



# RoboLabs

Incredible machines for fastfood & funfood

## Vortex popcorn machine Robopop 75 (VPM-RM4LT) (VPM-RM4LTUS)

### User manual



**Read this manual carefully before use and keep for future reference!**

PDF version of this manual is available on [www.robolabs.pro](http://www.robolabs.pro)

## Safety requirements



**DO NOT** use excessive water while cleaning!



**DO NOT** disassemble the machine while it is connected to the mains!



Some parts might be hot while in operation!



**DO NOT** process other kernels than corn!



Only instructed personnel is allowed to operate the equipment!



**DO NOT** not leave running machine unattended!



Read and understand all instructions before use!

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# 1 Overview

## 1.1 Purpose

Vortex Popcorn™ machine Robopop 75 is a hot-air popcorn making machine (hereinafter "machine"). It can process both Butterfly and Mushroom popcorn varieties. Machine is based on patented Vortex technology that has following advantages:

- No oil is used at all. As a result, popcorn has no carcinogens and trans-fats; moreover, production cost is lower.
- Once popped, popcorn is immediately removed from the hot area, thus its nutritional value and taste are kept as much as possible.

The machine is intended for professional use only.

## 1.2 Technical specifications

Model	VPM-RM4LT	VPM-RM4LTUS
Throughput	up to 34 kg/h	up to 34 kg/h
Rated voltage	3N 230/400 V	3P 208-240 V
Rated frequency	50 Hz	60 Hz
Rated power	11,3 kW	11,3 kW
Dimensions (LxWxH)	1370x600x1690 mm	1370x600x1690 mm
Weight	200 kg	200 kg

## 1.3 Delivery set

Popper	1 pc
Popcorn cart	1 pc
Corn supply tube cleaning brush	1 pc
Plastic bags (LDPE)	50 pcs
Electric compartment key	2 pcs
Spare halogen lamp	1 pc
User manual	1 pc

## 2 Assembling and Installation

Unpack the machine carefully. Check the delivery set. Remove protective film from all surfaces. Put at the dedicated place, lock all four swivel casters.

### 2.1 Power requirements



**Power outlet must have grounding contact!**



**Presence of grounding connection must be checked on regular basis!**



**If supply cord damaged, it must be replaced by manufacturer, service agent, or qualified persons in order to avoid hazard!**



**Connections must be done by qualified electrician ONLY!**

For 400 V, 50 Hz service use IEC 60309 3P+N+PE 32 A plug:



For 208–240 V, 60 Hz service use NEMA 15-60P plug:



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



### 2.2 Ambient conditions and vent requirements

The equipment must be operated at the ambient temperature from +5°C to +40°C (+41°F to +104°F) and relative humidity not more than 45% at 40°C (104°F). The temperature decreasing related to RH increasing,

for example, 90% of RH at 20°C (68°F). Altitude above sea level should not exceed 1000 m. Ambient conditions have strong impact on the end product quality.



**A ventilation hood measuring at least 800x800mm must be provided above the machine, with a minimum capacity of 750 m<sup>3</sup>/h!**

### 3 Design and operating principle

Main components of the machine are: 1 – Turbine; 2 – Chamber; 3 – Hopper with feeder; 4 – Sifter (perforated drum); 5 – Popcorn cart with plastic bag; 6 – Scrap tray; 7 – Control panel, see Figure 1.



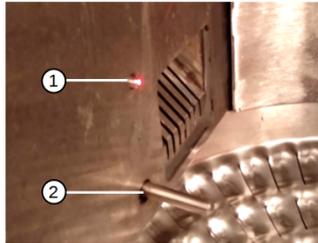
Figure 1: Robopop 75 main components

### 3.1 Turbine (blower)

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

### 3.2 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 chamber inside, helping operator to control the process inside. Chamber is equipped with optical sensor (1) and temperature sensor (2):



Optical sensor is to monitor processes in the chamber. Popper uses signal from this sensor in order to maintain smooth and effective operation process. Temperature sensor is to control the temperature in the chamber.

