RoboLabs

Incredible machines for fastfood & funfood

Conveyor oven

RC800MD

Instruction manual

Original instructions. Read this document before use and keep it for future reference. PDF version is available on www.robolabs.pro

Contents

Preface

This document (hereinafter — the manual) contains essential information on installation, intended use, and technical maintenance of conveyor oven RC800MD (hereinafter — the machine).

The manual is intended for operators who work with the machine, and for technical personnel who conduct installation, commissioning, and technical service.

The manual must be kept during all life time of the machine in place readily available for operators, and technical personnel.

1 Safety requirements

This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

- Not grounded machine can cause electric shock. Power outlet MUST HAVE proper grounding to avoid electric shock.
- DO NOT use excessive water or water jet for machine cleaning. DO NOT spill water on electric panels or parts. Using excessive water during cleaning can cause short circuit and electric shock.
- DO NOT immerse machine and/or supply cord into water.
- ALWAYS unplug machine before cleaning or servicing.
- No user serviceable parts inside electric panel. DO NOT open electric panel unless you are qualified for this.

⚠ WARNING

- Some surfaces are hot. Touching hot surfaces might cause burn. DO NOT touch while in operation.

⚠ WARNING

- DO NOT use machine in the way other than intended.
- DO NOT leave operating machine unattended.
- DO NOT modify design of the machine.
- DO NOT wear dangling jewelry, loose clothing, rings or have loose, long hair that could get caught up by moving conveyor.

⚠ WARNING

- Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury, or death. Read and understand this manual before use.
- Only instructed personnel is allowed to operate the machine.

2 General information

2.1 Designation

Conveyor oven RC800MD (hereinafter — the machine) is intended for baking different products such as pizza.

Commercial use only.

2.2 Technical specifications

Capacity[1]	130 pcs/hr
Working chamber length	1000 mm
Conveyor width	800 mm
Baking temperature	up to 350 °C
Baking time	up to 30 min
Rated voltage	400 V
Rated frequency	50 Hz
Rated current	43 A
Net dimensions (LxWxH)	1525 x 1950 x 535 mm
Net weight	340 kg
Design life	7 years

2.3 Delivery set

Machine	1 pc
Conveyor	1 pc
Crumb tray	2 pcs
Tray guide rail	4 pcs
Bumper	2 pcs
Chain belt shroud	1 pc
Heat screen	1 pc
Chain belt	1 pc
Documentation set	1 pc

1 Capacity is given for 30 cm pizza and baking time 3 min 30 sec. Capacity for 40 cm pizza and baking time 4 min 30 sec is 70 pcs per hour.

2.4 Packing

The machine is supplied in packaging that protects the machine from mechanical impact and soil during transporting and storage.

Machine comes in two packages:

Package №1: 1750 x 1680 x 730 mm, 290 kg, see Fig. 1.

Package №2: 2050 x 1050 x 250 mm, 65 kg, see Fig. 2.

Figure 1

Figure 2

2.5 Transportation and storage

The 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 and plus 55 °C.

2.6 Design and principle of operation

Main components of the machine are shown on (see Fig. 3).

Conveyor, made of frame with two shafts, and conveyor belt installed on the shafts. Drive shaft is actuated by electric motor located in the **electric panel** via **chain belt**. Chain belt is covered with **chain belt shroud**.

Behind electric panel there are **turbine** and **heating elements**. Turbine is driven by **motor**. Heating elements heat up air inside the machine, and turbine pushes hot air on the products that sit on conveyor belt, through **air ducts with impingement nozzles**. There are three air ducts located above the conveyor and four air ducts located under conveyor.

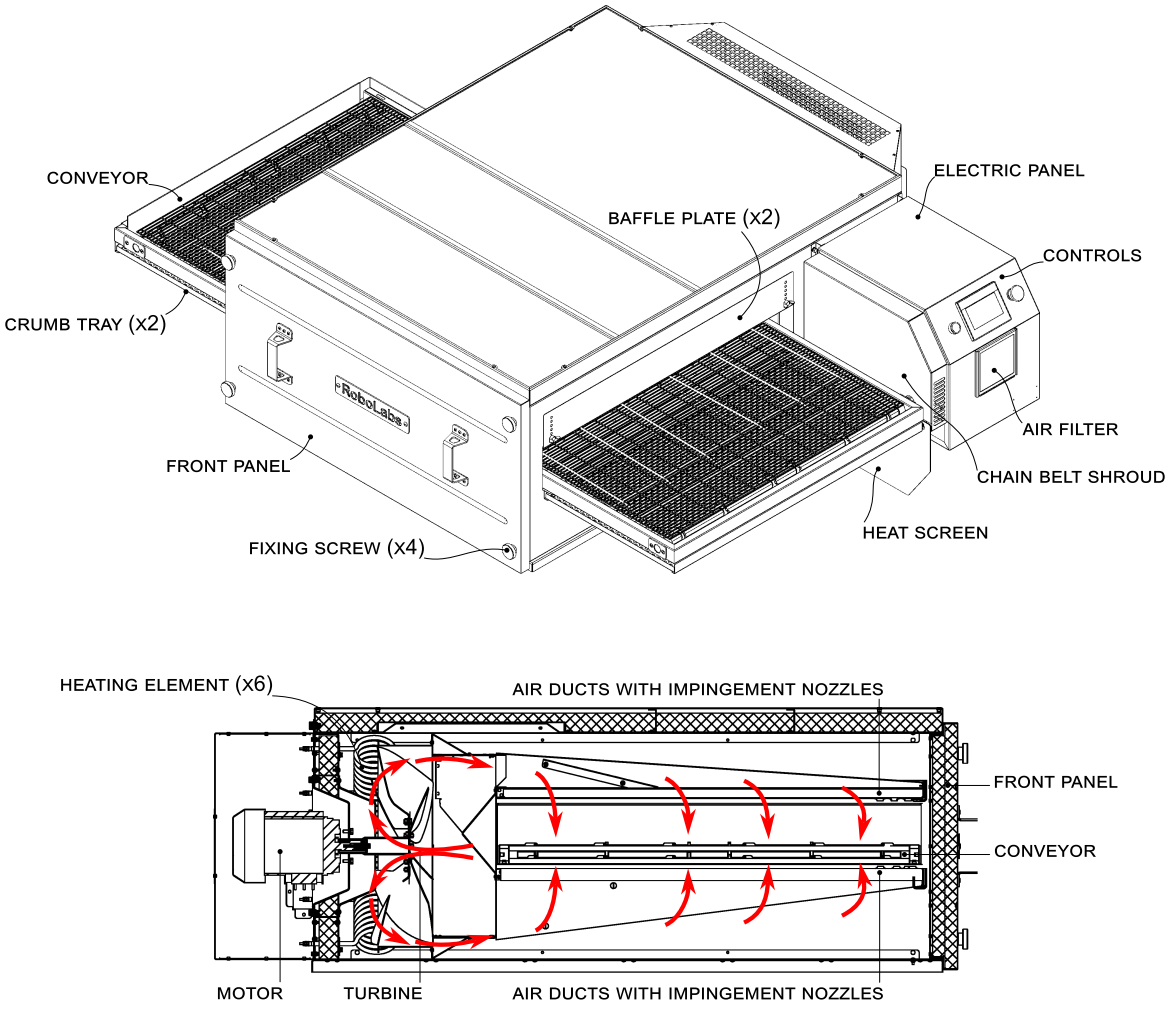


Figure 3

On the front side of electric panel **controls** are provided, including: START button, touchscreen, and Emergency stop switch.

