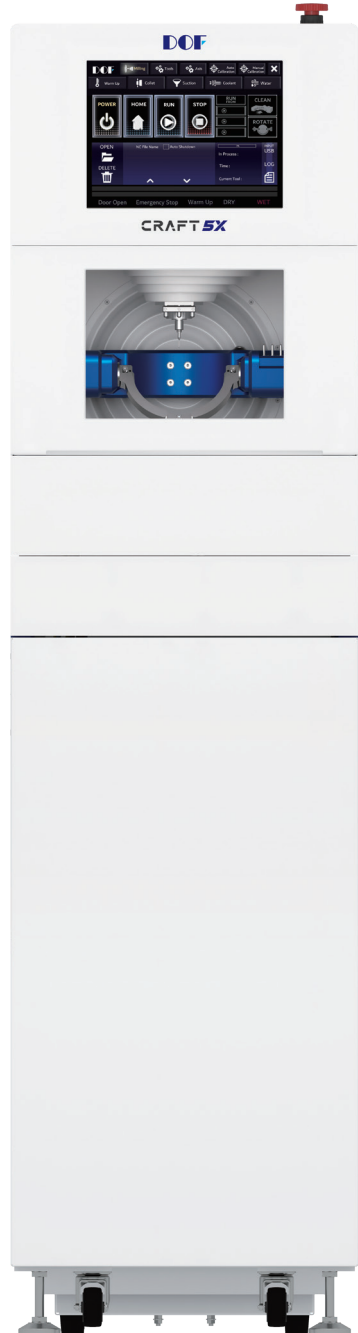




All-in-One Milling Machine

CRAFT 5X

Basic Manual ■

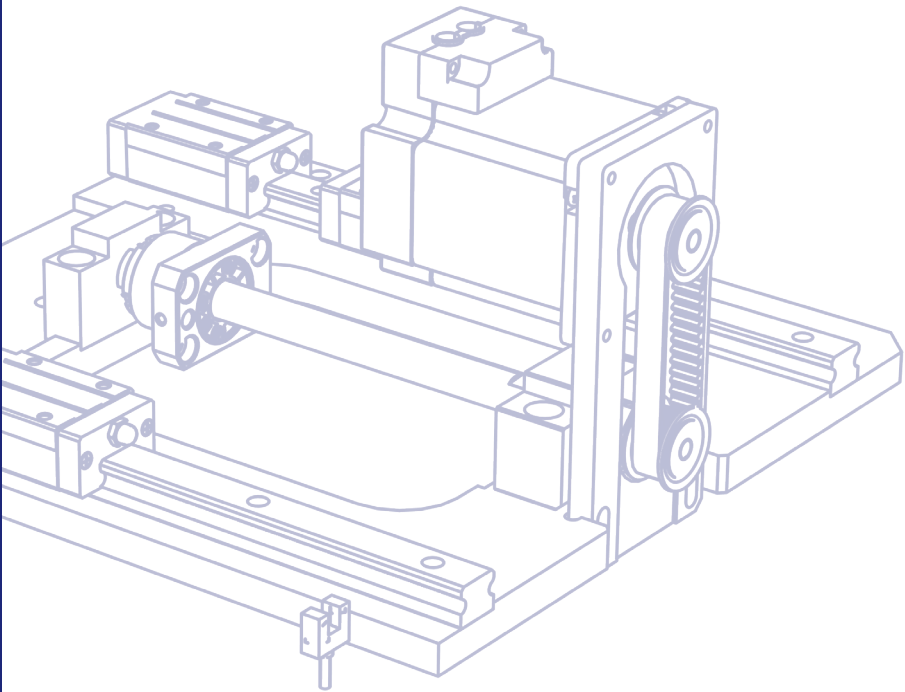


CRAFT 5X

CRAFT 5X

Basic Manual ver 1.1

TOGETHER, WE INNOVATE



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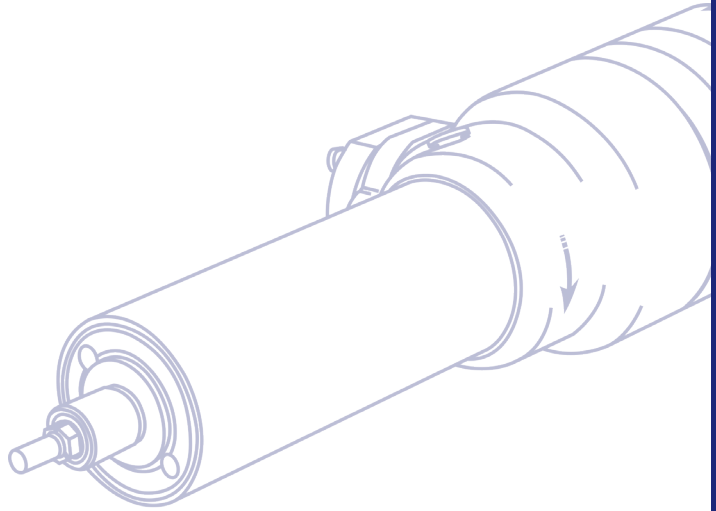
This document is used only for the purpose of explaining how to use CRAFT 5X.

If you have any questions regarding this manual or CRAFT 5X, please contact us below.

Address #601-602, 77, Seongsui-ro, Seongdong-gu, Seoul, 04790 Korea

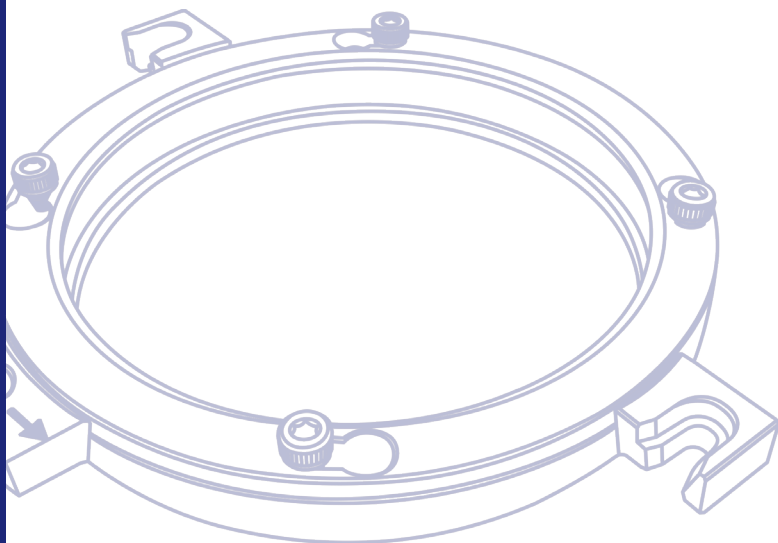
E-mail info@doflab.com

* The basic manual distributed with the product may not contain the latest version of the content.



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QUALITY GUARANTEE ■

We guarantee the quality of this product. The warranty period is one year from the date of purchase. If a failure occurs during use, please contact your local dealer or DOF.

■ Quality Assurance Precautions

Please read and understand this manual before using the product, especially note the following

- Make sure that the input voltage and the rated capacity are suitable for the main power.
- Before using the product, check the installation status and inspection details.
- In the following cases, no warranty liability shall be taken even during the warranty period.
 - ※ Damage caused by a mistake or carelessness.
 - ※ Modifications of performance.

SAFETY PRECAUTION.

CRAFT 5X is a milling machine equipment that processes implants needed in dentistry or dental labs. Only professionally trained persons may use this equipment.

This machine is equipped with various safety devices to protect the operator and the machine from unintentional accidents. The operator must never be overconfident of these safety devices and must be familiar with the following safety precautions in order to use the machine safely.

■ General Precautions

- Fully understand the manual and functions, and perform the work according to the prescribed practice.
- Plan scopes and sequences of each task in advance.
- Specify numbers of people required for each task, and only the specified people perform the task.
- Wear appropriate clothing for work.
- Keep the machine and its surroundings clean and tidy.
- Never touch a switch or a cable with wet hands.
- Perform periodic checks and adjustments or repairs according to the check points described in this manual.
- Check the set points of the machine periodically and do not change these arbitrarily.
- Do not disassemble or adjust the device and safe covers.
- Always turn off the power before working within the operating area of the machine.
- This equipment can be moved through the four wheels of the lower table, but it is recommended not to move it after installation as much as possible.
- Never move the upper milling machine after installation.

Operation Precautions

- Acquire instructions in the operation manual.
- Clear obstacles around the machine that may obstruct operations.
- Always close the door before starting an operation.
- If power is shut off due to a power failure or lightning, an accident may occur. Therefore, shut off the power before it becomes unstable.
- If the machine stops due to a power failure, turn the main power switch off immediately.
- Check setting values of the gauge and the condition of operating parts.
- Be careful not to operate other menus.
- Before removing workpieces, make sure that the machine is stationary.
- During a machine operation, never touch any part of the machine.
- Loosen bolts slowly and gradually on fixtures.
- Remove external objects completely before mounting a workpiece and tools.
- Make sure to set the depth of cut and feed rate to a small values.
- Do not leave any tools or devices inside the machine.
- Make sure the setup is complete.
- If the setup condition has changed, operate the machine step by step to see if it can be operated without any problems.
- When working in a new setup condition, double check the condition before starting an operation.
- Before performing any operations such as spindle rotation, tool change, or axis movement, make sure that these operations can be safely performed.
- Make sure that the operating part is in place before starting automatic operation.
- Never open the door and covers while the machine is operating.

SÉCURITÉ PRÉCAUTION.

CRAFT 5X est un équipement de fraiseuse qui traite les implants nécessaires en dentisterie ou dans les laboratoires dentaires. Seules des personnes professionnellement formées peuvent utiliser cet équipement.

Cette machine est équipée de divers dispositifs de sécurité pour protéger l'opérateur et la machine contre les accidents non intentionnels. L'opérateur ne doit jamais trop se fier à ces dispositifs de sécurité et doit être familiarisé avec les précautions de sécurité suivantes pour pouvoir utiliser la machine en toute sécurité.

■ Précautions générales

- Comprenez parfaitement le manuel et les fonctions, et effectuez le travail conformément aux pratiques prescrites.
- Planifiez à l'avance les portées et les séquences de chaque tâche.
- Spécifiez le nombre de personnes requises pour chaque tâche, et seules les personnes spécifiées effectuent la tâche.
- Portez des vêtements de travail sûrs adaptés aux travaux.
- Gardez la machine et son environnement propres et rangés.
- Ne touchez jamais un interrupteur ou un câble avec les mains mouillées.
- Effectuez des vérifications et des réglages ou des réparations périodiques selon les points de contrôle décrits dans ce manuel.
- Vérifiez périodiquement les points de consigne de la machine et ne les modifiez pas arbitrairement.
- Ne démontez pas et ne réglez pas l'appareil et les couvercles de sécurité.
- Toujours couper l'alimentation avant de travailler dans la zone de fonctionnement de la machine.
- Cet équipement peut être déplacé à travers les quatre roues de la table inférieure, mais il est recommandé de ne pas le déplacer autant que possible après l'installation.
- Ne déplacez jamais la fraiseuse supérieure après l'installation.

■ précautions de fonctionnement

- Acquérir des instructions dans le manuel d'utilisation.
- Éliminez les obstacles autour de la machine qui peuvent gêner les opérations.
- Fermez toujours la porte avant de commencer une opération.
- Si l'alimentation est coupée en raison d'une panne de courant ou de la foudre, un accident peut survenir. Par conséquent, couper l'alimentation avant qu'elle ne devienne instable.
- Si la machine s'arrête en raison d'une panne de courant, éteignez immédiatement l'interrupteur principal.
- Vérifiez les valeurs de réglage de la jauge et l'état des pièces en fonctionnement.
- Faites attention de ne pas utiliser d'autres menus.
- Avant de retirer des pièces, assurez-vous que la machine est à l'arrêt.
- Pendant le fonctionnement de la machine, ne touchez jamais aucune partie de la machine.
- Desserrez les boulons lentement et progressivement sur les luminaires.
- Retirez complètement les objets externes avant de monter une pièce et des outils.
- Assurez-vous de régler la profondeur de coupe et la vitesse d'avance sur de petites valeurs.
- Ne laissez aucun outil ou appareil à l'intérieur de la machine.
- Assurez-vous que la configuration est terminée.
- Si la condition de configuration a changé, faites fonctionner la machine étape par étape pour voir si elle peut être fonctionné sans aucun problème.
- Lorsque vous travaillez dans une nouvelle condition de configuration, vérifiez la condition avant de démarrer un opération.
- Avant d'effectuer des opérations telles que la rotation de la broche, le changement d'outil ou l'axe mouvement, assurez-vous que ces opérations peuvent être effectuées en toute sécurité.
- Assurez-vous que l'élément de commande est en place avant de démarrer le fonctionnement automatique.
- N'ouvrez jamais la porte et les couvercles pendant que la machine fonctionne.

■ CERTIFICATION

- **FCC Certification**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: **(1)** This device may not cause harmful interference, and **(2)** this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- **IC Certification**

This Class A digital apparatus complies with Canadian ICES-003.

■ Important Information



WARNING.

English : Warning statements identify conditions or practices that could result in injury or loss of life.

Français : Les déclarations d'avertissement identifient les conditions ou les pratiques qui pourraient entraîner des blessures ou des pertes de vie.



CAUTION.

English : Caution statements identify conditions or practices that could result in damage to this product or other property.

Français : Les déclarations de précaution identifient les conditions ou les pratiques qui pourraient endommager ce produit ou autre propriété.

Terms on the Product. These terms may appear on the product:

DANGER

English : indicates an injury hazard immediately accessible as you read the marking.

Français : indique un danger de blessure immédiatement accessible que vous lisez le marquage.

WARNING

English : indicates an injury hazard not immediately accessible as you read the marking.


Français : indique qu'un risque de blessure n'est pas immédiatement accessible lorsque vous lisez le marquage.


CAUTION


English : indicates a hazard to property including the product.


Français : indique un danger pour la propriété, y compris le produit.

