Sk Resident

RoboLabs

Incredible machines for fastfood & funfood

OPERATING MANUAL

MINI ROBOPOP® 25 (VPM-MRS2F)

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 WASH MACHINE WITH WATER JET!

DISCONNECT MACHINE FROM THE MAINS BEFORE SERVICING!

DO NOT LEAVE RUNNING MACHINE UNATTENDED!

ALL SWIVEL CASTERS MUST BE LOCKED WHILE IN OPERATION!

BEWARE MOVING PARTS!

SOME PARTS ARE HOT WHILE IN OPERATION!

DO NOT USE MACHINE FOR PROCESSING OTHER KERNELS THAN CORN!

ONLY INSTRUCTED PERSONNEL ARE ALLOWED TO OPERATE THE MACHINE!

PRINT OUT THE ANNEX A AND AFFIX IT NEXT TO THE MACHINE FOR OPERATOR'S REFERENCE!

1. OVERVIEW

1.1. Purpose

Vortex Popcorn machine VPM-MRS2F (hereinafter “popper” or “machine”) is a hot-air popper for making popcorn. Both Butterfly and Mushroom varieties can be processed. Popper built on patented Vortex technology that has following benefits:

- No oil is used at all, so hot-air popped popcorn has no carcinogens and trans-fats; and the cost of production is reduced.

- Once popped, popcorn is immediately removed from the hot area, thus its nutritional value and taste are kept as much as possible.

1.2. Technical specifications

Throughput[1]	up to 12 kg/hr
Rated current	25 A
Rated voltage	1/N/PE AC 230 V 50-60 Hz
Net weight	150 kg
Dimensions	1070x580x1600 mm

1.3. Delivery set

1x Vortex popcorn machine VPM-MRS2F

2x Controls module key

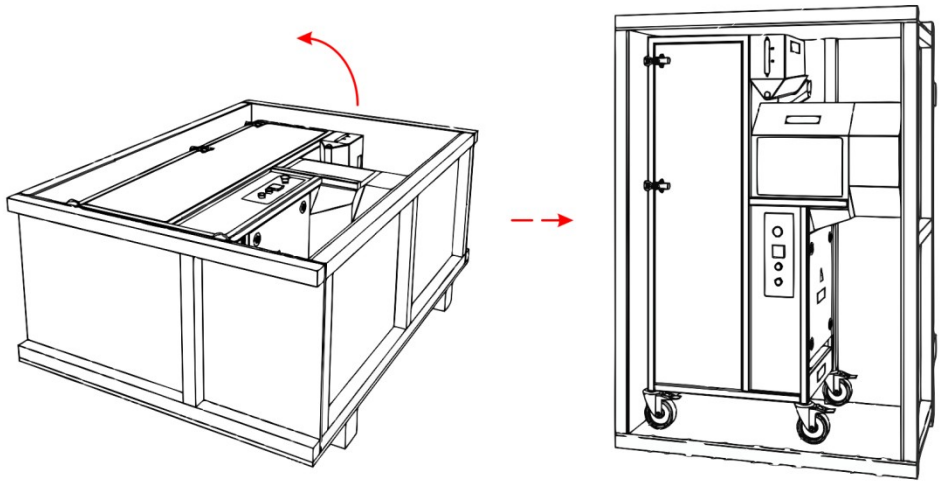
1x Halogen lamp 48 W 64684 ECO

1x Operating manual

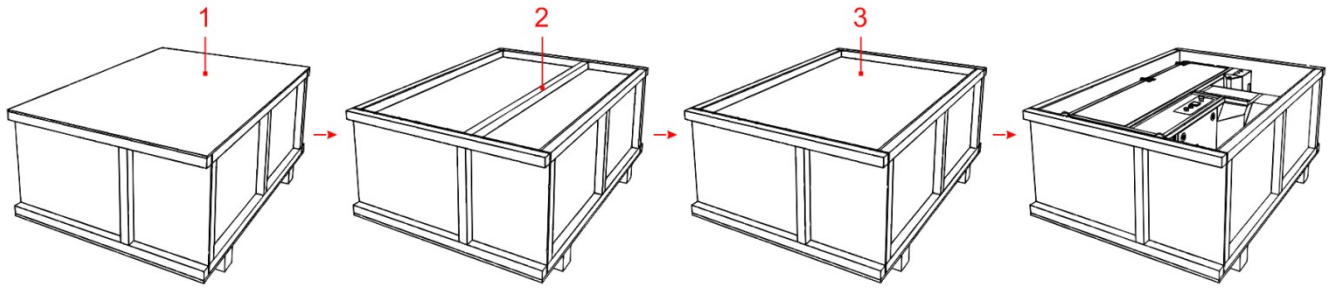
1 *Amount of raw corn processed. Production rate of the machine depends on corn quality. Due to humidity loss during popping and some amount of unpopped kernels and husk, weight difference may be up to 20%.*

