

LaboForce-Mi

Instruction Manual

Original Instructions



CE

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1 About this manual

Instruction Manuals

Struers equipment must only be used in connection with and as described in the Instruction Manual supplied with the equipment.



Note

Read the instruction manual carefully before use.



Note

If you wish to view specific information in detail, see the online version of this manual.

2 Safety

2.1 Intended use

The device is for professional semi-automatic materialographic preparation (grinding or polishing) of materials for further materialographic inspection.

LaboForce-Mi is intended to be used in combination with:

- LaboPol-30
- LaboPol-60

Do not use the device for the following

Other equipment than stated in the section "Intended use".

Model

LaboForce-Mi

2.2 LaboForce-Mi safety precautions



2.2.1 Read carefully before use

Ignoring this information and mishandling of the equipment can lead to severe bodily injuries and material damage.

General safety precautions

1. The machine must be installed in compliance with local safety regulations. All functions on the machine and any connected equipment must be in working order.

2. This device must be mounted securely on the machine.
3. The operator must read the safety precautions and Instruction Manual, as well as relevant sections of the manuals for any connected equipment and accessories.
4. If you observe malfunctions or hear unusual noises, switch off the machine and call technical service.
5. In case of fire, alert bystanders and the fire brigade. Disconnect the electrical power supply. Use a powder fire extinguisher. Do not use water.
6. This machine must be operated and maintained only by skilled/trained personnel.
7. Always switch off the electrical power supply and remove the plug or power cable before dismantling the machine or installing additional components.
8. The machine must be disconnected from the electrical power supply prior to any service. Wait 5 minutes until residual potential on the capacitors is discharged.
9. Struers equipment must only be used in connection with and as described in the Instruction Manual supplied with the equipment.
10. If the equipment is subjected to misuse, incorrect installation, alteration, neglect, accident or incorrect repair, Struers will accept no responsibility for damage to the user or the equipment.
11. Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

2.3 Safety messages

Struers uses the following signs to indicate potential hazards.



ELECTRICAL HAZARD

This sign indicates an electrical hazard which, if not avoided, will result in death or serious injury.



DANGER

This sign indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING

This sign indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION

This sign indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



CRUSHING HAZARD

This sign indicates a crushing hazard which, if not avoided, could result in minor, moderate or serious injury.

**HEAT HAZARD**

This sign indicates a heat hazard which, if not avoided, can result in minor, moderate or serious injury.

General messages**Note**

This sign indicates that there is a risk of damage to property, or a need to proceed with special care.

**Hint**

This sign indicates that additional information and hints are available.

2.4 Safety messages in this manual

**WARNING**

Struers equipment must only be used in connection with and as described in the Instruction Manual supplied with the equipment.

**CAUTION**

Keep clear of rotating parts during operation.

**CAUTION**

When working at machines with rotating parts, take care to prevent clothes and/or hair from being caught by the rotating parts.

3 Getting started

3.1 Device description

LaboForce-Mi is a control panel/specimen mover unit which can be mounted on the following machines for semi-automatic mineralographic preparation (grinding/polishing): LaboPol-30 and LaboPol-60.

The operator selects the grinding/polishing surface and the cooling fluid/abrasive suspension to be applied.

A holding device for the preparation of specimens must be used with the specimen mover. The holding device holds 8 specimens.

The specimen mover head has pressurized feet which can be adjusted individually to keep the specimens in place.

The operator decides which holding device should be used.

The operator sets the rotation speed of the preparation disc before starting the process.

The operator starts the machine by pressing the **Start** button on the control panel.

The operator applies other fluids manually or by using a separate dosing unit.

The operator stops the machine by pressing the Stop button on the control panel.

