleaning

From the kettle's side, there is a scrap pad laid under the conveyor belt. During machine operation, a lot of small particles of caramel and popcorn are accumulated onto this part. Take it out and wash with warm water.

Conveyor drive shaft cleaning

It is important to clean conveyor drive shaft area once in a week or more often. To get access to the area, remove four wing nuts and take protective shroud out. It is convenient to clean shaft's gears with stiff bristle brush. Once the area is cleaned, put silicone scraper, mind its position (refer to section 2.3).

Conveyor belt cleaning

During normal operation belt contamination is minimal. Use warm water with cloth for cleaning. It is convenient to use a steam generator as well.



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!

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 C. Make sure that sealing rings are put in proper order, see Annex C.

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:

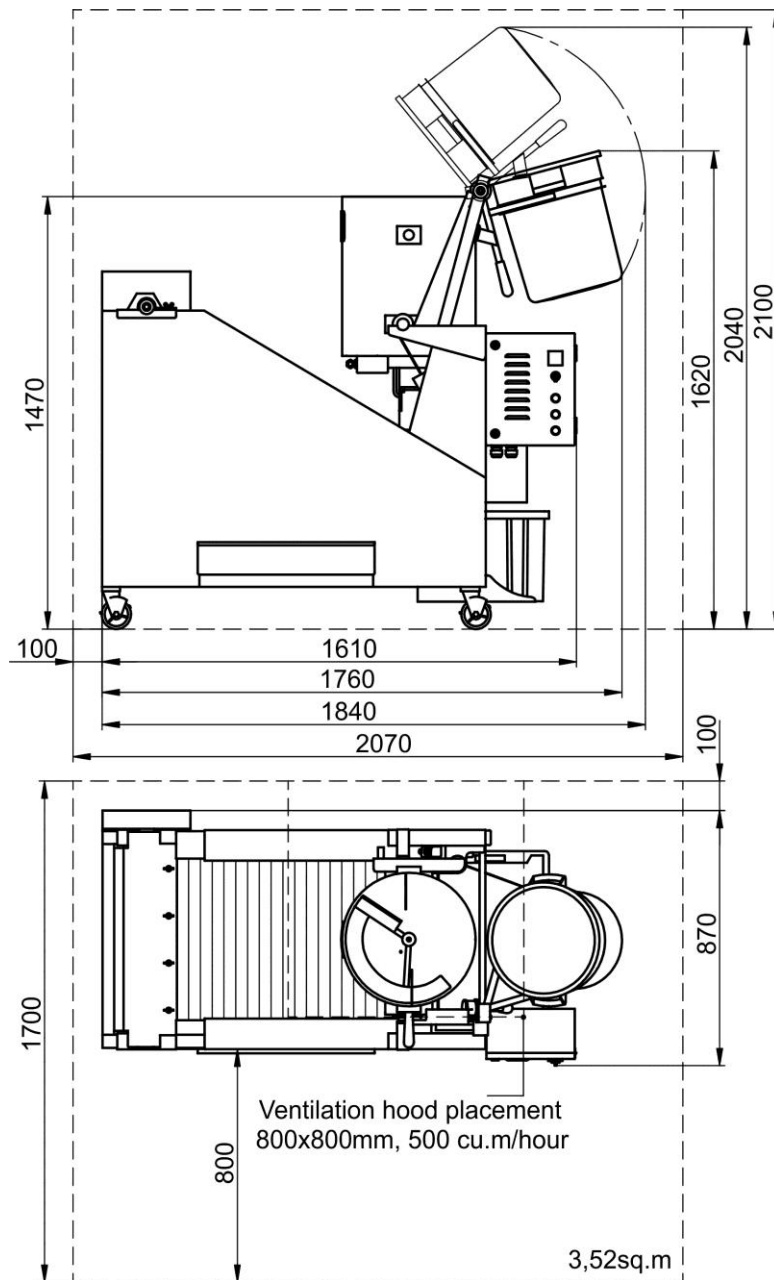
Email: support@robolabs.pro

Phone: +7 495 956 4000

Annex A. Installation

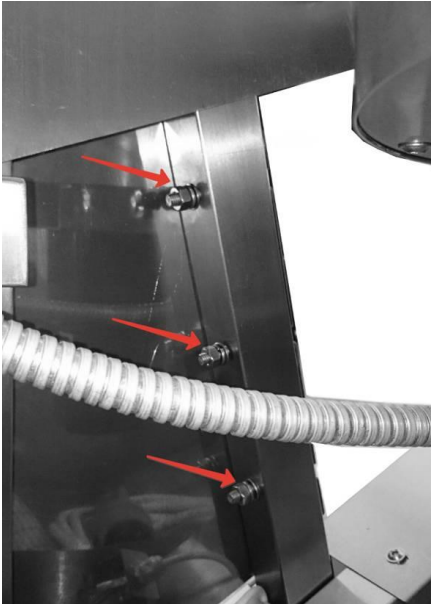
Overall dimensions

Below are the machine's dimensions and minimal space requirements for machine operation, all values are given in mm.