1.4. Unpacking

HEAVY EQUIPMENT! AT LEAST 3 PERSONS ARE REQUIRED TO GET THE CRATE IN UPRIGHT POSITION!



Unpack the machine carefully. To do this, follow instructions below:



1. Remove wood screws along the perimeter of upper cover plate (1), take off the plate.

2. Demount wood bar (2).

3. Remove protective cardboard sheet (3).

4. Once the package is open, the plywood crate with machine must be set upright.

5. Once the crate is in upright position, release and remove fastening belts holding the machine inside.

6. Release the breaks of the front swivel casters, and then carefully roll out the machine from the crate.

7. Check the contents of the package. Remove protective film from all surfaces.

1.5. Power requirements

CONNECTIONS MUST BE DONE ONLY BY QUALIFIED ELECTRICIAN!

ELECTRIC SOCKET MUST HAVE GROUNDING TERMINAL!

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 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. It is recommended to use IEC 60309 2P+E 32 A plug. Refer to the wiring diagram on the power cord label.

1.6. Ambient conditions

The equipment must be operated at the ambient temperature between +5° and +40°C (+41°F to +104°F), relative humidity not more than 45% at 40°C/104°F). Altitude above sea level should not exceed 1000 m.

While in operation, a lot of moisture and heat is coming out of the popper. The installation area must be equipped with an exhausting hood (800x800 mm, 300 cu.m/hr or more) installed above the output port of the machine.

Ambient conditions have strong effect on the end product quality! See section 2.6 for more details!

1.7. Safety components

On the front panel the EMERGENCY STOP button is located. The button completely turns off the machine at any time.

USING EMERGENCY STOP BUTTON MAY LEAD TO CHAMBER CLOGGING!

There is a contactor included in the electrical circuit before solid-state relays, which run heating elements. Emergency thermostat runs the contractor. The thermostat sensor is located inside the chamber, next to the heating elements. In case of solid-state relays failure or main automation system failure and uncontrolled heating, the emergency thermostat will be triggered and will shut off the heating elements, avoiding overheating.

The main controller watches current frequency of the turbine. If current frequency is less than 20 Hz during the operation, then the controller will shut off the machine in 12 seconds.

There is an automatically operated 32 A electrical switch (circuit breaker) installed at the mains input inside the machine.

The sifter drum isn’t rigidly connected to the drive rollers. Thus, if a slight effort to block the sifter is applied, the sifter won’t rotate and will stay in its position.

The machine is installed on a stand equipped with locking casters with mechanical locks, which avoid spontaneous movements of the machine.

1.8. Main components

Main components are: 1 - Turbine; 2 - Chamber; 3 – Corn feeder; 4 – Control panel; 5 – Sifter (perforated drum); 6 – Scrap tray, see Fig.1:

Fig. 1 Main components

TURBINE (BLOWER)

The turbine provides constantly circulating airflow inside the popper. This is a direct type drive; the blower sits on motor's shaft. Rotational speed is controlled by the main PLC.

CHAMBER

This is where popping happens. Airflow circulates through the chamber; air is being heated by heating elements. In the chamber's lower part there is a bowl with special shaped holes that causes air vortex.

During machine operation corn kernels are being fed into the chamber; kernels are being heated up, and finally, immediately blown away from the chamber once popped.

Chamber can be easily accessed through the door provided. Halogen lamp illuminates the chamber inside.

Chamber is equipped with temperature sensor, which helps the machine to

control and maintain temperature in the chamber automatically.

CORN FEEDER

Corn feeder can hold 8 kg or raw corn. There is an auger inside the feeder that pushes corn kernels into the chamber.

SIFTER AND SCRAP TRAY

Sifter is a rotating drum that screens un-popped kernels (“old maids”), partly popped popcorn, and other small fractions into scrap tray located under the sifter. Scrap tray is easily removable.

CONTROL PANEL

There are following items on the control panel:

START/PAUSE push button – to turn the machine on, and set it to pause mode.