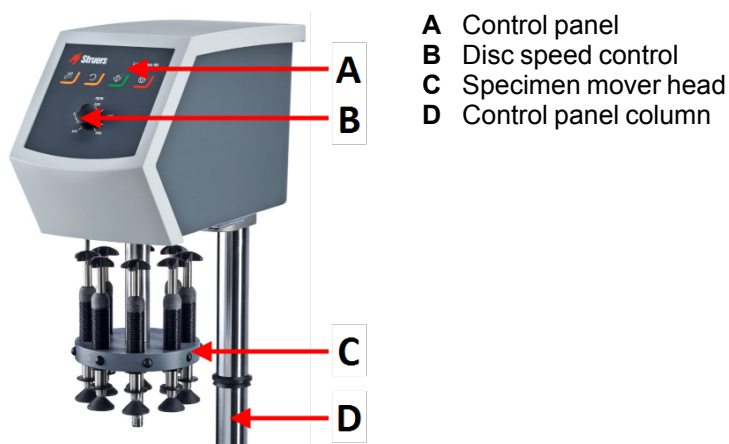
The operator cleans the specimens before the next preparation step or inspection.

The machine must always be used with the splash guard in place.

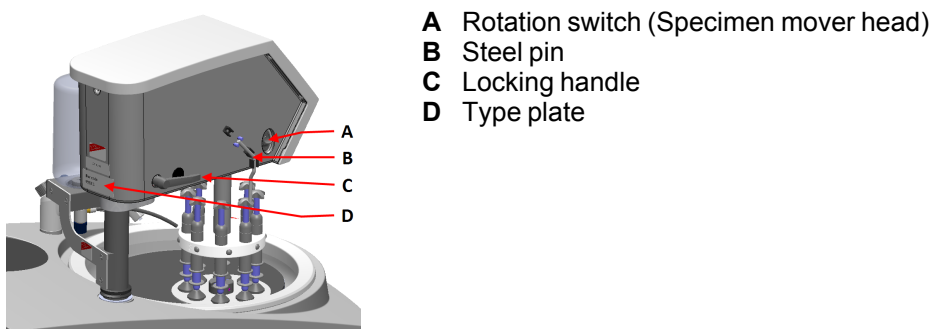
If the emergency stop is activated, the power to all moving parts is cut.

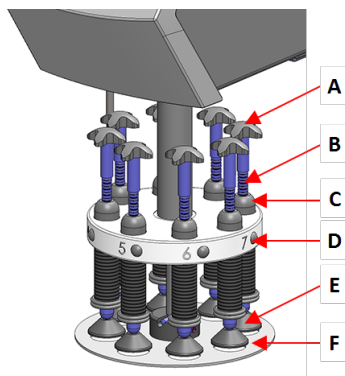
3.2 LaboForce-Mi

Front view



Rear view



The specimen mover

- A** Mover cross for forced rotation
- B** Force indicators
- C** Force adjustment screw
- D** Quick release button
- E** Pressure feet
- F** Specimen mover plate

4 Transport and storage

If, at any time after the installation, you have to move the unit or place it in storage, there is a number of guidelines we recommend that you follow.

- Package the unit securely before transportation.
Insufficient packaging could cause damage to the unit and will void the warranty. Contact Struers Service.
- Struers recommends that all original packaging and fittings are kept for future use.

4.1 Long-term storage or shipping

For instructions on how to prepare the unit for long-term storage or shipping, see the specific machine manual.

Pay specific attention to the following:

- Disconnect the unit from the electrical power supply.
- Remove the control panel or specimen mover.
- Place the machine and accessories in their original packaging.

5 Installation

5.1 Unpacking

**Note**

Struers recommends that all original packaging and fittings are kept for future use.

1. Cut the packing tape on the top of the box.

2. Remove the loose parts.
3. Remove the unit from the box.

5.2 Checking the packing list

Optional accessories may be included in the packing box.

The packing box contains the following items:

Pcs.	Description
1	LaboForce-Mi
1	Spacing disc
1	Instruction Manual set

5.3 Installation - LaboForce-Mi

**Note**

This device must be mounted securely on the machine.

