

Translated from
Original German Operating Manual
MV-R 100/120

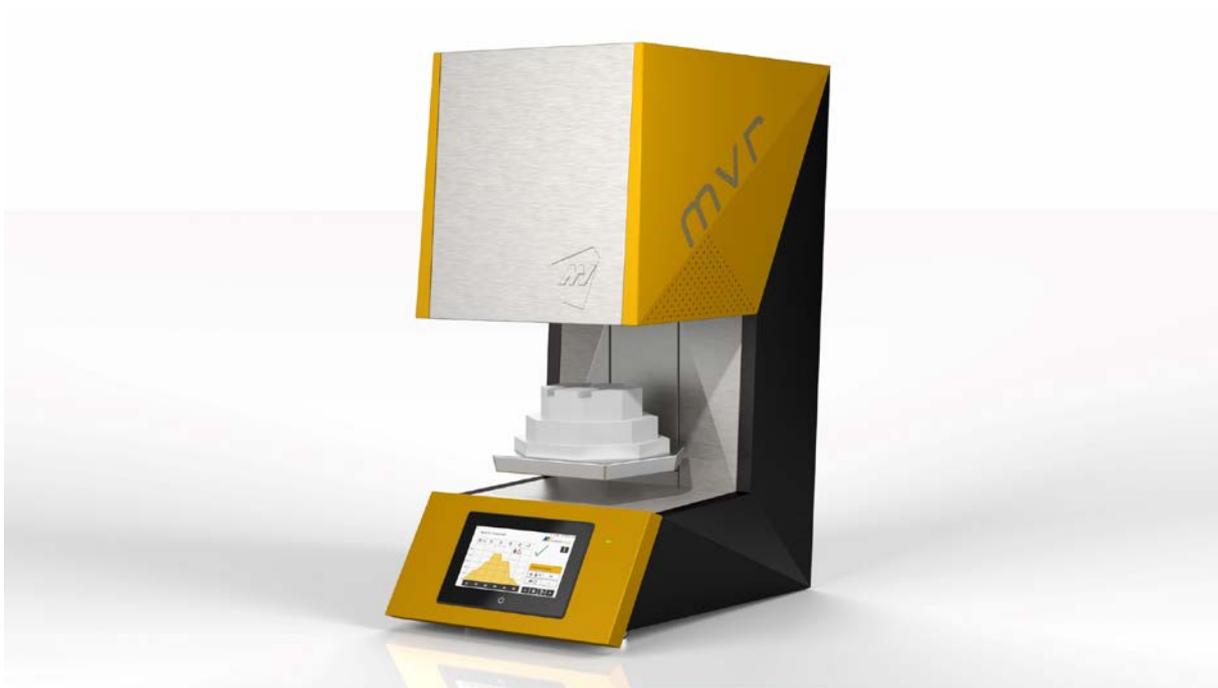


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General information

Limitation of liability

The contents of this operating manual were created taking the applicable laws and standards into account.

The unit was developed using state-of-the-art technology.



NOTICE

The manufacturer assumes no liability for damage resulting from:

- Disregard/non-observance of the operating manual
- Intentional misuse
- Use other than as intended
- Operation by untrained personnel
- Operation by non-professionals (carrying out maintenance work, etc.)
- Technical modifications to the unit that were not agreed with the manufacturer
- Use of replacement parts that were not approved by the manufacturer

Responsibilities of the operator

The unit is used for commercial purposes. The operator of the unit is therefore subject to the statutory obligations relating to occupational safety. In addition to the safety instructions in this operating manual, the regulations on safety, accident prevention and environmental protection that apply to the unit's area of application must be complied with.

In particular, the following apply:

- The operator must be familiar with the applicable regulations on occupational safety.
- The operator must ensure that all employees who use the unit have read and understood this operating manual.
- The operator must also train personnel at regular intervals and inform them of the dangers that can arise when using the unit.
- The operator must provide personnel with the necessary protective equipment.
- The operator must have all safety devices checked regularly for operability and completeness.