STOP/COOLING push button – to turn the machine in cooling mode.

EMERGENCY STOP button – to turn the machine in case of emergency (see section 1.7 for more details).

Temperature regulator – to set the operating temperature.

2. INTENDED USE

2.1. Operation modes

The popper has following operation modes:

- Heating mode. Once START/PUSE button is pressed, popper automatically starts to heat up. The button indicator blinks slowly. Upon reaching certain temperature popper switches automatically to popping mode.
- Popping mode. This is the main operation mode. START/PAUSE button indicator glows.
- Pause mode. Popper doesn't process corn in this mode, but maintains set temperature in the chamber. So, operation may be resumed in no time. START/PAUSE button indicator blinks fast.
- Cooling mode. In cooling mode heating elements are completely de-energized; turbine keeps running, cooling down the machine. Once temperature drops low enough, popper is turned off automatically. START/PAUSE button indicator is off.
- Testing mode. This mode is used for testing popper components. See section 2.5 for more details.

2.2. Popping mode

Popping mode is the main operation mode. Popper operates in cyclic way, processing corn kernels batch by batch. Each cycle consists of three stages:

1) Feeding. Hopper auger rotates, pushing corn kernels into the chamber.
2) Popping. Corn kernels are heated up in the chamber, eventually blown out from the chamber once popped.
3) Purging. Turbine speed is increased in order to remove dust and scrap from the chamber.

2.3. Quick start guide

THE VERY FIRST BATCH OF CORN IS NOT INTENDED TO EAT!

MAKE SURE THE CHAMBER IS CLEAN BEFORE TURNING MACHINE ON!

1. Fill the hopper with raw corn and prepare a container for popped corn.

2. Press START/PAUSE button to turn the machine on. Heat up starts automatically.

3. It takes about 15 minutes to reach the set temperature.

4. Corn feed starts automatically.

5. Wait for the feeder to be empty. It will take not more than 15 minutes.

6. Turn off the machine by pressing the COOLING/TURN OFF button. The machine will automatically switch into cooling mode, and then will be shut off completely. The cooling stage takes 10 minutes approx.

PAUSE MODE

Press the START/PAUSE button to enter in the pause, to suspend operation. Machine will execute current cycle normally, but won't start next one. Sifter will stop in a few minutes. Press START/PAUSE button again to resume operation, or press COOLING/TURN OFF button to switch the machine in the cooling mode.

CHAMBER PURGE FEATURE

During warming up stage, chamber purge procedure is activated at the same time as the sifter starts to rotate. Thus the chamber is being emptied of scrap left there before.

Also, if COOLING/TURN OFF button is kept pressed during cooling stage for more than 3 sec, then chamber purge cycle is activated. Use this feature to clean the chamber without opening it.

2.4. Parameters

TEMPERATURE

Popping temperature shall be chosen by the user. Due to different features of used corn and chosen settings, and also cyclic type of operation, moderate temperature fluctuations are possible.

Popping temperature affects the way how popcorn pops; its shape and size. Too high values lead to smaller popcorn. Too low values lead to reduced productivity, improperly popped kernels, and chamber clogging.

Common popping temperature for Butterfly is between 190 and 205°C; for Mushroom it is between 205 and 215°C.

To change the temperature set value (SV) use up and down arrow keys on the main temperature regulator.

POPPING TIME

To adjust the popping time, enter into to the testing mode. Press and hold the COOLING/TURN OFF button and then press and release the START/PAUSE button.

The START/PAUSE button indicator blinks slowly, which means that popping time is reset to 110 sec, the maximal value[2]. Press the START/PAUSE button to change the popping time.

There are three available values:

- 110 sec (slow blinking), which corresponds to 3/4 of the maximum productivity (default setting);
- 90 sec (faster blinking), which corresponds to 7/8 of the maximum productivity;
- 75 sec (fastest blinking), which corresponds to the maximum productivity.

Press the EMERGENCY STOP button to save the popping time set and exit.

The main criterion of optimal popping time is that more than 95% of corn should be popped and thrown out from the chamber before chamber purging.

2 *For safety reasons, each time when you enter into the testing mode, the parameter is reset to 110 sec.*

CHAMBER CLOGGING CAUSED BY IMPROPERLY CHOSEN PARAMETERS IS NOT A WARRANTY CASE!

If popping time is set on the maximum and most of the corn batch can't pop and fly out in time, it is recommended to increase the temperature set point, for not less than 10°C.