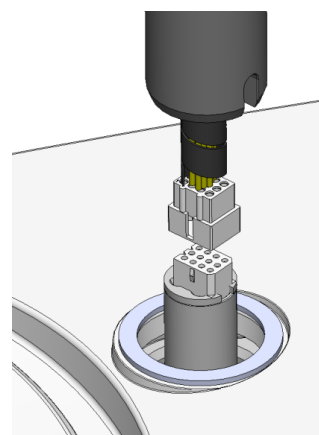
**Note**

Do not use the speed control knob on the control panel to move the specimen mover.

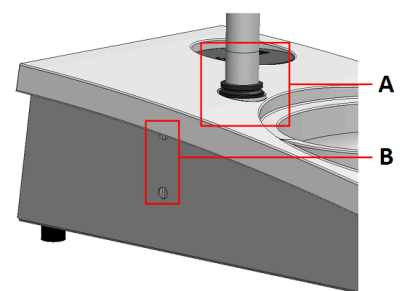
Procedure

Install the specimen mover in the connection hole of the machine.

1. Remove the plastic disc protecting the communication cable.
2. Connect the communication cable on the column to the connection port on the machine.

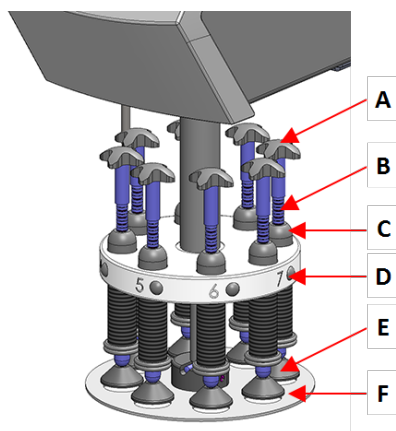


3. Slide the black V-ring down the column until it covers the connection hole.
4. Use the Allen key to tighten the two fastening screws. Do not tighten the screws completely.



A V-ring
B Fastening screws

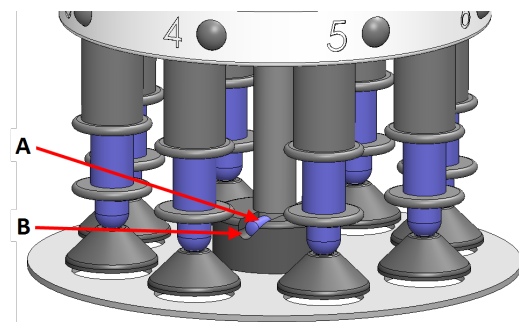
5.4 The specimen mover



A Mover cross for forced rotation
B Force adjustment screw
C Force indicator
D Quick-release button
E Pressure feet
F Specimen mover plate

5.4.1 Inserting a specimen mover plate

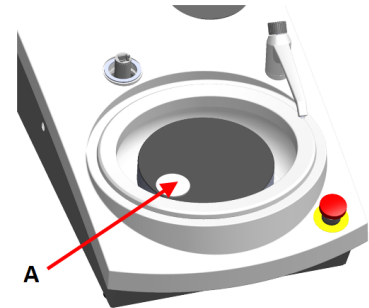
1. Insert a specimen mover plate and push until the pin is aligned in the groove.
2. Make sure that the specimen mover plate is securely mounted.



A Pin
B Groove

5.4.2 Adjusting the height of the specimen mover plate

1. Use the locking handle on the left side to unlock the specimen mover and let it move into upright position.
2. Select the 'thickest' preparation surface to be used and place it on the preparation disc. Usually, this will be SiC Foil on an MD-Gekko disc or SiC Paper on an MD-Fuga disc.
3. Place the supplied spacing disc on the preparation surface.
4. Support the specimen mover head and loosen the 2 fastening screws that hold the column.
5. Lift and support the specimen mover.
6. Press the specimen mover head down as far as possible.
7. Use the locking handle to lock the specimen mover head in operating position.
8. Lower the column until the specimen mover plate rests on the spacing disc.
9. Adjust the horizontal position of the specimen mover plate.

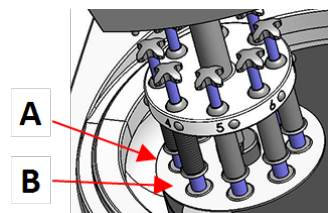


A Spacing disc

See [Adjusting the horizontal position of the specimen mover plate](#) ► 12.

