ON NANO
INTERNATIONAL GMBH

Osiris International Inc.
Cave Creek AZ 85331
United States
www.on-nano.com

nanoDEBOND 200

Wafer Debonding System

Osiris International Inc.
Cave Creek AZ 85331
United State

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General Information

System info

Unit:	nanoDEBOND 200 Wafer Debonding System
Serial no.	2025/KA-0 00160
Date of production:	2025 / 03
Designation:	Manual Debonding Tool
Intended purpose:	for debond individual wafers from rigid carriers or other wafers under thermal influence.

Manufacturer

ON nano International GmbH
Kurfuerstendamm 194
10707 Berlin, Germany

Phone:	+49 7771 6349 60
E-mail:	service@on-nano.com
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Managing Director:	Pirmin Muffler
Register Court:	HR-Amtsgericht HRB 268939 B
VAT No.:	DE451465194

Document Information

The operating instructions must always have kept close to the device and been accessible to the personnel.

CE marking / Product Identification

The product identification is placed on the rear side of the device.

CE

ON nano International GmbH
Franz-Ziwey-Ring 18, 78333 Stockach, Germany
Tel: +49 7771 6349 60
service@on-nano.com

description: manual debonding system with hotplate
type: nanoDEBOND 200
S/N: 2025/KA-0 00160
operating voltage: 230 VAC 110VAC /L/N/PE/50Hz/10A
control voltage: 24 VDC
year of construction: 2025 *Made in Germany*

Product Identification

The product identification is placed on the rear side of the device.

Safety Instructions

Before installing, starting up, and operating the device, all safety instructions must be read carefully and considered accordingly.

Liability

The manufacturer accepts no liability for material damage, personal injury or secondary damage resulting from improper use or ignoring of safety instructions as well as failure to update the manuals after the device or its software has been modified. Nor will the manufacturer take any liability of damages due to loss of data.

In addition, the terms of business that are part of the order/contract will apply.

Our products are continuously modified and improved due to innovation, legal requirements, and standards. Therefore, the information given in this document may not accurately reflect every detail of the delivered system. Please contact the manufacturer in cases of uncertainty.

Applied direction

Directive 2006/42/EC on Machinery

EMC-Directive 2014/30/EU on Electromagnetic Compatibility

EMC Directive 2014/35/EU on Low Voltage

Applied harmonized standard

EN 60204-1; (VDE 0113-1):2007-06 – Safety of machinery – Electrical equipment of machines – Part 1: General requirements

EN ISO 12100:2010 – Safety of machinery – General principles for design – risk assessment and risk reduction.

Warranty

We guarantee for the equipment as stated in the order/contract.

This warranty expires in case of:

- Interference into or modification of the Product without the prior consent of the manufacturer
- Improper use of the product
- Insufficient maintenance of the product
- Inappropriate operation of the product
- Negligence of correct supply requirements
- Application of third-party components
- Alteration of program or configuration without manufacturer’s consent

Definition of Abbreviations and Terms

Abbr. / Terms	Definition
CDA	Clean Dry Air
Substrate	Wafer, Substrate, Fragment, Mask or Lens
Media	Fluids and Chemicals used for Processes and Cleaning

Symbols Used in the Manual

☑
- Condition
  Defined conditions must be met in order to execute next action

☞
- Action
  You are requested to do something

- Result
  Explains the result of an action

- Information and additional advice

Used Safety Signs

General Hazard

Marks activities and areas on the equipment where health or life may be endangered if the safety instructions are not observed.

Hazard due to electric voltage

Marks activities and areas on the equipment where electric voltages may occur if the protective devices have been deactivated.

Hazard due to high temperature

Marks activities and areas on the equipment where high temperature can cause severe burns

Safety Instructions

Safety instructions plus important information are marked in the following way:

DANGER

Indicates an immediate hazard while using the system.

Neglecting of instructions given in this documentation or on the system itself can result in personal injury or death of the operator or of persons being close by.

The system, other equipment or the environment can be seriously damaged as well.

WARNING

Indicates an impending hazard or fatal unsafe practice while using the system.

Neglecting of instructions given in this documentation or on the system itself can result in severe personal injury of the operator or of persons being close by.

The system, other equipment or the environment can be damaged as well.

CAUTION

Indicates a possible hazard or unsafe practice while using the system.

Neglecting of instructions given in this documentation or on the system itself can result in personal injury of the operator or of persons being close by. The system, other equipment or the environment can be damaged as well.

Note

Indicates a possible hazard or unsafe practice while using the system.

Neglecting of instructions given in this documentation or on the system itself can result in personal injury of the operator or of persons being close by.

The system, other equipment or the environment can be damaged as well.

Safety Instructions: General

Prior to installation, starting and operation of the system relevant safety instructions should be read carefully and considered accordingly.

Persons charged with transport, storing, installation, starting, operation, maintenance and service must know the content of this manual.