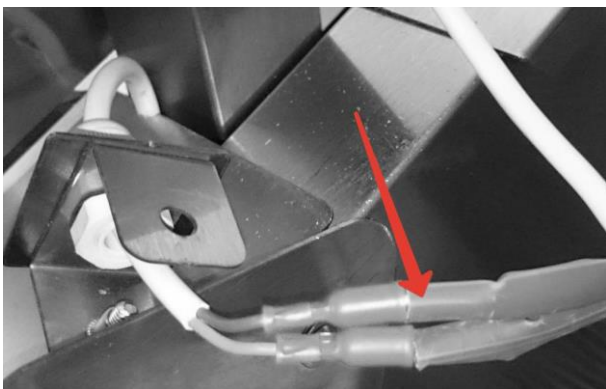


RoboSugar CPA-10A dumping mechanism set-up

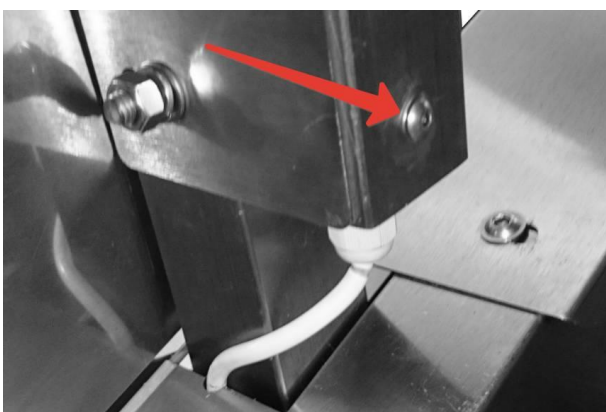
Remove three fasteners, then put the mast on its place, but do not insert bolts for now:



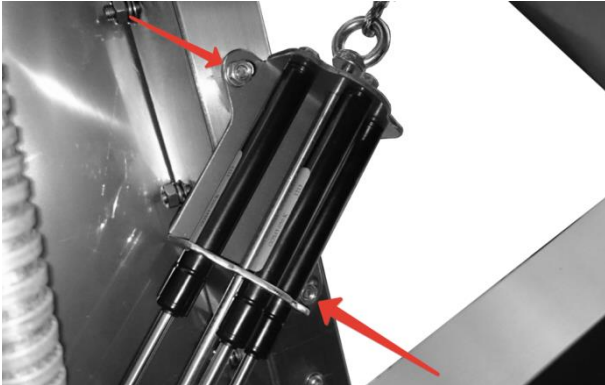
Connect electric magnet. Insulate joints if needed:



Stow the wires inside the mast, then put end-piece with the wire into the end of mast and tighten the fixing screw:



Install gas spring assembly. To do this easily, turn the kettle down. Adjust assembly position it the way that steel bar doesn't touch anything during kettle movement. Fix the assembly's position with two screws:



Put the popcorn container into the cradle and fix it with two plastic ties.



MAKE SURE THAT KETTLE AND POPCORN CONTAINER DON'T TOUCH EACH OTHER WHILE CONTAINER IS MOVING!

If kettle is touching container during turning down, then pillar position must be adjusted; to do this, loosen three fixing bolts, adjust pillar position, and finally tighten all three bolts.

Annex B. Replacing sealing rings

In the upper part of the mixer there are two sealing rings, which are subject to wear and tear.

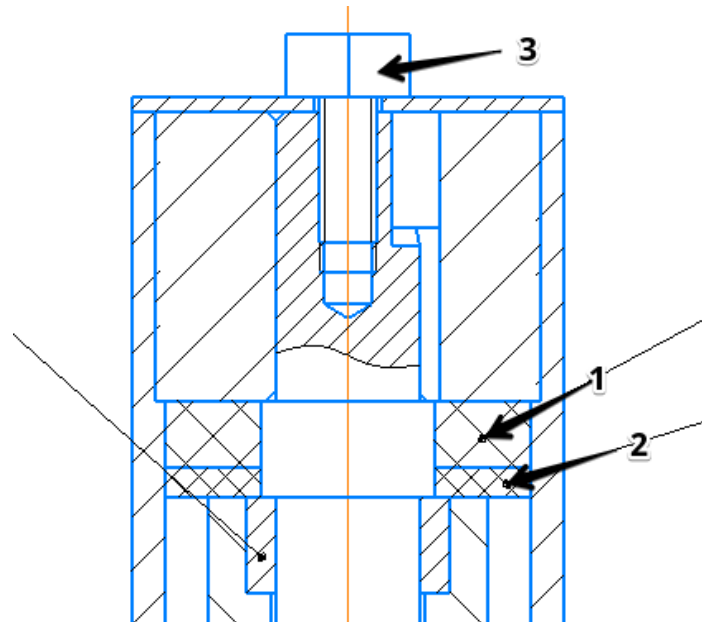
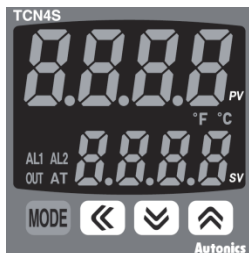


Fig. 1 Mixer sealing rings: 1 – PTFE ring; 2 – Rubber sealing ring; 3 – Fixing screw bolt

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.