TURBINE SPEED

The Vortex patented technology is based on air convection inside the machine. Airflow intensity is being changed during operation accordingly to the operational algorithm. Airflow is being generated by the main turbine that is being controlled by VFD unit (voltage frequency driver).

If the speed is too low, the mass of corn won't be moved in the chamber; that will cause chamber clogging, and popcorn smoldering. If the speed is too high, percentage of scrap will be increased, since some kernels will be blown out of the chamber before they pop.

To change the reference speed of the turbine, do the following.

HIGH VOLTAGE INSIDE! ONLY QUALIFIED AND TRAINED PERSONNEL ARE ALLOWED TO DO THE FOLLOWING OPERATIONS!

1. Open the electric compartment that is under the sifter.
2. Press START button to turn the machine on.
3. Check if the value on the VFD display starts with F. If not, press MODE button few times, until you see reading starting with F.
4. Use 'up' and 'down' arrow keys on VFD unit to change the reference speed.
5. Close the compartment.

F VALUE MUST BE WITHIN 30.00 TO 40.00!

2.5. Testing mode

It is possible to check certain components of the machine in testing mode.

Press and hold COOLING/TURN OFF button and press START button to enter into the testing mode.

SIFTER TESTING

Press and keep pressed COOLING/TURN OFF button for more than 3 seconds. Sifter will rotate as long as the button is kept pressed.

FEEDER TESTING

Press the COOLING/TURN OFF button once. Feeder will execute a single cycle of feeding.

Press EMERGENCY STOP button to exit the testing mode.

CORN WILL BE PUSHED INTO THE CHAMBER DURING FEEDER TESTING. ALL CORN MUST BE REMOVED FROM THE CHAMBER BEFORE START!

2.6. Popcorn quality

Popcorn is a very sensitive product that requires ultimate attention towards many aspects. Understanding popcorn processing technology is the key to good quality production.

RAW CORN

It is impossible to get good stable result using low quality supplies, first of all, raw corn kernels. Choose reputable and reliable corn suppliers. Make sure that raw corn is stored and handled properly at your production site. Ask your corn suppliers for recommendations on storage and handling recommendations.

POPCORN CRUNCHINESS

Popcorn is crunchy when its moisture content doesn't exceed 1-1.5%. Popcorn that just came out of the machine has higher moisture rate (4-5%) as it is still losing moisture as cooling down. It is recommended to provide proper environment and establish the workflow at the site in such a way to be able to achieve top quality product.

3. TECHNICAL MAINTENANCE

3.1. Cleaning guide

DISCONNECT THE PLUG BEFORE CLEANING!

DO NOT WASH MACHINE WITH WATER!

WAIT UNTIL MACHINE IS COOLED DOWN BEFORE CLEANING!

DO NOT USE SHARP TOOLS OR ABRASIVES FOR CLEANING!

The purpose of technical maintenance is to maintain the equipment in good condition during all the lifetime and to meet fire safety rules.

The following schedule[3] is recommended below:

ACTION	PERIOD
Surface cleaning, dust and waste removal	Once a day
Sifter cleaning (husk, popcorn removal)	Once a day
The chamber cleaning (husk, corn dust, un-popped corn removal)	Once a day
Chamber grid cleaning (husk, corn dust removal)	Once a month

OUTER SURFACES CLEANING

Clean outer surfaces of the machine by the means of dry and clean cloth; it is allowed to use a cloth slightly damped with soap water.

CHAMBER CLEANING

It is necessary to clean the chamber of husk and dust once a day. To clean the chamber, unfasten the latches which hold the door, and pull it out. After that,

3 *Technical maintenance should be performed as necessary.*

remove husk and debris from the chamber. It is handy to use a vacuum cleaner for this operation.

After cleaning, close the chamber door.

During long time operation, certain amount of corn dust is accumulated in the chamber. It is important to clean the mesh screen on regular basis.

Open the chamber. There is a baffler in the center. The mesh screen is behind the baffler. Normally there is enough room to get access to the screen in order to clean it. However, if required, baffler can be removed. To do so, remove two bolts that fix the baffler to sidewalls. And then pull the baffler out. Once cleaning is done, put the baffler back and fix it with the bolts.