Removable **air filter** prevents dust and debris in the electric panel.

Two **baffle plates** allow to adjust input and output clearance for the product.

When few machines stacked, **heat screen** prevents overheating for electric panel of the machine located above another one.

Removable **crumb trays** collect crumbs from the product as it moves on the conveyor.

Removable **front panel** fixed with four **fixing screws**; it is intended to facilitate cleaning and servicing of the machine.

3 Commissioning

DANGER

- Not grounded machine can cause electric shock. Power outlet MUST HAVE proper grounding to avoid electric shock.
- Wall receptacle MUST be installed by a qualified electrician.
- If supply cord damaged, it MUST be replaced by manufacturer, service agent, or a skilled person in order to avoid hazard.
- DO NOT connect the machine to voltage inverters of any kind.

WARNING

- Installation, assembling, and electric connections must be performed by a qualified technician.

3.1 Ambient requirements

This machine is designed to be operated indoors 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) while using at altitudes not exceeding 1000 m over the sea level. The temperature decreasing is related to RH increasing, for example, 90% of RH at 20 °C (68 °F). This machine MUST NOT be exposed to precipitations of any kind (rain, snow and so on).

It is a must to provide proper ventilation arranged in accordance with all applicable laws and rules.

The distance to closest combustible surfaces must exceed 150 mm. It is a must to provide at least 150 mm gap between ventilation holes on the machine and any objects.

3.2 Unpacking and installation

1. Unpack the machine carefully and keep packaging for future use.
2. Check the delivery set.
3. Remove protective film where applicable.
4. Put the machine on pedestal[2] RL907022. Lock swivel casters of the pedestal.
5. Put **conveyor** inside, note the position of drive shaft **sprocket** on the conveyor, see Fig. 4.

2 Shall be ordered separately.

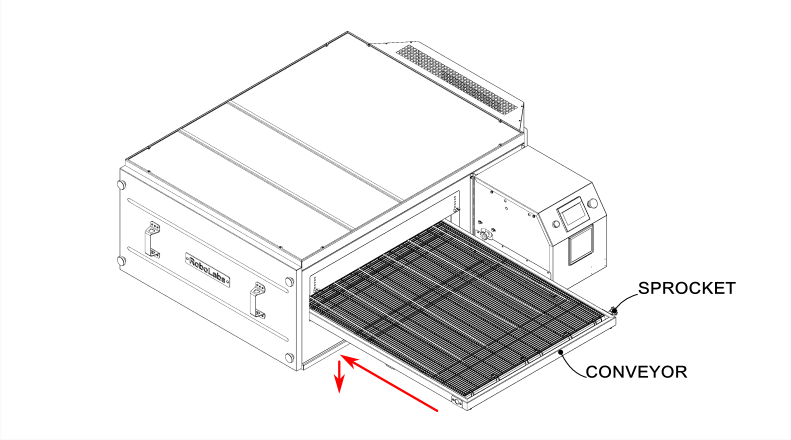


Figure 4

6. Put **chain belt** on conveyor's sprocket and other sprocket, mounted on the shaft protruding from electric panel, see Fig. 5.

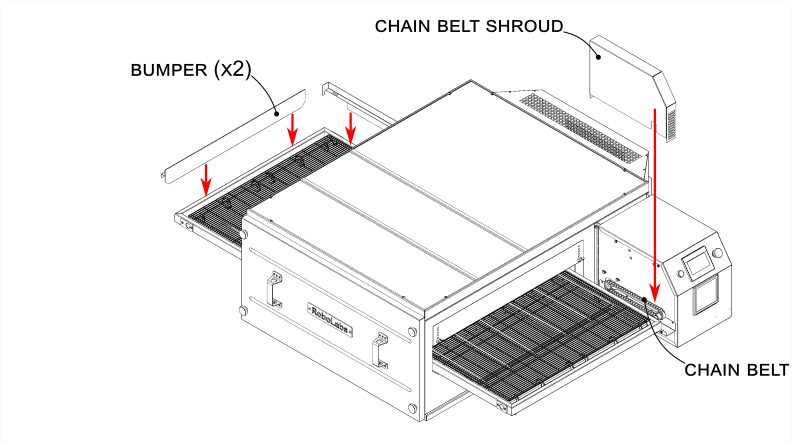


Figure 5

7. Put **chain belt shroud** on its place to close the chain belt.
8. Put two **bumpers** on the conveyor.

9. Fix **tray guide rails** under conveyor, see Fig. 6. Fasteners are fixed to the conveyor.

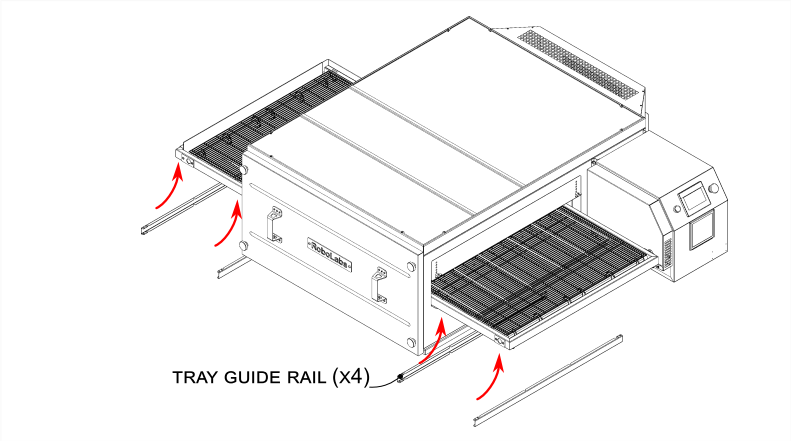


Figure 6

10. Insert **crumb trays** into the gray guide rails, see Fig. 7.
11. Install **air filter** in its socket on electric panel.
12. If the machine is stacked on another machine, install **heat screen**. Lower machine in the stack or machine installed alone does not need the heat screen installed.