### 3.3 Sifter and scrap tray

Sifter is a rotating drum with holes that screens un-popped kernels, partly popped popcorn, and other small fractions into scrap tray located under the sifter. Scrap tray is easily removable.

### 3.4 Hopper

Corn hopper can fit one standard bag of corn (22,68 kg / 50 Lbs). Equipped with feeding auger.

### 3.5 Control panel

1. EMERGENCY STOP push button.
2. 4-digit LED display. Shows parameter values, alerts and notifications.
3. TEMPERATURE adjusting buttons, marked with up and down arrows.
4. START/PAUSE push button with light indicator. This button is used for starting machine, pause mode activation, and other operating purposes.
5. COOLING/TURN OFF push button. This button is used to turn machine into cooling mode, and other operating purposes.



### 3.6 Popcorn cart

Popper delivery set includes wheeled cart and 200-liter bags set. Cart is equipped with swivel lockable casters.

## 4 Intended use

### 4.1 Modes of operation

During operation, the machine is operated in different modes:

#### Heating mode

Once machine is turned on, it automatically starts to heat up. Upon reaching certain temperature machine switches automatically to popping mode.

#### Popping mode

This is the main operating mode. Machine operates in cyclic way, processing corn kernels batch by batch. Each cycle consists of three stages:

1. **Feeding** – auger rotates, pushing corn kernels into the chamber.
2. **Popping** – corn kernels are being heated up in the chamber, eventually being blown out from the chamber once popped.
3. **Purging** – turbine is accelerated to higher speed in order to blow everything that are left in the chamber, i.e. un-popped kernels, dust and other scrap.

#### Pause mode

Machine doesn't process corn in this mode, but maintains temperature in the chamber; popping process can be resumed at any time. The sifter stops after 3 minutes of pause mode.

#### Cooling mode

Before turning off, machine must be cooled down. In cooling mode heating elements are completely de-energized; turbine keeps running, cooling down the machine. Once temperature drops low enough, machine is turned off automatically.

## Setup mode

This mode is used for fine adjustment of the machine and also to test feeder and sifter. For more details see **Technical manual** section.

## 4.2 Operating parameters

Properly chosen parameters are essential for good quality product and stable operation process. Popping temperature and basic turbine speed are the parameters available for an operator.



**Machine misoperation caused by wrong chosen parameters IS NOT considered as warranty case!**

### Popping temperature

During operation, the machine maintains the chamber temperature at the set value. The temperature affects the shape and size of popped popcorn. Too high temperature causes smaller popcorn. Too low temperature reduces capacity, causes improperly popped kernels. Common popping temperature for Butterfly is between 200-215°C; for Mushroom it is between 210-225°C. Temperature set point can be adjusted during heating or popping modes. Press and hold one of the adjustment buttons. The changing value appears on the display. Once desired value is reached, release the button.

### Turbine speed

Turbine speed affects airflow intensity in the chamber. Butterfly corn requires less intense airflow because of the shape; Mushroom requires more intensive airflow for the same reason. To avoid clogged chamber, it is not recommended to decrease turbine speed unless the scrap rate exceeds 7% (compared to the weight of raw corn processed). To change the basic turbine speed, see **Technical manual** section.

### 4.3 Quick start instructions

1. Empty the scrap tray.
2. Fill the hopper with corn kernels.
3. Put empty plastic bag into popcorn cart and put the cart under the sifter.
4. Press the START/PAUSE push button to turn the machine on.
5. Once chamber is heated up, the machine is switched in popping mode automatically.
6. To suspend the process for short time, press the START/PAUSE push button. The machine will stop making popcorn, but will maintain temperature in the chamber at the set value. To resume popping, press the START/PAUSE push button again.
7. To end the operation, press the COOLING/TURN OFF push button. The machine stops supply corn to the chamber and is switched to cooling mode. Once the machine is cool enough, it will be shut off automatically.