This manual contains information and warnings to be followed by the user to ensure safe operation and to maintain the system in secure condition. It should be located in a suitable place close to the system.

In addition to this manual all valid, legal and other local regulations concerning prevention of accidents as well as protection of the environment are applicable.

Please consider all instructions, in particular safety instructions, in order to achieve safe operation of the system.

Possible hazards harming the user or resulting in damage to the system are clearly stated within appropriate chapters of this manual.

Advice contained in this chapter is intended to supplement, not to supersede, the safety advice given in other chapters of this manual, nor the general safety code of behavior prevailing in the user's country.

The operating company must ensure the following:

- Appropriate administrative controls shall be established.
- Appropriate standard operating procedures shall be established.
- Appropriate personal protective equipment shall be used.
- Adequate ventilation shall be provided.
- Devices for emergency-stop shall be installed.
- The personnel must be instructed at regular intervals about potential hazards.

Safety Instructions: General Hazards

This system has been designed and manufactured considering all relevant safety regulations. Improper use or operation by persons not qualified accordingly may result in danger:

- to life and health of the operator
- to the system itself
- to surroundings of the user
- to performance and efficiency of the system.

General hazards of the system, depending on design or type, may arise in the following ways:

- mechanical hazard caused by squeezing, shearing and cutting, catching and winding, stitching or by freely moving parts
- thrust caused by kinetic energy of moving mass
- sharp corners and edges
- electrical hazard caused by touching live parts (directly or indirectly)
- thermal hazard causing burns
- chemical hazard causing poisoning, corrosion and explosion
- toxic hazard due to inhalation of vapors and gases
- gases under pressure
- liquids under pressure
  - combination of hazards caused by
  - faulty installation
  - incorrect loading of substrates / wafers
  - breakdown of power or media supply
  - breakdown and/or incorrect arrangement of preventive measures
  - combination of escaping media
- hazards caused by
  - human misconduct
  - noise
  - allergies, excitations of mucous membrane, unknown effects caused by media
  - ejection of parts
  - disturbance / malfunction of control system
  - leaking of hoses or pipes
  - combination of atmospheres of vapors
  - fire hazard
  - natural hazards caused by lightning, environmental catastrophes etc.

Safety Instructions: Mechanical

DANGER

Never remove covers during operation
(only for service case).
Never open the system when it`s switched on.

CAUTION

Moving parts may cause squeezing or cutting of extremities.
Do not touch any moving parts of the system while in operation.

CAUTION

Operation of the system by several persons may cause hazards based on misconduct or missing mutual understanding.
Operation of the system by two or more persons is not allowed.
If in case of service or maintenance tasks the system must be operated by two persons, these must conduct a secure joint procedure.

Note

By applying components of other manufacturers additional and unknown hazards may arise. No liability will be taken in this case.
Use only genuine parts provided by the manufacturer of the system.
Genuine parts are constructed conforming to applicable safety regulations.

Safety Instructions: Operation

DANGER – Hot Surface

Hot surface
The demounting plates will reach temperatures of 220 °C based on option provided.
Touching of it may lead to serious injuries.
Don't touch the hot plate surface!
The plate may still be hot, even when switched-off.
Prior to any maintenance or repair work, make sure that all heated parts have reached ambient temperature.
Before touching any parts check the actual temperature displayed on temperature indicator.

DANGER – Fire hazard

Fire hazard
Do not place any inflammable objects on demounting plates or close to it.
Do not use any inflammable media close to the demounting plates.
Do not operate the demounting plates in an area with explosion hazard.

Safety Instructions: Power Supply

DANGER

Electrical hazard

This system operates under high voltages. Danger of high voltages exists even when the system is switched off, but still connected to the power supply.

Capacitors within the system may be charged even in case the system is switched off and disconnected from mains supply line.

DANGER

Electrical hazard

While switched on, electrical connectors will be live. Opening of covers or removing of parts may result in exposure to live parts.

CAUTION

Electrical hazard

The system needs to be grounded in all cases. Do not remove or cut off any ground wire of power supply or inside the system. Insufficient grounding can cause additional electrostatic charging of plastic parts, hoses or pipes, and the system as a whole.

Ensure the following:

- Water or perspiration may cause electrically hazardous conditions.
- Wear dry, intact and non-conductive gloves, clothing and shoes.
- Do not touch live electrical parts.
- Make sure all protective covers are installed.

Safety Instructions: Maintenance

WARNING

Troubleshooting must be performed by suitably qualified and authorized personnel.

Before beginning any maintenance work, please observe the following:

Maintenance work must be done only by personnel who are familiar with the hazard zones and know how to prevent any possible hazards by applying the appropriate safety measures.

Check the function of the switch-off devices before beginning to work.

Inform the operating personnel about the maintenance work before beginning it and mark the system appropriately during the maintenance work.