Documentation

Content and structure

This operating manual is an essential part of this unit. It contains instructions and information on how to use the unit safely and must be available to all users throughout the unit's service life. This operating manual is intended for use by trained operating personnel.

Labelling scheme for integrated text boxes and references

The following safety notices are used in this manual:



DANGER

Indicates an imminent danger that may cause serious physical injury or death.



WARNING

Indicates a potentially dangerous situation that may cause serious physical injury or death.



CAUTION

Indicates a potentially dangerous situation that may cause minor physical injury.



NOTICE

Indicates a potentially harmful situation in which the product or an object in its vicinity may be damaged.

NOTICE

Information or tips for easier operation.

Formatting and symbols

-  indicates a general safety instruction
- indicates that a requirement must be met
- 1. indicates a step to be carried out
-  indicates the outcome of carrying out a step
- indicates a list
-  indicates a button

Service address



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76297 Stutensee-Blankenloch, Germany
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www.mihm-vogt.de

Safety

The **MV-R 100/120** is a high-temperature oven for commercial use in dental laboratories and may be used only for sintering sinterable ceramics.

Requirements for personnel

Trained and qualified personnel who know how to use the unit and whose specialist training, skills, experience and knowledge of the relevant regulations enables them to carry out the tasks assigned to them independently and recognise and avoid potential hazards.



NOTICE

Personal protective equipment must be worn when working on the **MV-R 100/120** in order to avoid accidents and harm to health.



WARNING

Electricity!

Risk of death from electric shock.

- Do not touch live cables and components with wet hands.
- Observe the accident-prevention regulations when working with electric current.
- Before carrying out any installation, maintenance, cleaning or repair work, disconnect the power supply of the **MV-R 100/120** and secure it against being switched back on.



WARNING

Risk of ignition!

Use of inflammable and explosive materials near the oven.

- Do not operate the **MV-R 100/120** near highly flammable sources.
- Do not install the **MV-R 100/120** on highly flammable supporting surfaces.



WARNING

Risk of burns from hot surfaces!

The surfaces of the *MV-R 100/120* become hot during operation. These may cause burns if touched.

- Do not touch the housing or the oven door during operation.
- Do not reach into the heating chamber. It may still retain a high level of residual heat from the previous heating process.
- Ensure that the *MV-R 100/120* has cooled down before carrying out maintenance, cleaning and repair work.
- Wear heat-resistant safety gloves if work must be done on hot components.
- Use a suitable and sufficiently long pair of tongs to place items to be sintered into the oven and remove sintered items from the oven.



CAUTION

Incorrect operation!

No liability is assumed for damage that may be caused by misuse, incorrect operation, incorrect connections or improper maintenance/repair work carried out by untrained personnel. All warranty services are also excluded in such cases.

The unit must not be used if it or the mains cable becomes damaged and no longer functions correctly. In this case, contact the manufacturer immediately.

For your own safety and to increase the service life of your unit, use only original replacement parts.

To ensure safe operation of the *MV-R 100/120*, regional regulations (e.g. accident-prevention regulations) apply in addition to the instructions in this operating manual. The former must be made available by the operator of the unit. The safety notices on the *MV-R 100/120* must be kept in a legible condition.



CAUTION

Materials and substances that are harmful to health!

Risk of contamination.

The insulation in the combustion chamber consists of ceramic mineral fibres (INDEX no. 650-017-00-08). These are classified as carcinogenic (Category 1B (Annex VI, EC 1272/2008). Fibre dust may be released during work on the combustion chamber (e.g. replacing the door insulation).

Exposure to dust may cause cancer if it is inhaled, as well as cause irritation to the eyes, skin and respiratory organs.