## 4.4 Display notifications

Popper has 4-digit 7-segment LED indicator located on the front panel. During the operation, the following messages may appear:

<b>Reading</b>	<b>Meaning</b>	<b>Action required</b>
<b>HHHH</b>	Machine is in heating mode	None
<b>CCCC</b>	Machine is in cooling mode	None
<b>POPP</b> (glows)	Machine is in popping mode	None
<b>POPP</b> (blinks)	Machine is in pause mode	None
<b>Corn</b> (blinks)	Corn is over	Add corn
<b>Err1</b>	Turbine fault	See Troubleshooting
<b>Err2</b>	Chamber clogged	See Troubleshooting
<b>Err3</b>	Temperature sensor fault	See Troubleshooting
<b>Err4</b>	Interconnection fault	See Troubleshooting

## 4.5 Forced purge feature

The machine automatically actuates purge procedure during machine operation. However, it is possible to actuate the purge procedure at any time. If you see that chamber is going to be clogged with popcorn, press and hold COOLING push button for 3 seconds. The machine executes one purge cycle. Repeat if necessary. To resume popping, press START/PAUSE button.

## 5 Popcorn quality

Popcorn is a product that requires ultimate attention towards many aspects. Understanding popcorn processing technology is essential to get high quality product.

### 5.1 Raw corn

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

### 5.2 Moisture content

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 and tastes soggy, because it is still losing moisture as cooling down. It is a must to arrange the workflow in such a way that popcorn has enough time to cool down before the next stage of processing, e.g. coating. At the same time, don't expose popcorn for too long in open containers, because popcorn starts to take moisture back from the ambient air. Use air-tight containers if needed to keep popcorn moisture content at the proper level.

### 5.3 Production capacity

Due to the nature of popping process, there the weight of raw corn processed is not the same as the weight of ready-to-eat product at the machine's output. The difference is allowed to be up to 20%. Low quality corn or improperly chosen parameters may increase the weight difference. For example, if too dry corn used, or there are a lot of damaged kernels, then there will be a lot of un-popped kernels screened in sifter and dumped to scrap. Another example, if turbine speed is set too high, a lot of kernels are blown out before they would have been popped. The scrap rate is allowed to be up to 5-7% (by weight, compared to the weight of raw corn processed).

## 6 Maintenance and cleaning



**DO NOT use excessive water while cleaning!**



**ALWAYS unplug the machine from the mains before cleaning!**



**DO NOT use sharp tools or abrasives!**



**Wait until machine is cool before cleaning!**

The purpose of maintenance and cleaning is to keep machine in good condition during all the lifetime and to meet safety requirements. Recommended cleaning schedule:

Outer surface cleaning	every day
Chamber cleaning	every day
Sifter cleaning	once a week
Sifter rollers cleaning	every two weeks
Feeder cleaning	every month

### 6.1 Outer surface cleaning

Clean outer surfaces of the machine with a soft and clean cloth slightly dampened with soap solution. Wipe dry immediately.

### 6.2 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, remove husk and debris from the chamber. It is handy to use a vacuum cleaner for this operation. After cleaning, place the door back and fasten up the latches. During long time operation, certain amount of corn

dust is accumulated in the chamber. It is important to clean mesh screen. Use a soft brush or a vacuum cleaner to remove dust from the mesh screen.

In case of severe clogged mesh screen do the following.

1. Open the chamber.
2. Remove two bolts (3)
3. Take out the baffler (2).
4. Clean the mesh screen (1).
5. Put the baffler back in the chamber.
6. Fix the baffler with the screws.



### 6.3 Clogged chamber

The chamber optical sensor provides accurate process of operation. The new batch won't be started until the previous batch is evacuated from the chamber, thus the possibility of clogged chamber is minimal. However, in case of lack of voltage in the mains, or using Emergency stop button during the operation, or other reasons, the chamber may get clogged with popcorn. In such case do the following:

1. DO NOT PANIC!
2. Unplug the machine from the mains.
3. DO NOT open the chamber, DO NOT use fire extinguisher! The machine is made of stainless steel, as long as chamber door is closed, popcorn may smolder and smoke, but won't get fire.
4. Wait until the machine cools down (may take few hours).
5. Open the chamber and clean inside.