Annex C. Temperature regulator settings



PARAMETER	VALUE	DESCRIPTION
IN-T	dPt.H	Temperature sensor Pt100
OR	TCR.H	Temperature sensor thermocouple K type
L-Sv	90	Low limit set point value
H-Sv	180	High limit set point value
OUT	SSr	Control output: to solid-state relays
AL-1	AN I. <input type="checkbox"/>	Alarm operation mode
	AN <input type="checkbox"/> .A	
ALYS	5	Alarm output hysteresis
AL I	-5	Alarm temperature setting
P	120	Proportional band
I	400	Integral time setting (integral component)
D	150	Derivative time setting (derivative component)
LoC	LoC2	Lock settings (all settings, except Operating temperature)

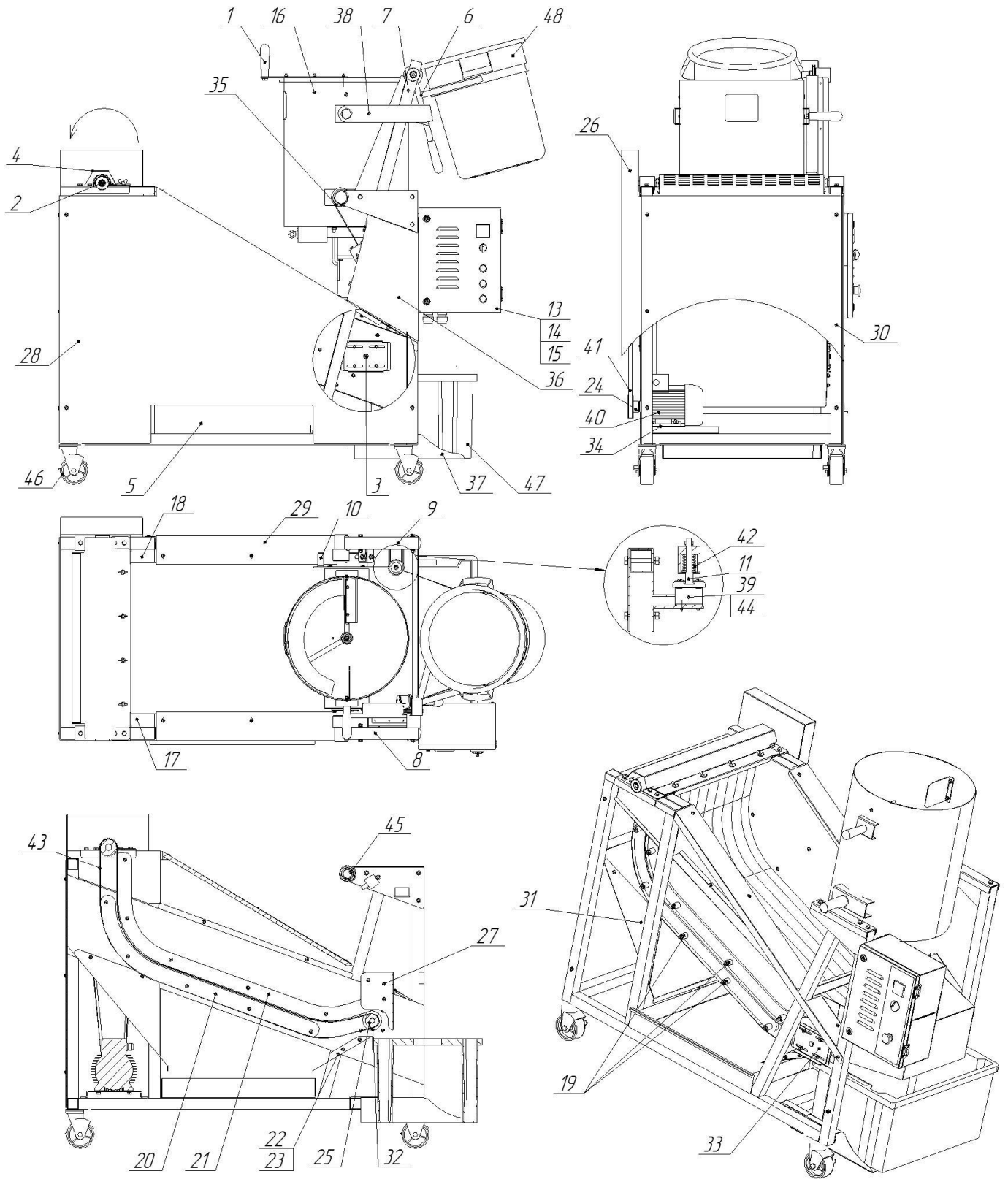
Default temperature set value (SV) is 165°C.