- Wear personal protective equipment when carrying out all work on the combustion chamber (protective goggles, protective gloves, Class FFP2 respiratory protection, etc.).
- Use only vacuums with fine particle filters (HEPA dust class H).

Insulating material, which can be seen as white dust, may be rubbed off in the oven door area. You should do the following with these deposits:

- Wipe them off with a damp cloth or
- Extract them using a vacuum with a fine particle filter (HEPA dust class H)

The deposits must not be blown off with compressed air.

First aid measures

- If inhaled: If you notice any irritation, go into a dust-free area, drink some water and clean your nose. If symptoms persist, consult a doctor.
- If contact is made with the skin: If contact is made with the skin, wash the affected area immediately with plenty of soap and water.
- If contact is made with the eyes: Immediately rinse your eyes carefully and thoroughly using eye wash or water. Do not rub them!



NOTICE

Always dispose of insulating material in an enclosed container (see chapter entitled "Disposal").



WARNING

Risk of burns due to objects falling out.

There is an acute risk of burns if any objects fall out. A fireproof table and flooring support must be installed.

1. The oven may only be operated when stationary for safety reasons. Only then is the operator able to quickly avoid any parts that fall out.
2. The company that operates the premises is responsible for conducting an appropriate safety briefing for operators.
3. If a fracture occurs in the sintering process due to failure to adhere to the recommended drying procedure, there is a risk of hot objects immediately falling out when the oven door opens.
4. The oven may be loaded and unloaded only using crucible fork aids. A trained operator must be present during the loading and unloading phase for safety reasons.



NOTICE

This operating manual must be read and understood by each user before working on and with the unit.

The operating manual must be kept for the specified service life of the **MV-R 100/120**.

Technical description

Function

The **MV-R 100/120** is used to fire sinterable ceramics.

The product to be sintered is placed in the sintering dish and set on the support disc. After the heating parameters are entered and the Start symbol is pressed, the electrically-powered oven door closes and the heat-up process starts.

Once the heating program has ended and the **MV-R 100/120** has cooled down, the oven door opens and the finished product can be removed.

Heating chamber

The product is sintered in the heating chamber. This consists of two different ceramic insulation layers and is operated using MoSi₂ heating elements. The outer insulating layer is designed for temperatures up to 1200 °C; the inner layer for temperatures up to 1700 °C.

Oven door

The oven door consists of a ceramic door panel.

A slip clutch used in the drive mechanism prevents excessive contact pressure between the oven door and heating chamber.

Oven housing

The oven housing consists of steel plating coated with plastic on both the inside and outside.

Program control system

The program control system has a timer function that can be used to specify a day and time for the program to finish.

Operating parameters and heating programs are stored in a non-volatile memory and are retained even if the power supply fails.

The set target temperature is maintained within an accuracy of ± 1 °C.

A temperature sensor integrated into the heating chamber measures the temperature of the chamber close to the product.

A thermocouple fail-safe prevents the **MV-R 100/120** from overheating if the temperature sensor becomes defective.

Conformity



EG-Konformitätserklärung

Der Hersteller / Inverkehrbringer

MIHM-VOGT GmbH & Co. KG
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76297 Stutensee
Tel.: +49 (0) 72 44/7 08 71-0
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erklärt hiermit, dass folgendes Produkt

Produktbezeichnung: Sinterofen
Modellbezeichnung: MV-R 100 / MV-R 120
Baujahr: 2019

Beschreibung:

Der Sinterofen ist ein Hochtemperaturofen für den gewerblichen Einsatz in Dentallaboren.

allen einschlägigen Bestimmungen der angewandten Rechtsvorschriften (nachfolgend) - einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen - entspricht. Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. Diese Erklärung bezieht sich nur auf die Maschine in dem Zustand, in dem sie in Verkehr gebracht wurde; vom Endnutzer nachträglich angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt.