6. Use the tube cleaning brush from the delivery set to clean the corn supply tube.

## **6.4 Sifter cleaning**

Take out the sifter drum. Wash it with suitable mild detergents, wipe dry immediately.

## **6.5 Sifter rollers cleaning**

During operation, the sifter rollers might accumulate corn dust and oil, becoming greasy and slippery, affecting normal sifter operation. Thoroughly clean the sifter rollers' surface to provide good friction.

## **6.6 Feeder cleaning**

Use a soft dry clean cloth to clean the feeder inner surfaces. It is allowed to use a vacuum cleaner to remove dust from inside the feeder.

## **6.7 Conservation**

If machine is not used for long time, do all the cleaning procedures.

## 7 Troubleshooting

### 7.1 Too much scrap

#### Possible reasons

Low quality corn  
Too high turbine speed

#### Solution

Use high quality corn  
Decrease turbine speed

### 7.2 Popcorn is not crispy

#### Possible reasons

Low quality corn  
Extreme ambient conditions  
No exhausting hood  
Popcorn is still hot

#### Solution

Use high quality corn  
Provide proper ambient conditions  
Provide exhausting hood  
Let popcorn to cool down

### 7.3 Err 1 message

Turbine speed is below 20 Hz. A qualified technician must be called.

### 7.4 Err 2 message

#### Possible reasons

Low quality corn  
Corn storage conditions are bad  
Wrong settings

#### Solution

Use high quality corn  
Provide proper storage conditions  
Adjust the settings

### 7.5 Err 3 message

Temperature sensor fault. A qualified technician must be called.

### 7.6 Err 4 message

PLC to temperature module connection fault. A qualified technician must be called.

## 8 Technical manual



This section is for qualified technical personnel only!

### 8.1 Sifter and feeder testing

Turn the machine off.

Press and hold COOLING button and press START/PAUSE button once; release COOLING button as you see ***St-S*** on the display.

**Sifter testing** Press and hold COOLING push button. The display will show ***St-S*** message and sifter starts to rotate as long as the button is kept pressed.

**Feeder testing** Press and release COOLING push button. The display will show ***St-F*** message and feeder executes one feeding cycle.

### 8.2 Setup mode

There are two ways to enter the setup mode and change the parameters:

1. If machine is turned off, press and hold COOLING button and press START/PAUSE button once; release COOLING button as you see ***St-S*** on the display.
2. If machine is running (heating, popping, or cooling mode), press and hold two temperature adjustment push buttons, the display shows ***test***, and when you see next reading, release the buttons. The reading will be like ***P214***, where P represents the current stage of the machine operation (it can be either H or C for heating or cooling stage, respectively); and 214 is the current temperature in the chamber.

Press START button to move through the parameters. Use temperature adjustment push buttons to change the value of the parameter displayed.

**tP (Time\_Popping)** Maximal duration of popping stage.

**Fr (Feeder\_RPM)** Corn auger speed (in rpm). The higher the value, the more corn supplied per batch.

**tF (Time\_Feeder)** Duration of auger operation (in seconds). The higher the value the more corn supplied per batch.

**tb (Time\_Boost)** Duration of purging stage (in seconds).

**tH (Time\_Heating)** Forced heating period (in seconds) in the beginning of each cycle of operation.

**Sr (Sifter\_RPM)** Sifter rotation speed (in rpm). Low speed can cause clogged chamber.

**FP (Freq\_Popping)** Turbine speed increment (in Hz) for popping stage.

**Fb (Freq\_Boost)** Turbine speed increment (in Hz) for purge stage.

**Cn (Cnt\_Pop)** Count threshold for optical sensor in the chamber.

**Pt (Temp\_P)** Proportional band (PID regulation parameter).

**It (Temp\_I)** Integral time (PID regulation parameter).

**dt (Temp\_d)** Derivative time (PID regulation parameter).

**tE (Temp\_Preheat)** During heating stage heaters operated by 90 s cycles. tE (in seconds) defines the pause between those cycles. For example, tE is 60 by default, so heaters are on for 90 s, then they are off for 60 s, and so on. This parameter allows to reach the optimal warm up time without temperature limiter tripping.