For maintenance or repair work, the Main Power Switch must be set OFF.

When performing maintenance work during which the equipment must be switched on, secure the equipment against any inadvertent switching.

Additional Safety Information

- Do not take actions on the system other than described in this manual.
- Do not operate the system while covers or other protective systems have been removed.
- Maintenance and service work may only be executed by ON nano service personnel or persons qualified accordingly.
- Disconnect all wires of power supply prior to opening of the system. In case work must be done while the system remains open (for adjustments, maintenance etc.) it should only be done by qualified personnel, knowing all potentially dangerous points and being able to prevent hazards by taking appropriate precautions.
- In case fuses must be replaced make sure that only fuses of same type and current rating will be used.
- In case of insufficient grounding or of damaged ground conductor make sure that the system will be inoperable and secure it against unauthorized or unintentional operation.
- Whenever it is likely that the system is no longer electrically safe, make it inoperable and secure it against any unauthorized or unintentional operation.
- The system is likely to be electrically unsafe if:
  a) any damage is visible
  b) it fails to perform according to specification
  c) it has been subject to prolonged storage under unfavorable conditions
  d) it has been subject to severe transport stress.

In these cases, the safety state of the machine must be checked by ON nano service personnel.

Product Description

Intended Use

The Debonding System nanoDEBOND 200 is suitable for wafers from 3" up to 8".

The Debonding System nanoDEBOND 200 is designed for processes up to 200 °C.

The Debonding System nanoDEBOND 200 is intended exclusively to debond wafers, substrates or fragments from rigid carriers or other wafers under thermal influence.

The Debonding System nanoDEBOND is specially intended:

- for laboratories and research institutions
- for small series productions
- For industrial applications

The Debonding System nanoDEBOND 200 is not suited or designed for any other applications than the ones stated above.

Any modification of the system requests manufacturer's prior consent as well as his confirmation in writing.

Product Components

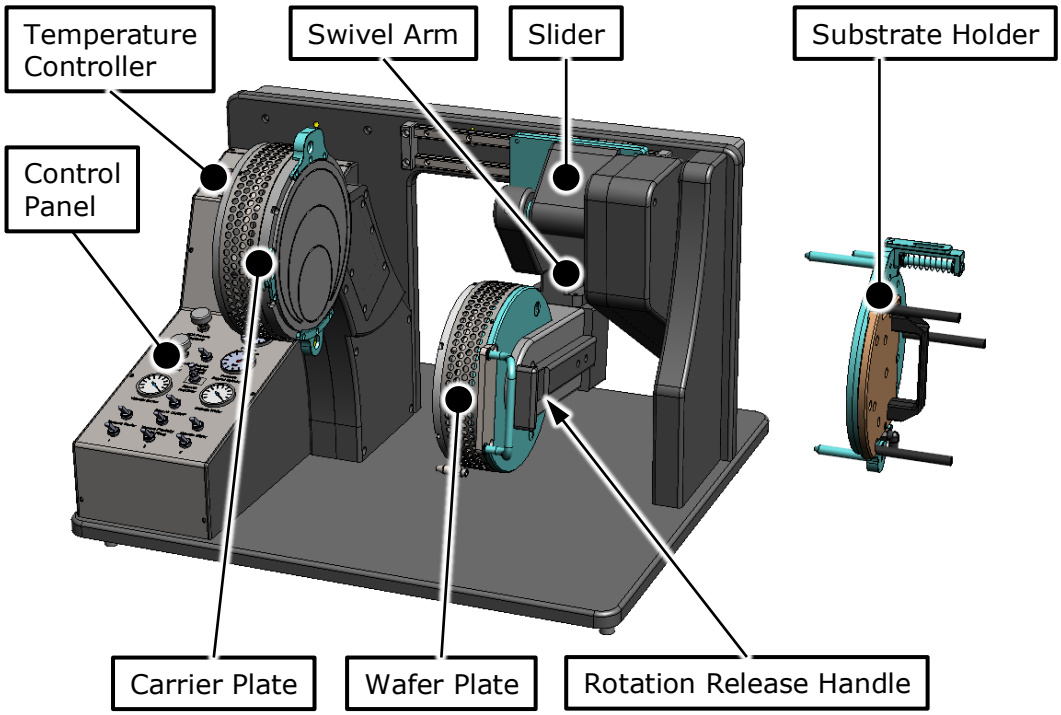


Figure 1: General view process module

(substrate holder is an option to preheat the carrier with wafer to avoid thermal shock)