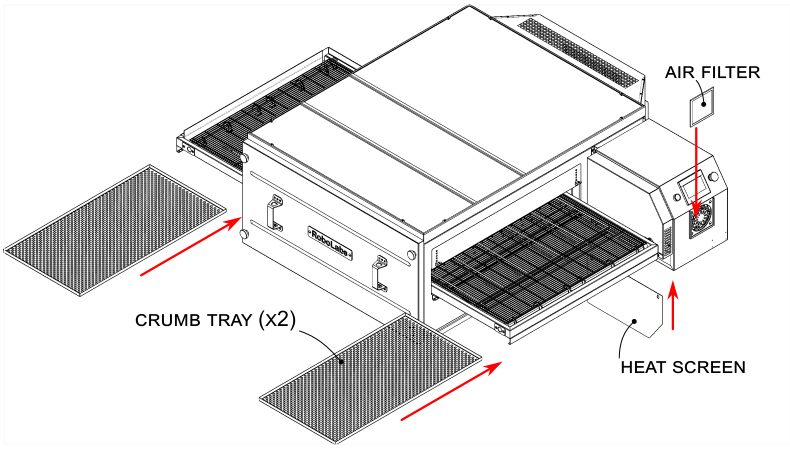


Figure 7

13. Put cover[3] RL907021 on the top of the machine. **ATTENTION!** In case of stacked machines, the cover must be installed only on the machine that is on top.
14. Hang exhausting duct[4] RL907023 above the machine. The gap between the hood and the machine must not exceed 2 cm.
15. Wipe all surfaces with a clean cloth dampened with a mild soap. Remove soap residues with a cloth dampened with water. Let it dry.
16. Inspect the supply cord for any damages.

3 Shall be ordered separately.
4 Shall be ordered separately.

3.3 Electric requirements

The machine requires 3 phase 400 V 50 Hz five-wire system (L1-L2-L3-N-GND).

Use 3P+N+PE 63 A 400 V pin and sleeve connector (IEC 60309). Short-circuit current rating for the machine is 6 kA.

The wall receptacle must be connected to a switchboard equipped with a circuit breaker rated 63 A.

Equipotential bonding wire (up to 10 sq.mm) shall be connected to screw terminal on the base frame marked with IEC 60417-5021 sign: ⏚

Check the voltage in the receptacle. Check the grounding in the receptacle. Plug the machine in.

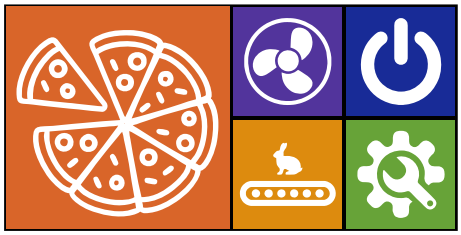
Make sure that the supply cord is not twisted, pulled, and is not mechanically impacted in any other way; and also is not in contact with hot surfaces.

3.4 First start (operation check)

ATTENTION! Machine that was kept for a long time at temperatures below 0 °C must be kept in normal room temperature (20-22 °C) not less than 12 hours before first start.

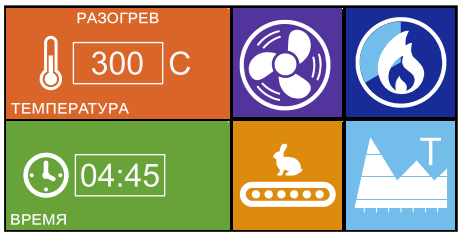
Follow these steps to check the machine operation:

1. Press START button, wait for the start screen:



2. Press to check conveyor operation. Make sure it operates without any side noises. Press to stop.
3. Press to check turbine operation. Make sure it operates without any side noises. Press to stop.

4. Press to start heating up. Turbine and heaters start, «РАЗОГРЕВ» message appears on the screen:



5. In case if «Проверьте подключение к сети» message appears on the screen (wrong phase sequence), unplug the machine and swap any two phase wires in the plug.
6. Wait until conveyor automatically starts.
7. Press to start cooling down. Wait until machine cooled down and turbine stopped; the starting screen appears.
8. Press to turn the machine off.

4 Intended use

⚠ DANGER

- DO NOT use machine if supply cord, cable plug, or wall receptacle are damaged.
- DO NOT allow supply cord to be twisted, bent, pulled, contacted with sharp edges, or to be mechanically impacted in any other way.
- DO NOT let supply cord to be in contact with hot surfaces.

⚠ WARNING

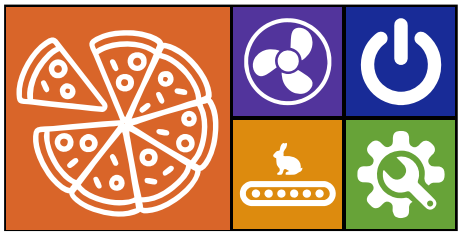
- Some surfaces are hot. Touching hot surfaces might cause burn. DO NOT touch while in operation.

⚠ WARNING

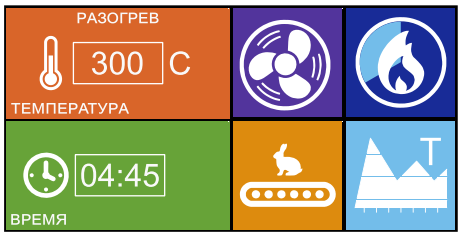
- DO NOT leave working machine unattended.
- DO NOT use machine in other way than intended.
- DO NOT operate with air filter removed.
- DO NOT use Emergency stop switch for normal shut down.
- DO NOT use sharp items on touch screen.
- DO NOT wear dangling jewelry, loose clothing, rings or have loose, long hair that could get caught up by moving conveyor.
- It is a MUST to provide free access, at any time, to wall receptacle, and switchboard to which the receptacle is connected.

4.1 Operating order

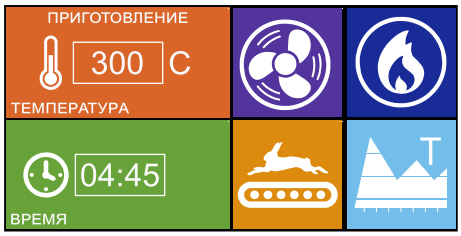
1. Press START button, wait for the starting screen:



2. Press to start heating up. Turbine and heaters start, «РАЗОГРЕВ» message appears on the screen:



3. Conveyor will start automatically, when temperature inside reaches 250 °C.
4. Wait for «ПРИГОТОВЛЕНИЕ» message:



5. Put pizza on conveyor belt. Take baked pizza from the output side of the conveyor in time.
6. In the end of a day press to start cooling down, «ОХЛАЖДЕНИЕ» message appears on the screen:

7. Once machine cooled down enough, turbine will shut down automatically, and the start screen appears.
8. Press to turn the machine off.
9. Unplug the machine.