**dEF (reset to default)** List parameters until you see **dEF** on the display, press and hold COOLING button and press START button once. All parameters, except basic turbine speed will be reset to its default values, and the machine will be shut off. NOTE: only available if the turbine is not running.

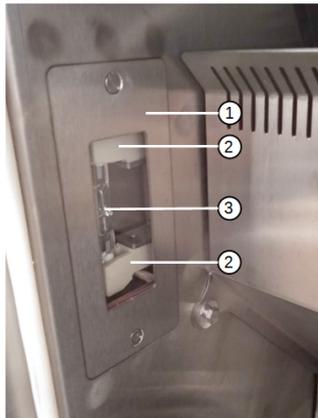
The new value is saved once changed. If the turbine is stopped, press EMERGENCY STOP button, *or* press START button once **dEF** appears on the display. If the turbine isn't stopped (the machine is in either heating, or popping, or cooling stages), then press and hold two temperature adjustment push buttons for 5 seconds to exit.

Param	Description	Default	Min	Max	Inc
<b>tP</b>	Time_Popping	180*	150	300	30
<b>Fr</b>	Feeder_RPM	160*	100	350	10
<b>tF</b>	Time_Feeder	10	10	30	5
<b>tb</b>	Time_Boost	10	10	30	5
<b>tH</b>	Time_Heating	40	10	60	5
<b>Sr</b>	Sifter_RPM	95	10	95	5
<b>FP</b>	Freq_Popping	10	10	15	1
<b>Fb</b>	Freq_Boost	20	15	30	1
<b>Cn</b>	Cnt_Pop	15	3	30	3
<b>Pt</b>	Temp_P	450*	100	950	50
<b>It</b>	Temp_I	150*	100	950	50
<b>dT</b>	Temp_d	40	0	90	10
<b>tE</b>	Temp_Preheat	60	0	90	30
<b>dEF</b>	Reset to default	–	–	–	–

\* — three digit values are displayed without last zero digit, for example: **tP18** reading means that **tP** is set at 180.

### 8.3 Light bulb replacement

1. Turn off the machine and disconnect it from the mains. Wait until the machine cools down.
2. Open the chamber.
3. Lamp is located on the left sidewall of the chamber.
4. Remove two screws that holds lamp screen (1) and take the screen off. 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 lightbulb (3) is being hold by spring loaded socket (2). Shift the bulb upwards or downwards to release its opposite end, and then take the bulb out.
6. DO NOT touch the new 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 screen back and fix it with the screws. Close the chamber.



## 8.4 VFD unit

### Basic speed F

1. Open electric box and locate the VFD control panel:



2. Turn the machine on.
3. Use 'up' and 'down' arrow keys on VFD control panel to set the desired value. New figure will be shown on the display in real time, in format "FXX.X".
4. Close the electric box.



**F must be set in the range between 20 and 40 Hz!**  
Values beyond this range may cause clogged chamber, or machine failure!

## VFD unit setup

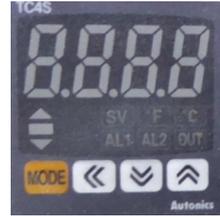
Run the machine in setup mode (the drive must be stopped). To change or view parameter value, press ENTER, the display shows **00. \_\_**. Then use up or down keys to choose the first two digits of the parameter (for example, **02.**). Now press ENTER again, display shows **02.00**. Use up or down keys to choose the second two digits of the parameter, for example, **02.11**. Press ENTER again to see the current value of the parameter. Change value, if needed, with up or down keys. Press ENTER to confirm and save the new value, the display shows End. Now use MODE button to return back to the previous level of selection or to the main mode.

Parameter	Value	Description
00.02*	9	Settings initialization
00.03	0	Start-up display selection
01.00	70.00	Maximum output frequency
01.16	4	Auto accel/decel
02.00	3	Source of first master frequency command: RS-485
02.01	4	Source of first operation command: RS-485
02.04	0	Motor direction control
02.07	1	Up/Down mode
02.09	0	Source of second frequency command
02.10	1	1st and 2nd master frequency command combination
02.11	40.0	Keypad frequency command
09.00	5	VFD communication address
09.01	1	Transmission speed: 9600 bps
09.02	3	Transmission fault treatment:keep operating
09.04	1	Communication protocol: ASCII 7, E, 1

\* — after setting parameter 00.02 to 9, the VFD displays “End”, and get back to the main indication mode (Fxxx). After this, continue setup process from parameter 00.03.