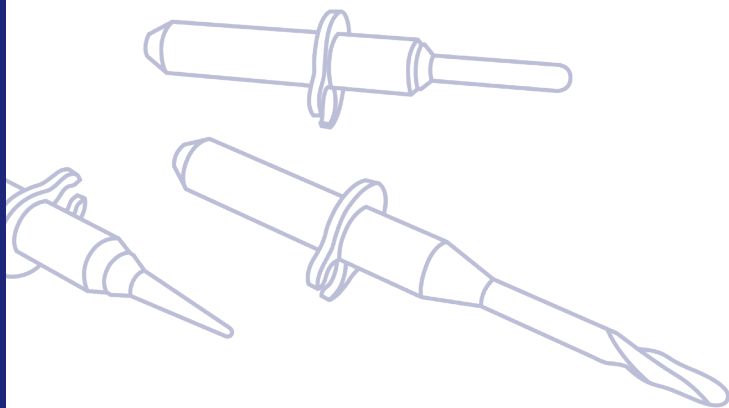
These symbols may appear on the product:

	<p>English :</p> <p>WARNING</p> <p>High Voltage</p>	<p>Français :</p> <p>ATTENTION</p> <p>Haute tension</p>
---	--	--

	<p>English :</p> <p>Protective Ground (Earth) Terminal</p>	<p>Français :</p> <p>Terrain de protection Terminal (Terre)</p>
---	---	--

	<p>English :</p> <p>CAUTION</p> <p>Refer to Manual</p>	<p>Français :</p> <p>MISE EN GARDE</p> <p>Reportez-vous au manuel</p>
---	---	--

	<p>⚠ WARNING</p> <p>Moving parts can crush and cut. Do not operate this product with covers or panels removed.</p>	<p>⚠ AVERTISSEMENT</p> <p>Les pièces mobiles peuvent écraser et couper. N'utilisez pas ce produit avec les couvercles ou les panneaux retirés.</p>		<p>⚠ DANGER</p> <p>HAZARDOUS VOLTAGE. Disconnect power before servicing.</p>	<p>⚠ DANGER</p> <p>TENSION DANGEREUSE. Débranchez l'alimentation avant de procéder à l'entretien.</p>
		<p>⚠ WARNING</p> <p>Read and understand technical manual before servicing this machine. Failure to follow safety instructions could result in death or serious injury.</p>		<p>⚠ AVERTISSEMENT</p> <p>Lisez et comprenez le manuel technique avant de réparer cette machine. Le non-respect des consignes de sécurité peut entraîner la mort ou des blessures graves.</p>	



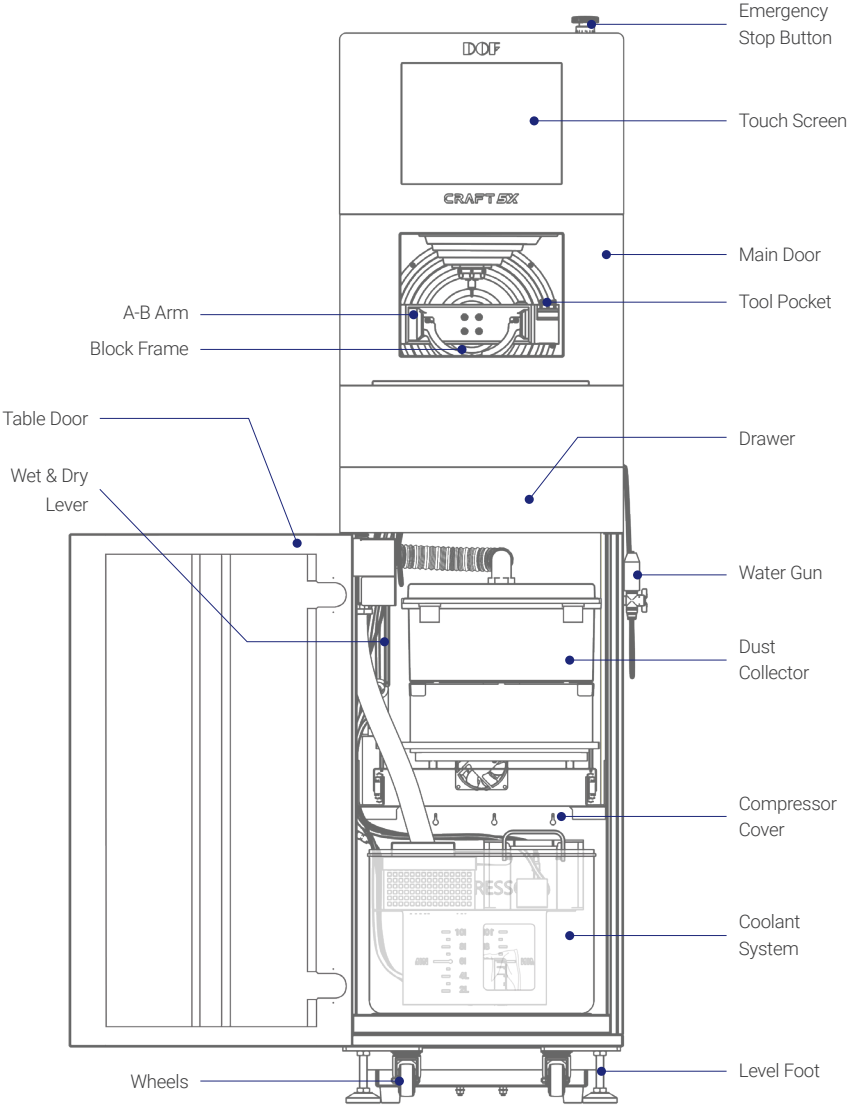
CRAFT 5X PARTS ■

The screens shown in this manual may differ with the actual screens of Craft 5X.

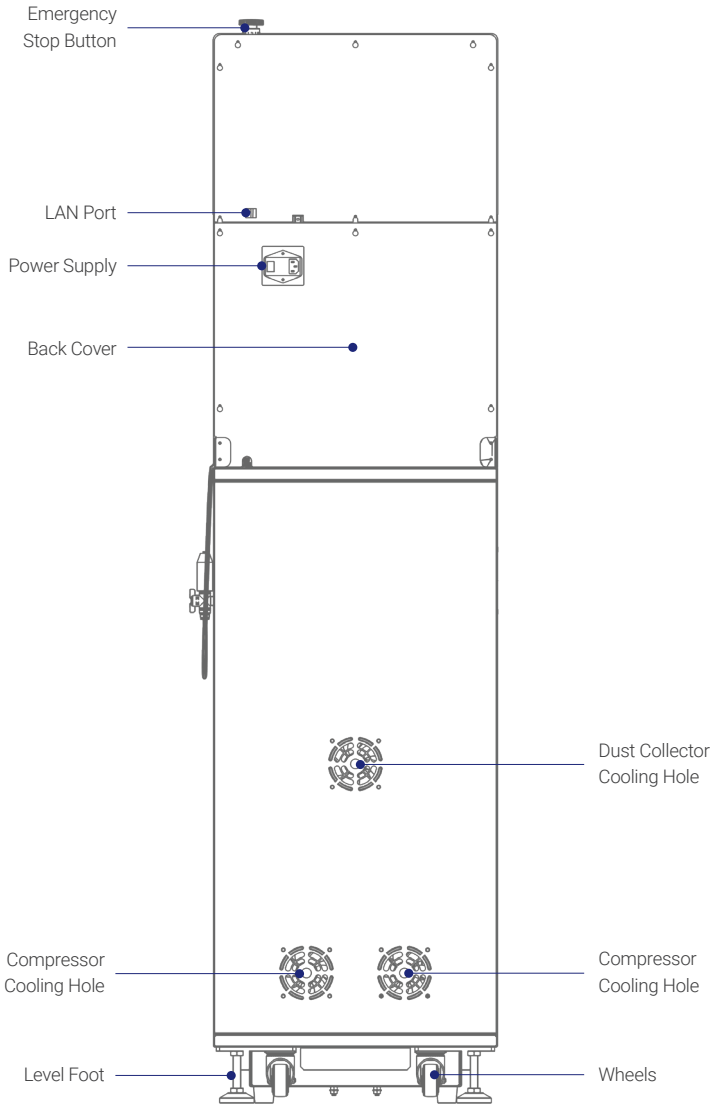
The design and specifications of this product may change without prior notification for product and service improvement. The actual features in the machine may differ from the illustrations.

For more accurate information about the machine, please refer to the catalogue.

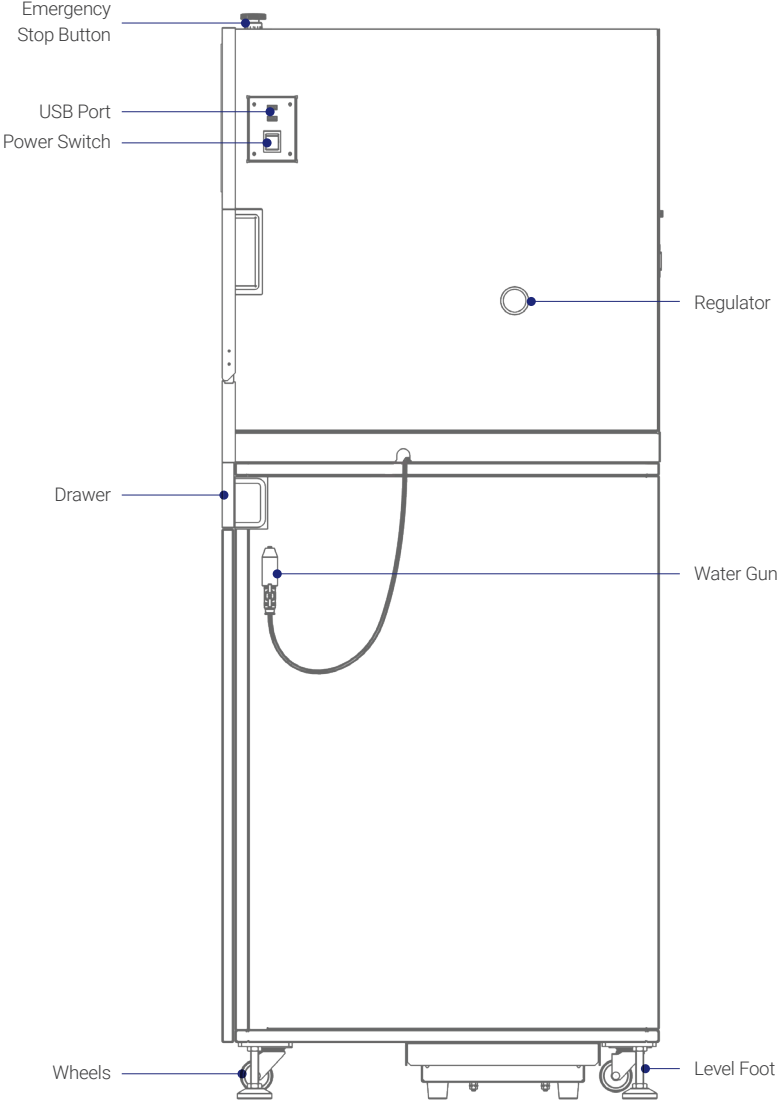
■ Front



■ Back

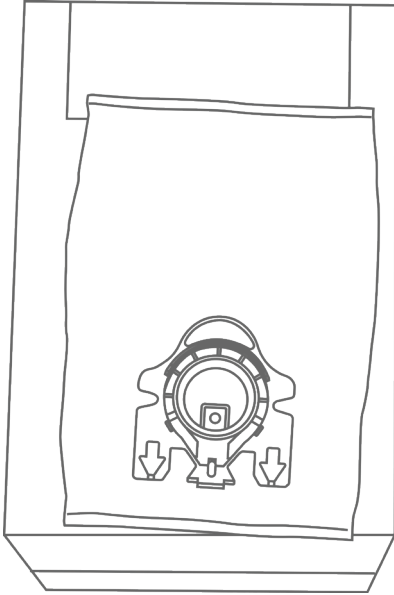


■ Side

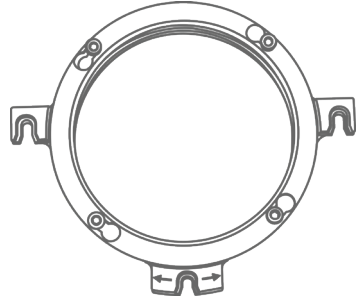


■ Components

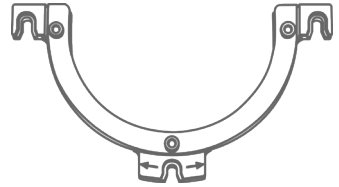
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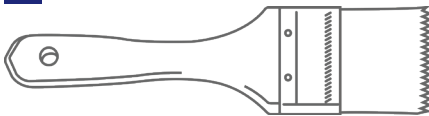
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3



4



5



1 Bag Filter

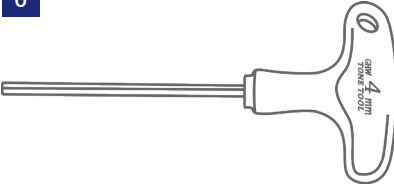
3 C-Type Jig

5 Wrench Set

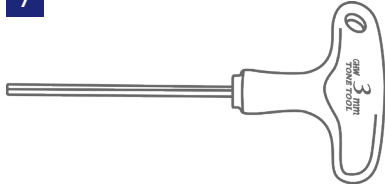
2 O-Type Jig

4 Cleaning Brush

6



7



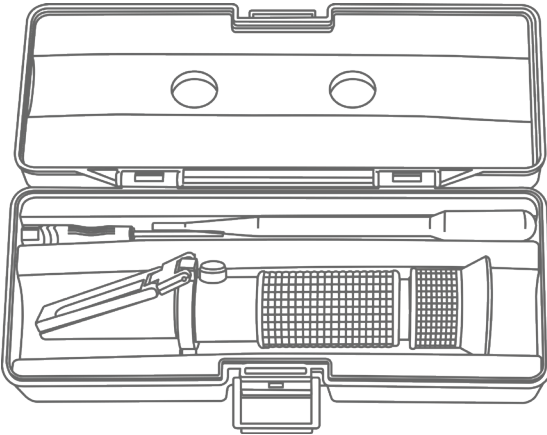
8



9



10



11



6 4mm T-Wrench

7 3mm T-Wrench

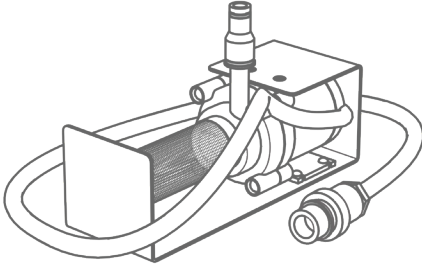
8 Tool Remover

9 Collet Cleaner

10 Concentration Meter

11 19mm Spanner

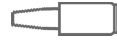
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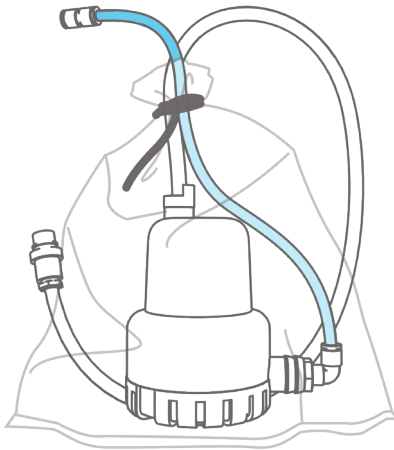
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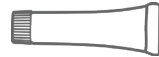
15



13



16



17



12 Water Pump

14 Collet Wrench

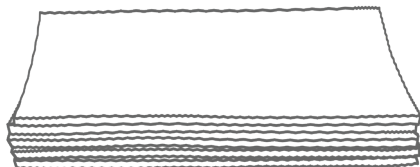
16 Grease

13 Coolant Pump

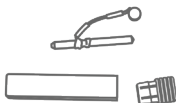
15 Cleaning Cotton (Spindle)

17 Touch Pen

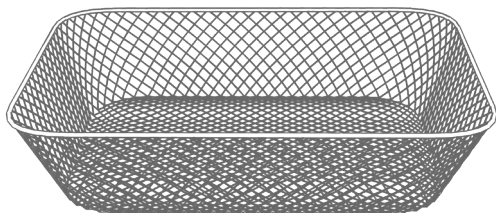
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21



