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**Caution!**

Please read this manual carefully before using the Desktop Injection Molding Automated Machine Microplast 2019.

This operating manual (hereinafter OM) includes general information intended to familiarize the operating personnel with the operation and operating rules of the Desktop Injection Molding Automated Machine Microplast 2019 (hereinafter referred to as the machine). The document contains technical characteristics, description of the design and principle of operation, as well as information necessary for the correct use of the product. Before getting started, it is necessary to familiarize yourself with this manual, since the operation of the device must be carried out by persons familiar with the principle of operation and design of the machine.

Proper and effective use of the machine requires mandatory availability:

- Conditions for polymer details manufacturing when using this machine;
- Trained, and familiar with this OM user.

The enterprise-manufacturer reserves the right to make non-critical changes, without impairing product specifications. These changes may not be mentioned in the text of this document.

The scope of delivery of the instrument includes the operational documentation including this operating manual and the instrument passport.

## 1 DESCRIPTION AND OPERATION OF THE DEVICE AND ITS COMPONENTS

### 1.1 The purpose of the device

Desktop Injection Molding Automated Machine Microplast 2019 is intended for polymers molding into steel press-forms under pressure. The machine is designed for long-term usage 7/24.

### 1.2 Technical characteristics of the machine

Desktop Injection Molding Automated Machine Microplast 2019 allows operator to mix and color polymers. Technical characteristics of the machine are presented in Table. 1.1.

Table 1.1 – Specifications

| General Machine characteristics                          |                   |
|--|-------------------|
| Overall dimensions                                       | 800x300x250 mm    |
| Weight, not more   | 30 kg             |
| Power supply   | 220 V             |
| Main   | 50-60 Hz          |
| Amperage, not more                                       | 2.5 A             |
| Watt consumption, not more                               | 400 W             |
| Technical characteristics                                |                   |
| Injection system   | intrusion         |
| Cycle time, depends on the press-form                    | 6-15 sec          |
| Volume of injection                                      | 2 cm <sup>3</sup> |
| Compression force  | 1000 kg           |
| Adapter plate (plate for press-form fixation) dimensions | 120x120 cm        |
| Stroke motion of adapter plate                           | 150 mm            |
| Regulated temperature range, maximum                     | 310 °C            |
| Accuracy of temperature maintenance                      | 2 °C              |
| Quantity of temperature zones                            | 2                 |
| Bore diameter  | 16 mm             |
| Nozzle diameter  | 1 mm              |
| Memory of the modes (press-forms)                        | 50 modes          |
| Operating conditions                                     |                   |
| Ambient air temperature, ° C                             | from -45 to +40   |
| Relative humidity, %                                     | up to 80 at 25 °C |
| Atmospheric pressure, kPa                                | from 84 to 106,7  |

**1.3 Standard delivery set**

- Desktop Injection Molding Automated Machine Microplast 2019 ..... 1 pc.
- Control module with touch screen ..... 1 pc.
- Power cable ..... 1 pc.
- Connecting cable (machine-control module) ..... 1 pc.
- Operation manual ..... 1 pc.