## 8.5 Temperature limiter setup

Temperature limiter have three setting groups: first setting group, second setting group, and SV setting group (the main indication mode). The settings must be changed in the same order as they appear in the list. Note that after changing In-t (temperature sensor type) or UnI-t (temperature unit) values, parameters H-Su, L-Su, AL1, AL2, AHYS must be set again. The regulator has more parameters than listed below; if you see a parameter not from the list, skip it and proceed to the next one.

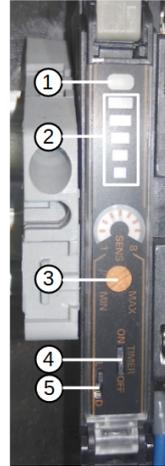


To access the second group of parameters press and hold orange MODE button for 4 seconds; once you see PAR2 on the display, release the MODE button. To access the first group of parameters, press and hold the MODE button 2 seconds, until you see PAR1 on the display. Use MODE button to list parameters. Actual value of the parameter is shown in the lower line of the display. Use up or down arrow keys to change the value. Once the new value is set, press MODE button to proceed to the next parameter.

Group	Param	Value	Description
2 <sup>nd</sup>	LoC	oFF	Unlock all settings for changing
2 <sup>nd</sup>	In-t	YCA	Temperature sensor type
2 <sup>nd</sup>	L-Su	250	SV low-limit value
2 <sup>nd</sup>	H-Su	400	SV high-limit value
2 <sup>nd</sup>	C-nd	onoF	Control type
2 <sup>nd</sup>	oUt	rLY	Control output
2 <sup>nd</sup>	AL-1	An1. _	AL1 alarm operation mode
2 <sup>nd</sup>	AHYS	50	Alarm output hysteresis
1 <sup>st</sup>	AL1	0	AL1 alarm temperature
1 <sup>st</sup>	HYS	50	Hysteresis
2 <sup>nd</sup>	LoC	LoC2	All settings locked, except SV
SV	SV	350	Default temperature

## 8.6 Optical amplifier setup

1. Operation indicator
2. Incident level scale
3. Adjustment knob (8-turn)
4. Timer switch (must be in OFF position)
5. Mode switch (must be in L position)



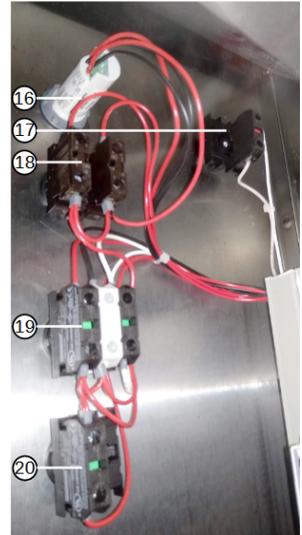
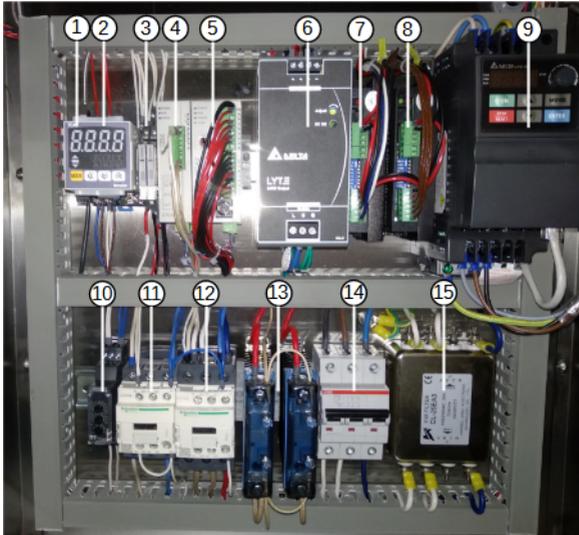
To adjust the optical amplifier, put a folded sheet of white paper in the chamber as shown on the picture below, so the sight line of the sensor is interrupted with this paper screen.