4.2 Baking temperature

To change baking temperature do the following:

1. Press current temperature value on the screen, a keypad appears:

2. Type the new value and press ENTER to save.

4.3 Baking time

Baking time depends on conveyor speed. To change baking time do the following:

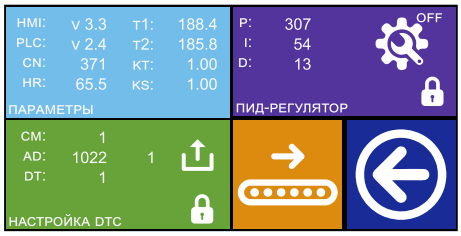
1. Press current value for minutes on the screen, a keypad appears:

2. Type the new value and press ENTER to save.
3. Repeat the same for seconds.

4.4 Conveyor direction change

Conveyor movement direction can be changed before starting operation. This setting is protected by a password. To change the direction do the following:

1. Press START button, wait for the start screen.
2. Press , settings screen appears:



3. Press , a numpad appears.
4. Type password 2325 and press ENTER; after this direction is changed, and the button is available for changing direction once again.
5. Press to save the new value and return.

4.5 Abnormal operation

In case of any signs of abnormal operation of the machine, such as distinctive smell, smoke formation, loud side noises, and so on, turn the machine off, de-energize the wall receptacle from the switchboard, and call for a technician.

5 Cleaning

⚠ DANGER

- ALWAYS unplug before cleaning.
- DO NOT use excessive water or water jet for machine cleaning. DO NOT spill water on electric panels or parts. Using excessive water during cleaning can cause short circuit and electric shock.
- DO NOT immerse machine and/or supply cord into water.
- DO NOT keep supply cord on the floor.

⚠ WARNING

- Some surfaces are hot. Touching hot surfaces might cause burn. ALWAYS wait until cooled down before cleaning.

⚠ WARNING

- ALWAYS use personal protective equipment: safety goggles, gloves, apron.

⚠ CAUTION

- Front panel and conveyor are heavy. DO NOT remove the panel or conveyor alone to avoid injuries, or machine damage.
- DO NOT use sharp items, or abrasives while cleaning.

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

5.1 Daily cleaning

1. Unplug the machine. Inspect supply cord, cable plug, and wall receptacle for any damages. In case of found damages DO NOT use the machine until damaged parts replaced.
2. Remove any food from the machine.
3. Remove crumb trays, clean them from debris, wash with mild soap, rinse with water, let it dry.
4. Wipe outer surfaces of the machine with a clean cloth damped in mild soap. Remove soap residues with a cloth dampened with water; let it dry.

5.2 Monthly cleaning

1. Remove **air filter**, **heat screen**, **crumb trays**, **bumpers**, and **baffle plates**, see Fig. 8.
2. Clean removed components from dust and debris. In case of severe contamination use suitable detergents in accordance with its instructions for use.

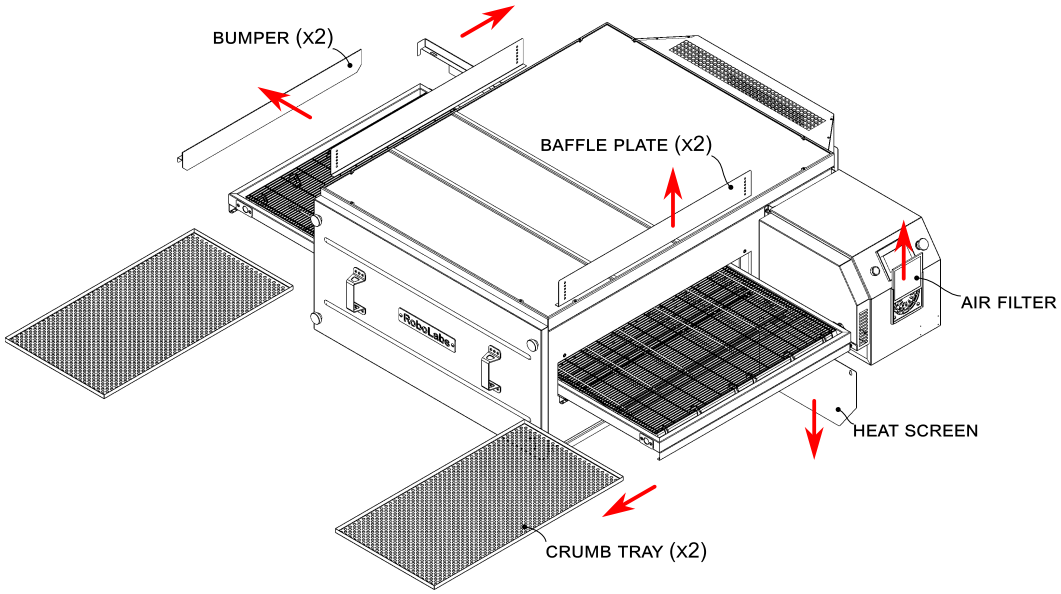


Figure 8

3. Unscrew four **fixing screws** and remove the **front panel**, see Fig. 9. **ATTENTION!** The panel is heavy. At least two person required to remove the panel: one person holds the panel with two handles, another person remove the screws.
4. Clean the panel from dust and grease. In case of severe contaminations, use suitable detergents in accordance with its instructions for use.

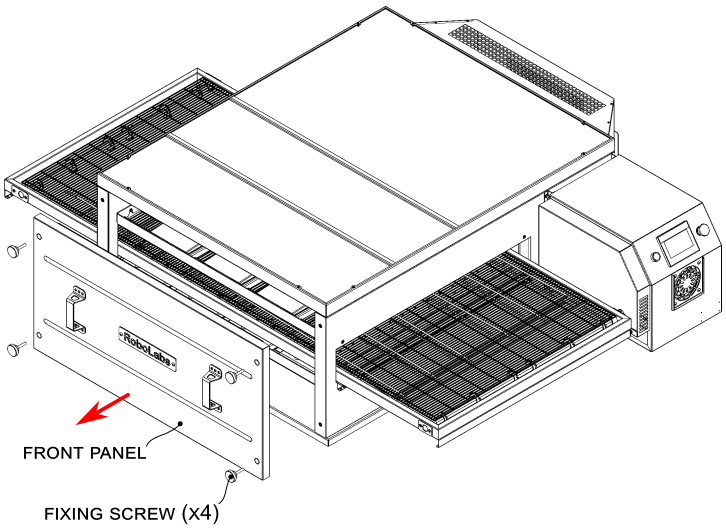


Figure 9

5. Remove three **upper air ducts**, see Fig. 10. To do this, take a duct by its end part, lift a bit and pull it out from the machine.