Backside

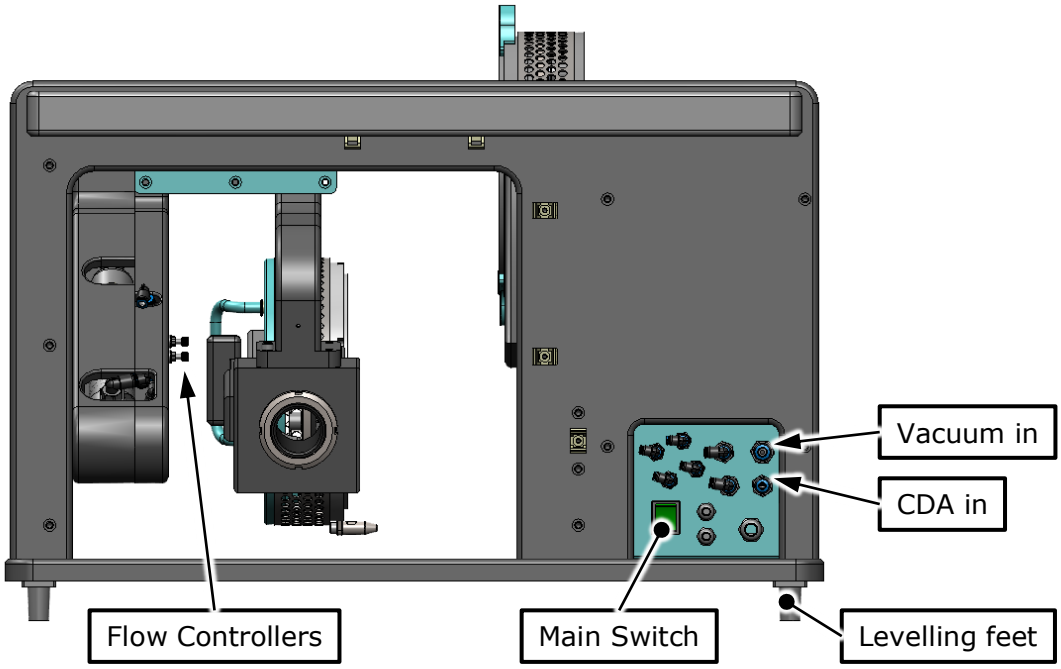


Figure 2: Backside view

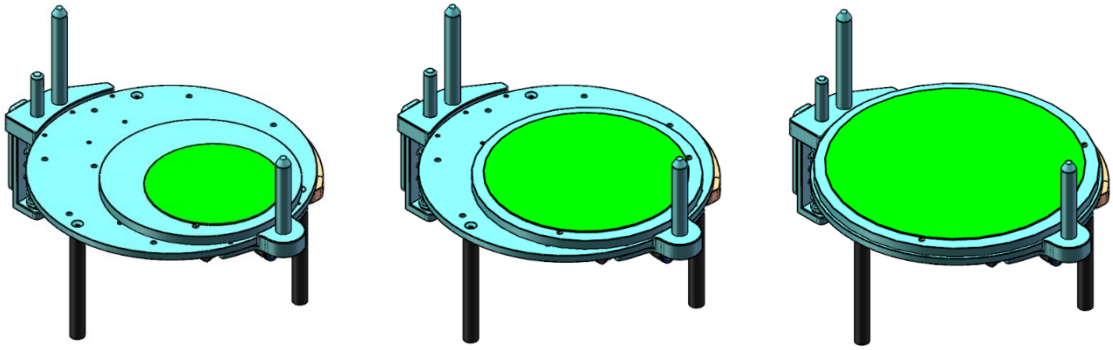
The Flow Controllers allow the move up and return speed to be set separately for the lifting of the swivel arm. They should be adjusted so that the arm does not hit hard at the end position.

Substrate Holder for proximity preheat (option)

The substrate holder is an extra feature option to preheat the carrier with substrate to avoid any thermal shock for sensitive Wafer or Substrate

The proximity preheat is mechanical adjustable

The substrate holder can be equipped with 3 different vacuum plates



6 inch 8 inch 12 inch

Figure 3: sample Substrate Holder

Control Panel

Regulators, gauges an switches as labeled

Switches:

On

Off

Vacuum Proximity Wafer Fixing is for the substrate holder

Vacuum Carrier and Wafer:
Ø 4" (100mm)

For Carrier and Wafer:

Switch No 1:

Additional Ø 6" (150mm)

Switch No 2:

Additional Ø 8" (200mm)