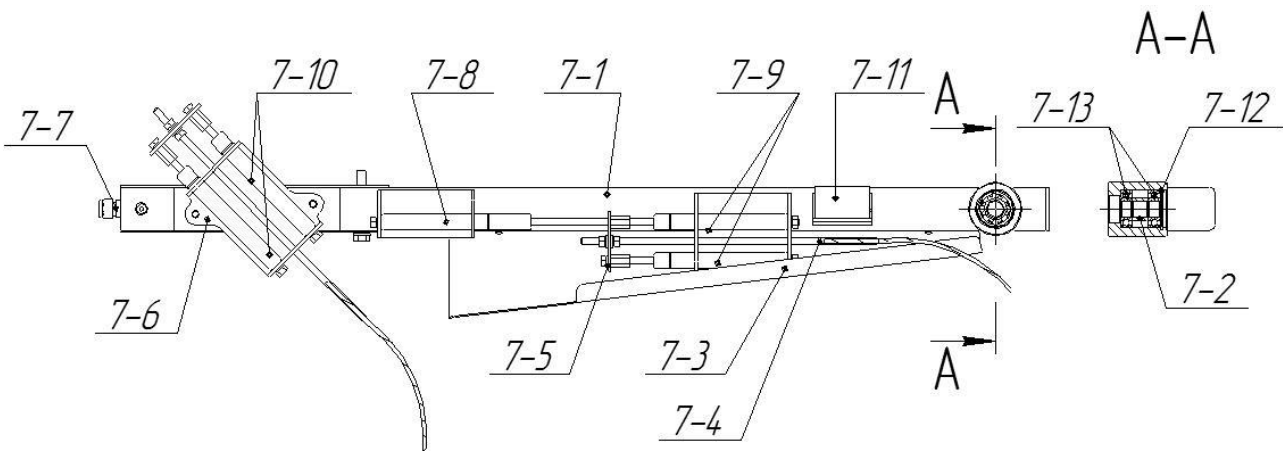
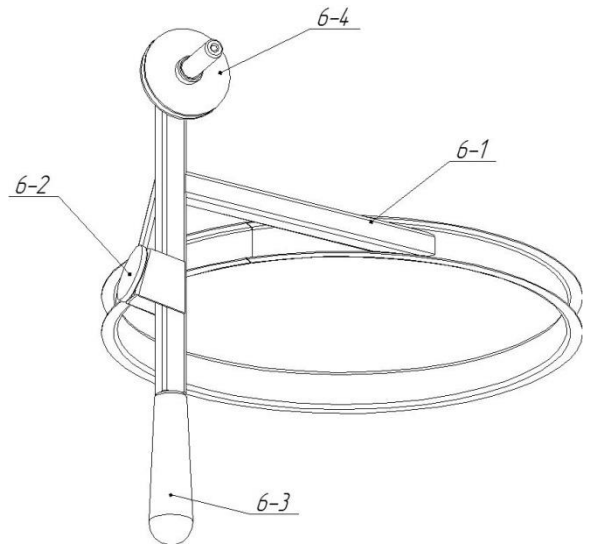
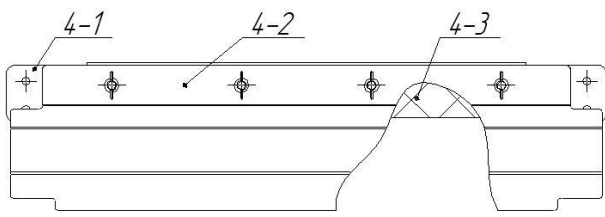
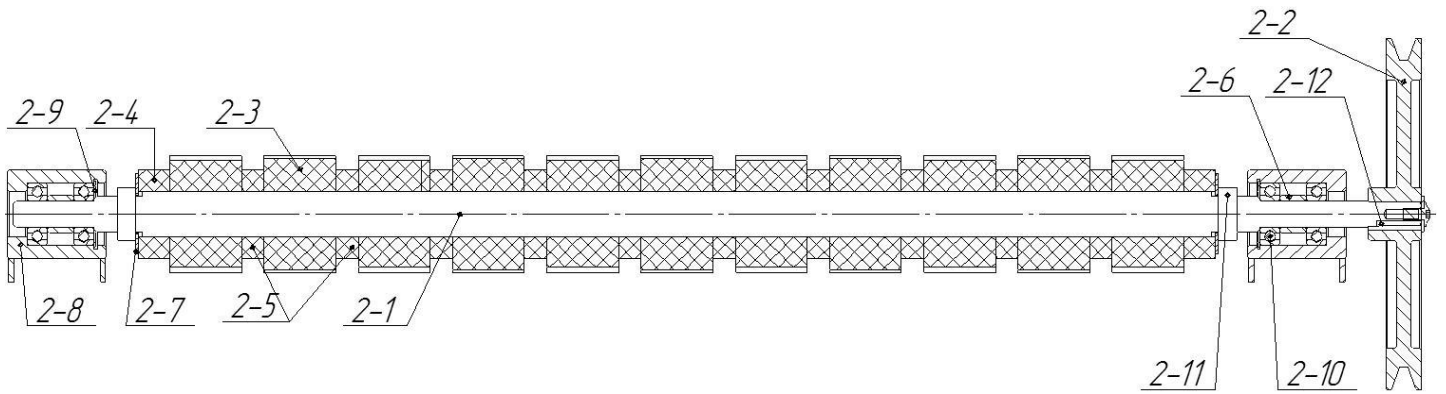
Annex D1. Electric components

