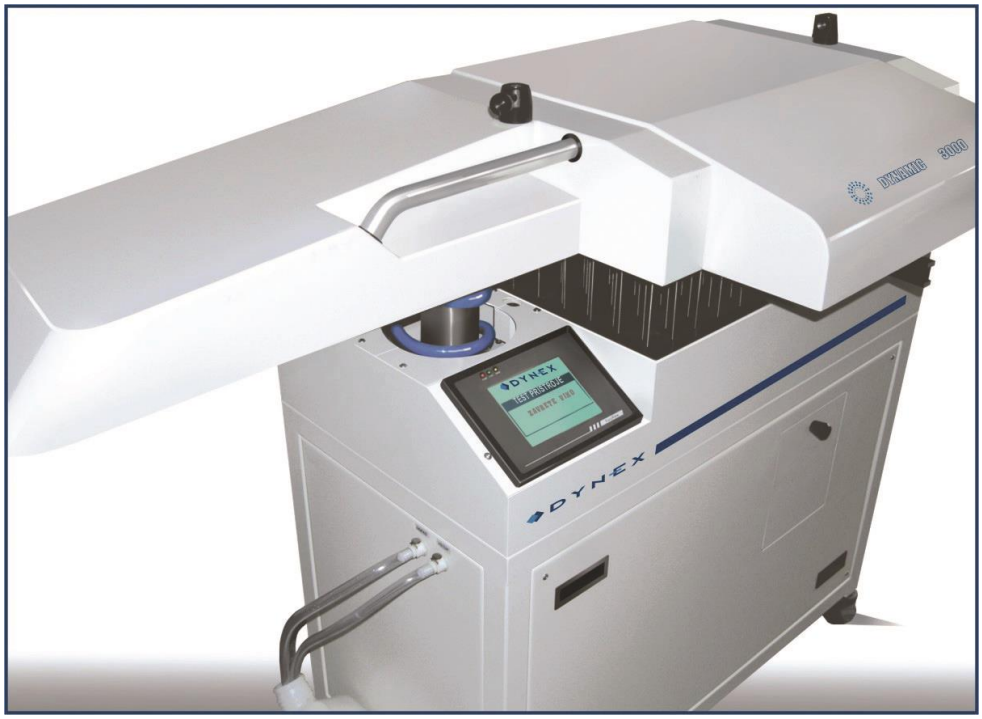
Microplate strip filler

DYNAMIC



Manual for operation and maintenance

CE

Ver_01
Rev_20.8.2018

Information contained in this manual is required for the operation of the instrument. Therefore please read the manual thoroughly. Pay attention to notes related to the safe operation of the instrument.

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Ver_01
Rev_20.9.2018

Contents:

1 Introducing the device

DYNAMIC is a compact device for semi-automatic filling of microtiter plates with a maximum of 96 different reagents. Communication with the operator is provided with a color touchscreen that allows comfortable control of the main computer. The filled reagents are placed in plastic bottles in the working bathtub of the device. The reagents are transferred from working bathtub by air pressure to the filling head, which filling them into the microtiter plate by opening all 96 reagents in one work cycle.

Starting the work cycle is done manually by pressing a button or by automatically inserting the microtiter plate into the holder. Number of filled plates is indicated on the device panel. Working pressure and head opening time are programmable. A diaphragm oil-less compressor is used as the source of compressed air, the gas pressure is further precisely regulated by the internal controller. This allows the filling mode to be customized to the specific user requirements. To maintain accurate filling, the device is equipped with compensation for hydrostatic pressure variation, when liquid is dispensed, and fine manual volume correction. The lid of the bathtub is operated manually with both hands, the handle is used in the left part of the lid. After lifting the lid into the upper dead center, the lid can rotate around the vertical axis counterclockwise to access the working bathtub. Rotating simultaneously secures the lid automatically so that the reagents can be safely prepared in the bathtub. After the reagents have been prepared, the lid is released after reverse rotating and is dropped. Sealing the lid is performed by gently tightening the two locking screws on top of the lid.