Folgende Rechtsvorschriften wurden angewandt:

Maschinenrichtlinie 2006/42/EG
EMV-Richtlinie 2014/30/EU

Folgende harmonisierte Normen wurden angewandt:

EN 61010-1:2010	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen (IEC 61010-1:2010)
EN 61010-2-010:2014	Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 2-010: Besondere Anforderungen an Laborgeräte für das Erhitzen von Stoffen (IEC 61010-2-010:2014)
EN 61326-1:2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen - Teil 1: Allgemeine Anforderungen (IEC 61326-1:2012)
EN ISO 12100:2010	Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010)

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:
Tobias Gillen

Ort: Stutensee
Datum: 18.09.2019

(Unterschrift)
Dietmar Gräbe

Intended use

The **MV-R 100/120** is a high-temperature oven for commercial use in dental laboratories and may be used only for sintering sinterable ceramics.



NOTICE

The protection of persons can no longer be ensured and no liability can be assumed for damage caused by misuse, incorrect operation, incorrect connections or improper maintenance/repair work carried out by untrained personnel. All warranty services are also excluded in such cases.

The use of spare and wearing parts that have not been procured from the manufacturer will render the approval and warranty of the **MV-R 100/120** null and void.

Potential misuse

- Operation by untrained and insufficiently qualified personnel.
- Use of products that were not approved by the manufacturer.
- Use of replacement parts that were not approved by the manufacturer.
- Any use not in accordance with the declaration of conformity.
- Technical modifications to and conversions of the unit that were not approved by the manufacturer.



NOTICE

Only sintering aids/accessories/wearing parts as well as spare parts approved by Mihm-Vogt may be used.

You can find an overview of the approved media and equipment on the supplementary sheet in your device packaging.

Technical data

<i>MV-R 100/120</i>		
General information	MV-R 13A	MV-R 15A
Dimensions [mm] (W x D x H)	392 x 589 x 773 mm	
Combustion chamber volume	2 dishes Ø 120 x 30 mm	
Max. temperature [°C]	1650 °C	
Weight [kg]	64 kg	
Minimum clearance around the unit	50 mm	
Connected electrical load		
Voltage supply	220 - 230 V	200 – 240 V
Frequency	50 Hz	50/60 Hz
Max. power consumption	3500 W	
Protection		
Device end	16 AT	
Customer end	Connection to a separate electrical circuit with a 16-A circuit breaker, type K or type Z (other types of circuit breaker depending on the country of use)	
Protection class	IP 20 (protection against the ingress of foreign bodies, but not against the ingress of water)	
Operating conditions		
Installation area	Indoors only (in dry rooms)	
Temperature range	+5 to +40 °C	
Relative air humidity	Up to 31 °C: 80 %	
Maximum air humidity	Up to 40 °C: 50% no condensation	
Height	Max. 3000 m	
Degree of pollution	2	
Optimal pressure range of argon supply	6-8 bar	
Maximum pressure range of argon supply	10 bar	

Installation

Setup

The **MV-R 100/120** is designed as a table-top unit. A level surface of at least 50 cm x 60 cm that supports a load of up to 80 kg is recommended to ensure stability.

Setup conditions

- ▶ Always set up the **MV-R 100/120** in dry rooms that are as dust-free as possible, and make sure that liquids cannot penetrate the unit.
- ▶ Highly flammable and combustible gases and liquids must not be stored in the installation rooms.
- ▶ Do not place any combustible and flammable objects near the **MV-R 100/120**.
- ▶ Keep a distance of 50 mm around the **MV-R 100/120** for sufficient cooling.



CAUTION

Risk of ignition!

The floor covering may ignite due to a hot product dish shattering.

- ▶ Be mindful of flammable surfaces for the floor covering.



CAUTION

Tipping loads!

Supporting surface with an insufficient load-bearing capacity.

When setting up the **MV-R 100/120**, make sure that the supporting surface has a sufficient load-bearing capacity.



CAUTION

Risk of injury due to oven weight!