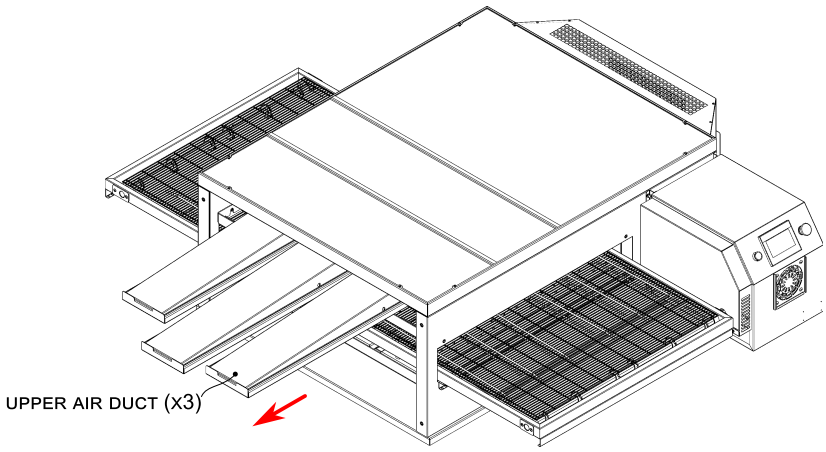


Figure 10

6. Take **upper holding bar**, lift it up, and then pull it out, see Fig. 11.

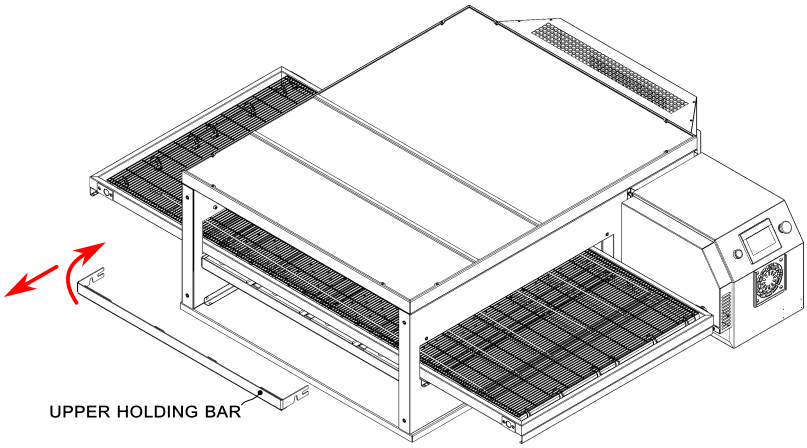


Figure 11

7. Clean upper air ducts and the upper holding bar from dust and grease. In case of severe contaminations, use suitable detergents in accordance with its instructions for use.

8. Remove **chain belt shroud**, see Fig. 12.
9. Stand in front of controls, take the **conveyor**, lift it a bit, push a bit inside so to loose the **chain belt**; then remove the chain belt, and finally take the conveyor out. **ATTENTION!** At least two person required to remove the conveyor.

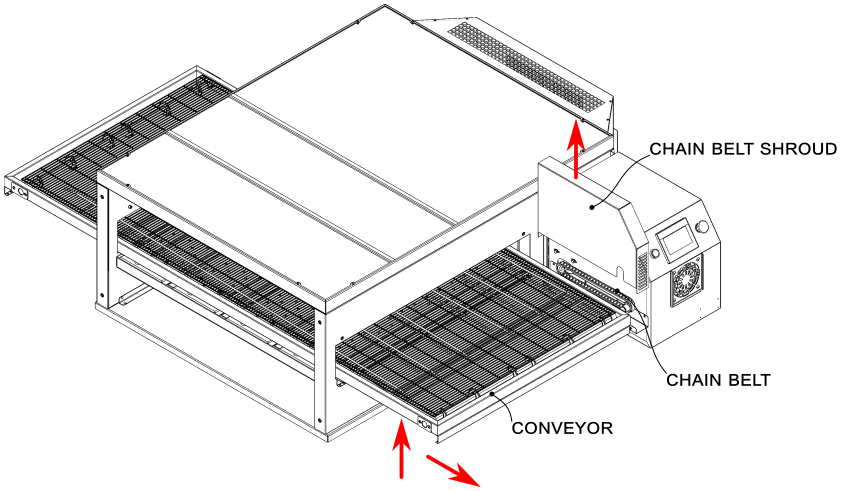


Figure 12

10. Remove four **lower air ducts**, see Fig. 13. To do this, take a duct by its end part, lift a bit and pull it out from the machine.

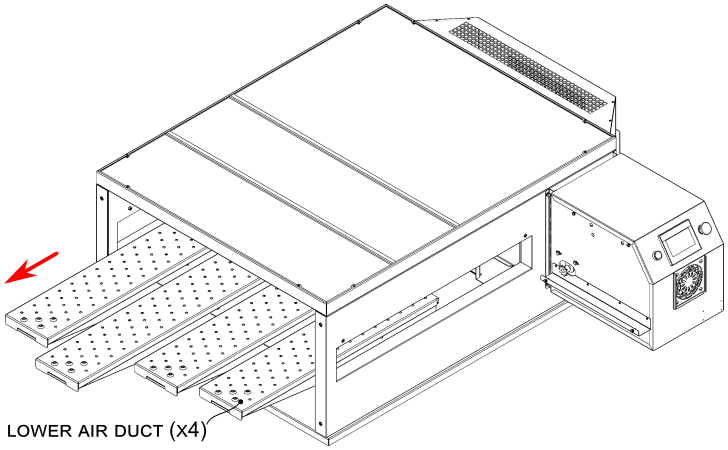


Figure 13

11. Take **lower holding bar**, lift it up, and then pull it out, see Fig. 14.

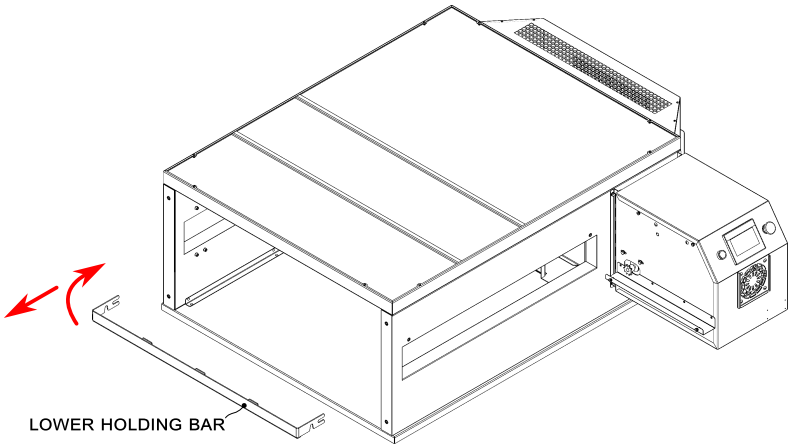


Figure 14

12. Clean lower air ducts and lower holding bar from dust and grease. In case of severe contaminations, use suitable detergents in accordance with its instructions for use.
13. Thoroughly clean internal surfaces of the machine, remove dust, grease, and debris. In case of severe contaminations, use suitable detergents in accordance with its instructions for use.
14. Assemble machine in the reverse order.