**1.4 General view**

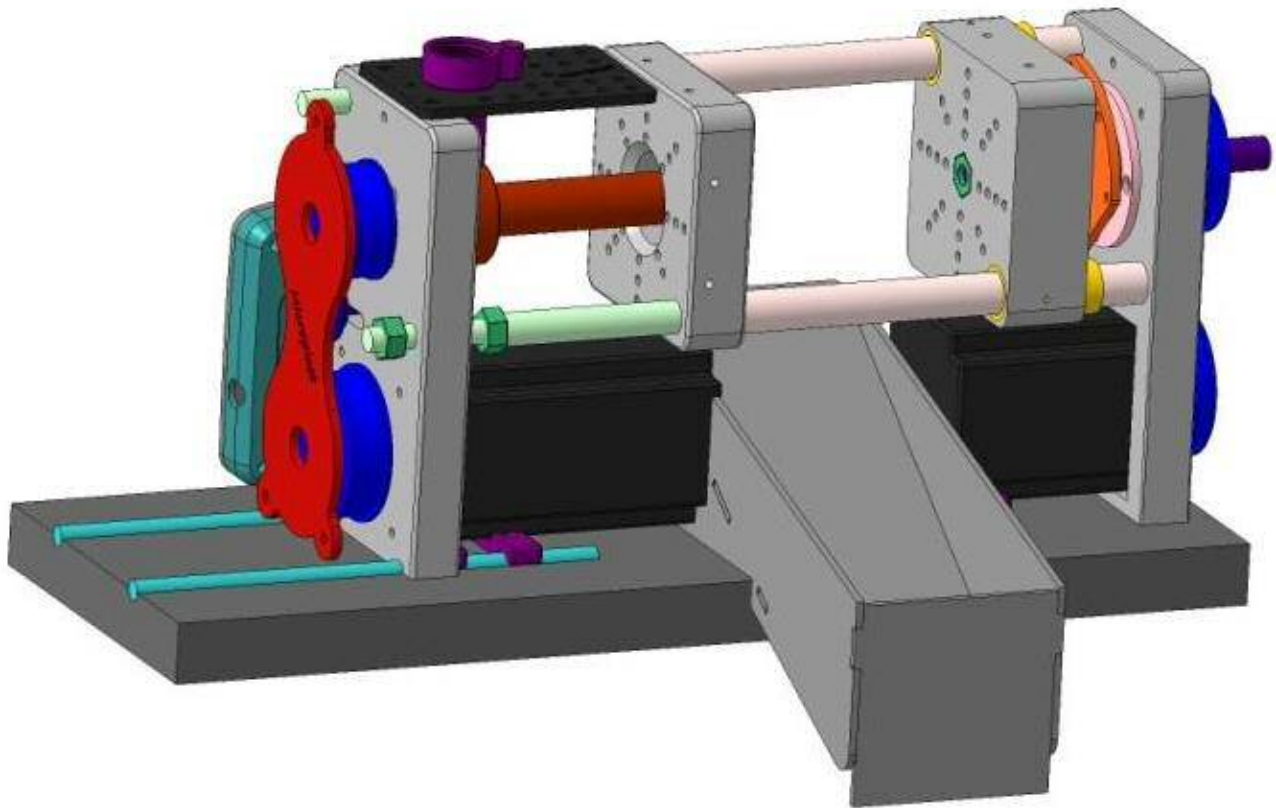


Figure 1 – General view of Desktop Injection Molding Automated Machine Microplast 2019

**1.5 Marking and sealing**

On the machine is applied to the symbol with the trademark of manufacturer, year of manufacture, as well as the machine serial number.

**1.6 Packing**

The machine, electric box and control module are delivered in a package, excluding their damage during transportation.

## 2 INTENDED USE

### 2.1 Operational limitations

Operation of the machine should be carried out under the influence of factors and taking into account the parameters of polymer details manufacturing in accordance with the specified technical documentation, and the machine must be used within its technical characteristics.

Only qualified personal, familiar with the operation manual is allowed to use this machine.

### 2.2 Operating conditions

The conditions for the operating are to be prepared in accordance with the recommendations above (operating conditions), normative and technical documentation for polymer details manufacturing.

### 2.3 Preparing for use

After the machine is unpacked, set up it on the table or flat surface. Electric box of the machine should be located on the opposite side to the operator. Injection unit is on the left-hand side, compression unit is on the right. Near the machine, put control module on convenient for you place.

1. Connect control module with the machine via connecting cable and fasten connector securely in control module by screws.



#### Caution!

DO NOT plug-in or plug-out connecting cable when the machine is turned on, it ALWAYS causes damages of the machine

2. Plug in power cable into the socket of control module.
3. Plug in power cable into the main socket.
4. Turn-on the machine by button on the back panel of control module. After 1 sec operation parameters of the machine will be shown on the screen. The machine is ready for operation.

### 2.4 Operator controls

All the operator controls are placed in separate unit - control module.

Control module allows operator to set and to control the machine parameters.