5.4.3 Adjusting the horizontal position of the specimen mover plate

1. Move the specimen mover head to the right.
- Place the specimen mover plate in a position that allows the specimen to run 3 – 4 mm over the edge of the preparation disc.



A Disc edge
B Specimen mover plate

5.4.4 Completing the adjustment

1. Tighten the 2 fastening screws firmly. The specimen mover will now remain in position.
 2. Cover the holes with the two caps.
- Allen key and cover caps are included in the package.

5.5 Noise and vibration levels

For information about noise and vibration levels, see the specific machine manual.

6 Operating the device

For instructions on how to operate the device, see the specific machine manual.

See also the section "Intended use" for the specific machine manual.

6.1 Control panel functions



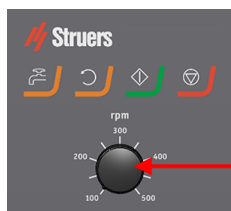
CAUTION

Keep clear of rotating parts during operation.



CAUTION

When working at machines with rotating parts, take care to prevent clothes and/or hair from being caught by the rotating parts.



A Disc speed control

Button	Function
	Disc rotation Starts rotation of the disc (Spin function).
	Water Manual override - Press the button to apply water. Water is applied when no process is running. - Press the button again to stop applying water.
	Start Starts the preparation process.
	Stop Stops the preparation process.

7 Maintenance and service

Technical questions and spare parts

If you have technical questions or when you order spare parts, state serial number and voltage/frequency. The serial number and the voltage are stated on the type plate of the machine.

7.1 General cleaning

To ensure a longer lifetime for your machine, Struers strongly recommends regular cleaning.



Note

Do not use a dry cloth as the surfaces are not scratch resistant.



Note

Do not use acetone, benzol or similar solvents.

If the machine is not to be used for a longer period of time

- Clean the machine and all accessories thoroughly.

7.2 Daily

- Clean all accessible surfaces with a soft, damp cloth.

7.3 Weekly

- Clean the control panel with a soft damp cloth and common household detergents.

7.4 Spare parts

For specific safety related parts, see the section "Safety Related Parts of the Control System (SRP/CS)" in the section "Technical data" in this manual.

Technical questions and spare parts

If you have technical questions or when you order spare parts, state serial number and voltage/frequency. The serial number and the voltage are stated on the type plate of the machine.

For further information, or to check the availability of spare parts, contact Struers Service. Contact information is available on [Struers.com](https://www.struers.com).

7.5 Service and repair

Struers recommends that a regular service check be carried out yearly or after every 1500 hours of use.

When the machine is started up, the display shows information about total operation time and the machines service information.

After 1500 hours of operation time, the display will show a message reminding the user that a service check should be scheduled.



Note

Service must only be performed by a Struers engineer or a qualified technician
Contact Struers Service.

Service check

Struers offers a range of comprehensive maintenance plans to suit the requirements of our customers. This range of services is called ServiceGuard.

The maintenance plans include equipment inspection, replacement of wear parts, adjustments/calibration for optimal operation, and a final functional test.

7.6 Disposal



Equipment marked with a WEEE symbol contains electrical and electronic components and must not be disposed of as general waste.

Contact your local authorities for information on the correct method of disposal in accordance with national legislation.



For disposal of consumables and recirculation fluid, follow local regulations.

8 Troubleshooting

For troubleshooting guidance, see the specific machine manual.