Switch No 3: no function

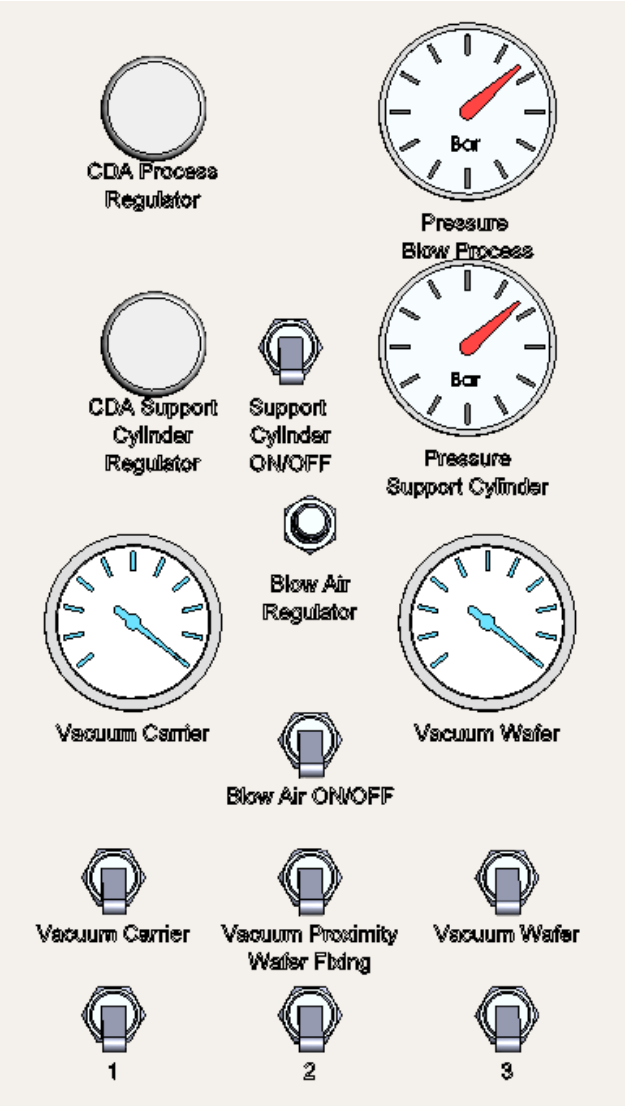


Figure 4: Control Panel

Required Media

following media are required:

CDA Clean Dry Air

Vacuum

Temperature Controller

Figure 5: View Temperature Controller

Adjustment Options

Key UP
By pressing this key together with the **“SET”** key you can increase the operating temperature.

Key DOWN
By pressing this key together with the **“SET”** key you can decrease the operating temperature.

Function key
undefined

Key SET
together with keys **“UP”** und **“DOWN”** to adjust the temperature.

Function key
undefined

Function Description

The setting of the operating temperature is done in °C. It can be selected by pressing the **“SET”** – key and additionally pressing the **“UP”**- or **“DOWN”** - key. After a short time, the current temperature is displayed while the hotplate is heating up or cooling down.

Installation

DANGER

Carefully read the manual with the required safety instructions before installing, commissioning and operating the device.

DANGER

The installation and start-up of the electrical equipment may only be performed by competent and qualified personnel. All valid national instructions must be observed.

Note

The system is not protected against the ingress of water. Therefore, it should be installed in a dry place only, where it is protected from humidity.

The equipment may only be installed and put into operation under the supervision of ON nano specialists.

Please observe the following:

- The operating company must make sure that the permissible floor load is not exceeded. The floor must be level and vibration-free.
- The operating company must make sure that the floor space is adequate for operation and maintenance.
- The operating company must make sure that the media lines and media tanks are properly connected to the modules.
- The operating company must make sure that the extraction system is properly installed and fully functional.
- The operating company must make sure that appropriate protective enclosures are installed and that potential hazard zones are not accessible.

Basic Safety Rules for Setup and Installation

Make sure you observe the following safety rules:

- Installation shall be done by, or under the supervision of, a qualified person.
- Installation including earthing, necessary disconnects, fuses and type of incoming power shall be in accordance with national and all local standards. Faulty installation, improper grounding of electrical equipment are sources of danger.
- The cables used must be in accordance with the given specifications.
- Back-up fuses of appropriate amperage must be used.

Ensure the following:

- Water or perspiration may cause electrically hazardous conditions.
- Wear dry, intact and non-conductive gloves, clothing and shoes.
- Do not touch live electrical parts.
- Make sure all protective covers are installed.

Unpacking

! This is a highly sensitive electromechanical appliance.
Be careful while unpacking, installing, starting and operating the unit.

☞ The modules are packed as follows:

- Wooden crate (can be opened with electric screwdriver)
- Stretch wrap film (can be unwrapped)

☞ Check the contents upon unpacking for damages during transport.
In case of transport damages or damages in transit, please contact the shipping company, the insurance company Osiris international Inc immediately.

☞ Verify receipt of all parts based on packing list.

☞ In case of missing parts, please refer to the manufacturer.

Ambient Conditions for Operation

This system will operate correctly under following conditions:

Cleanroom Environment	Designed for cleanroom class 10 (ISO 4)
Operating temperature	+20°C to +24°C (+68°F to +76°F)
Maximum temperature variation	ΔT ≤ 2°C / hour (ΔT ≤ 3,6°F / hour)
Relative humidity	30 to 50 %

Place of Installation

The system may only be placed on a stable, flat, vibration-free and safe surface not to be deformed under the weight of the unit and eventual accessories.

Leveling the System

The device must be aligned with the leveling feet, under the base plate.