To fill flushing liquids, a peristaltic pump can be used to inject liquid into the nozzle on the left side of the device and pump it into the bathtub area. Another pump is used to aspirate excess liquid from the bathtub into the waste. Also, liquid flowing through the head during filling is drained into the waste by a peristaltic pump.

2 Technical specifications

Type
DYNAMIC

Dimensions	: (600 x 1400 x 1020) mm WxLxH
Weight	: 166 kg
Degree of protection	: IP 20
Compressed air source	: membrane compressor max. pressure 4 bar

Electrical power

Voltage	: 230V
Frequency	: 50-60 Hz
Maximal input power	: 850VA

Dosage

Dosing pressure	: 20 – 200 mbar
Number of reagents dosed	: 96
Materials in contact with washing solutions	: bathtub, needles – stainless steel dosing hose- silicone rubber inlet hose- PVC
Materials in contact with dosing solutions	: bathtub, needels – stainles steel dosing hose- silicone rubber
Approx. fill time in manual mode	: 2s
Approx. fill time in automatic mode	: 0,6s

Class A ITE

Notice: Product class A. In a home environment, this poduct may cause high-frequency interference. In this case, the user may be required to take appropriate action.

3 General instructions and safety

3.1 General instructions and use

Use the DYNAMIC device as described in this manual and observe the safety regulations. If the device is used in a manner other than that recommended by the manufacturer, the protection provided by the device may be impaired.

Do not use too aggressive washing solutions that can damage the bath (stainless steel) or the connection and dosing hoses (PVC and silicone rubber) of the device. Only water or weak aqueous solutions of acids and lyes may be used. Do not use wash solutions warmer than 50 ° C. Handle the lid of the bathtub with both hands carefully, always secure the raised lid by rotations against closing.

Do not remove covers, do not open the device when it is plugged into the mains. There are no user controls inside the device.

3.2 CE Labelling

On the basis of the following guidelines and information in the manual product carries the CE mark.

** For more information, see Declaration of Conformity.*

3.2.1 Directive 98/79/EC about diagnostic medical devices in vitro

Risk management analysis was conducted for this instrument. This analysis is part of documentation of the instrument.

3.2.2 Directive 2014/30/EU: Electromagnetic compatibility (EMC)

The instrument was tested by an independent accredited test laboratory, which found that the instrument meets the requirements of following technical standards.

Measurement of radiated interference

Testing was performed according to ČSN EN 55011 Class B industrial, scientific and medical equipment - Radio disturbance characteristics - Limits and methods of measurement.

Endurance

The instrument was tested in accordance with ČSN EN 61326-1 electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements.

3.2.3 Directive 2014/35/EU Electrical safety (LVD)

The instrument was tested by an independent accredited testing laboratory, and is in conformity with the provisions of the directive 2014/35/EU relating to electrical safety. Testing was performed according to the following technical standards:

ČSN EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

ČSN EN 62304 Software of medical devices – Lifecycle of Software processes.

The software is in accordance with the requirements of standard ČSN EN 62304.

3.2.4 Directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

The instrument meets the requirements of the directive and does not contain hazardous substances covered by the directive.

Directives that are not designed to bring the CE mark but have a significant impact on the device's life cycle include the European directive on the disposal of waste electrical and electronic equipment.
For disposal are established rules that are in accordance with the European Directive 2012/19/EU on waste electrical and electronic equipment.

Disposal Recommendation

When recycling /disposal, contact your supplier. Please note that in case of contaminated instrument is the user's responsibility to ensure that the product has been decontaminated before disposal, and the user is required to provide a certificate of decontamination for their suppliers, which will ensure the destruction of goods.

4 Installation of the device

4.1 Handling and unpacking

The DYNAMIC is powered by mains voltage. The power connection socket together with the switch is in the right side wall, quick connections for flushing liquids and waste are on the left side.