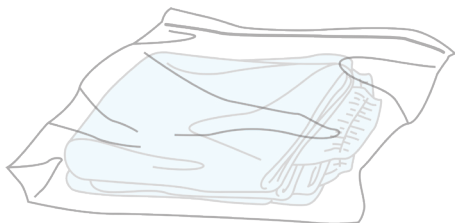
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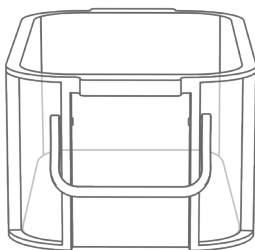
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20



23



18 Chip Collector Filter

20 Filter box cover

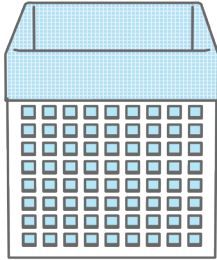
22 Screws

19 Mesh Basket

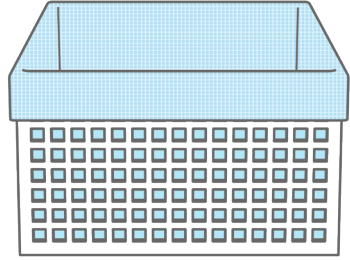
21 Calibration Tool

23 Cleaning Water Box

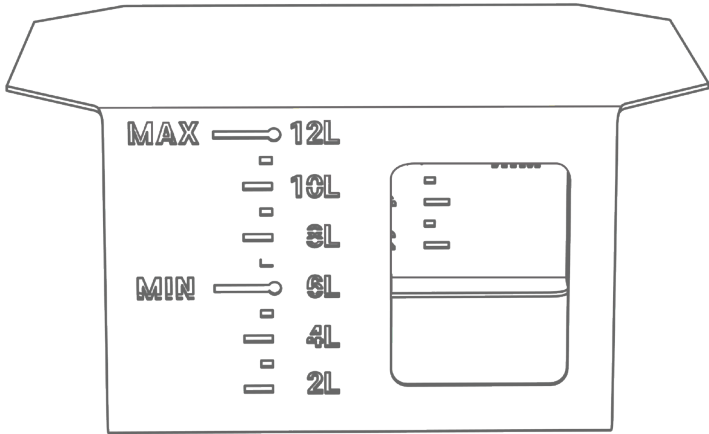
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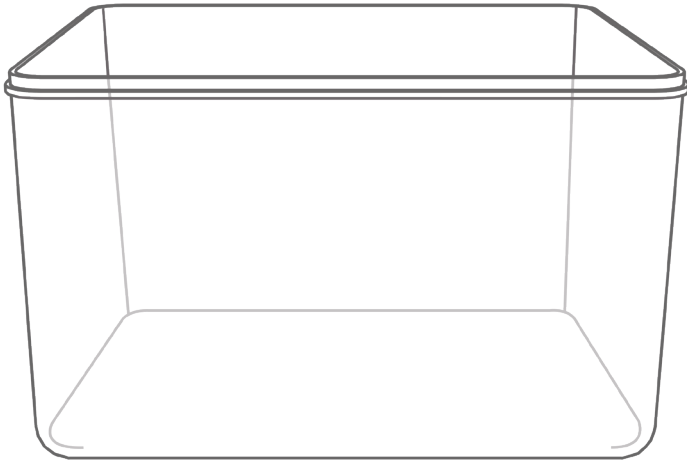


24 Filter Box (Small)

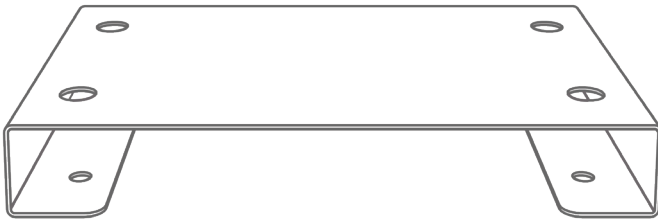
25 Filter Box (Large)

26 Support Deck

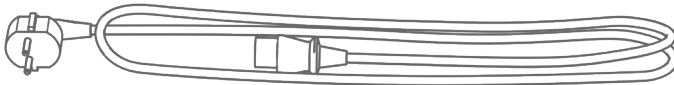
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28



29

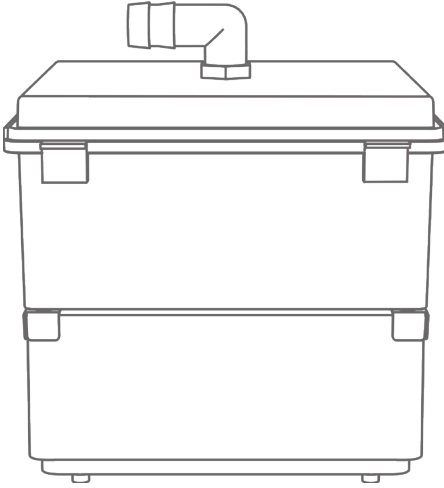


27 Water Tank

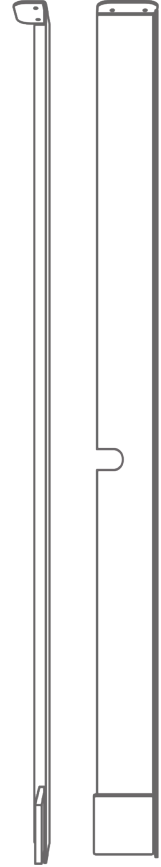
28 Water Tank Rack

29 Power Cable

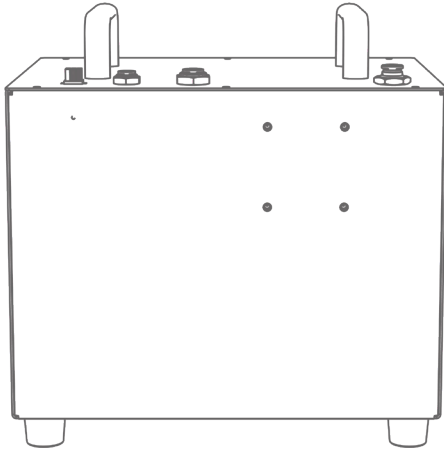
30



32



31



30 Dust Collector

31 Compressor

32 Side Cover

SPECIFICATION

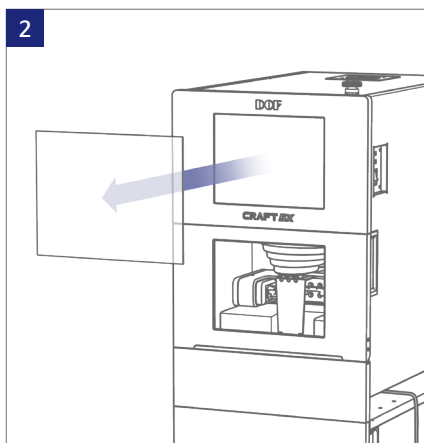
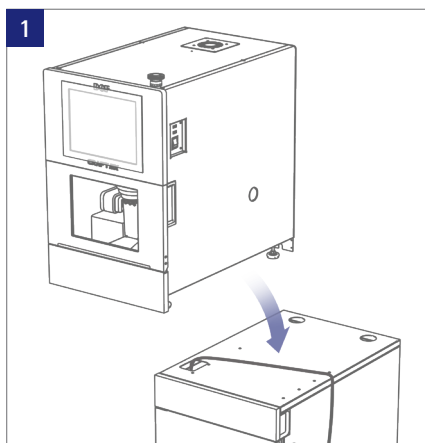
Dimensions	Machine	440mm x 660mm x 710mm (W x D x H)
	Table	436mm x 660mm x 1000mm (W x D x H)
Weight	Machine	75kg
	Table	70kg
Power	Rated Voltage	220 - 240 VAC
	Frequency	50/60 Hz
	Maximum Electric Current	6A
Spindle	Manufacturer	Jäger
	Collet chuck	4ø
	Maximum RPM	100,000 rpm
	Maximum Power	0.7kw
Number of Tools Housed		21
Number of Pre-milled Simultaneous Milling		10
Number of Reverse Pre-milled Simultaneous Milling		6
Number of Glass Ceramic Simultaneous Milling		6
Number of Hybrid Ceramic Simultaneous Milling		12
Required Power		1.5kw
Environmental Conditions		Temperature (5 - 40°C) Relative Humidity (Up To 80% R.H)
Indications		Zirconia, Wax, PMMA, PEEK, Composite resin Hybrid ceramic, Glass ceramic Pre-milled titanium abutment

* Design and specifications are subject to change without notice to improve performance.

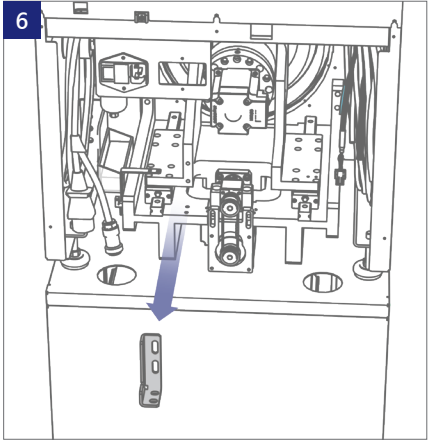
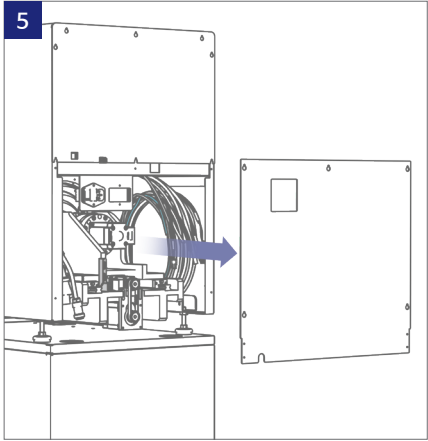
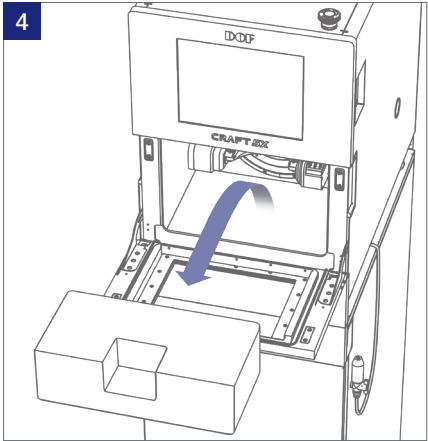
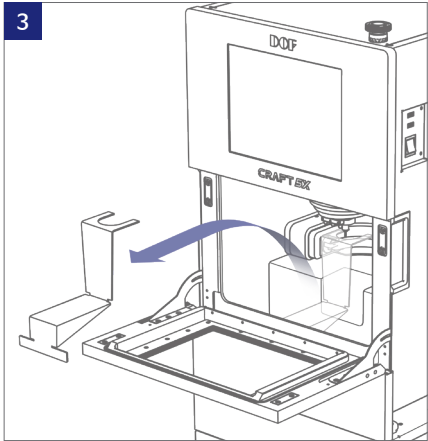
INSTALLATION.

CAUTION

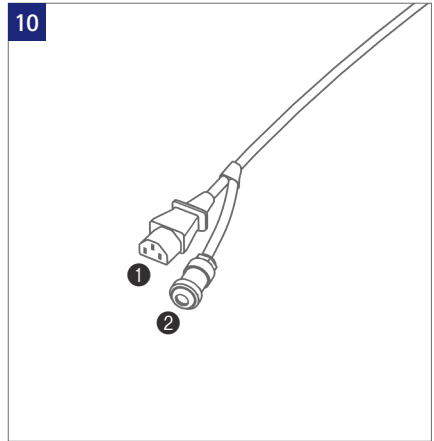
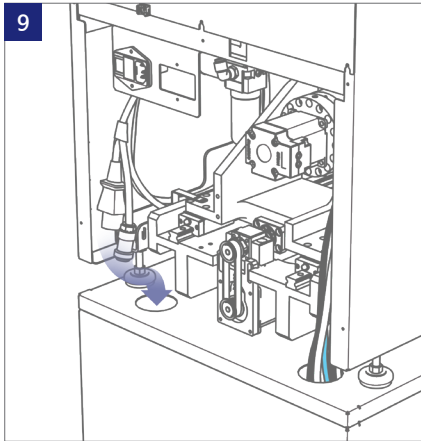
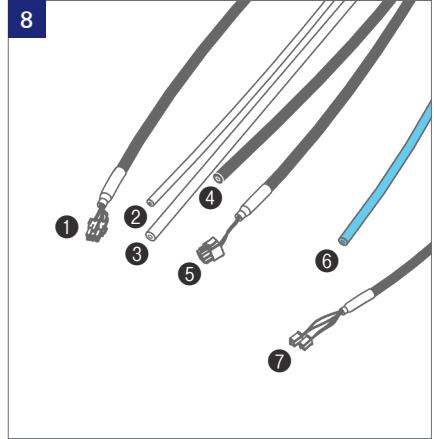
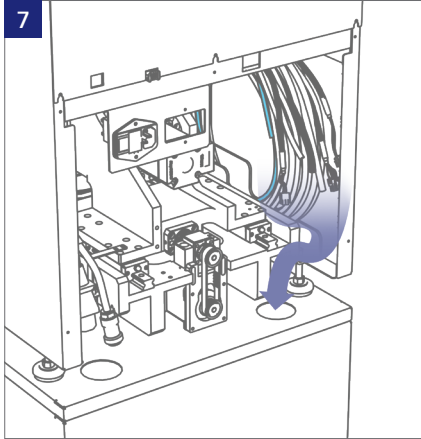
- Only DOF specialists can install this equipment, and if any problem occurs, contact the service center.
- Install on a flat space and keep at least 10cm away from the wall.
- Since dust is generated during operation, it is recommended to install it in a well-ventilated place.



- 1 Place a milling machine on top of a table.
- 2 Remove the 'Monitor Protection Cover'.



- 3 Open the door to remove the 'Spindle Protective Bracket'.
- 4 Remove the 'Sponge Foam' and close the door.
- 5 Remove the back cover of the machine.
- 6 Remove the 'Bracket' fixed to the casting.