Physical strain/back injuries due to the high inherent weight.

- ▶ Have at least two persons carry/move the **MV-R 100/120** together (max. 30 kg load bearing capacity/person).



CAUTION

Risk of overheating!

Overheating due to blocked air inlets.

- ▶ Make sure that the air vents remain clear on all sides.

1. Align the supporting surface horizontally.
 2. Place the **MV-R 100/120** on the supporting surface.
- ⚠ *Make sure the surface is non-slip.*
- ⚠ *Lift and carry the sintering oven only at the unit base.*

Electrical connection

Local installation

- ☑ The **MV-R 100/120** requires its own electrical circuit.
- ☑ The building's electrical circuit must have a type-K or type-Z circuit breaker with a rated current of at least 16 A (other types of circuit breaker depending on the country of use).
- ☑ An additional residual-current circuit breaker (designed for 30 mA tripping current) must be installed.
- ☑ To ensure electrically safe operation, the **MV-R 100/120** requires a protective earth conductor to be connected to the power socket.
- ☑ When selecting the installation location, ensure that the accompanying mains cable is 2.0 m long. Extending the cable is not permitted. The supply voltage must be within the rated voltage range of 200-240 V.



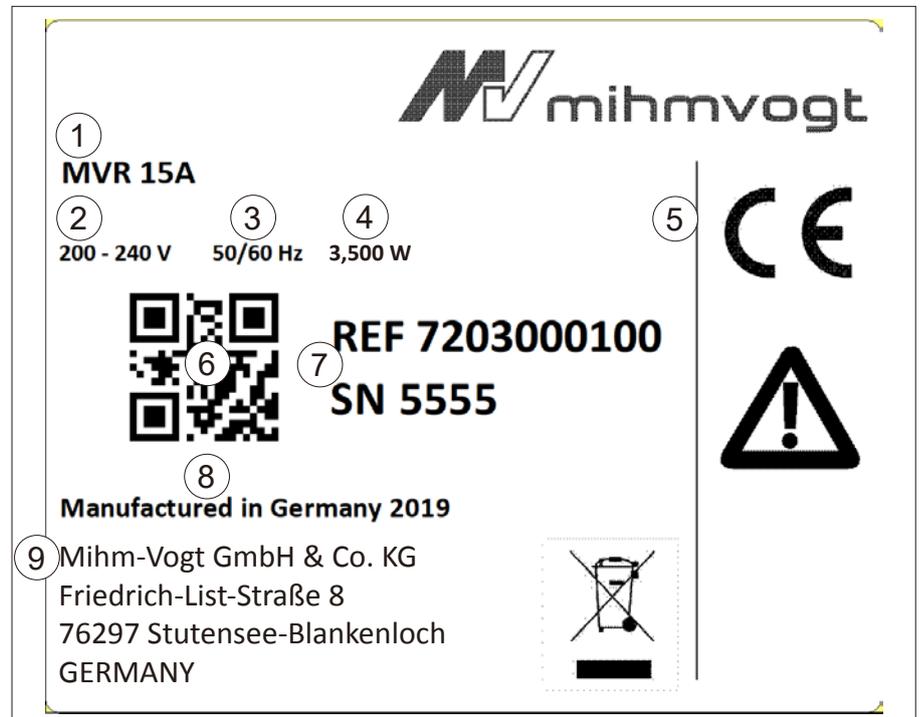
DANGER

Electricity!

Risk of death from electric shock.

- Do not touch live cables and components with wet hands.
- Observe the accident-prevention regulations when working with electric current.
- Only connect the unit to a voltage supply that matches the specifications on the rating plate.