9 Technical data

9.1 Technical data - LaboForce-Mi

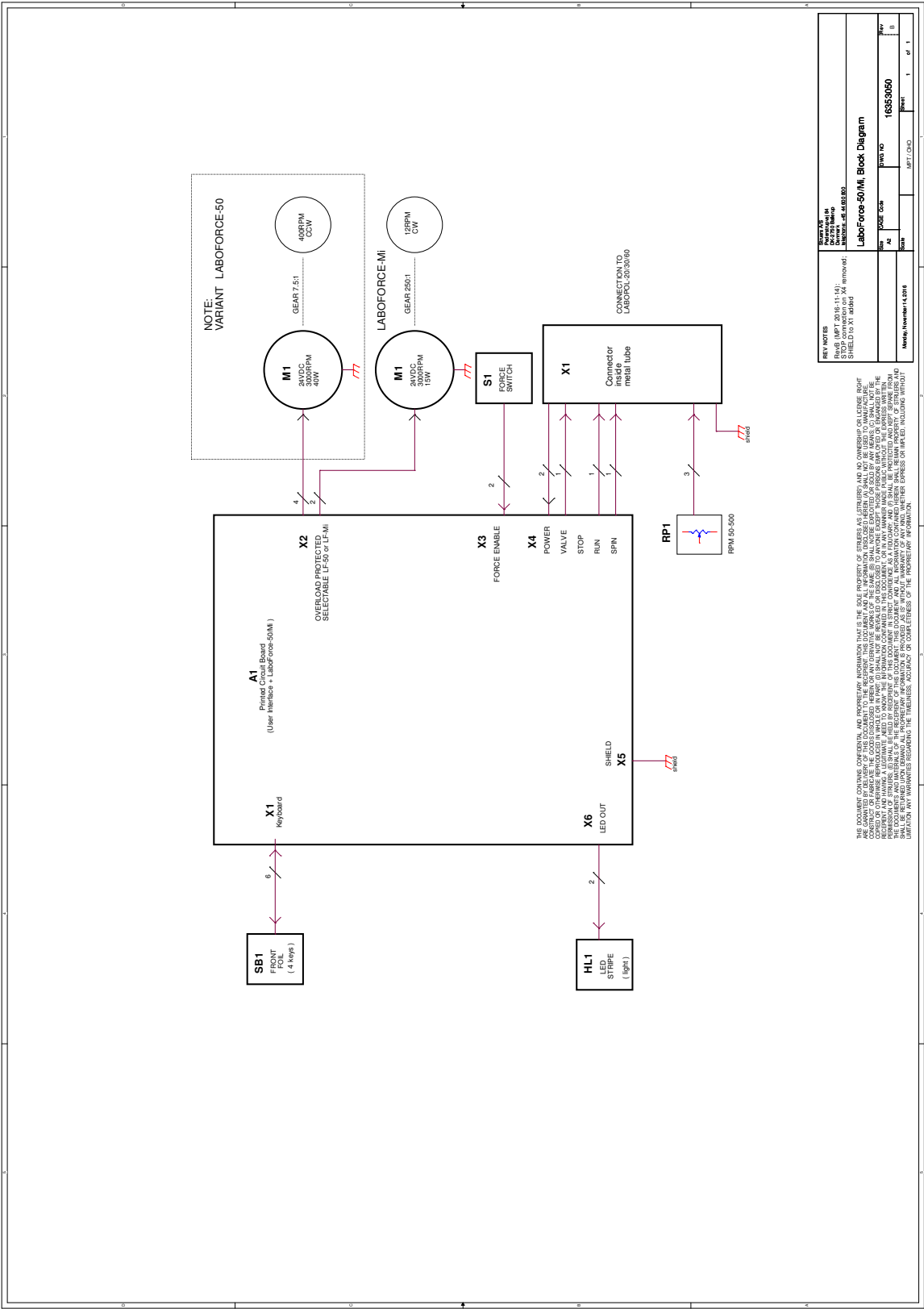
Subject	Specifications	
	Motor output	15 W
	Torque at 3 rpm	> 49 Nm(Newton meter)
	Rotational speed	3 rpm
	Rotational direction	Clockwise
	Force, individual specimens	2.5-20 N
Safety standards	See the Declaration of Conformity	
Noise level	See the noise level stated for: LaboPol	
Operating environment	Surrounding temperature	5-40°C/41-104°F
	Humidity	< 85 % RH non-condensing