If the operation indicator (1) is lit up, then rotate the knob (3) counter-clockwise until the indicator turns off. After that slowly rotate the knob (3) until indicator (1) is lit up.



## 8.7 Electric box layout

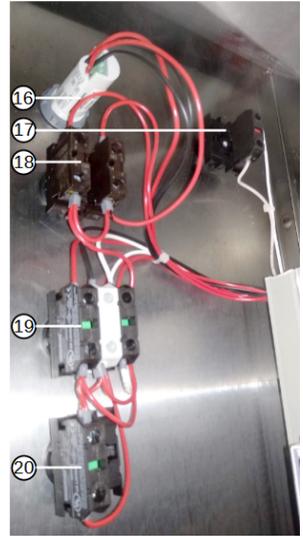
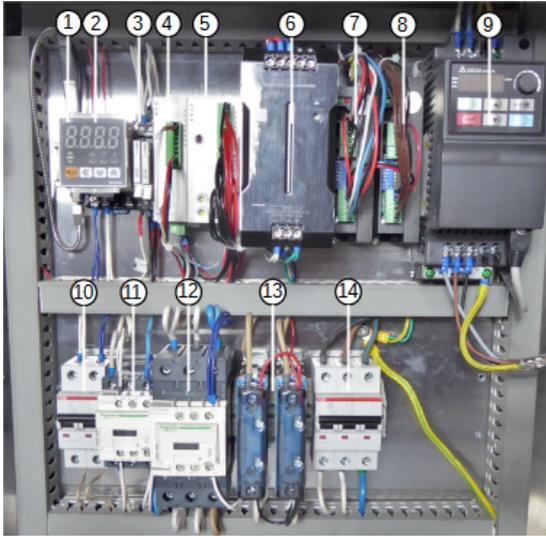
VPM-RM4LT machine (3N 230/400V 50 Hz)



- 1 – BL optical amplifier
- 2 – DC4 temperature limiter
- 3 – K1, K2 relays
- 4 – DC2 temperature controller
- 5 – DC1 main controller
- 6 – TV power supply unit
- 7 – DD1 step driver
- 8 – DD2 step driver
- 9 – UZ VFD unit
- 10 – FV voltage control relay

- 11 – KM1 contactor
- 12 – KM2 contactor
- 13 – VS1, VS2 solid-state relays
- 14 – QF circuit breaker
- 15 – EMI filter
- 16 – DC3 display
- 17 – SA1 switch
- 18 – SA2 push buttons
- 19 – SB1 push button
- 20 – SB2 push button

VPM-RM4LTUS machine (3P 208–240 V 60 Hz)



- 1 – BL optical amplifier
- 2 – DC4 temperature limiter
- 3 – K1, K2 relays
- 4 – DC2 temperature controller
- 5 – DC1 main controller
- 6 – TV power supply unit
- 7 – DD1 step driver
- 8 – DD2 step driver
- 9 – UZ VFD unit
- 10 – QF2 circuit breaker

- 11 – KM1 contactor
- 12 – KM2 contactor
- 13 – VS1, VS2 solid-state relays
- 14 – QF1 circuit breaker
- 16 – DC3 display
- 17 – SA1 switch
- 18 – SA2 push buttons
- 19 – SB1 push button
- 20 – SB2 push button

## 9 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 (minus 13°F and +131°F).

## 10 Quality control check

<hr/>	
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	
<hr/>	
Signature	Full name
<hr/>	
DD.MM.YYYY	

## 11 Warranty obligations

The manufacturer guarantees trouble-free operation of the equipment during 12 months from the date of receiving the equipment by a dealer (in accordance with transport documentation); or, in case of purchase directly through RoboLabs LLC, from the date of purchase, 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!*

## 12 Manufacturer details

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Phone: +7 495 956 4000