Connecting Media Supply and Disposal

All media lines connected with the system's reverse are carrying unmistakable plugs.
The sockets are marked appropriately.

Connecting Power Supply

DANGER

Connect the mains cable at last to the house power supply.

DANGER

Each installation and operation work at electrical equipment must be done by qualified personnel.

The valid national instructions must be followed. Prior all work check the system's disconnection of the power supply.

☞ Make sure that the system is switched off
Connect power cable to power supply system

Operating

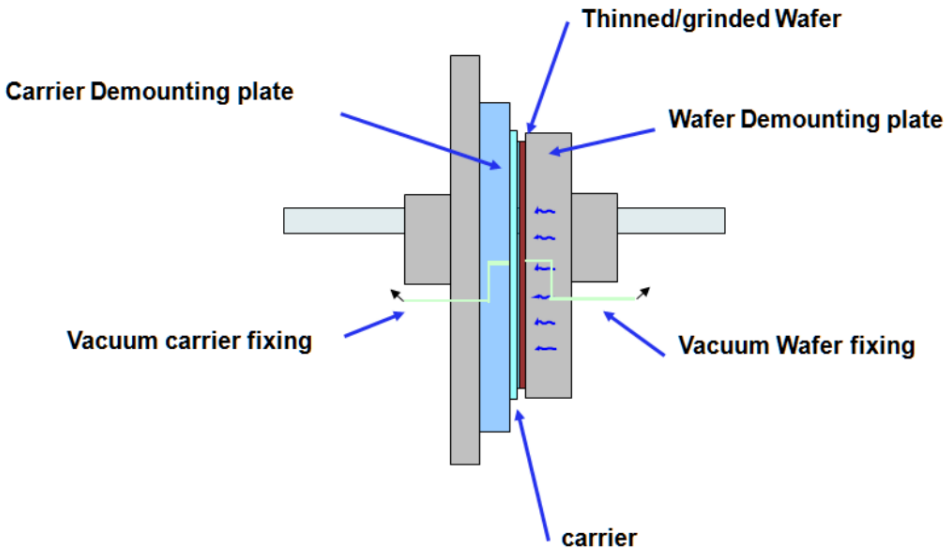
! Before operating the device, this manual and all safety instructions must be read carefully and observed.

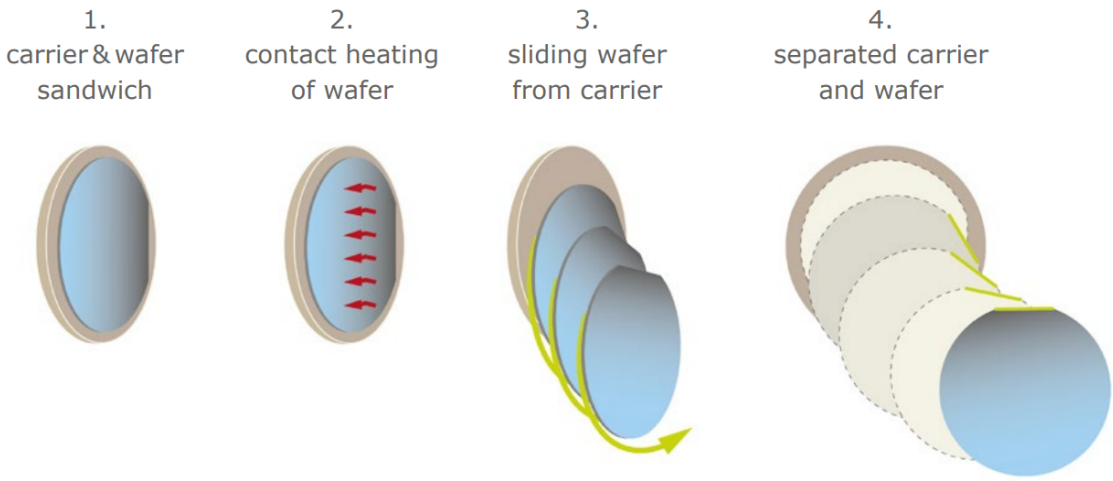
Danger

Debond Hotplates

The substrate, the demounting plates and its cover are very hot, touching them can cause severe burns.

Debond Concept





Start-Up

Preparations in General

! Depending on used features and media special preparations are necessary:

☞ Mount the vacuum plate fitting to the wafer on the substrate holder.

☑ Make sure that vacuum and CDA are connected and operational.

Switching the demounting plates on

☞ Press the main switch on the backside.

↳ Both plates begin heating up to the temperature set at least.

↳ The actual temperature is displayed on the temperature display.

Programming the Process Temperature

☞ Press the **'SET'** button of the temperature control

↳ The display of the temperature control changes from indicating the actual value to set value

☞ For setting the process temperature press simultaneously the **'SET'** and the **'UP'** button or the **'SET'** and **'DOWN'** button.