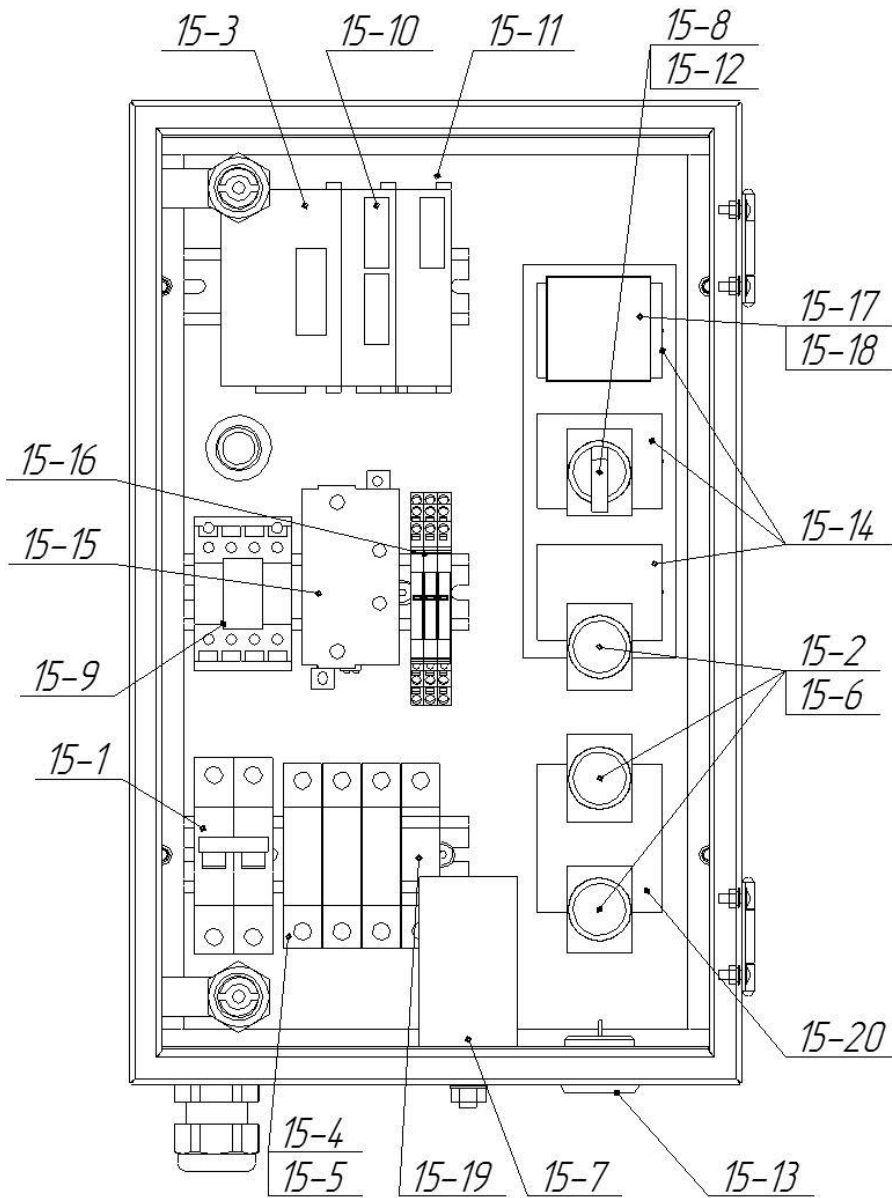
SIGN	DESIGNATION	MODEL	SPECS
AT	Safety thermostate	TK24-13-1-220 Thermorex	230 Vac, 16 A
BT	Temperature sensor	ДТПК124-00.32/4 Owen	Type K
C1	Capacitor	ДПС-0,45-30 Electrointer	450 Vac, 30 uF
C2	Capacitor	ДПС-0,45-12 Electrointer	450 Vac, 12 uF
DC1	Temperature regulator	TC4SP, Autonics	230 Vac
	DC1 socket	PG-11, Autonics	—
DC2	Controller (PLC)	DVP14SS211T, Delta	24 Vdc
DC3	PLC output extension	DVP08SN11T, Delta	24 Vdc
EK1, EK2, EK3	Heater	1GIK3CG41002, IRCA	230 Vac, 30Ω
EMI	EMI filter	30DKCS5	250 Vac, 30 A
FU1, FU2, FU3	Fuse 8,5x31,5	DF2BA1000 Schneider Electric or E9F8GG10, ABB	400 Vac, 10A
	Fuse disconnecter	DF83 Schneider Electric or E93/20, ABB	690 Vac, 20A
FV	Voltage control relay	RM17UBE15, Schneider Electric	250 Vac, 5 A
HA	Buzzer	SC235B, Sonitron	24 Vdc
HL1, HL2, HL3	Contact block with LED	B5, Emas	24 Vdc
K1, K2, K3	Electromechanical relay	G2RV-SL700 DC24, Omron	24 Vdc, 4A
KM	Contactore	LC1D09M7, Schneider Electric	230 Vac, 9A
M1	AC motor with gearbox	Y100-140F 104JB30G1542, Linix	400/230 Vac
M2	AC motor	AIP71B8	400/230 Vac, 750 rpm
QF	Circuit breaker	S202-C32, ABB	32 A
SA	Switch	B100S20, Emas	4A
SB1, SB2, SB3	Pushbutton, yellow	B100DS, Emas	4A
TV	Power supply	DVPPS02, Delta	24Vdc, 2A
VS1, VS2, VS3	Solid state relay	SA842070, Celduc	25A, 4-32 Vdc
VS4	Solid state relay	SAL963460, Celduc	35A, 4-32 Vdc
YA1, YA2	Electromagnet ⁵	YM-5030-24, Magnitek	Vdc