Keypad with 5 buttons is designed to control the main machine functions, and is located on the front panel of the control module.

“1” button – MOLD CLAMPING, START

“2” button - MOLD RELIESE

“3” button - INJECTION

“4” button – PRESSURE RELIESE

“5” button - STOP



Figure 2 – Keypad (front panel) with 5 buttons to control the main machine functions

To select and change the parameter operator should touch it on the screen. After that the selected parameter will get inversion color. Use “+” and “-” buttons on touch-screen to set the value of the parameter. These values are used until the machine power-off.  
To save all the parameters in the machine memory, operator should use memory buttons on changing keyboard at the center of touch-screen.  
In the Figure changing keyboard is encircled, its intended use is changed by right “arrow” button.



Figure 3 - Changing keyboard at the center of touch-screen

In the following Table 1 are shown all the parameters, which are displayed on the screen.

**View of control panel on touch-screen**

**NOTES**

|                    |  |   |   |  |  |
|--------------------|--|---|---|--|--|
| <b>TIME</b>        | Injection time of the material under high pressure | Injection time of the material under low pressure | Cooling time of molding in press-form   | Pause between cycles                   | Parameter is selected on touch- screen, and is set by “+” and “-” buttons. User can change parameters while the machine is operating and in any mode. Next cycle will start with new parameters.   |
| <b>SPEED</b>       | Speed of high pressure                             | Speed of low pressure                             | Speed of press-form opening (releasing) | Speed of press-form closing (clamping) | Parameter is selected on touch- screen, and is set by “+” and “-” buttons. User can change parameters while the machine is operating and in any mode. Next cycle will start with new parameters.   |
| <b>TEMPERATURE</b> | Temperature of the load zone                       | <b>Button of “ZERO” coordinate setting</b>        | Temperature of the nozzle zone          |  | “ZERO” button need a long-press (at least 3 sec). ZERO process must be gone when press-form is closed ONLY.  |
| Changing panel 1   | x-coordinate before pusher starts                  | Stroke of pushing out                             | Speed of pushing out                    | Quantity of pusher starts              | Parameters for pushing the product out of the press-form. User can change parameters while the machine is operating and in any mode. Next cycle will start with new parameters.  |
| Changing panel 2   | Coordinate for servomechanism starting             | Time of servomechanism operating                  | Zero speed                              | Turn on/off servomechanism in cycle    | Parameters for servomechanism  |
| Changing panel 3   | Load parameters to memory                          | Number of memory cell                             | Load parameters from memory             |  | Number of memory cell is changed by “+” and “-” buttons. User can load parameters to/from memory at any time and in any mode.  |
|                    | <b>+</b>   |   | <b>-</b>                                |  | “+” and “-” buttons for parameter changing. Available at any mode.   |
|                    | <b>Manual mode</b>                                 | <b>Cycle counter</b>                              | <b>Turn on/off heating process</b>      |  | Long pressing of “cycle counter” button is for “ZERO” setting. “Manual mode” button allows two select two speed values: clamping and releasing of press-form. Use low speed for correct “ZERO” setting of the machine and determination of x-coordinate for pushing out. |
|                    | <b>Semiautomatic mode</b>                          | <b>“Emergency stop” button</b>                    | <b>Turn on/off cooling fan</b>          |  | In semiautomatic mode the machine stops after press-form is opened (released). And the next cycle is starting after operator pushes the “1” button (MOLD CLAMPING).  |
|                    | <b>Automatic mode</b>                              |   | <b>Turn on servomechanism</b>           |  | Servomechanism is operating while the turn-on button is pressed. When the button is released, the servomechanism stops.  |

## 2.5 “ZERO” setting



### Caution!

After the machine is power-on, EVERYTIME before starting “ZERO” setting must be made.

By “ZERO” setting operator sends information to the machine about the exact location of its parts. To make “ZERO” setting do following:

- Clean the press-form. Please, check to be sure about nothing inside the press-form can damage it;
- Use Manual mode and press the button for clamping. Wait until press-form is closed;
- Press the button “MANUAL” and select slow clamping mode SLOW;
- Press the button “1” (MOLD CLAMPING). Operator must make very tight and exact press-form clamping.