☞ Let off the **'UP'** or the **'DOWN'** button.

☞ Let off the **'SET'** button.

↳ The display of the temperature control changes to indicate the actual process temperature.

Operating of the Preheat option.

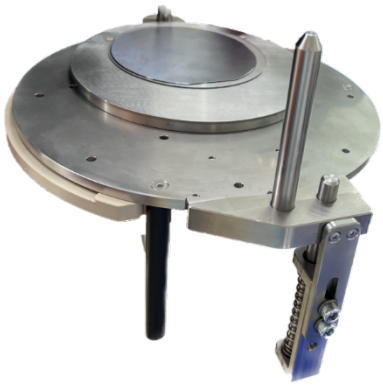
The temperature needed to debond the wafer from its carrier depends on the used adhesive.

The pressure of purge set should be as low as necessary.

Without the proximity Preheat option just place the bonded pear on the fixed heated plate. The Carrier needs to be supported with vacuum

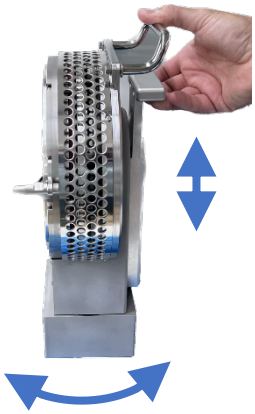
! Check pressure gauge when switching on vacuum for wafer plate or carrier plate. If no vacuum is indicated, reposition the substrate or select a smaller vacuum area.

1. Place the wafer and carrier assembly on the substrate holder with the carrier facing upwards and make sure that the substrate rests correctly on the surface.
2. Switch on the **Vacuum Proximity Wafer Fixing**.



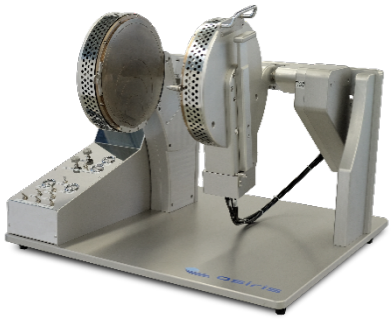
3. Insert the substrate holder into the guides of the carrier plate until the carrier rests against the plate.
4. Switch on the **Vacuum Carrier**.
5. Switch off the **Vacuum Proximity Wafer Fixing** and put the substrate holder away.

6. Using the Wafer Plate handle, the Wafer Plate can be turned 90°.



7. Turn the wafer plate to the carrier plate

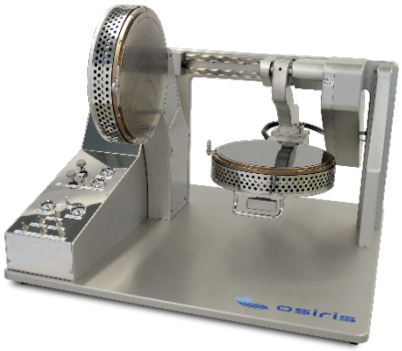
8. Switch on the **Support Cylinder.**
9. Ensure that the Carrier Plate and Wafer Plate are in line with each other.



10. Move the wafer plate carefully against the carrier plate.
11. Switch on the **Vacuum Wafer**.
12. Wait until the adhesive is heated and then switch the **Support Cylinder off.**

    Due to the heating of the adhesive, the wafer plate begins to move on its own weight, starting the de-mounting process.

13. When the de-mounting process is completed, move the Wafer Plate to the right and turn the Wafer up.
14. Switch off the **Vacuum Wafer**. Remove the wafer with a suitable wafer-removal tool.
15. To support the removal of the wafer, the wafer plate can be rinsed with CDA by switching **Blow Air on**.
16. Switch off the **Vacuum Carrier** whilst supporting the carrier. Carefully remove the carrier.



17. If necessary, clean both plates with a suitable detergent.

Cleaning

! The system doesn't need any special maintenance, except occasional cleaning.

! Cleaning intervals depend on usage intensity and the type of applied media.

☞ Do not use scratching or scouring cleaning agents or tools.

DANGER

Pay attention to all additional safety instructions in chapter 0 Safety Instructions.

DANGER

All maintenance and service tasks must be carried out by specially qualified persons only, knowing the perils and being able to prevent them by applying suitable safety measures.

Cleaning in General

☞ Clean the demounting plates with DI water or a solvent which is suitable for the process chemical.

☞ Clean the stainless-steel surfaces, the armatures and the cabinet only with alcohol or equal solvents.

☞ If required rinse the hoses with suitable cleaning agents.

Maintenance

DANGER

Prior to all maintenance and cleaning work inside the unit, the unit and additional modules must be disconnected from all external and media supplies.
Pay attention to all additional safety instructions in the referring chapter.

DANGER

All maintenance and service tasks must be carried out by specially qualified persons only, knowing the perils and being able to prevent them by applying suitable safety measures.