6 Technical service

⚠ DANGER

- ALWAYS unplug while servicing.
- Technical maintenance and repair MUST be conducted by a qualified technician only.
- A warning tag (DO NOT TURN ON! WORK IN PROGRESS!) must be placed at the switchboard during servicing.

⚠ WARNING

- Some surfaces are hot. Touching hot surfaces might cause burn. ALWAYS wait until cooled down before servicing.

⚠ WARNING

- ALWAYS use safety goggles while servicing.

To provide good and safe operation of the machine, it is a must to conduct technical maintenance on regular basis, and operating repair, as needed.

Technical maintenance — scope of work, which goal is to maintain the machine in operable condition during intended use.

Operating repair — scope of work, which goal is to recover the machine or its parts in case of malfunction, and renewal of its resource.

Technical maintenance Stage 1 must be conducted every 240 hours of machine's operation.

Technical maintenance Stage 2 must be conducted every 720 hours of machine's operation.

Operating repair must be performed as needed.

It is a must to conduct technical maintenance while performing operating repair.

6.1 Technical maintenance Stage 1 schedule

1. Ask the operators who work with the machine for any issues related to the machine and its operation.
2. Ensure that the machine is installed in accordance with the installation instructions (see section 3).
3. Visually inspect the machine to detect any faults or broken parts. Make photo as necessary.
4. Check the voltage in the wall receptacle. The value, measured between neutral terminal and each of phase terminal, must be 230 V ±10%.
5. Perform operation check (see section 3).
6. Unplug the machine. Inspect supply cord, cable plug, and wall receptacle. Pay attention to mechanical damages, damaged insulation, and colour changes. Replace damaged components.
7. Check the cable gland for supply cord. Cord must be tightly secured by the gland. Tighten loosen gland.
8. Check the control items: touchscreen, Emergency stop switch, START push button. Tighten their mountings, if necessary.
9. Remove chain belt shroud, clean chain belt and sprockets. Lubricate chain belt with a NSF H1 food grade lubricant suitable for chain belts with circumference speed up to 1,5 m/s.
10. Remove M5x12 screws and remove bearing hubs, see Fig. 15.
11. Clean the bearing hubs, remove dust, debris, and old grease from inside. Apply anti-seize NSF H1 food grade paste on the inner surface of the bearing hubs and mount the hubs back.

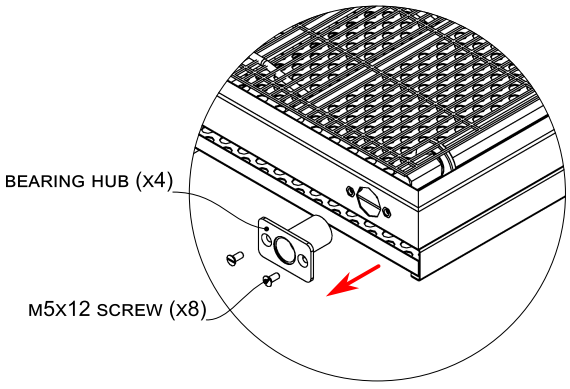


Figure 15

12. Check the resistance between the grounding terminal (GND terminal, see Fig. 17) and accessible conductive parts. The result must not exceed 0,1 Ohm.
13. Check connection and continuity of the equipotential bonding wire.
14. Make a note about conducted maintenance in the corresponding section of the machine's factory certificate.

6.2 Technical maintenance Stage 2 schedule

1. Unplug the machine. Open the electric panel. Remove dust and debris from inside.
2. Inspect internal wiring and components; pay attention to mechanical damages, insulation colour changing. Replace damaged wiring; restore markings on the wiring.
3. Clean MF fan's impeller and make sure that its rotor is not stalled. Check the fan operation.
4. Make sure that solid-state relays VS1, VS2 are tightly mounted on heat sink. Tighten if necessary.
5. Tighten contact joints and terminals of main current conducting parts, terminal block and connectors. Face up pitted contacts as necessary.
6. Remove **motor shroud**, see Fig. 16.
7. Inspect terminals of the **M1 motor** as well as respective wiring. Tighten terminals and face up pitted contacts as necessary.