*NOTE: it is recommended to do it by short pushing the button “1” (MOLD CLAMPING);*

- Press the button “ZERO” and hold it at least 3 seconds. As a result, X-coordinate becomes equal to 0.



### Caution!

**“ZERO” setting should be repeated in case of press-form replacement, power outage, not enough tight clamping, breakdown in machine.**

## 2.6 Press-form setting

1. At first, X-coordinate before pusher starts and pushing length are to be determined. These values are displayed in the center of the screen.



### Caution!

This procedure is obligatory. In other case press-form and machine are getting damages.

2. Input data about press-form and material in required cells:

OPEN - X-coordinate before pusher starts;

LENGTH – length of pusher motion;

SPEED – speed of pushing the product out of the press-form

AMOUNT – quantity of pusher starts





### 2.7 Manual mode

Manual mode is setting by default after the machine is powered-on.

Operator can force on Manual mode by pushing the button “MANUAL”.

The button “MANUAL” is green when Manual mode is on.

In Manual mode all the machine operations are controlled by required buttons, but operations are executed while button is hold only. When button is released operation (movement) stops.

### 2.8 Automatic mode

To start Automatic mode operator needs to do the following:

1. Make sure, that material is heated well and flows free-and-easy into the press-form. In Manual mode push the button “2” (MOLD RELIESE) and open the press-form in order to see gating nozzle.
  2. Press for short the button “3” (INJECTION). Material should come out of the gating nozzle into the open press-form.
  3. Press for short the button “4” (PRESSURE RELIESE) and remove injected material from the press-form by tweezers.
  4. Press the button AUTO and after that instantly push the button “1” (MOLD CLAMPING).
- Operator can stop the machine by STOP buttons: on keypad (button “5” on front panel) or display.

### 2.9 Semiautomatic mode

In Semiautomatic mode the machine stops at the end of every cycle. After press-form opens and plastic molding is pushed out, the machine stops the cycle. Operator starts the cycle by pushing START button (CLAMPING).

Semiautomatic mode is turned on by button “SEMI”. The button “SEMI” is green when Semiautomatic mode is on.

### 2.10 Available options

The machine is provided for optional devices connection to make design and maintenance of press-forms easier.

1. The machine allows to use cooling: fan or pump.
2. Power line output: voltage 12V, current not more 1.0A. Intermediate relay with required load characteristics should be used for more powerful devices. Cooling system is turned on by button “FAN” on the screen. Cooling is turned off by the second push of “FAN” button.

SERVOL defines X-coordinate for turning on servomechanism. If SERVOL is 0, the button ZEROSPEED is activating. If it is necessary to turn on servomechanism from zero (X-coordinate = 0), operator can decrease speed of press-form opening, speed value could be set in cell ZEROSPEED. SERVOTIME – is operating period of servomechanism.



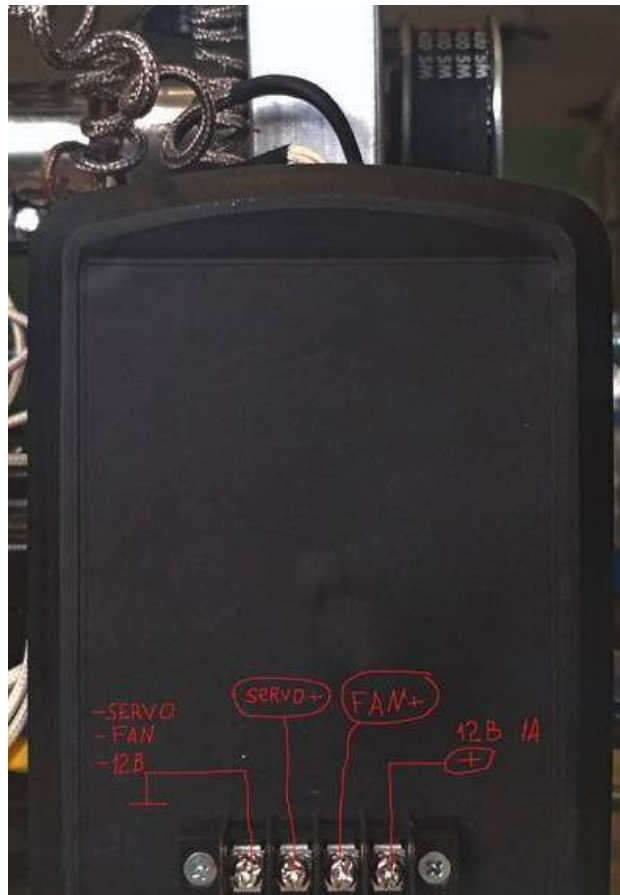
ZEROSPEED – speed of press-form opening. It is active when SERVOL=0.  
SERVO AUTO OFF – used to turn ON/OFF the servomechanism (by default – OFF).