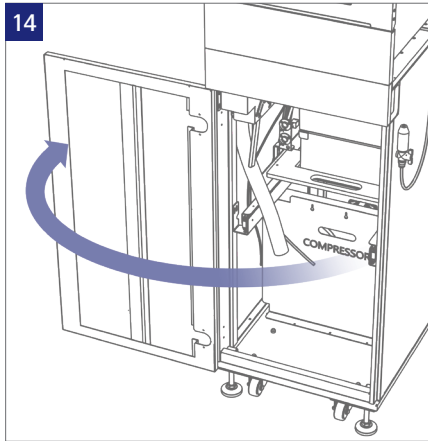
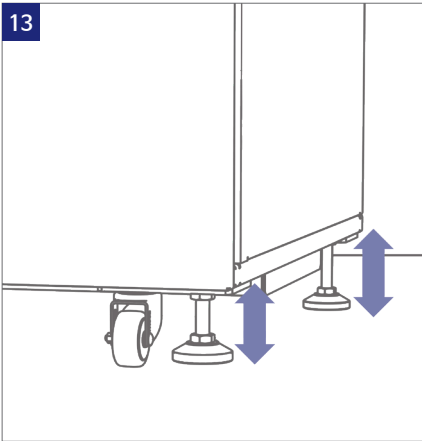
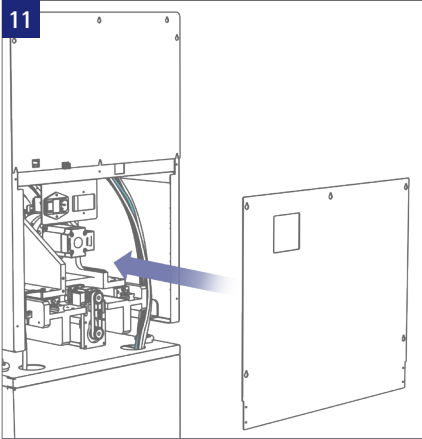


7 Bring the right side cable bundles to the hole at the bottom.

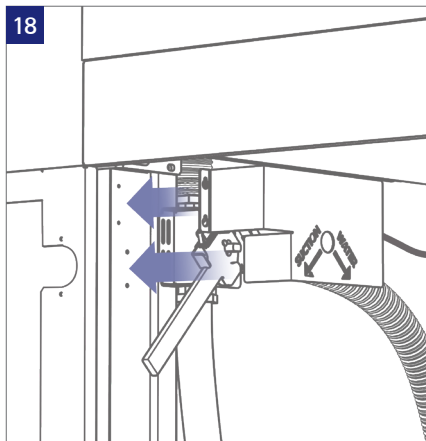
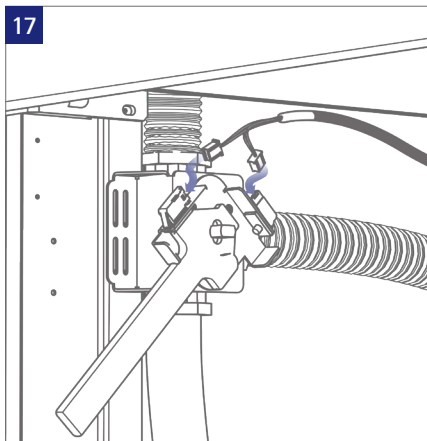
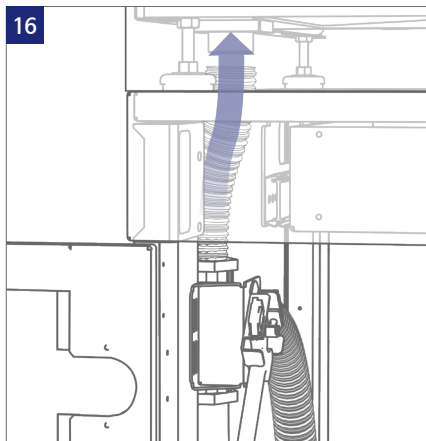
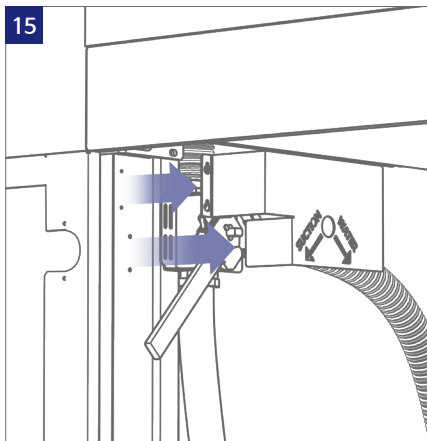
8 Cables **1** Compressor power cable **2** Compressor air hose (8ø) **3** Air sealing hose (10ø)
4 Compressor collet hose (10ø) **5** Water pump power cable **6** Regulator drainage hose (6ø)
7 Coolant hose (8ø) **8** Wet & Dry sensor cable

9 Bring the left side cable bundles to the hole at the bottom.

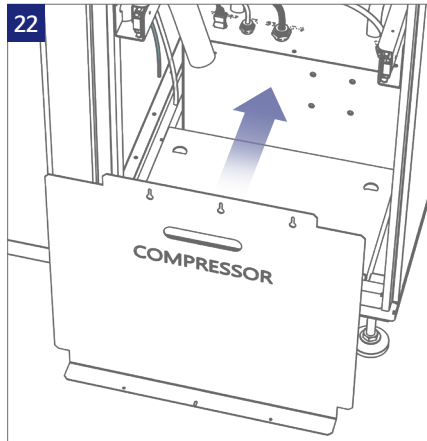
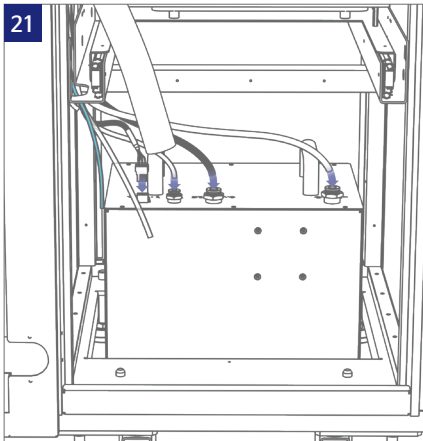
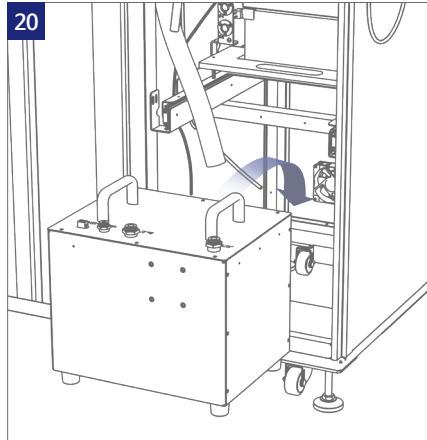
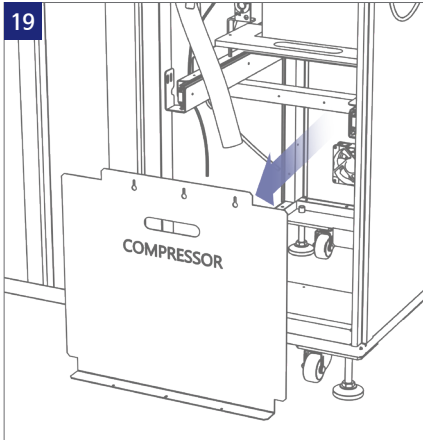
10 Cables **1** Dust collector power cable **2** Dust collector signal cable



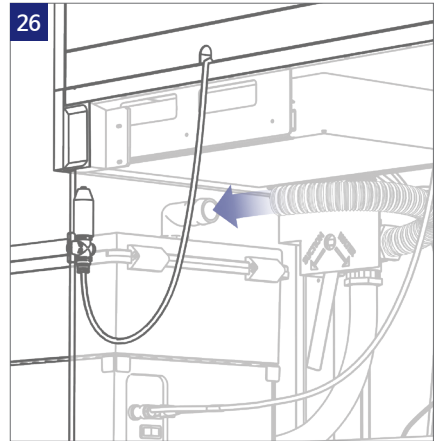
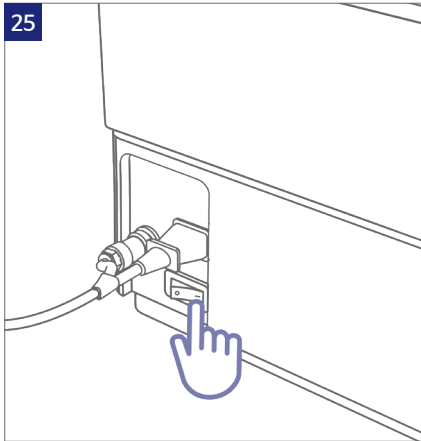
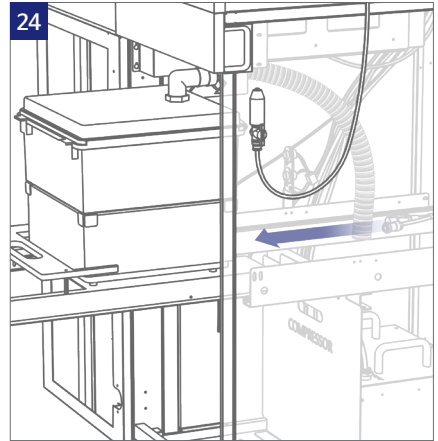
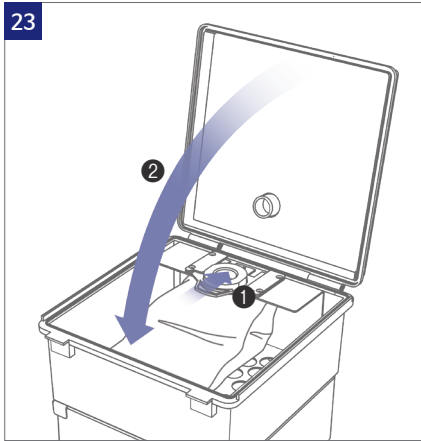
- 11 Close the back cover.
- 12 Move the machine to the desired location.
- 13 Level the machine by adjusting the height of the level foot.
- 14 Open the door of the bottom table.



- 15** Remove the 'Wet & Dry Lever Cover' on the top left of the table.
- 16** Connect the corrugated tube on the top of the 'Wet & Dry Lever' to the machine and fix it.
- 17** Connect the 'Wet & Dry Sensor Cable' from **7** to the 'Wet & Dry Lever'.
- 18** Combine the 'Wet & Dry Lever Cover'.



- 19 Open the 'Compressor Cover' located at the bottom of the table.
- 20 Put the 'Compressor' as shown in the picture.
- 21 Connect the cables from **7** corresponding to the 'Compressor'. From left to right, Compressor power cable, Compressor air hose(8 ϕ), Compressor collet hose(10 ϕ), Air sealing hose(10 ϕ).
- 22 Close the 'Compressor Cover'.

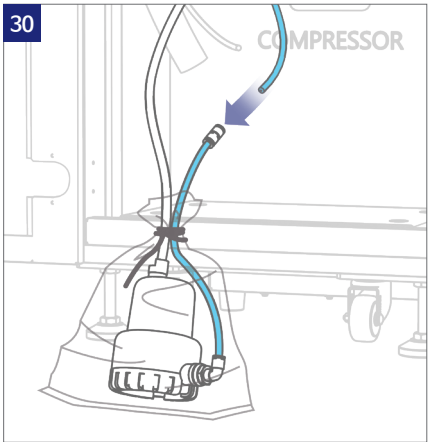
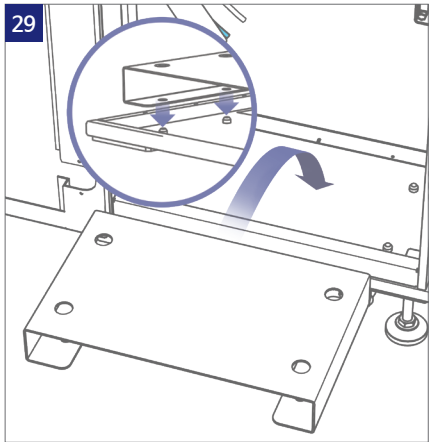
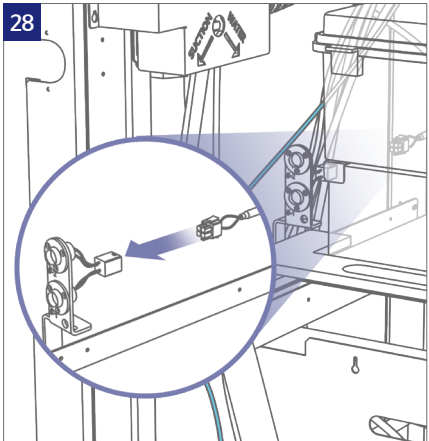
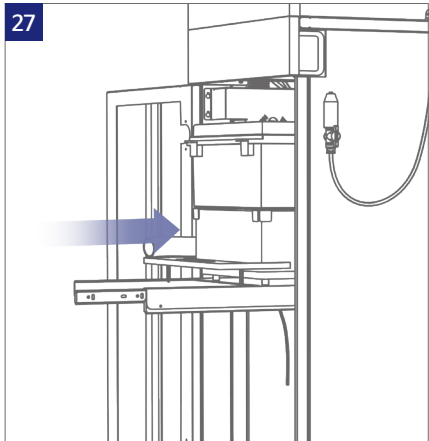


23 Open the cover of the 'Dust Collector' and ❶ install a 'Bag Filter', then ❷ close the cover.

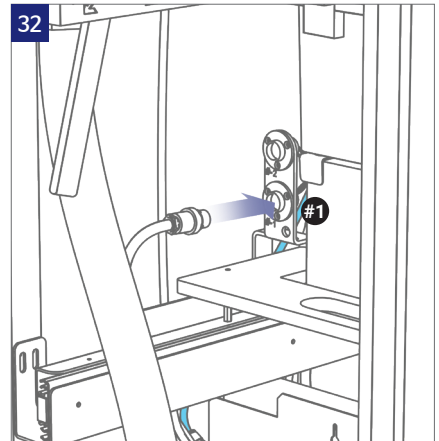
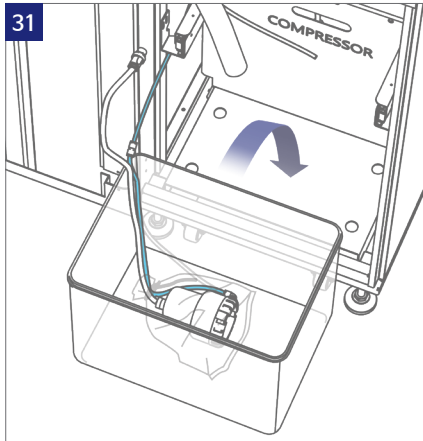
24 Place the 'Dust Collector' on the table tray and connect the power and signal cables.

25 Turn on the power switch of the 'Dust Collector'.

26 Connecting the corrugated tube to the 'Dust Collector'.

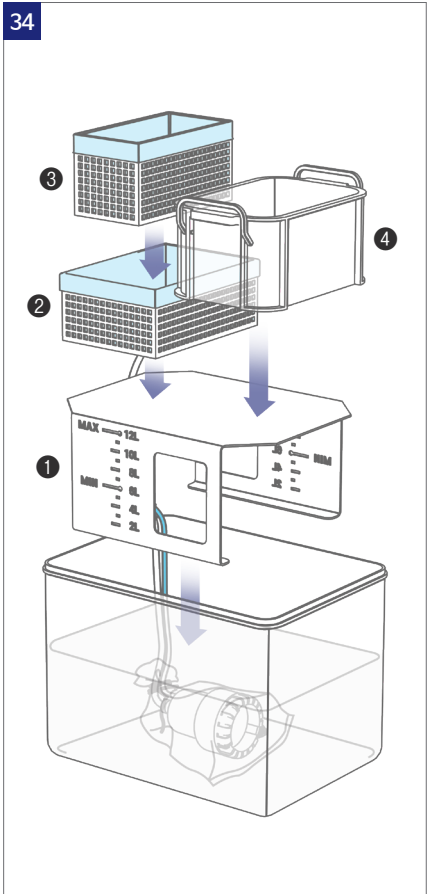
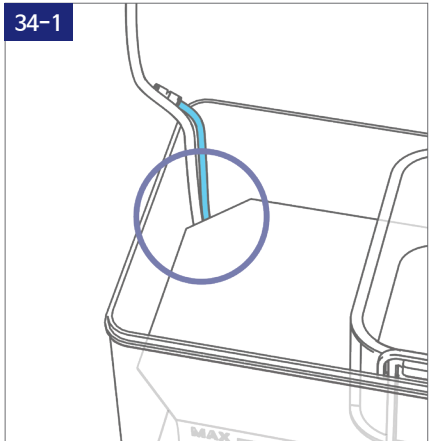
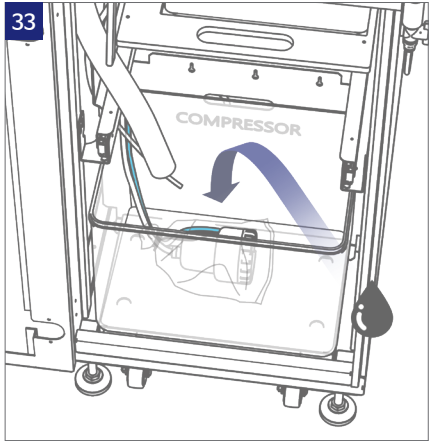


- 27** Push back the tray.
- 28** Connect the 'Water Pump Power Cable' to the socket as shown in the picture.
- 29** Place the 'Water Tank Rack' at the bottom of the table.
- 30** Connect the 'Coolant Hose' to the fitting of the 'Coolant Pump'.