Rating plate

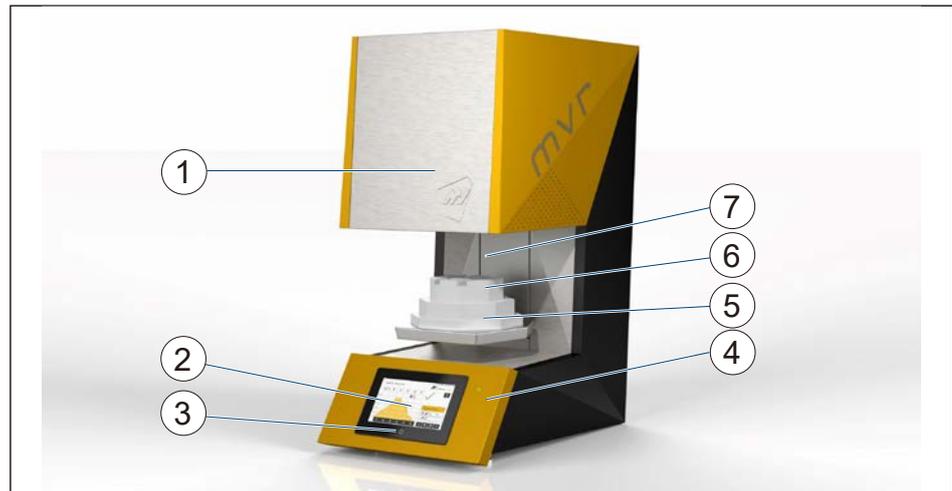


- | | | | |
|---|--------------------------|---|----------------------------|
| 1 | Machine type/designation | 6 | Mihm-Vogt reference number |
| 2 | Operating voltage | 7 | Serial number |
| 3 | Mains frequency | 8 | Year of manufacture |
| 4 | Power rating | 9 | Manufacturer details |
| 5 | CE mark | | |

Product description

Main product components

Base unit



- 1 Base unit
- 2 Operating panel
- 3 Switch-on button on the display
- 4 Status display
- 5 Door insulation/base support
- 6 Door insulation support
- 7 Sintering dishes

Rear of the base unit



- 1 Rating plate
- 2 Main on/off switch
- 3 Mains connection
- 4 USB port
- 5 LAN connection
- 6 Main fuse F1
- 7 Main fuse F2

Initial commissioning

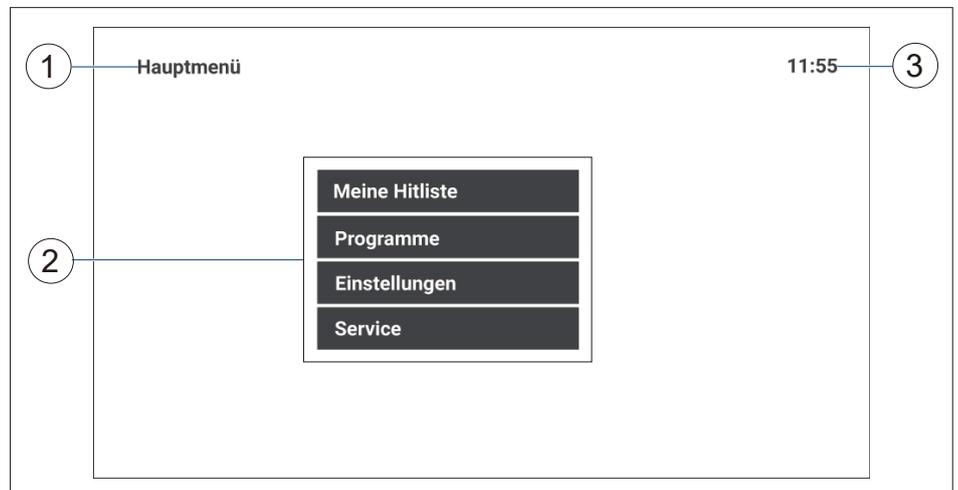
1. Connect the power supply connection cable to the mains connection [2].
2. Switch the main oven on via the main switch.
- ➡ The unit carries out a self-test and opens the door after the self-test.
3. Press the lift button  to open the door.
4. Use the door insulation (see chap. "Using the door insulation" on page 20).