Terminal 12V is common to all.

Terminal SERVO+ is connection on DC motor of servomechanism, electromagnet with current not more 1A.

Terminal FAN+ is for cooling fan connection, voltage 12V and current not more 1A.



Connection of optional devices

### 3 TECHNICAL MAINTENANCE OF THE PRODUCT AND ITS COMPONENTS

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#### 3.1 Security measures

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It is recommended that the device commissioned be periodically inspected for monitoring purposes:

- performance;
- compliance with the operating conditions;
- absence of external damage to the component parts of the device.

Persons who have received safety instruction are allowed to use the device.

#### 3.2 Warranty

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##### 3.2.1 Basic warranty

The manufacturer guarantees the conformity of the device to the requirements of the technical conditions under the user's compliance with the conditions of transportation, storage and operation, and timely maintenance. Warranty period is one year.

The warranty for the machine begins to operate from the date of purchase of the device, as a rule, on the day of shipment of the device to the customer. In the case that the device is purchased by an intermediary company, the beginning of the warranty period is the time of transfer of the device to the intermediary.

Spare parts installed during the warranty repair process are covered by the guarantee (until the end of the warranty period).

Spare parts replaced during warranty service under warranty are not returned to the owner of the machine.

Parts that are subject to wear during the operation of the machine fall into two main categories. The first includes those parts that require replacement or adjustment at the interval prescribed by the maintenance schedule of the device, and to the second wear elements, the frequency of replacement or adjustment of which depends on the operating conditions of the device.

The parts listed below have a limited service life and need to be replaced or adjusted at intervals prescribed by the maintenance schedule of the device. The basic warranty extends to these parts until the moment when their first replacement or adjustment is required. The warranty period for each part cannot exceed the restrictions (on the time of operation of the device or operating time) specified in the conditions of the basic guarantee.

- built-in rechargeable batteries;
- gaskets, if they are removed in connection with the concomitant adjustment;
- oil and working fluids.

*Note: The wear by friction does not extend the guarantee, if these parts fail due to normal wear during use of the appliance. However, if during the warranty period these parts fail due to an initial defect in the material or workmanship, they will be repaired or replaced according to the basic warranty.*

##### 3.2.2 Duties of the owner

The “Operation Manual” contain information on the proper operation and maintenance of your device. Proper operation and maintenance of the machine will help the user avoid expensive repairs caused by incorrect operation, neglect or improper maintenance. In addition, following our recommendations increases the life of the machine. Therefore, the owner of the machine should:

- If a defect or fault is detected, send your machine or failed part as soon as possible to the manufacturer or an authorized dealer for warranty repairs. This will help to minimize the repair required by your device.
- Use only recommended by our company spare parts, oil etc.
- Carry out maintenance for your appliance in accordance with the operating instructions.

*Note: Neglect of timely maintenance of the device in accordance with the prescribed schedule deprives you of the rights to warranty repair or replacement of defective parts.*

- Regularly clean the machine and its parts in accordance.
- Keep operating and storage conditions in accordance with the recommendations.