The device is equipped with a chassis with four lockable wheels allowing easy transport over a shorter distance within the laboratory/room. For long-distance transport, a suitable lifting mechanism (e.g. forklift truck) must be used for handling or loading the machine on a pallet. When handling, care must be taken to ensure that the lifting mechanism is properly lifted and that the machine is properly balanced when lifting. The center of gravity is approximately below the center of the lid. Lock the wheels after placing the device on a suitable location. Unpack the accessories from the shipping container and check the completeness and condition of the items according to the following list:

1. DYNAMIC
2. Network cable
3. Dosing hose - 2 pieces
4. Manual for operation and maintenance
5. Washing solution container – 2 pieces

If the device DYNAMIC is damaged or incomplete, please contact the DYNEX TECHNOLOGIES or your local distributor.

4.2 Environmental requirements

The device is designed to be placed in an indoor environment. Place DYNAMIC in a room so that it is protected from excessive dust, vibrations, strong magnetic fields, direct sunlight, drafts, high humidity or large temperature fluctuations.

Operating conditions:	15°C - 40°C IMPORTANT: After transport or storage in humid conditions, dry out the unit (2-3 h) before connecting it to the supply voltage. Disregarding this process can cause damage of the instrument.
Storage conditions:	1°C – 50°C
Operating altitude:	do 2000 m
Maximal relative humidity:	80%, non-condensing

4.3 Setting up the device

Place the device so that there is enough space around the device to handle and handle the filled plates. To the left of the device, place the containers with washing solutions (or sanitizing solutions) and the waste liquid container - the solutions used. Connect the supplied dosing hoses to the quick couplings, place the outlet hose in the waste container. Before turning on the device, close the dosing head by turning the locking lever counterclockwise. Plug the power cable into the socket on the right side of the device.

Fig.1 DYNAMIC

5 Control description

5.1 Switching-on the device

Switch-on the device with the rocker switch located next to the power cord socket. After switching on, a short test is performed and the main menu item is displayed on the touch screen. The buttons are selected by pressing the screen in the place shown. The response of the button is confirmed graphically and acoustically with a short beep. The device control is divided into four blocks: preparation, filling, cleaning and manual operation. Individual blocks are used to operate the instrument according to programmed algorithms - preparation and washing of the device before work, filling of microtiter plates and washing of the device after work. The manual operation section is used to manually operate individual functions. The blocks described are triggered by pressing the button on the last line of the screen, the other functions are activated by the on-screen buttons.

5.2 Function of individual buttons

PRIME the initial filling of the dosing system, pressing may be repeated until all the channels have been properly functioning

PULS manual dosing

RESET resetting the number of filled microplates

5.3 Preparation and washing before work

After selecting the option, one to four programmed steps are available. Each step pours the appropriate solution into the device bathtub, rinses the dosing head with a set number of pulses, and sucks the remaining liquid from the bathtub. The amount of liquid, the number and size of batches, and the latency between steps are adjustable, the settings are made by the technician when installing the device.

5.4 Filling of microtiter plates

Plate filling is performed automatically according to the parameters entered by the operator (program, initial volume of liquid and fine correction). After selecting the above parameters, it is necessary to drain the wash solution residues with the function PRIME. Plate filling is performed by simply inserting the plate into the holder. The number of filled plates is indicated on the top bar of the device panel and is automatically reset by the function PRIME. You can manually reset it by pressing the button RESET.

5.5 Washing after work

This menu item is quite similar to the preparation, only the set parameters may vary.

6 Maintenance

The DYNAMIC is relatively maintenance-free device, it is enough to keep it clean in order to achieve the right results. This is achieved by selecting suitable sanitizing solutions according to the nature of the reagents dosed and regular use of the required preparation and washing steps.

Replacement of dispensing hoses and hoses for the filling and discharging of cleaning solutions is performed only by a service technician during a periodic preventive inspection. The recommended interval is once a year.

7 Troubleshooting

Display is off	- disconnect the device from the mains, open the door at the rear and check the circuit breaker and the protector located inside, at the top right - contact the service technician
Head does not dose	- contact the service technician
Leakage of the head	- repeatedly loosen and close the head - contact the service technician