Using the door insulation



1 MV-R 100/120

Main screen after start-up of the unit



- 1 Menu designation
- 2 Menu buttons (navigation)
- 3 Time

Explanation of symbols

The function is active when the symbols are highlighted in yellow.

Operating symbols

	Control system main menu
	Go on to the next available step
	Go back to the last step
	Start the selected program
	Stop a running program
	Open/close the oven door
	Activate/deactivate a timer function
	Mark a stored program in the “fixed programs” list or the “my programs” list, and display them in “my list”

Interaction symbols

	Confirm an interaction, which appears as a pop-up
	Abort an interaction, which appears as a pop-up

Units symbols

 (°C/min) Increase rate in °C/min

 (°C) Target temperature in °C

 (min) Holding time in min

 Target time in hh:mm

Result symbols

 Display when the process is properly completed

 Display when the process is completed with errors

Warning symbols

 Warning about heat when opening the door during the process

Error symbols

 Informative error (4-digit error code)
Process continues to run

 Minor error (3-digit error code)
Process continues to run/work needs to be checked

 Major error (2-digit error code)
The process is automatically aborted/work is highly likely to be unusable

Sintering aids



NOTICE

Only use sintering aids approved by Mihm-Vogt.

You can find application notes in the information flyer for the relevant sintering aid.



CAUTION

Risk of crushing limbs!

The oven door closes automatically.

- Only press the **Start** button after the filled sintering dish has been positioned.
- Make sure that nobody reaches between the oven door and heating chamber while the oven door is closing.

Transport, packaging and storage

Transport



WARNING

Injury due to the *sintering oven* falling down!

Slipping/falling when lifting and carrying the **MV-R 100/120** may lead to serious injuries.

- Carry/hold the **MV-R 100/120** only at the lower edge of the housing (base).
- Always have at least two persons carry the **MV-R 100/120** (max. 30 kg/person).



CAUTION

Risk of injury due to oven weight!

Physical strain/back injuries due to the high inherent weight.

- Have at least two people carry/move the **MV-R 100/120** together.



NOTICE

Transport damage!

To prevent injury to personnel and material damage:

- Transport the unit in an upright position only.
- Do not stack units on top of each other.
- Do not place any other objects on the unit.
- Transport must be as free of shaking and vibrations as possible to prevent the unit from being damaged.
- Make sure that the unit is secured against slipping and falling during transport.
- If necessary, gloves (against slipping and cut injuries) as well as safety shoes (against foot injury upon falling) must be worn when carrying the device.
- The goods must be inspected for damage and loss immediately upon receipt. Defects must be documented by the freight carrier on the letter of consignment in order to lodge claims. **Mihm-Vogt GmbH & Co.KG** assumes no liability for any damage and loss that is only found subsequently.

Packaging



NOTICE

The packaging protects the **MV-R 100/120** against transport damage, corrosion and other forms of damage. Remove it only shortly before initial commissioning, and store it in dry conditions for later reuse.

Storage



NOTICE

Temperature damage!

To prevent temperature damage:

- Store the unit only at temperatures between +5 and +40 °C.
- Always store the unit in dry and dust-free conditions.
- Avoid exposure to direct sunlight.
- Avoid mechanical vibrations.

Care and maintenance

Clean the housing of the *MV-R 100/120* every so often with a damp cloth.



NOTICE

Damage to the heater!

- Make sure the heating chamber does not become dirty. This could damage the heater.



NOTICE

Use of colouring liquids affects the unit's service life!

- During the sintering process, the use of colouring liquids can significantly shorten the service life of the heating elements.

Service programs

A cleaning cycle should be run periodically depending on how often the oven is used. This serves to remove contamination due to liquids and other impurities that become deposited in the insulation.

Depending on the frequency of use, a regeneration cycle should also be carried out, which is necessary for regeneration of the heating elements.