Subject	Specifications	
Storage and transport conditions	Surrounding temperature	0 – 60°C/32 – 140°F
	Humidity	< 85 % RH non-condensing
Power supply	LaboForce-Mi is connected directly to LaboPol	
Dimensions and weight	Width	18.3 cm/7.2"
	Depth	43.5 cm/17.1"
	Height	44.8 cm/17.6" (measured from the preparation disc)
	Weight	13 kg/29 lbs

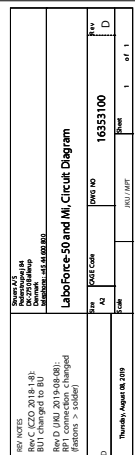
9.2 Diagrams - LaboForce-Mi

Title	No.
LaboForce-50/LaboForce-Mi, Block diagram	16353050 B
LaboForce-50/LaboForce-Mi, Circuit diagram	16353100 D

16353050 B



LaboForce-Mi



9.3 Legal and regulatory information

FCC notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

10 Manufacturer

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark
Telephone: +45 44 600 800
Fax: +45 44 600 801
www.struers.com

Responsibility of the manufacturer

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations.

The manufacturer assumes no responsibility for errors in the text and/or illustrations in this manual. The information in this manual is subject to change without notice. The manual may mention accessories or parts not included in the supplied version of the equipment.

The manufacturer is to be considered responsible for effects on safety, reliability, and performance of the equipment only if the equipment is used, serviced, and maintained in accordance with the instructions for use.

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark

Declaration of Conformity

EU / UE / EL / EC / EE / ES / EÜ / AB

Manufacturer / Производител / Výrobce / Producent / Hersteller / Κατασκευαστής / Fabricante / Tootja / Valmistaja / Fabricant / Proizvođač / Gyártó / Fabbicante / Gamintojas / Ražotājs / Fabrikant / Producent / Fabricante / Producătorul / Výrobca / Proizvajalec / Tillverkare / 販売元 / 제조사 / Produsent / Изготовитель / Imalatçı / 制造商

Декларация за съответствие Prohlášení o shodě Overensstemmelseserklæring Konformitätserklärung Δήλωση συμμόρφωσης Declaración de conformidad Vastavusdeklaratsioon	Vaatimustenmukaisuusvakuutus Déclaration de conformité Izjava o skladnosti Megfelelőségi nyilatkozat Dichiarazione di conformità Atitikties deklaracija Atbilstības deklarācija	Verklaring van overeenstemming Deklaracja zgodności Declaração de conformidade Declarație de conformitate Vyhlasenie o zhode Izjava o skladnosti Intyg om överensstämmelse	適合宣言書 적합성 선언서 Samsvarserklæring Заявление о соответствии Uygunluk Beyanı 符合性声明
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Name / Име / Název / Navn / Name / Όνομα / Nombre / Nimetus / Nimi / Nom / Naziv / Név / Nome / Pavadinimas / Nosaukums / Naam / Nazwa / Nome / Denumirea / Název / Ime / Namn / 名前 / 제품명 / Наименование / Adı / 名称	LaboForce-Mi
Model / Модел / Model / Model / Modell / Μοντέλο / Modelo / Mudel / Mali / Modèle / Model / Modell / Modello / Modelis / Modelis / Model / Model / Modelo / Modelul / Model / Model / Modell / モデル / 모델 / Modell / Модель / Model / 型号	LaboForce-Mi
Function / Функция / Funkce / Funktion / Funktion / Λειτουργία / Función / Functsiioon / Toiminto / Fonction / Funkcija / Funkció / Funzione / Funkcija / Funktie / Funkcja / Função / Funcția / Funkcia / Funkcija / Funktion / 機能 / 기능 / Funksjon / Назначение / Fonksiyon / 功能	Specimen mover for LaboPol-30, LaboPol-60 (Grinding/Polishing machine)
Τυρε / Тип / Typ / Type / Typ / Τύπος / Tipo / Tüüp / Tyyppi / Type / Tip / Típus / Tipo / Típas / Tips / Type / Typ / Tipo / Tipul / Typ / Tip / Typ / 種類 / 유형 / Type / Тип / Tűr / 类型	06386130