31 Place the 'Coolant Pump' in the 'Water Tank' and place them at the bottom of the table.

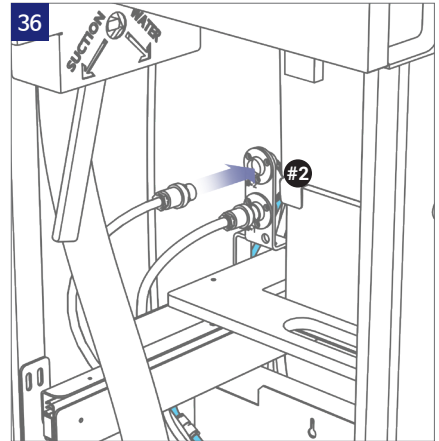
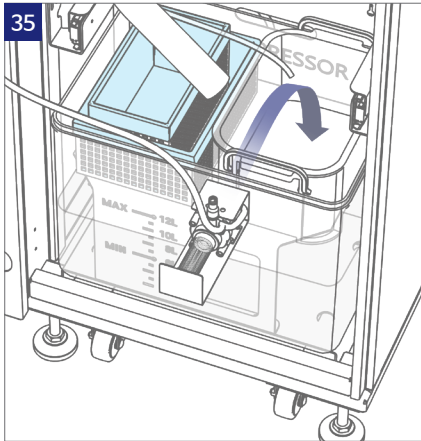
32 Connect the 'Coolant Pump Power Cable' to the 'Power Supply Socket' #1 port of **28**.



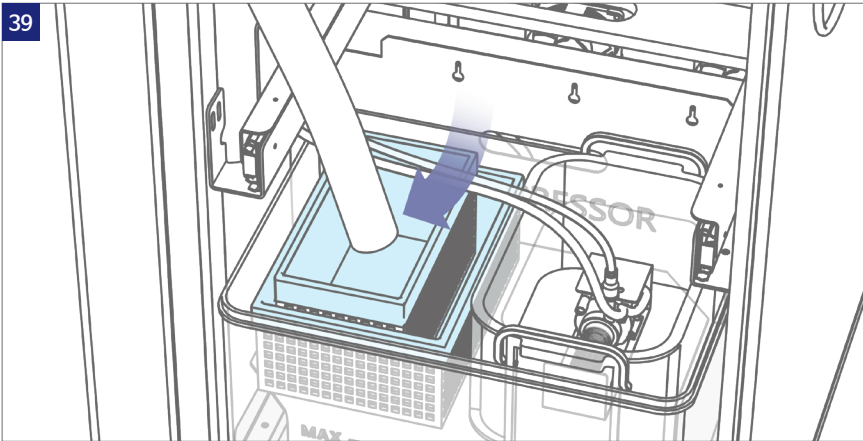
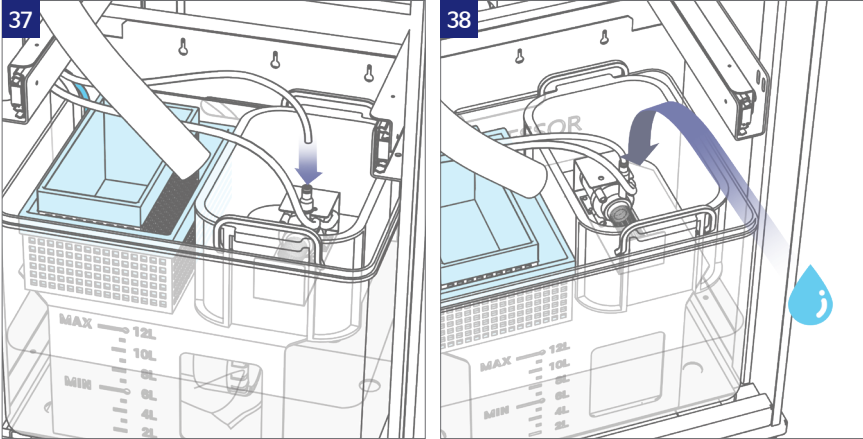
33 Fill the water tank with lubricant. **Swisslube 12~15%** (Please refer to manufacturer's manual for accurate concentration. **Don't exceed 20% as it can cause a breakdown.**)

34 As shown in the image, stack **1** Support Deck **2** Filter Box (Large) **3** Filter Box (Small) **4** Cleaning Water Box in the 'Water Tank'.

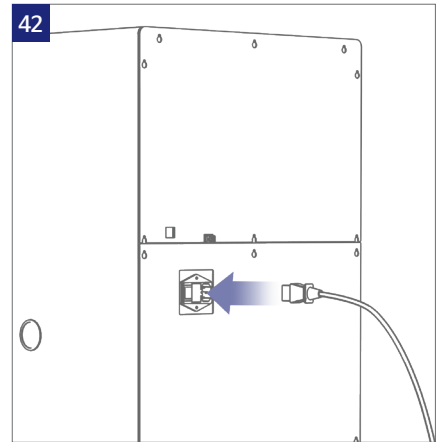
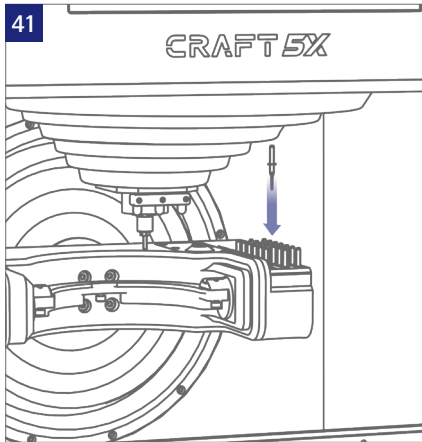
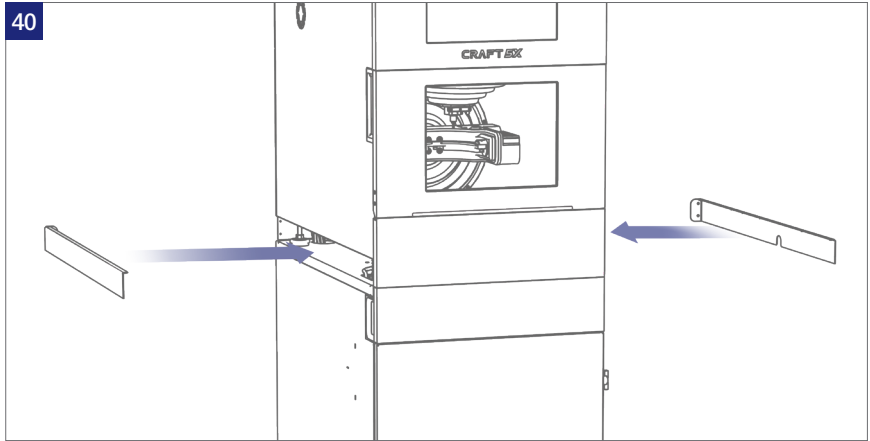
34-1 At **34**, make sure that the 'Coolant Pump Power Cable' and 'Coolant Hose' come out to the edge of the 'Support Deck'.



- 35 Put the 'Water Pump' in the 'Cleaning Water Box'.
- 36 Connect the 'Water Pump Power Cable' to the 'Power Supply Socket' #2 port of 28.

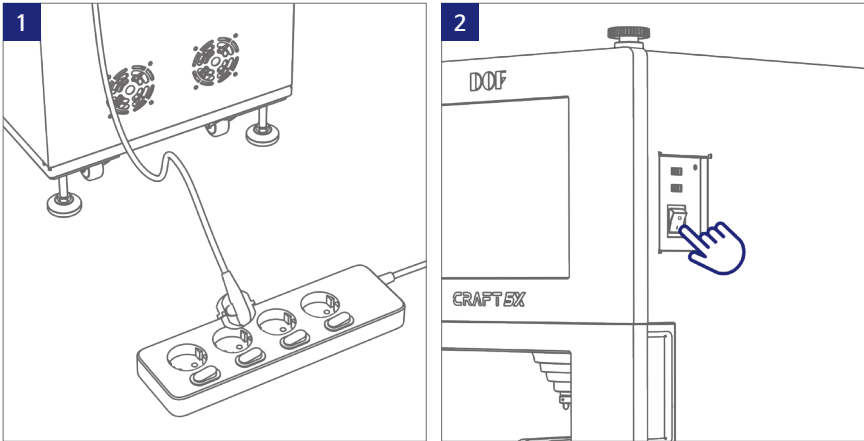


- 37** Connect the 'Water Gun Hose' to 'Water Pump' fitting.
- 38** Fill the 'Cleaning Water Box' with water.
- 39** Put the 'Water Drainage Hose' into the 'Filter box' and close the bottom table door.

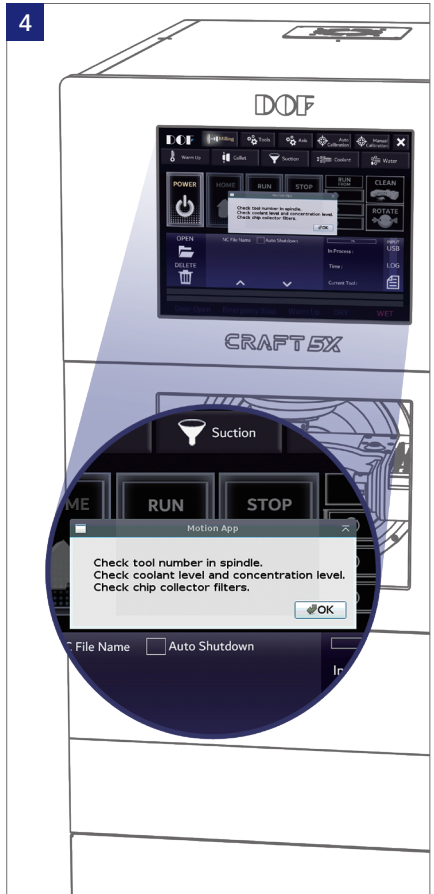
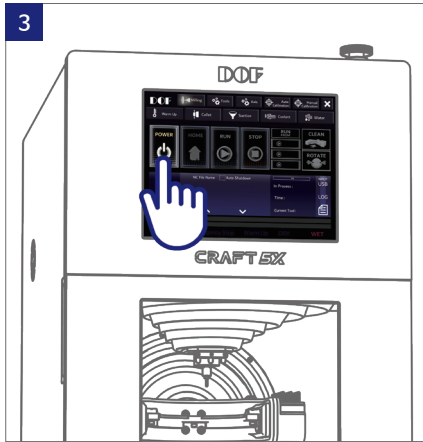


- 41 After attaching the side covers, tighten the screws.
- 42 Open the 'Main Door' of the machine, mount tools to the 'Tool Pocket' and close the door.
- 43 Connect the power cable of the machine.

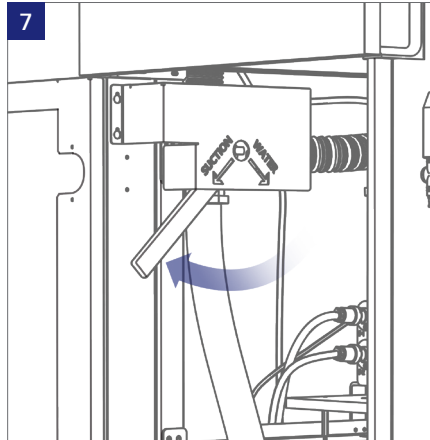
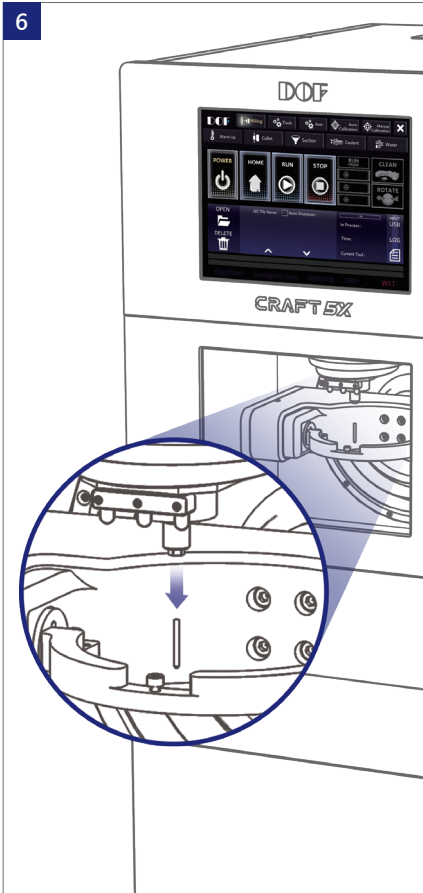
CHECKLIST.



- 1 Connect the machine plug to the outlet. It is recommended to use a grounded outlet. If it is not grounded, connect the ground wire to the machine. Do not use other than the supplied power cable.
- 2 Turn on the power switch located on the side of the machine.



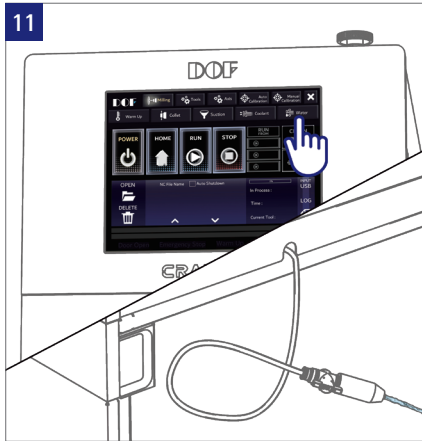
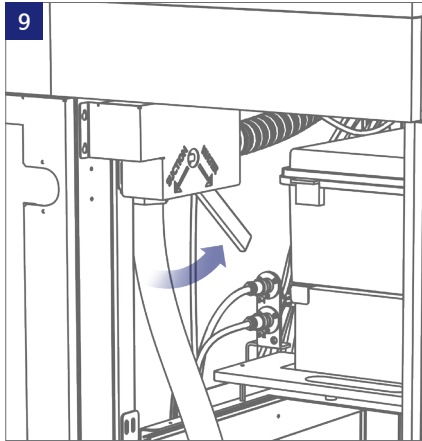
- 3 'MotionApp' program is automatically executed when the PC is turned on. Click the 'POWER' button in 'MotionApp' to connect the PC and the machine.
- 4 The checklist pops up after clicking the 'POWER' button. The machine starts home motion after clicking the 'OK' button. Do not operate other buttons or open the 'Main Door' of the machine during home motion.
- 5 Press the 'Collet' button on the display.