- Temperature check (only in conjunction with a test kit)
- Heating chamber cleaning
- Heating element regeneration

Faults and error messages

Safety



DANGER

Electricity!

Risk of death from electric shock.

- Work on electrical systems may be performed by qualified electricians only.
- Before carrying out any installation, maintenance, cleaning or repair work, disconnect the power supply of the **MV-R 100/120** and secure it against being switched back on.
- Do not touch live cables and components with wet hands.
- Observe the accident-prevention regulations when working with electric current.



WARNING

Hot surfaces!

Risk of serious burns to the limbs.

- Do not touch the housing or the oven door during operation.
- Ensure that the **MV-R 100/120** has cooled down completely before carrying out maintenance, cleaning and repair work.
- Wear heat-resistant, thermally insulated safety gloves when work must be done on hot components.



NOTICE

Material damage due to incorrect repair of electric cables!

This may cause malfunctions and make electric components defective.

- Do not repair defective cables or plugs.

Overview of error codes

Error	Category	Cause	Measures
F10	Control system	GS1 defective	Contact service technician
F1000	Control system	SD card defect	Contact service technician
F1010	Control system	Battery defective	Contact service technician
F20	Mains voltage	Mains supply interrupted	Check mains supply
F2010	Mains voltage	Mains supply fault	Check mains supply
F30	Heating circuit	GS1 defective	Contact service technician
F32	Heating circuit	GS1 defective	Contact service technician
F40	Thermal sensors	Temperature sensor S defective	Contact service technician
F41	Thermal sensors	Temperature sensor S defective	Contact service technician
F42	Thermal sensors	Thermal sensor on circuit board	Contact service technician
F400	Thermal sensors	Temperature sensor K defective	Contact service technician
F401	Thermal sensors	Temperature sensor K defective	Contact service technician
F50	Cooling	Cooling system defective	Contact service technician
F500	Cooling	Fan defective	Contact service technician
F60	Drive	Door drive defective	Contact service technician
F61	Drive	Door drive defective	Contact service technician
F62	Drive	Door drive defective	Contact service technician
F70	Process temperature	Temperature error	Check usability of sintered items, voltage supply
F71	Process temperature	Max. temperature greater than 1680 °C – emergency shutdown	Contact service technician
F700	Process temperature	Process temperature outside of tolerance	Check usability of sintered items, voltage supply
F701	Process temperature	Final temperature not reached	Usability of sintered items
F80	Argon	Argon pressure not in target range	Bottle empty or valve not open
F81	Argon	Argon pressure is too low	Contact service technician
F82	Argon	Argon pressure is too low	Contact service technician
F8000	Argon	Argon pressure input low	Bottle empty or valve not open

Decommissioning

Decommissioning can be carried out for two reasons:

- For the purpose of reinstalling the unit at another location.
- For the purpose of final disposal.

If the **MV-R 100/120** is to be reinstalled at another location, decommissioning must be well prepared. All components and fittings must be carefully removed, labelled and, if necessary, packaged for transport. This ensures that all parts can be identified correctly and refitted in the correct positions when reassembling the unit.

1. Switch the **MV-R 100/120** off.
2. Disconnect the **MV-R 100/120** from the voltage supply.
3. Remove all connections from the **MV-R 100/120**.

Disposal

Safety



WARNING

Release of pollutants!

Pollutants can be inhaled when the insulating materials are handled.

- Wear personal protective equipment (respiratory protection) during disposal.



WARNING

Potential contamination of the environment and groundwater due to improper disposal!

- The regulations and guidelines of the legislature in the country of operation must be complied with when disposing of parts of the unit and operating materials.

Disposal

1. Sort the component parts of the **MV-R 100/120** into recyclable materials, hazardous substances and operating materials.
2. Dispose of the component parts of the **MV-R 100/120** or take them to be recycled.