- Wear appropriate personal protective equipment.
- Replace parts only with original parts which are authorized by the manufacturer. Do not substitute or modify any parts.
- Maintain the complete electrical installation in safe working condition. Do not operate the equipment in faulty condition. Improper or worn electrical connections can increase the chance of an electrical shock. Do not use worn, damaged or bare cables.
- Avoid live circuits. Always disconnect the equipment from the mains power supply before doing any maintenance. Use appropriate lock-out/tag-out procedures.
- If protective devices must be removed for maintenance, make sure that all protective devices are re-installed after the maintenance job is terminated.

Preventive Maintenance Schedule

! The preventive maintenance intervals in the table below are meant to be approximate guidelines only. Actual intervals may be different depending in the operating and environmental conditions.

General Maintenance Tasks

Task / Cycle	Daily	Weekly	Monthly	Quarterly	Annually
Visually check for damage. Damages must be reported to the person in charge without delay.	X				
Check all safety interlocks for correct function	X				
Check the air service unit for correct pressure		X			
Visually inspect the pneumatic lines Defective pneumatic lines must be replaced immediately			X		
Visually check all cables breaks Damaged wiring must be replaced immediately			X		
Visually check all connection cables and plugs Loose connections must be tightened immediately				X	
Check all sensors and limit switches for correct function				X	
Check the integrity of the pneumatic system				X	
Check all mechanical guides for signs of wear					X
Check all contacts on screw-type terminals					X
Check screws at moving parts for a tight fit, tighten if necessary					X

Troubleshooting

WARNING

The elimination of faults must be carried out by appropriately qualified and authorized personnel.

WARNING

Remove blockages of mechanically operated machine parts with great care.

Pneumatically operated machine parts are pressurized and can move if you remove the blockage!

This can result in serious injuries.

Possible Causes and Solutions

Problem	Causes	Solutions
Displays do not start	Any power or data supply is interrupted.	Check all power and data connections.
Problem with a pneumatic drive	• Problem with compressed air supply • Mechanical blockage of the cylinder • Limit switch on cylinder is defective or not correctly adjusted. • No power supply to limit switch • Cylinder is defective	• Check if the cylinder has reached its target position. • Check if there is a mechanical blockage, eliminate the problem with great care • Pneumatically operated machine parts are pressurized and can move if you remove the blockage! • If the cylinder is in the correct position, check the functionality of the sensor

Transportation and Storage

Storage and Transport Conditions

Admissible temperature range	5°C to +50°C (41°F to +122°F)
Maximum temperature variation	ΔT ≤ 20°C/h (ΔT ≤ 36°F/h)
Relative humidity	30 to 60 %

Note

The equipment is not protected against the ingress of water.

It must never be exposed to high humidity or rain.

Transportation

If the system is to be relocated later on:

- Make sure that all power or media supplies have been disconnected from all modules.
- Additional modules and accessories must be packed separately.
- Keep modules upright during transport.
- Secure all parts from falling down.
- Make sure that the modules are not exposed to strong impacts.
- Make sure that no equipment parts can be damaged during transport.

Storage

Store the device and additional parts:

- dust-free and protected (best packed).
- individual parts equipped with chemical dehumidifiers.

Disposal

At the end of the life cycle, the equipment must be disposed of in an environmentally friendly manner in accordance with local regulations and laws in force at the time of disposal. It contains many valuable materials, which should be recycled.

☞

- Get in touch with ON nano Inc for return shipment.

or

- Get in touch with a local waste management and recycle company.

Product Specifications

Technical Data

Dimensions W x D x H	730 mm x 640 mm x 550 mm 28.7" x 25.2" x 21.7"
Substrate Size	up to Ø 8" (Ø 200 mm)
Temperature Range	up to 200°C*, in 0,1° steps
Accuracy of Temperature	< ± 1°C at 100°C
Weight	ca. 280 kg
Noise Emission	<70 dB(A) Workplace-related emission value
Basic Materials	Stainless Steel, anodized aluminum, Electric equipment

Ambient Conditions

Operating Conditions

Operating temperature	+20°C to +24°C (+68°F to +76°F)
Maximum temperature variation	ΔT ≤ 2°C / hour (ΔT ≤ 3,6°F / hour)
Relative humidity	30 to 50 %

Storage and Transport Conditions

Admissible temperature range	5°C to +50°C (41°F to +122°F)
Maximum temperature variation	ΔT ≤ 20°C/h (ΔT ≤ 36°F/h)
Relative humidity	30 to 60 %

Requirements

Power	208VAC / 2~ / PE / 50-60 Hz / 10A
Power Consumption	Max. 1600W
CDA (Clean dry air)	8,0 bar +/- 2,0 bar Tube OD 6mm, ID 4mm
Vacuum	-0,8bar +/- 0,1bar Tube OD 6mm, ID 4mm