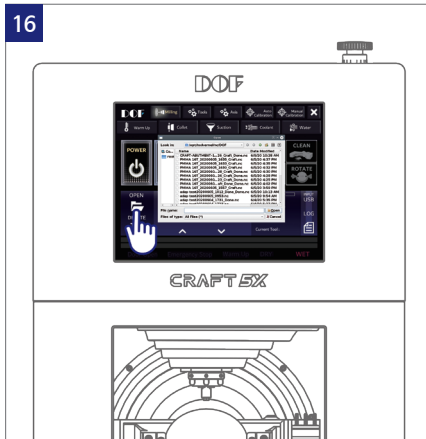
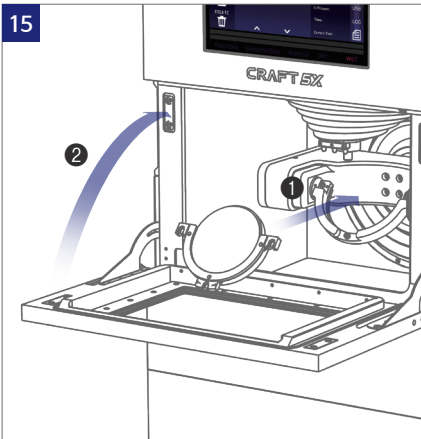
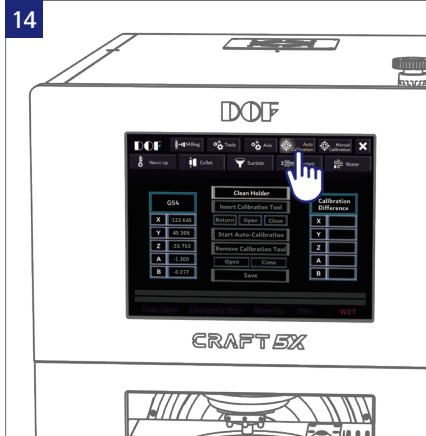
6 The temporary tool for protection is removed. Open the door, remove the temporary tool, and close the door. Press the 'Collet' button one more time to close the collet.

7 Position the 'Wet & Dry Lever' at the dry direction.

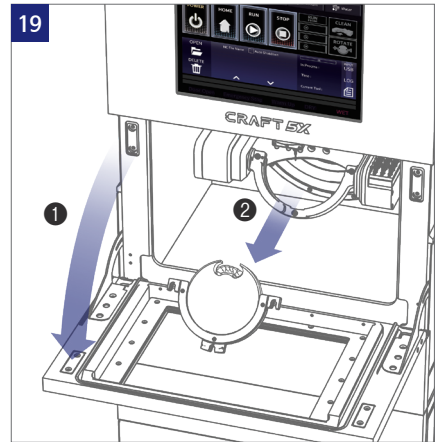
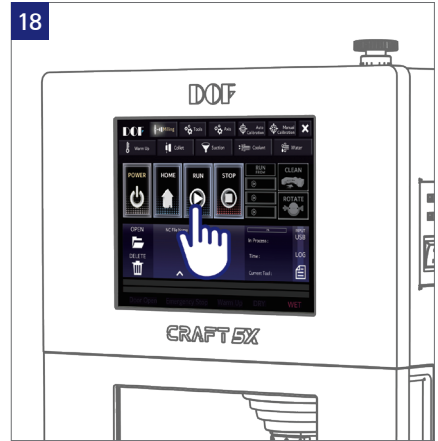
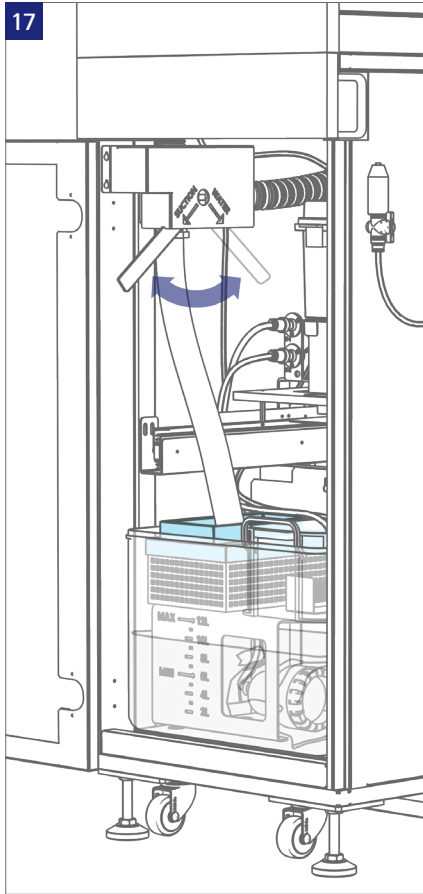
8 Press the 'Suction' button on the display to check suction works properly.



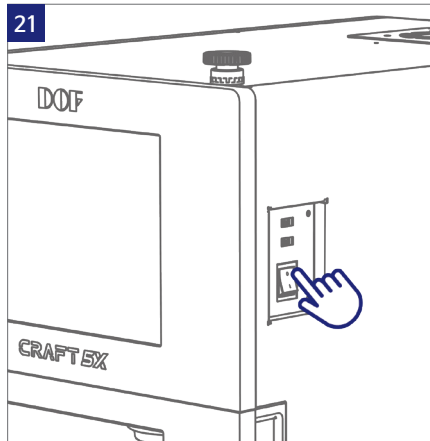
- 9 Position the 'Wet & Dry Lever' at the wet direction.
- 10 Press 'Coolant' button on the display to check the coolant supply of the machine.
- 11 Press 'Water' button on the display to check the water coming out of the 'Water Gun'.
- 12 Press the 'Warm up' button on the display to conduct a test run.
It takes about 30 minutes to warm up.



- 13 Make sure that there is a tool at the tool pocket number 4 before warming up. Warming up starts by pressing the 'OK' button.
- 14 Run 'Auto Calibration' after warming up is complete. (Refer to page 62)
- 15 Open the 'Main Door', ① mount a block in the machine and ② close the door.
- 16 Press 'OPEN' button to load the desired NC file.



- 17 Adjust the 'Wet & Dry Lever' to wet or dry setting according to materials.
- 18 Press the 'RUN' button to start milling.
- 19 After milling is complete, ① open the 'Main Door' and ② remove the block from the machine.









20 Shut down the PC by clicking 'X' at the top right corner of 'MotionApp'.

21 After the PC is shut down, turn off the power switch at the right side of the machine.



MOTIONAPP.

■ Page Transition

-  **Milling**
Import NC files and start milling.
-  **Tools**
Check the life of tools.
-  **Axis**
Control the machine manually.
-  **Auto Calibration**
Run the calibration automatically.
-  **Manual Calibration**
Run the calibration manually.
-  **X**
Exit 'MotionApp'. ONLY the PC shuts down.
Switch the machine to shut down completely.



■ Auxiliary Function

1



Warm Up

It preheats the machine. It is recommended to operate once a day before milling every day.

2



Collet

Open or close the collet of the spindle. The 'Compressor' is activated by pressing it and opens the collet.

3



Suction

Turn the 'Dust Collector' on and off. Check the 'Wet & Dry Lever' when the button is not working.

4



Coolant

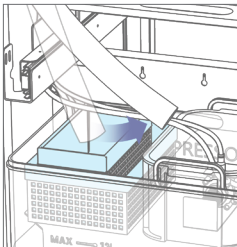
Turn the 'Coolant Pump' on and off. When the 'Coolant' is on, coolant is sprayed inside the machine. Check the 'Wet & Dry Lever' when the button is not working.

5



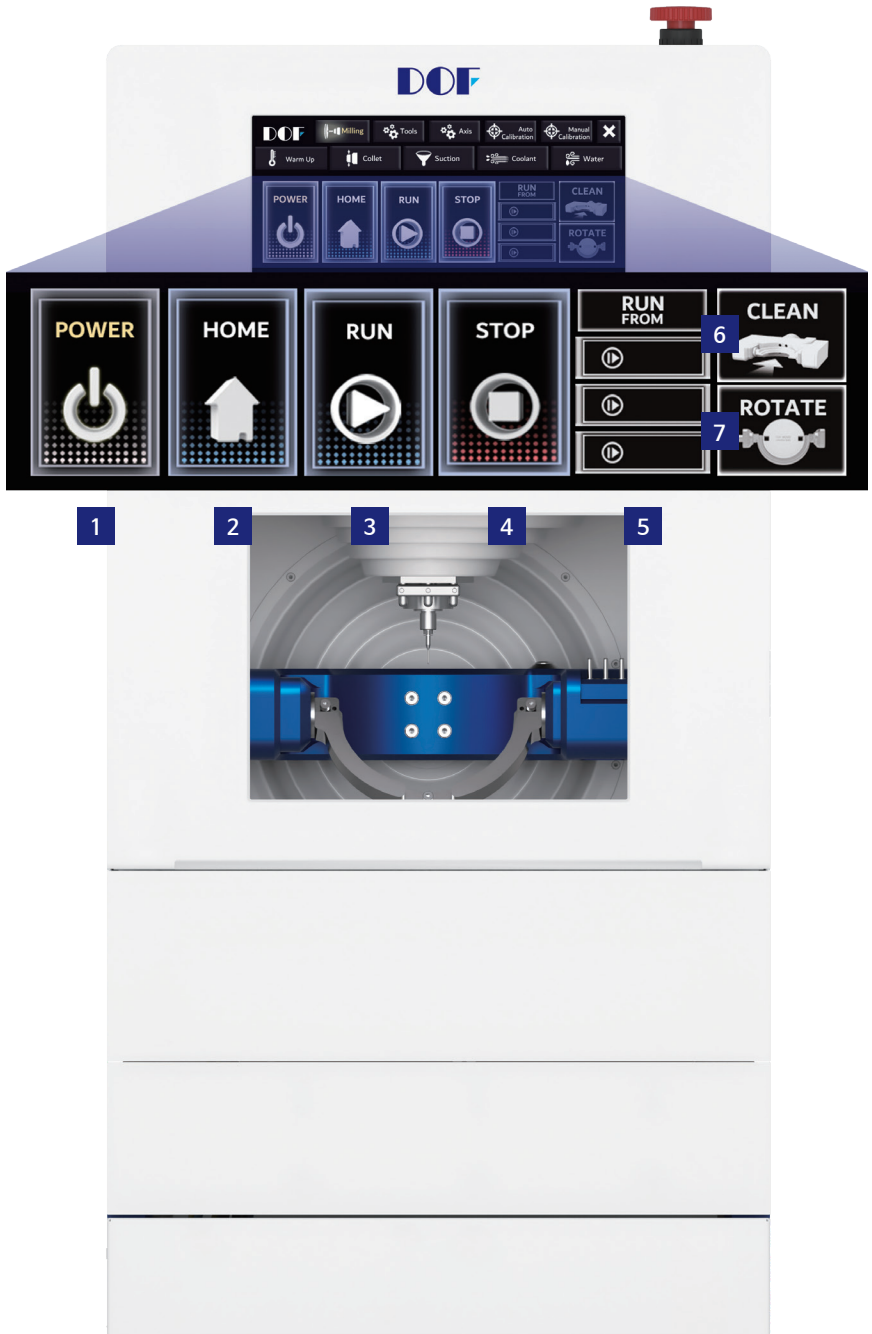
Water

Turn the 'Water Pump' on and off. When the 'Water' is on, the water comes out of 'Water Gun' for cleaning inside machine. Check the 'Wet & Dry Lever' when the button is not working.



When using this function, position the 'Water Drainage Hose' from the 'Filter box' to the 'Cleaning Water Box'.

Once finished, put the hose back to its original position.



■ Milling Page

1



Connect 'MotionApp' to the machine. Click 'Power' to start the machine. By clicking 'X' button at 'MotionApp', the machine and 'MotionApp' are disconnected.

2



Move all axes to the start position. The button turns on when all axes are in the start position and it can be pressed when the machine is stopped.

3



Start milling a NC file on the list. If multiple NC files are added to the list, the top file is the first. If the list is empty, the button won't activate.

4



The 'PAUSE' icon will appear when 'RUN' is pressed. Press 'PAUSE' to temporarily stop the milling. Pressing again will continue the milling.



Stop all motion during milling and operating manually. However, 'HOME' operation cannot be stopped. 'HOME' operation can only be stopped by using the emergency stop button.

5



Run from mid sections using 2mm, 1mm, or 0.6mm tool of a selected NC file. Check the stopped section before starting milling. For example, if the spindle has 1mm tool at the time it is stopped due to error, only 1mm tool can start milling. Starting with a 0.6mm tool may break the tool.

6



Positions the current tool to its pocket. Move the spindle and the A, Y-axis for easy cleaning of the inside. It is only activated when the machine is stopped. If there are no tools, an error message will appear.

7



Move to the disc exchange location. The A-axis is rotated to the position where milling materials can be easily replaced.



■ NC File Management

1



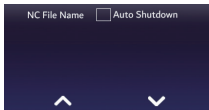
Open a NC file. Open the file explorer window and load the desired NC file. The imported NC file is displayed in the list on the right.

2



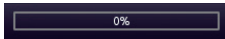
Delete the imported NC file from the list. Select the file and click the button.

3



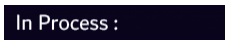
The imported files are displayed. Multiple files can be milled continuously or selected files can be milled first. The milling sequence can be changed by pressing the down arrow. The auto shutdown has been clicked, if the machine will shut down once the millings on the list are complete.

4



The progress bar of the processing file.

5



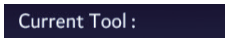
The name of the file currently being processed.

6



The cumulative machining time of the file.

7



The current tool information of the spindle. By clicking the tool number, a pop up will appear to change the tool number. If the tool is changed arbitrarily, be sure to correct the number.



8



Copy the NC file from the USB to the NC folder.

9




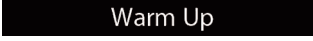




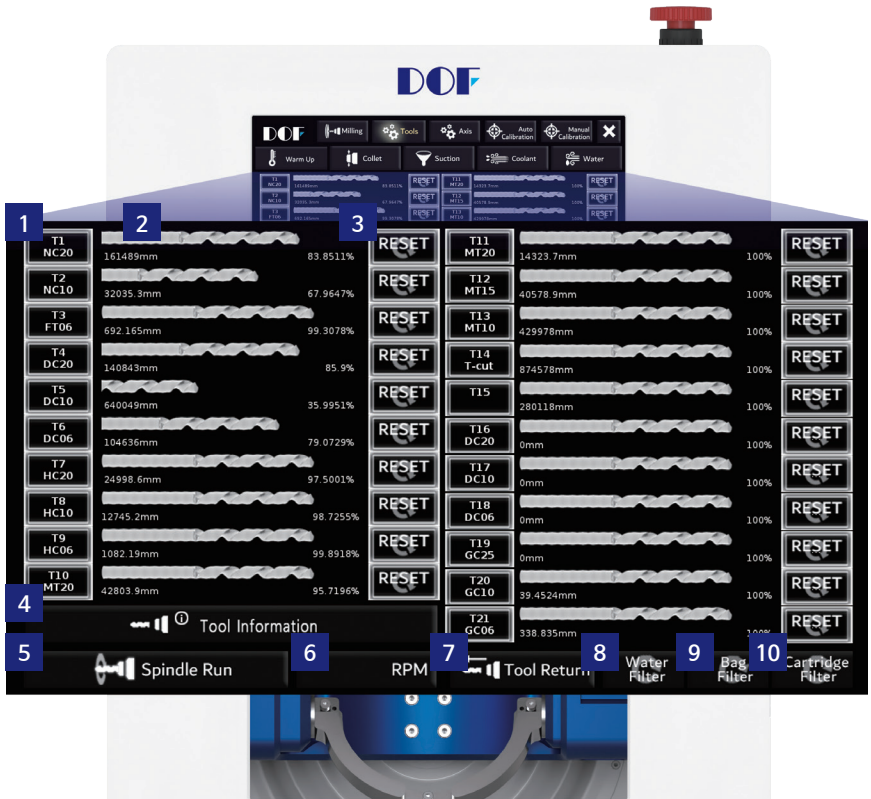
Check log information. Clicking the button opens a pop-up log window where checking the created log records by date is available.