SIFTER CLEANING

Sifter is not rigidly connected to the machine and can be taken out of the machine. Sifter lies freely on two shafts each with couple of rubber rollers. In the course of time, the rollers' surface may become greasy and slippery, because of natural corn oil and dust. This may cause sifter stop and chamber clogging. To avoid this, rollers must be cleaned as necessary. It is suitable to do with a hard steel brush or other tool that provides strong impact on grease layer on rollers' surface.

3.2. Light bulb replacement

To replace light bulb do the following.

1. Turn off the machine and disconnect it from the mains. Wait until the machine cools down.

2. Take chamber door off to open the chamber.

3. Light bulb is located in the upper part of the chamber.

4. Remove four screws that holds lamp screen and take the screen out. If it is stuck, carefully insert flat screwdriver under the metal frame of the screen and turn it gently to detach the screen.

5. The light bulb is hold by spring loaded socket. Shift the bulb left or right to release its opposite end, and then take the bulb out.

BULB MAY BE VERY HOT! BURN HAZARD!

6. One must not touch the new light bulb with bare fingers; skin fat can cause

bulb destruction during further operation. If the bulb is greasy, it is required to wipe it thoroughly with soft, clean and dry cloth before putting it in.

7. Once bulb replacing is done, put the protective screen back and fix it with four screws. Close the chamber.

DO NOT OPERATE POPPER WITHOUT BAFFLER OR MESH SCREEN!

3.3. Conservation

If the machine is not in use for a long time, it is necessary to perform all the technical maintenance works, including complex cleaning of the sifter.

4. TROUBLESHOOTING

Problem	Possible cause	Possible remedy
Chamber clogged with popcorn often	- low quality corn - corn storage conditions are not met - wrong chosen settings of the machine	- do not use low quality corn - provide proper storage conditions for raw corn - adjust popping temperature - adjust turbine speed
Scrap percentage is too high	- low quality corn - too high turbine speed	- do not use low quality corn - decrease turbine speed
Popcorn is not crispy	- low quality corn - extreme ambient conditions - no exhausting hood provided - popcorn is still hot	- do not use low quality corn - provide proper ambient conditions - provide exhausting hood - arrange the workflow such a way to let popcorn to cool down
Too small popcorn	- too high popping temperature	- reduce popping temperature
Too much butterfly shaped popcorn while making Mushroom	- too low popping temperature	- increase popping temperature

In case of other issues, related to servicing, repair, spare parts, contact the dealer or the factory (see below).

5. TRANSPORTATION AND STORAGE

Popcorn machine 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 to +55°C.

6. QUALITY CONTROL CERTIFICATE

QC CERTIFICATE

_____ № _____
PRODUCT NAME SERIAL NUMBER

THE MACHINE IS MADE WITH ACCORDANCE TO MANDATORY REQUIREMENTS OF THE STATE STANDARDS, ACTUAL TECHNICAL DOCUMENTATION, AND APPROVED FOR USE.

QUALITY CONTROL ENGINEER

STAMP HERE

_____ _____
SIGNATURE FULL NAME

_____
DATE

7. WARRANTY OBLIGATIONS

The manufacturer guarantees trouble-free operation of the machine during 12 months from the date of receiving the machine by the 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 machine 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 machine 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

RoboLabs LLC

11 Industrial Street, Tver, 170100 Russia

Technical support: support@robolabs.pro

For all inquiries related to service, repair, and spare parts, submit the following information to the dealer, or the manufacturer:

- photo of machine's nameplate with serial no.
- related photo/video materials
- photo of the part or parts need to be replaced

ANNEX A. CHAMBER CLOGGING

DO NOT OPEN THE CHAMBER DOOR WHILE IT'S HOT!

DO NOT USE FIRE EXTINGUISHER!

CHAMBER CLOGGING CAUSED BY UNSKILLED ACTIONS OF OPERATING PERSONNEL IS NOT THE WARRANTY CASE!

If chamber is clogged, and/or smoke is coming out from the machine, DO THE FOLLOWING:

1. Press EMERGENCY STOP button.
2. Take out the plug from the mains socket.
3. Wait until machine is cooled down.

POPPER IS MADE OF STEEL AND CHAMBER IS SEALED; EVEN IF POPCORN BEGINS TO SMOLDER, IT WON'T GET A FIRE WITHOUT EXTRA AIR!

4. Cooling down will take not less than 2 hours.
5. Carefully open the chamber and proceed to cleaning.
6. If corn supply tube is clogged with popcorn, use some flexible item, like a piece of thick rubber hose, to remove clogging.