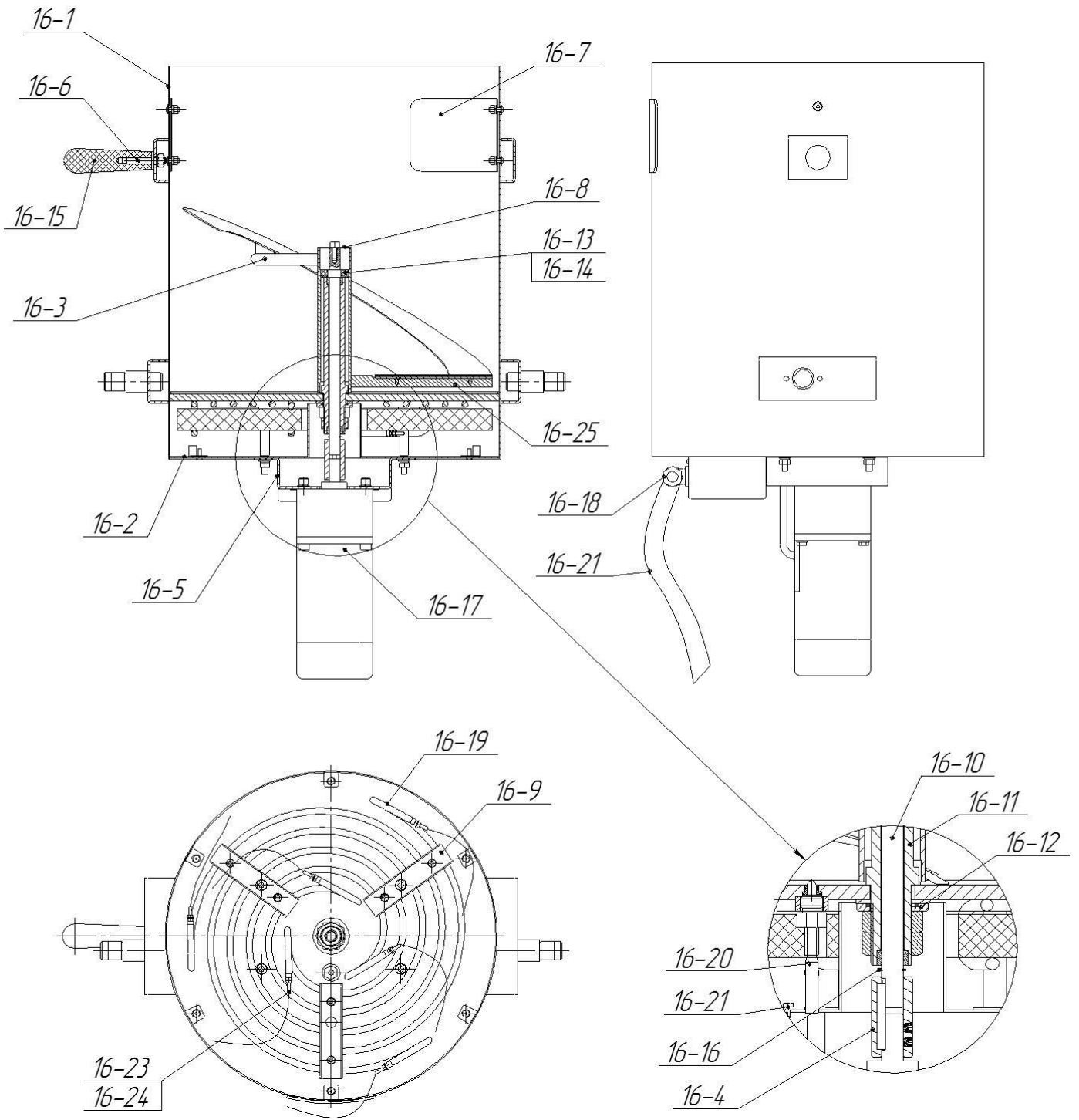
⁵ Only for CPA-10A (automatic) RoboSugar model