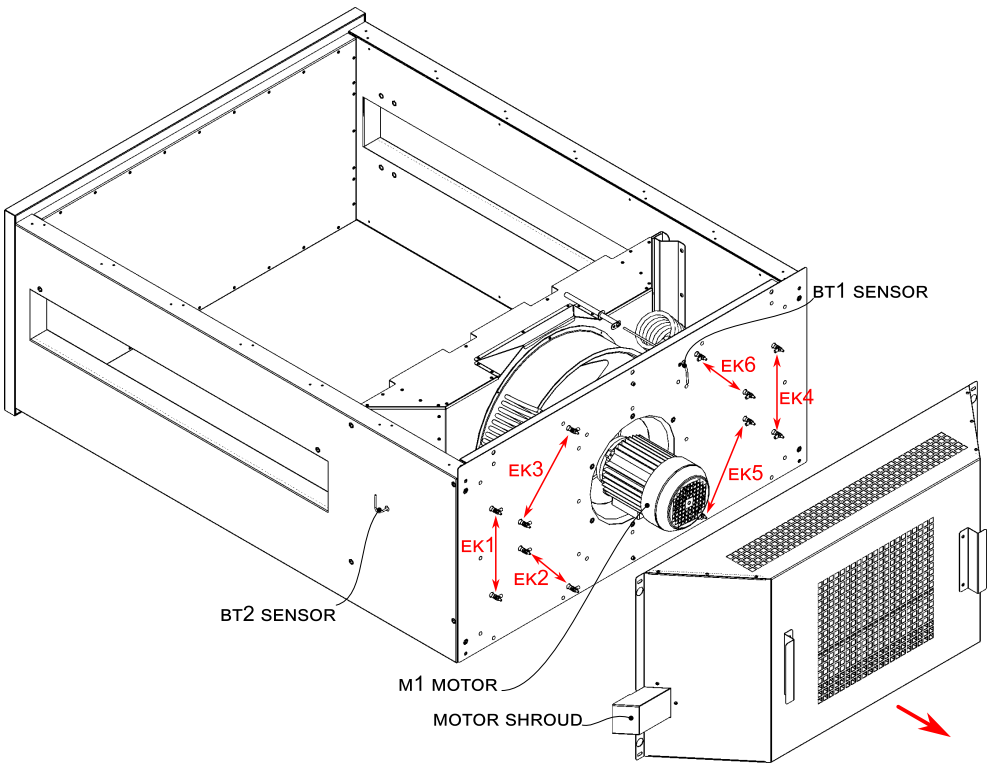


Figure 16

8. Make sure that M1 motor's rotor is not stalled.
9. Check M1 motor coils continuity, and also make sure that there is no ground fault.
10. Inspect terminals of the heating elements (**EK1**...**EK6**), as well as respective wiring. Tighten terminals and face up pitted contacts as necessary. In case if heating elements need to be replaced, use anti-seize electric-conductive paste while connect the wires to the terminals of the elements.
11. Check continuity of the heating elements, and also make sure that there is no ground fault.
12. Inspect wiring for **BT1** and **BT2 sensors**. Make sure that insulation on the sensors wiring is not damaged.
13. Make a note about conducted maintenance in the corresponding section of the machine's factory certificate.

6.3 Supply cord replacing

1. Unplug the machine.
2. Open electric panel.
3. Disconnect supply cord wires from terminals.
4. Release cable gland, remove old cord.
5. Insert new cord in the cable gland; connect to the terminals.
6. Tighten cable gland; make sure the cord is secured firmly and cannot move back and forth through the gland.
7. Close electric panel.

6.4 Thermal cut-out

Thermal cut-out (hereinafter — unit) connected to a sensor located in the heating elements area. Outupt of the limiter runs the contactor that feeds the heaters. In case of high rise of the temperature in the heaters area the module opens the contactor, thus de-energizing the heaters.

While in operation, the display reads temperature on heating elements and the unit is in operational mode.

There are two setting groups — Group 1 and Group 2. To enter Group 2, press and hold MODE for 4 seconds; release once display reads **PAr2**.

To enter Group 1, press and hold MODE for 2 seconds; release once display reads **PAr1**.

Press MODE to list parameters. Press «, to see current value of a parameter. Press » ^ to change the value. Press MODE to move to the next parameter.

When nothing pressed during 30 seconds, the unit returns back to operational mode. To return back to operational mode earlier, press and hold MODE few seconds.

To change set value (SV) use », ^, while the unit is in the operational mode.

It is a must to change parameters in the same order as they appear in the chart, except parameter LoC. It must be set to **oFF** to unlock other parameters. Once all parameters are set up, change the value of parameter LoC in accordance with the chart.

After changing parameters **In-t** (sensor type), **UnIt** (measurement units), parameters **H-Su**, **L-Su**, **AL1**, **AL2**, **AHYS** are initialized and must be set again. The unit has more parameters than listed in the chart. Skip a parameter if it is not in the chart. Parameters might be locked (depending on current value of parameter LoC). Before setting up parameters, set parameter LoC to 'oFF'.

Group	Parameter	Value	Designation
Par2	In-t	YCA	Sensor type
Par2	L-su	0300	SV low limit
Par2	H-su	0600	SV high limit
Par2	C-nd	onoF	Control type
Par2	oUt	SSr	Control output type
Par2	AL-1	An2.A	AL1 operation mode
Par2	AHYS	50	Alarm output hysteresis
Par1	AL1	50	AL1 alarm temperature set value
SV	SV	590	Set value
Par2	LoC	LoC3	Lock setting (all locked)

6.5 Stepper driver

Stepper driver DD drives the motor M2 that actuates conveyor.

Driver appearance and its terminals layout are shown on Fig. 17.

Current-limiting resistors R1, R2 are spliced into the the wire coming to the “PUL-” and “DIR-” terminals (also see wiring diagram).

Driver operation mode is defined by positions of eight dip-switches on the driver, marked as SW1...SW8. The driver factory settings are the following:

SW#8	OFF
SW#7	ON
SW#6	ON
SW#5	OFF
SW#4	OFF
SW#3	ON
SW#2	OFF
SW#1	OFF

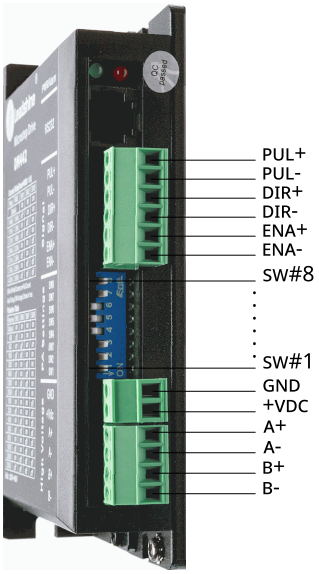


Figure 17

6.6 Electric panel layout

Electric components designations is shown on Fig. 18. For component designations see wiring diagram.