### **3.2.3 Warranty Limitations**

Our company is not responsible if the need for repair or replacement of parts was caused by one of the following factors:

- Damage caused by negligent / improper operation of the appliance, a natural disaster, water ingress into the appliance, the probe, accessories and parts of the appliance (in the absence of a production fault) by an accident or using the appliance for other purposes;
- Operational wear of parts;
- Failure to comply with these recommendations for maintenance of the machine within the specified time;
- Violation of the operating conditions of the device;
- Changes in the design of the device or its components, interference with the operation of the instrument systems, etc., without agreement with the manufacturer;
- Use of batteries and other components of improper quality;
- Voltage drop in the mains;
- Deny to timely correct any damage identified during routine maintenance;
- Factors beyond the scope of company control, for example: air pollution, hurricanes, chipping, scratches and the use of unsuitable cleaners;
- Use of repair technologies not approved by our company;
- Use of non-recommended by our company spare parts and fluids.

### **3.2.4 Other cases not covered by the warranty**

The basic warranty excludes the liability of our company for any unforeseen or consequential damage incurred because of a defect covered by the above warranties. Such damage is (but is not limited to the following list):

- compensation for inconvenience, phone calls, costs of placing and transferring the device, loss of profits or damage to property;
- all warranties become invalid if the device is officially recognized as not subject to repair.

### **3.2.5 Guarantees and consumer legislation**

The basic warranty do not infringe upon your legal rights granted to the user by the purchase and sale contract, which is drawn up upon the purchase of the device from the manufacturer or dealer. As well as applicable local legislation defining the rules for the sale and servicing of consumer goods.

## **3.3 Maintenance of the machine**

Maintenance of the machine is performed during the entire service life and is divided into:

- preventive;
- planned.

Preventive maintenance is carried out not less often than once in three months and includes external inspection, clearing and greasing.

Planned maintenance is carried out by user at least once a year and is a mandatory requirement for maintaining the guarantee from the manufacturer.

It is very important to carry out its maintenance in a timely manner throughout the life of the machine.

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## 4 MAINTENANCE

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The machine by type of performance and taking into account operating conditions refers to products that are repaired at special enterprises or at the manufacturer.

To set the device for warranty service in the service center (SC), it is necessary to present correctly completed passport for the device. SC makes a mark in the passport about setting the device for warranty service and sends a photocopy to the manufacturer.

Sending the device for warranty (post-warranty) repair or verification should be done with the passport of the device. In the accompanying documents it is necessary to indicate the mailing details, telephone and fax of the sender, as well as the way and the address of the return delivery.

Warranty repair is carried out in the presence of a completed passport.

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## 5 STORAGE

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Store the machine at an ambient temperature of +5 ° C to +40 ° C and relative humidity up to 80% at a temperature of 25 ° C.

In the case of short-term storage and during interruptions between applications, the machine must be stored in a suitable packaging container. In the storage place there should be no vapors of corrosive substances (acids, alkalis) and direct sunlight. The machine must not be subjected to sudden shocks, falls or strong vibrations.

The machine should be stocked on shelves or stocked in transport packaging.

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## 6 TRANSPORTATION

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Packed machine can be transported by any mode of transport provided the following conditions are met:

- transportation is carried out in factory packaging;
- there is no direct exposure to moisture;
- the temperature does not exceed -50 ° C to +50 ° C;
- humidity does not exceed 95% at temperatures up to 35 ° C;
- vibration in the range from 10 to 500 Hz with amplitude up to 0.35 mm and acceleration up to 49 m / s<sup>2</sup>;
- impacts with a peak acceleration value of up to 98 m / s<sup>2</sup>;
- the machine placed in the transport are fixed to avoid falling and collision.

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## 7 RESYCLING

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The product does not contain in its design any dangerous or poisonous substances that can harm human health or the environment and do not pose a threat to life, health of people and the environment at the end of their service life. In this regard, the recycling of the product can be made according to the rules for the disposal of general industrial waste. Recycling is carried out separately by groups of materials: plastic elements, metal fasteners.