Annex D2. Parts list









ITEM#	ARTICLE#	PART	MODEL
1	22479	Cover (aluminum)	TM 987.15.00.000
2	22480	Conveyor drive shaft	TM 1338.02.00.000
2-1	22481	Shaft	TM 1338.02.00.001
2-2	22199	Driven pulley	TM 1338.02.00.003
2-3	22113	Sprocket set (x11)	TM 1338.02.00.004
2-4	22482	Side spacer ring (x2)	TM 1338.02.00.006
2-5	22483	Spacer ring (x10)	TM 1338.02.00.007
2-6	22484	Hub	TM 1338.02.00.008
2-7	22485	Washer	TM 1617.01.00.012
2-8	22486	Support bracket	TM 1338.02.01.000
2-9	22325	Lock collar	A35 ГОСТ 13943-80
2-10	2480	Bearing	202 ГОСТ 8338-75; d=15 mm, D=35 mm, B=11 mm
2-11	518	Nut	M20-6H.04.016 ГОСТ 5916-70
2-12	22503	Cotter key	TM 1617.01.00.0011
2-20	14062	Shift assembled (without pulley and supporting brackets)	
3	22487	Adjusting bracket	TM 1338.04.00.000
4	22504	Scraper	TM 1338.06.00.000
4-1	22488	Baseplate	TM 1338.06.00.001
4-2	22489	Shroud	TM 1338.06.00.002
4-3	22490	Silicone scraper	TM 1338.06.00.003
5	22491	Scrap tray	TM 1338.08.00.000
6	22492	Popcorn container holder	TM 1338.10.00.000
6-1	22493	Bracket	TM 1338.10.01.000
6-2	22494	Pad	TM 1338.10.02.000
6-3	22495	Handle	TM 514.02.00.002
6-4	22496	Pulley	TM 1338.10.00.001
7	22497	Beam assembled	TM 1338.11.00.000
7-1	22498	Beam	TM 1338.11.01.000
7-2	22484	Hub	TM 1338.02.00.008
7-3	22499	Shroud	TM 1338.11.00.001
7-4	22500	Rod with wire cable	TM 1338.11.00.002
7-5	22501	Bar	TM 1338.11.00.003
7-6	22502	Channel bracket	TM 1338.11.01.004
7-7	22505	Cover plug with gland	TM 1338.11.01.009/TM 1338.11.01.010/PG7/Stack bolt M5
7-8	14482	Damper	Guden GDC51-J
7-9	2677	Gas spring	Guden GGS43-050-K
7-10	16142	Gas spring	Guden GGS43-080-K ,
7-11	13855	Electric magnet	YM-5030, 24Vdc
7-12	22325	Lock collar	A35 ГОСТ 13943-80