■ Status Display Area

-  Alarm and warning messages are displayed.
-  It is on when the door is opened.
-  It is on when the emergency stop button is pressed.
-  It is on when the machine is warming up.
-  It is on when set to dry. Setting is changed by adjusting the 'Wet & Dry Lever'.
-  It is on when set to wet. Setting is changed by adjusting the 'Wet & Dry Lever'.



■ Tools Page

1



The tool pocket number and the tool name are displayed. Tools must match to the tool numbers.

2



The tool's cumulative length of use and remaining life are displayed. At the end of the tool life, it turns into red. Replace the tool.

3

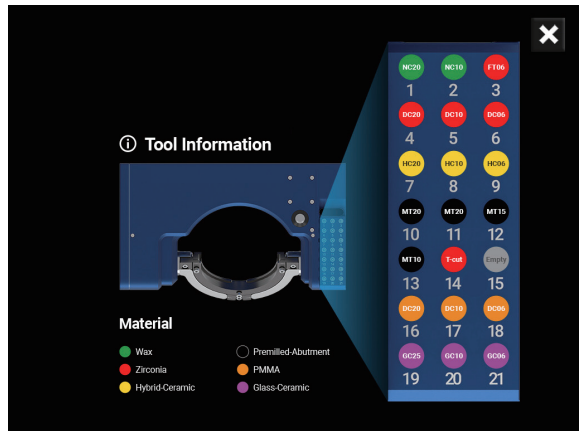


Reset the cumulative usage time and remaining life of the tool. Click the 'RESET' button to reset the tool status after replacing the tool.

4

 Tool Information

Check the tool information of tool pockets.



5

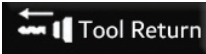
 Spindle Run


Spindle is running. The spindle can only be operated if it has a tool.


6


22000 RPM

Desired RPM can be entered a minimum of 5,000 to a maximum of 100,000 RPM.

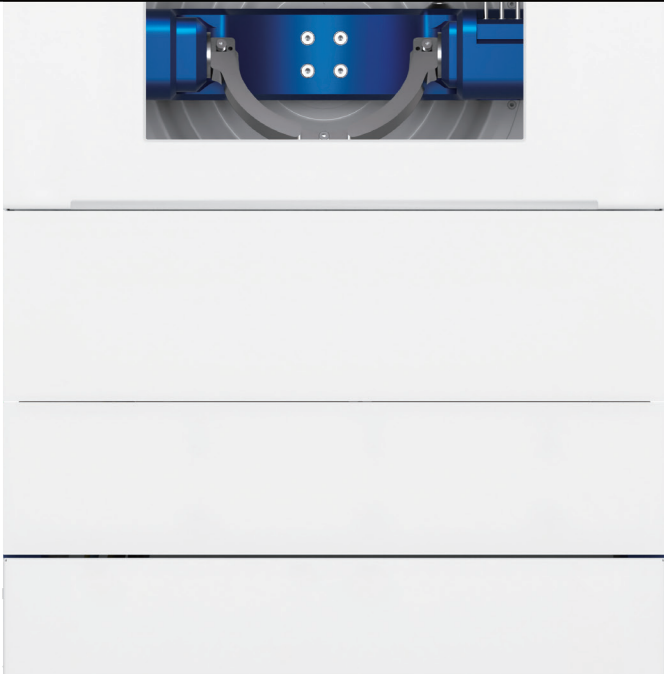
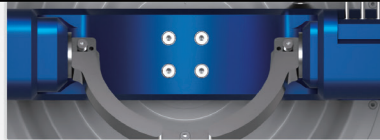
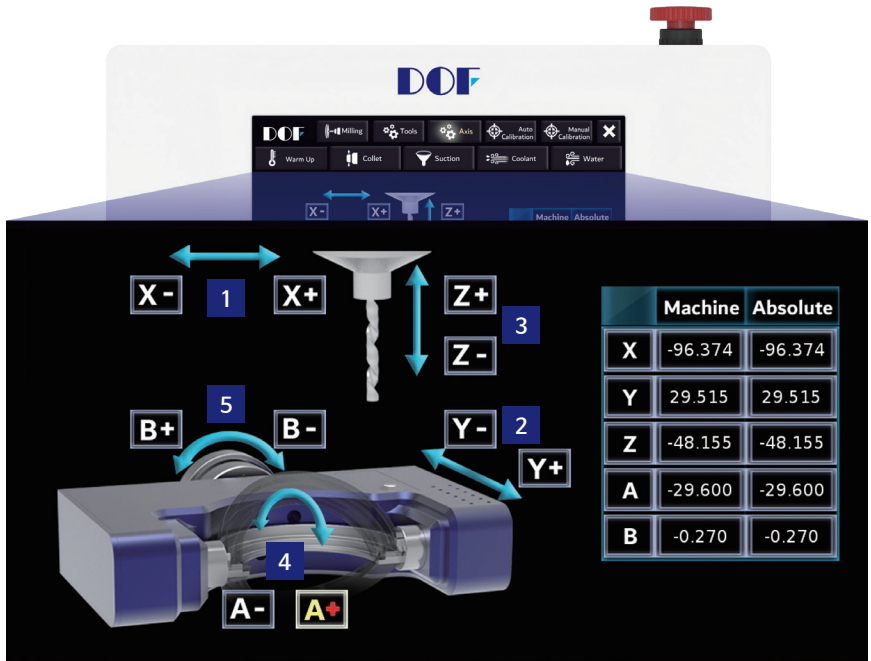
- 7  Tool Return

Return a tool at the spindle to the 'Tool Pocket'.
Check the tool number before clicking the button.
- 8  Water Filter

When the lubricant life is over, replace the lubricant of the coolant tank. The life is initialized by pressing the button after replacing the lubricant.
- 9  Bag Filter

When the bag filter life is over, replace the bag filter of the dust collector. The life is initialized by pressing the button after replacing the filter.
- 10  Cartridge Filter






When the cartridge filter life is over, replace the cartridge filter of the dust collector. The life is initialized by pressing the button after replacing the filter.

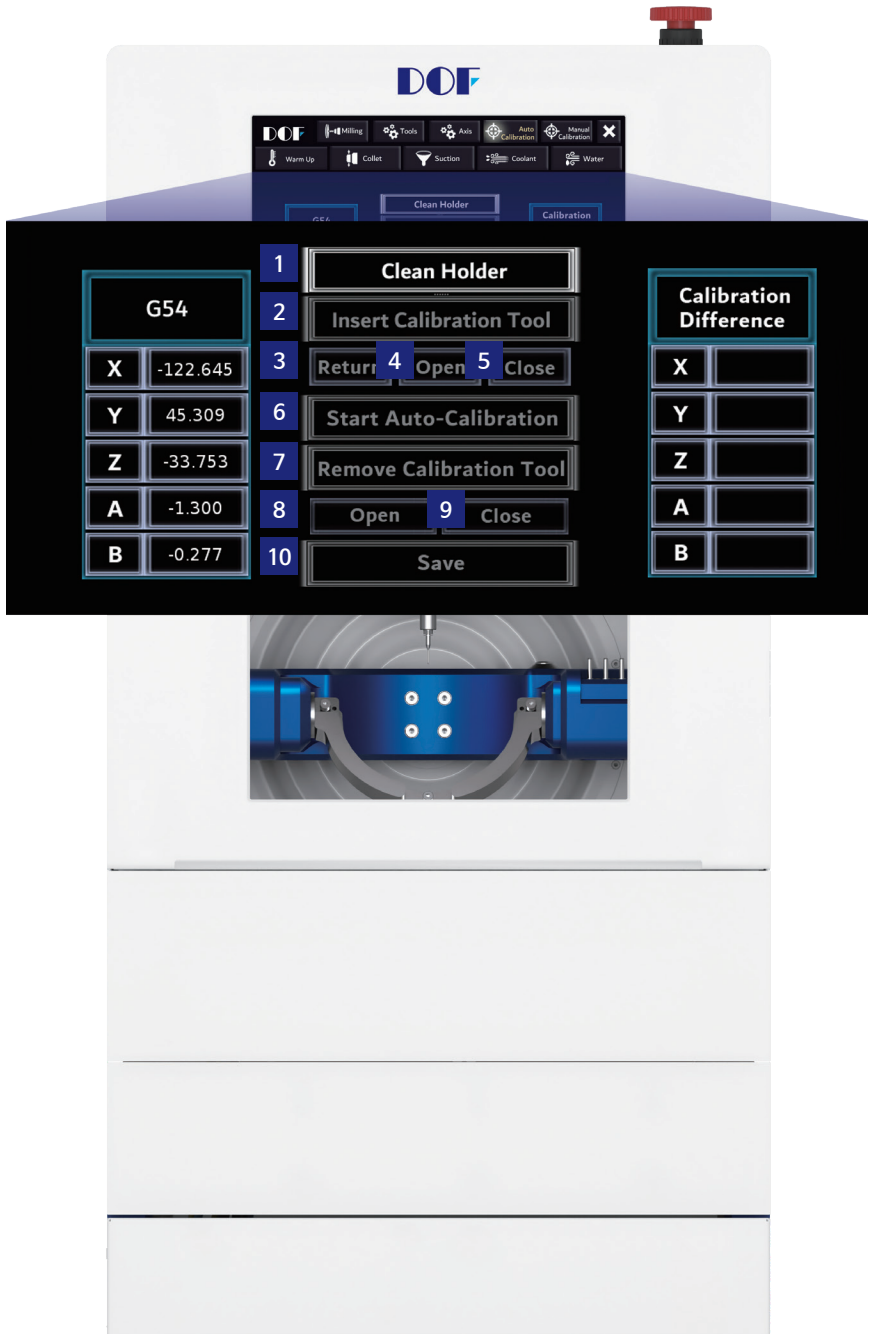


■ Axis Control Page



Caution! Collision can disorient the machine and break the tool.

-  Move the X axis left and right.
-  Move the Y axis back and forth.
-  Move the Z axis up and down.
-  Move the A axis back and forth.
-  Rotate the B axis left and right.



■ Auto Calibration Page

1

Clean Holder

After moving to the disc exchange position, 'Insert Calibration Tool' button is activated. Before starting calibration, remove the disc and clean the inside of the machine.

2

Insert Calibration Tool

Mount the 'Calibration Tool' on the spindle, and after clicking it, 'Return' button is activated.

3

Return

Return the mounted tool to the tool pocket. After the tool returns, 'Open' button is activated. If the spindle does not have a tool, 'Open' button is automatically activated.

4

Open

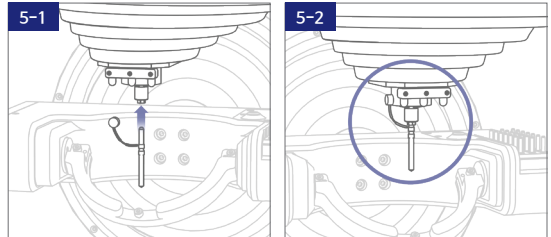
Open the collet to mount the 'Calibration Tool'. When the collet opens, 'Close' button is activated.

Attach the 'Calibration Tool' to the collet and attach the magnet to the spindle body. By clicking 'Close' button, the collet is closed and 'Start Auto-Calibration' button is activated.

* The shorter side of the 'Calibration Tool' is inserted to the spindle.

5

Close



6

Start Auto-Calibration

Initiate automatic calibration. After calibration, the result is automatically generated on the right. The error message below appears and calibration is stopped, If the result value differs by more than 1mm. the user has to go to the 'Milling Page' and click 'STOP' button to check whether there is a problem with the equipment. If the calibration result is incorrect, repeat calibration.

7

A rectangular button with a double border and the text "Remove Calibration Tool" in white on a dark background.

Return the 'Calibration Tool' and 'Open' button is activated by clicking it.

8

A rectangular button with a double border and the text "Open" in white on a dark background.

The collet is opened to remove the 'Calibration Tool' from the spindle by clicking it.

9

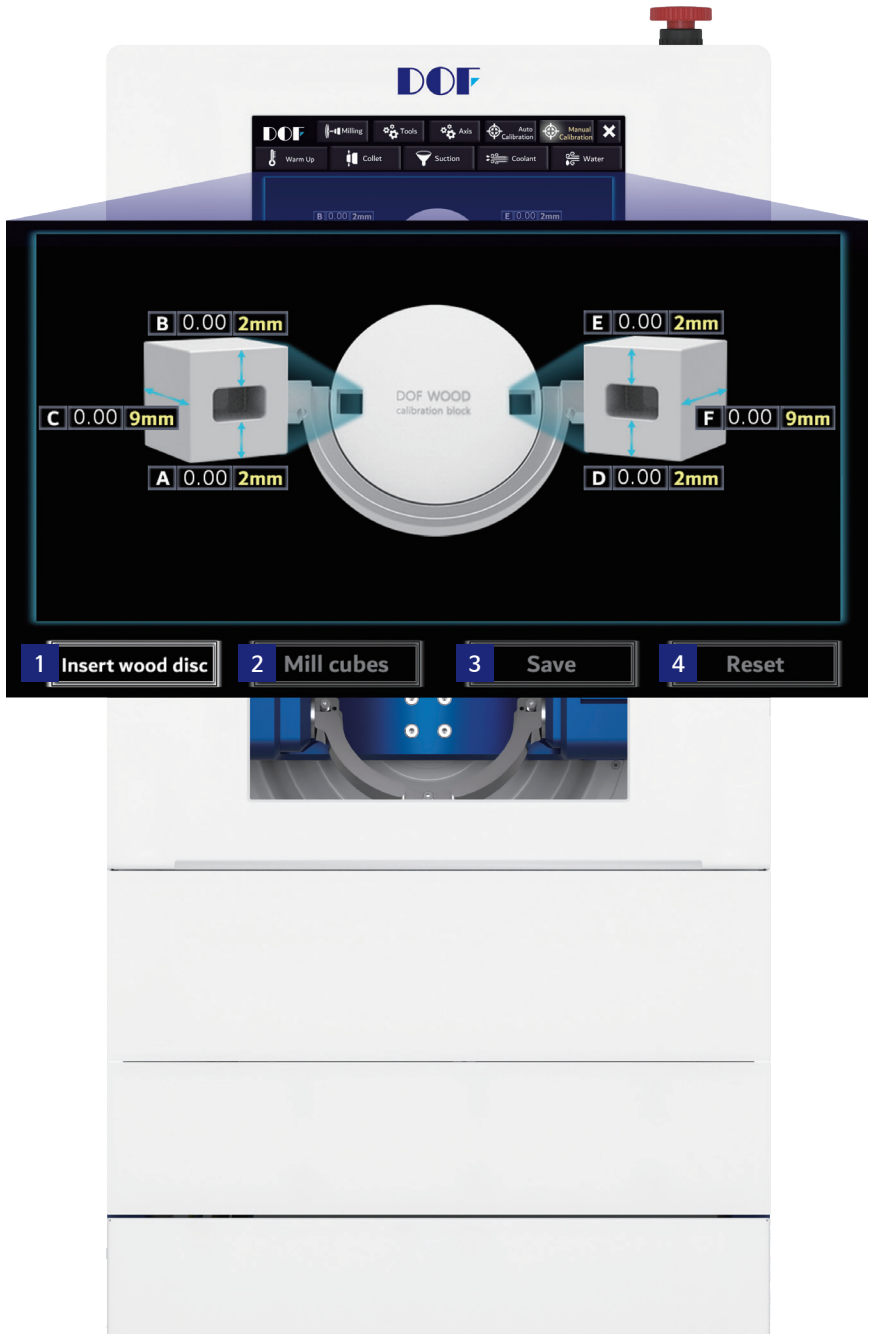
A rectangular button with a double border and the text "Close" in white on a dark background.