Serial no. / Серийн номер / Výrobní číslo / Seriennummer / Seriennummer / Σειριακός αριθμός / N.º de serie / Seerianumber / Sarjanro / No de série / Serijski broj / Sorozatszám / N. serie / Serijos Nr. / Sērijas Nr. / Serienr. / Numer seryjny / N.º de série / Nr. serie / Výrobné č. / Serijska št. / Seriennummer / シリアル番号 / 일련번호 / Serienr. / Серийный номер / Serí no. / 序列号


Module H, according to global approach

en We declare that the product mentioned is in conformity with the following directives and standards:	es Declaramos que el producto mencionado cumple con las siguientes directivas y normativas:	it Dichiariamo che il prodotto citato è conforme ai seguenti standard e direttive:	pt Declaramos que o produto mencionado está em conformidade com as seguintes normas e diretivas:	ja 弊社はこの指定製品が以下の指令および基準に適合することを宣言します。
bg Декларираме, че посоченият продукт е в съответствие със следните директиви и стандарти:	et Kinnitame, et nimetatud toode vastab järgmistele direktiividele ja standarditele:	lt Pareiškiame, kad nurodytas gaminy's atitinka šias direktyvas ir standartus:	ro Declarăm că produsul menționat este în conformitate cu următoarele directive și standarde:	ko 해당 선언서 상의 제품은 다음 지침 및 기준에 적합함을 선언합니다.
cs Tímto prohlašujeme, že uvedený výrobek je v souladu s následujícími směrnici a normami:	fi Vakuutamme, että mainuttu tuote on seuraavien direktiivien ja standardien mukainen:	lv Mēs apstiprinām, ka minētais produkts atbilst šādām direktīvām un standartiem:	sk Vyhlasujeme, že uvedený výrobok je v súlade s týmito smernicami a normami:	no Vi erklærer at produktene som er nevnt er i samsvar med følgende direktiver og standarder:
da Vi erklærer herved, at det nævnte produkt er i overensstemmelse med følgende direktiver og standarder:	fr Nous déclarons que le produit mentionné est conforme aux directives et normes suivantes :	nl Wij verklaren dat het vermelde product in overeenstemming is met de volgende richtlijnen en normen:	sl Potrjujemo, da je omenjeni izdelek v skladu z naslednjimi direktivami in standardi:	ru Настоящим заявляем, что указанная продукция отвечает требованиям перечисленных далее директив и стандартов:
de Wir erklären, dass das genannte Produkt den folgenden Richtlinien und Normen entspricht:	hr Izjavljujemo da je spomenuti proizvod sukladan sljedećim direktivama i standardima:	pl Oświadczamy, że wymieniony produkt jest zgodny z następującymi dyrektywami i normami:	sv Vi intygat att den angivna produkten överensstämmer med följande direktiv och standarder:	tr Belirtilen ürünün aşağıdaki direktiflere ve standartlara uygun olduğunu beyan ederiz:
el Δηλώνουμε ότι το εν λόγω προϊόν είναι σύμφωνο με τις ακόλουθες οδηγίες και πρότυπα:	hu Kijelentjük, hogy jelen termék megfelel a következő irányelveknek és szabványoknak:			zh 我们特此声明上述产品符合以下指令和标准：

2006/42/EC	EN ISO 12100:2010, EN ISO 13849-1:2015, EN ISO 13849-2:2012, EN 60204-1:2006, EN 60204-1-A1:2009, EN 60204-1/Corr.:2010
2011/65/EU	EN 50581:2012
2014/30/EU	EN 61000-3-2:2014, EN 61000-3-3:2013, EN 61000-6-1:2007, EN 61000-6-3:2007, EN 61000-6-3-A1:2011, EN 61000-6-3-A1-AC:2012
2014/35/EU	
Additional standards	NFPA 79, FCC 47 CFR Part 15 Subpart B

Authorized to compile technical file/
Authorized signatory

Date: [Release date]