ITEM#	ARTICLE#	PART	MODEL
7-13	2480	Bearing	202 ГOCT 8338-75 d=15mm, D=35mm, B=11mm
8	22506	Support bracket	TM 1338.12.00.000
9	22507	Support bracket	TM 1338.13.00.000
10	22508	Back stop	TM 1338.14.00.000
11	22509	Clamp	TM 1338.15.00.000
15	22513	Control unit	TM 1338.17.00.000-03
15-1	14277	Circuit breaker	S202-C32, ABB
15-2	188	Contact block with LED	B5, Emas
15-3	13871	Power supply unit	DVPPS02, Deltha
15-4	14233	Fuse holder	DF83, Schneider Electric
15-5	14234	Fuse	8,5x31,5 DF2BA1000, Schneider Electric
15-6	1555	Push button, yellow, non-lock	B100DS, Emas
15-7	15558	Capacitor	450V 20uF
15-8	1301	Contact block	B1, Emas
15-9	13450	Contacto	LC1D09M7 Schneider Electric
15-10	13870	PLC	DVP14SS211T, Delta
15-11	13766	I/O extension unit	DVP08SN11T, Delta
15-12	11527	Switch 2-pos	B100S20, Emas
15-13	11613	Buzzer	SC235B, Sonitron
15-14	14642	Solid-state relay	G3NA-210B-UTU DC5-24, Omron (SA 842070)
15-15	14641	Solid-state relay	G3PE-545B-UTU DC12-24, Omron (SAL 963460)
15-16	12647	Electromechanical relay	G2RV-SR700-DC24, Omron
15-17	11445	Temperature regulator socket	PG-11
15-18	16118	Temperature regulator	TC4SP-14R, Autonics
15-19	14429	Voltage control relay	RM17UBE1565 Schneider Electric
15-20	13706	EMI filter	30DKCS5, Delta
16	22514	Kettle assembled	TM 1338.18.00.000
16-1	22515	Kettle housing	TM 1338.18.01.000
16-2	22516	Cover plate	TM 987.02.100
16-3	22517	Mixer	TM 987.02.200
16-4	13790	Hub	TM 987.02.300
16-5	22518	Motor bracket	TM 987.02.001
16-6	22519	Handle pin	TM 987.02.002
16-7	22520	Baffler	TM 987.02.003
16-8	22521	Washer	TM 987.02.005
16-9	22522	Heater clamp	TM 987.02.006
16-10	16471	Shaft	TM 987.02.011
16-11	22523	Tube with hubs assembled	TM 987.02.012/TM 987.02.016
16-12	22524	Washer with ring	TM 987.02.014/TM 987.02.0115
16-13	22525	Teflon ring	TM 1685.02.00.017

ITEM#	ARTICLE#	PART	MODEL
16-14	22526	Silicon ring	TM 1685.02.00.018
16-15	22495	Handle	TM 514.02.00.002
16-16	12547	Lock collar	A15 ГОСТ 13942-86
16-17	11433	AC motor with gearbox	230Vac 1 phase YY100-140F
16-18	11528	Gland	PKH90-15
16-19	11818	Heating element	1650W 1GIK3CG41002
16-20	22407	Temperature sensor	ДТПК124-32/3,0
16-21	3553	Temperature limiter	TK24 (230°C)
16-22	13837	Spiral wrap conduit	Д15 (20,22)
16-23	13694	Hot-resistant wire NiCu	4 sq.mm (CNVAS) 6 m
16-24	15658	Connector Ni	4-6 mm M5
16-25	15434	Teflon scraper	TM 987.02.204
17	22527	Internal panel	TM 1338.00.00.001
18	22528	Internal panel	TM 1338.00.00.001-01
19	22529	Hub	TM 1338.00.00.002
20	15478	Lower guide rail	TM 1338.00.00.003
21	15478	Upper guide rail	TM 1338.00.00.004
22	22530	Box panel	TM 1338.00.00.005
23	22531	Protective pad	TM 1338.00.00.006
24	22198	Driving pulley	TM 1338.00.00.007
25	22541	Conveyor idle shaft	TM 1338.00.00.008
26	22532	Shroud	TM 1338.00.00.009
27	22533	Bumper	TM 1338.00.00.010
28	22534	Vanity panel	TM 1338.00.00.011
29	22535	Rear vanity panel	TM 1338.00.00.012
30	22536	Side vanity panel	TM 1338.00.00.013
31	22537	Motor panel	TM 1338.00.00.016
32	22538	Side disk	TM 1338.00.00.017
33	22539	Mounting plate	TM 1338.00.00.018
34	22540	Silicone liner	TM 1338.00.00.019
35	22542	Kettle pulley	TM 1338.00.00.021
36	22543	Protective panel	TM 1338.00.00.022
37	22544	Box rack	TM 1338.00.00.023
38	22545	Safety bracket	TM 1338.00.00.026
40	16122	AC motor	AIP71B8Y3, IM1081 (legs), 750 rpm, 0.25 kW
41	12167	V-belt	AVX13x2057 (contitech)
42	12014	Spring	3 mm 5,5 rounds Height 42 mm
43	14534	Meshbelt	Type 11 (600x3200 mm) AISI 304
44	13855	Electric magnet	УМ-5030, 24Vdc
45	13680	Bearing	ШЦП25
46	1215	Swivel caster lockable	D=125 F18

ITEM#	ARTICLE#	PART	MODEL
47	12168	Plastic box	600x400x300 mm
48	1305	Popcorn container	BRUTE D 39,7cm h 43,5 cm 37,9 liters