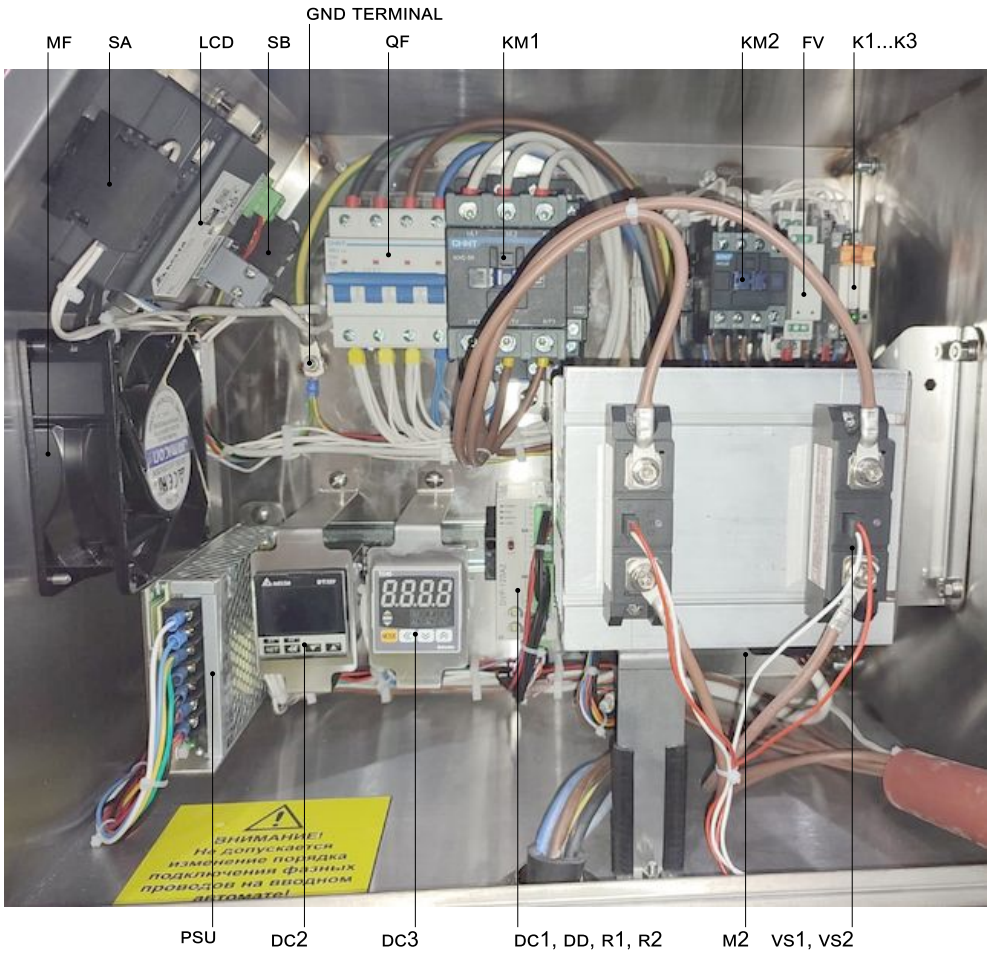


Figure 18

6.7 Troubleshooting

Trouble	Possible reason	Remedy
Touchscreen doesn't turn on after START button is pressed.	Machine is not plugged to the mains.	Plug in the machine to mains.
	Emergency stop switch is actuated.	Check the position of the switch. Release if actuated.
	No power in the wall receptacle.	Check the voltage in the receptacle.
	Supply cord fault.	Check supply cord for continuity. Replace fault component.
	QF circuit breaker is off.	Check the circuit breaker, turn on.
	SA emergency stop switch is actuated.	Release the switch.
	Emergency stop switch SA fault.	Check the switch operation. Replace fault component.
	SB button fault.	Check the button operation. Replace fault component.
	K1 relay fault.	Check relay operation. Replace fault component.
	K2 relay fault.	Check relay operation. Replace fault component.
	PSU power supply unit PSU fault.	Check the unit operation. When 230 V ±10% provided on the unit's input terminals L, N, then 24 Vdc voltage must present at the output terminals +V, -V of the unit. Replace fault component.
	Touchscreen LCD wiring fault.	Check continuity between: • LCD touchscreen • PSU power supply unit Restore connection, face up pitted contacts, tighten loosen contacts.
	Wrong supply polarity on LCD touchscreen.	Check and fix supply polarity.
	LCD touchscreen fault.	If the screen doesn't show anything while it is connected to power, replace the screen.

Trouble	Possible reason	Remedy
	Open circuit.	Check continuity between: • cord plug • QF circuit breaker • KM2 contactor • SB button • PSU power supply unit • K1, K2 relays Restore connection, face up pitted contacts, tighten loosen contacts.
Machine doesn't turn off after ⏻ pressed.	Relay K1 fault.	Check relay operation. Replace fault component.
	Open circuit.	Check continuity between: • DC1 controller • K1 relay Restore connection, face up pitted contacts, tighten loosen contacts.
Warning message «ВНИМАНИЕ! ПРОВЕРЬТЕ ПОДКЛЮЧЕНИЕ К СЕТИ» on the screen.	Wrong phase sequence.	Swap any two phase wires in the cord plug.
Machine doesn't heat up, or heats up slowly.	EK1-EK6 heaters fault.	Check the heaters. Replace fault component.
	VS1, VS2 solid-state relays fault.	Check solid-state relays. Replace fault component. When installing new relay, apply thermal paste between relay and heat sink. In case of solid-state relay fault, clean MF fan impeller, check fan operation. Tighten loosen screws (that fix the relays to heat sinks). Check air filter. Replace fault component.
	KM1 contactor fault.	Check operation of the contactor. Replace fault component.
	Wrong settings of DC3 thermal cut-out.	Set up the thermal cut-out.
	DC3 thermal cut-out fault.	Check thermal cut-out operation. With AL1 indicator on, there should be mains voltage on terminal 7 of the thermal cut-out. Replace fault component.

Trouble	Possible reason	Remedy
	Wrong settings of DC2 temperature regulator.	Set up the temperature regulator.
	DC2 temperature regulator fault.	When properly set, after turning machine on to heating up stage, there should be 24 Vdc present on terminals 5 and 6 of the regulator. Replace fault component.
	BT1 temperature sensors fault.	Check continuity of the sensor. Replace fault component.
	BT2 temperature sensors fault.	Check continuity of the sensor. Replace fault component.
	Open circuit.	Check continuity between: • EK1-EK6 heaters • VS1, VS2 solid-state relays • KM1 contactor • DC1 controller • DC2 temperature regulator • DC3 thermal cut-out Restore connection, face up pitted contacts, tighten loosen contacts.
Turbine doesn't spin.	Relay K3 fault.	Check relay operation. Replace fault component.
	M1 motor fault.	Check motor coils continuity. Check if there is ground fault. Check if the motor's rotor is not stalled. Replace fault component.
	KM2 contactor fault.	Check contactor operation. Replace fault component.
Conveyor doesn't work.	Mechanical issues in conveyor or chain belt.	Check operation of conveyor's moving parts. Inspect and see if the bearing hubs that holds both shafts of the conveyor are not worn out. Replace the bearing hubs if necessary.
	M2 motor fault.	Check motor coils continuity. Check to see if the motor's rotor is not stalled. Replace fault component.
	Wrong DD stepper driver settings.	Set up the driver in accordance with factory settings.

Trouble	Possible reason	Remedy
	DD stepper driver fault.	Press  on the start screen. Check to see if voltage impulses present on output terminals A+/A-, B+/B- of the driver. Replace fault component.
	Open circuit.	Check continuity between: • M2 motor • DD stepper driver • R1, R2 fixed resistors • DC1 controller Restore connection, face up pitted contacts, tighten loosen contacts.
Switchboard circuit breaker trips whenever machine is turned on.	Short circuit in the machine.	Locate and eliminate short circuit in the machine. Replace fault component.