Close the collet after removing the 'Calibration Tool' and magnet.

10

A rectangular button with a double border and the text "Save" in white on a dark background.

Save the calibration result.



■ Manual Calibration Page

Calibration is progressed in the order of numbers below. Click buttons one by one to perform calibration step by step.

1

Insert wood disc

After the A-axis moves to the disk exchange position, mount the 'DOF WOOD calibration block'.

2

Mill cubes

Start cube milling using the NC20 tool 1. Measure the cube and enter each of the six values displayed on the screen. It is recommended to enter 2 decimal places.

3

Save

Save the entered values. Once entered, the value cannot be modified. Please double check before saving.

4

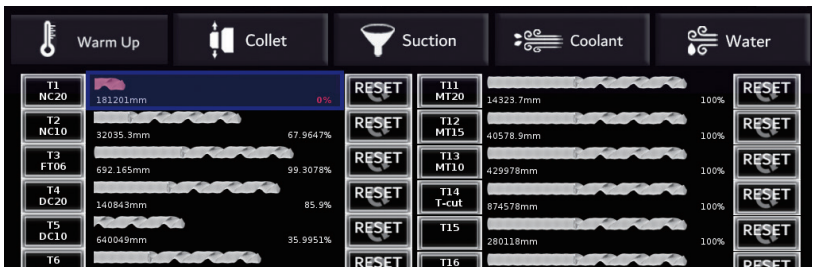
Reset

Calibration can be restarted after saving.

MAINTENANCE

■ Tool Replacement

- 1 An alarm message is generated when a tool reaches the end of its life.
- 2 Tool life check is available on the 'Tool Page'. As the tool is consumed, the length of the tool on the screen becomes shorter.



- 3 Remove the tool from the 'Tool Pocket' and insert a new tool into the pocket.
- 4 Click 'RESET' button on the 'Tools Page' to reset the tool life.

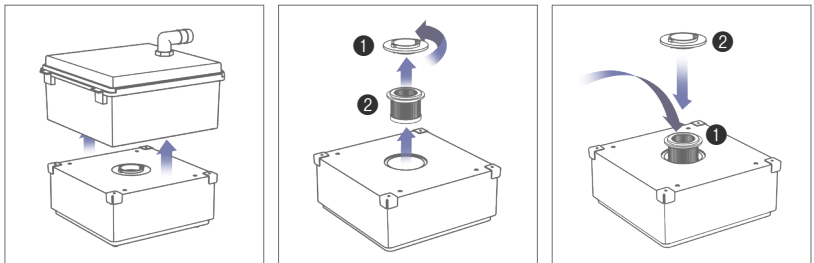


■ Dust Collector Bag Filter Replacement

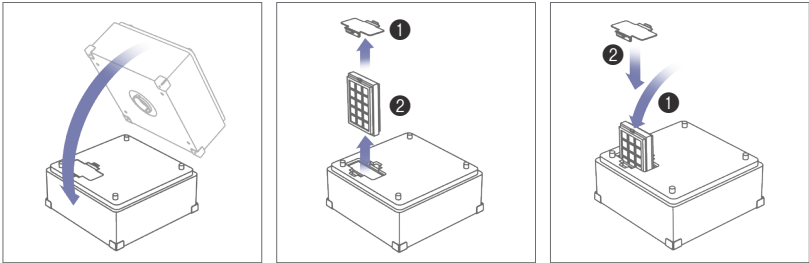
- 1 When the 'Bag Filter' life is over, 'DRY' button flashes.
('Bag Filter' replacement cycle is 3,000 hours)
- 2 Turn off the machine.
- 3 Open the table door and pull the table tray forward.
- 4 Open the 'Dust Collector' cover and replace the 'Bag Filter'.
- 5 Close the cover and return the 'Dust Collector'.
- 6 After turning on the machine, press the 'Bag Filter' button to reset the bag filter life.

■ Dust Collector Cartridge Filter Replacement

- 1 When the 'Cartridge Filter' life is over, 'DRY' button flashes.
(Cartridge Filter' replacement cycle is 1,500 hours)
- 2 Turn off the machine.
- 3 Open the table door and pull the table tray forward.
- 4 Remove the top of the 'Dust Collector' and turn the 'Cartridge Filter' cover to the left. Replace the 'Cartridge Filter' and close the cover.



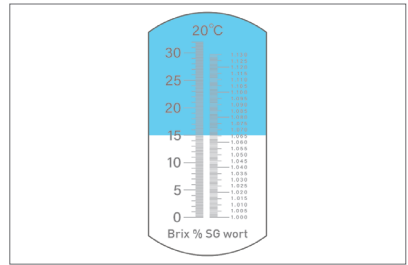
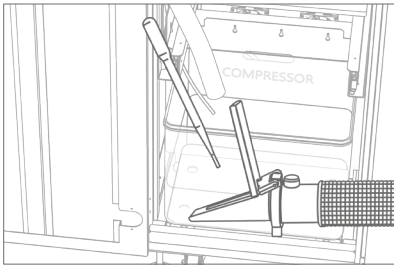
- 5 Turn over the 'Dust Collector' and replace the HEPA filter at the bottom as well.



- 6 Place the top of the 'Dust Collector'.
- 7 Slide the drawer in and close the table door.
- 8 After turning on the machine, press the 'Cartridge Filter' button to reset the cartridge filter life.

■ Lubricant Replacement

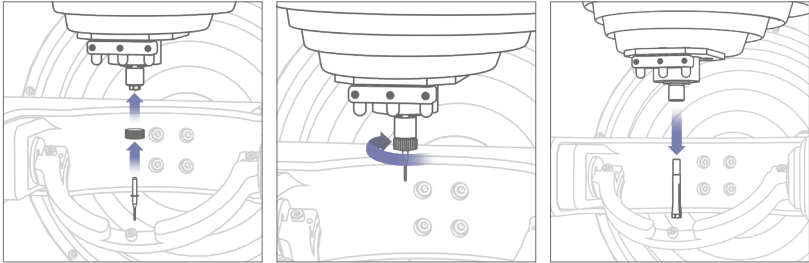
- 1 When the lubricant life is over, 'WET' and 'Water Filter' buttons flash.
(Lubricant replacement cycle is 160 hours)
- 2 Turn off the machine.
- 3 Remove the coolant system except the 'Water Tank'.
- 4 Take the 'Coolant Pump' out of the 'Water Tank'.
- 5 Remove the old lubricant and fill with the new lubricant.
- 6 The recommended concentration varies by the lubricant manufacturer. Please refer to manufacturer's manual. **Swisslube 12~15%**



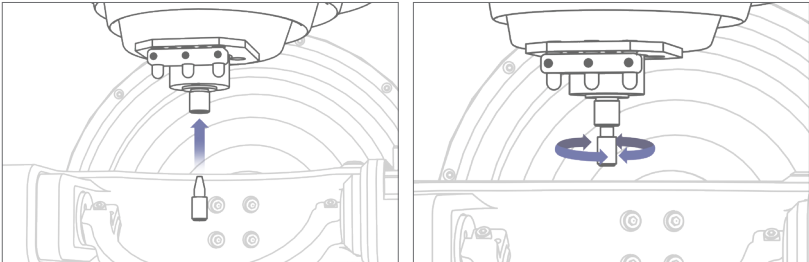
- 7 Place the 'Coolant Pump' in the 'Water Tank' and reassemble the coolant system.
After turning on the machine, press the 'Water Filter' button to reset the lubricant life.

■ Spindle Cleaning

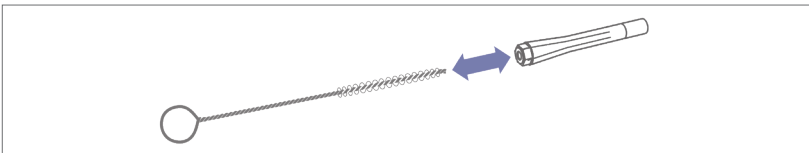
- 1 Remove a tool from the spindle.
- 2 In 'MotionApp', click 'Collet' button to open the collet.
- 3 Attach the 'Collet Wrench' with a milling tool to the collet and turn it clockwise to remove the collet from the spindle. After separation, click 'Collet' button to close the collet.



- 4 Clean the inside of the spindle using the 'Cleaning Cotton (Spindle)' from the service kit.



- 5 Clean the collet using a 'Collet Cleaner'.

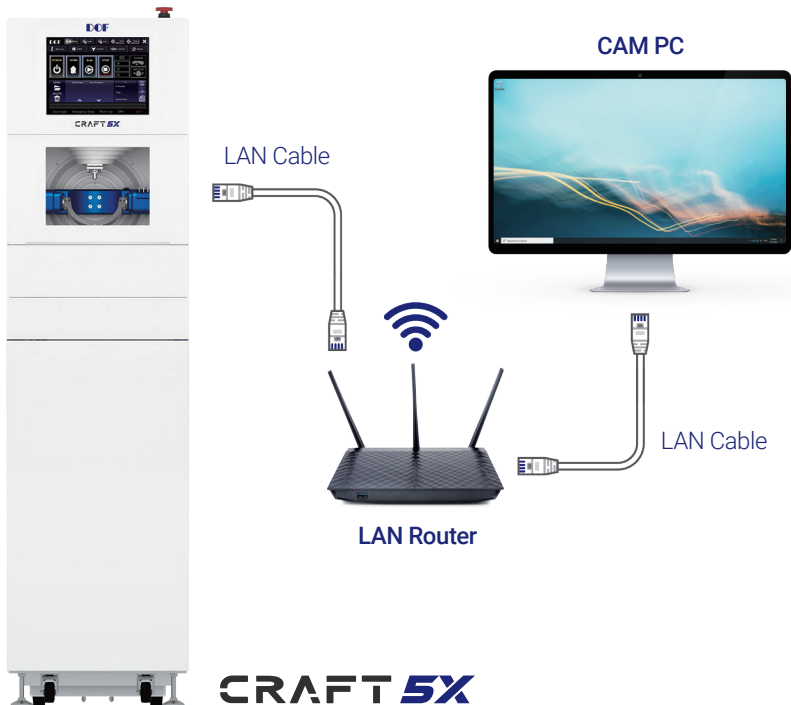


- 6 Apply a thin layer of grease to the outer surface of the collet.
- 7 Click 'Collet' button again to open the collet.
- 8 Turn the collet counterclockwise to secure it.
- 9 When the collet is secured, click 'Collet' button to close the collet.

NETWORK SHARE

■ Recommended Settings


It is recommended to set same IP range for the CRAFT 5X and CAM PC. (use only one LAN router)

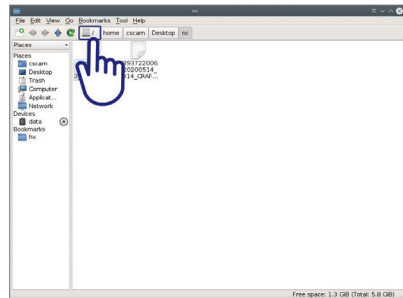


■ Get Started

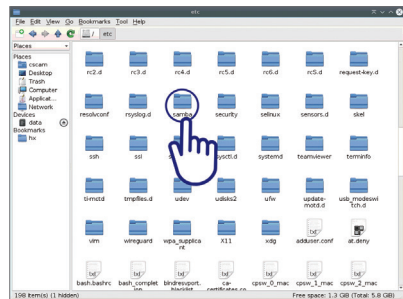
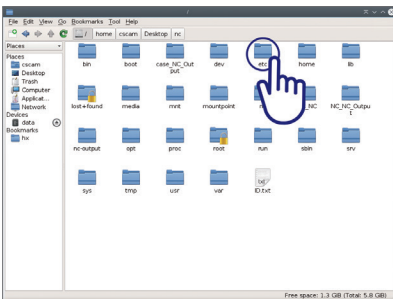
- 1 At CAM PC's network sharing basic setting, go to advanced sharing setting and turn firewall off.

■ Change the existing NC folder → a Network Shared Folder

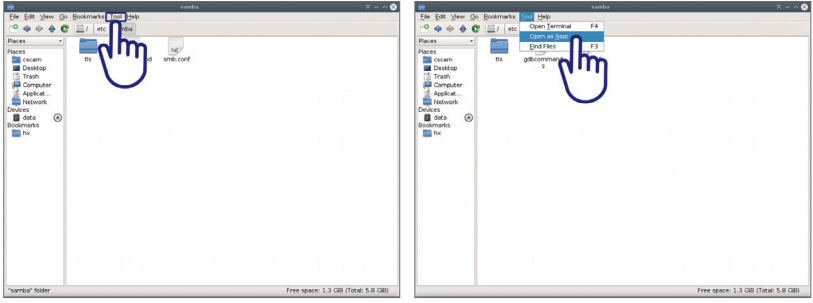
- 1 Double click the NC folder on the desktop, then click  / under the Bookmark menu at the top of the folder.



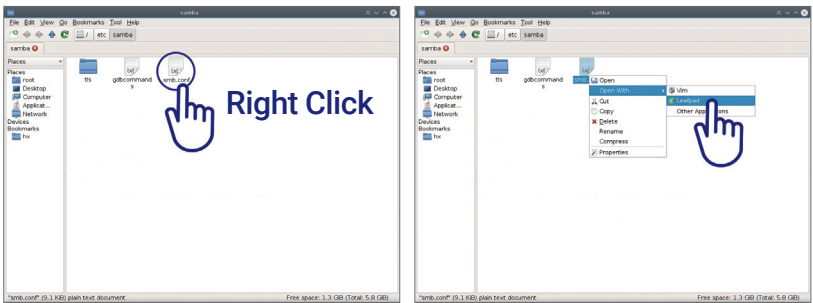
- 2 Access the folder path to 'etc > samba'.



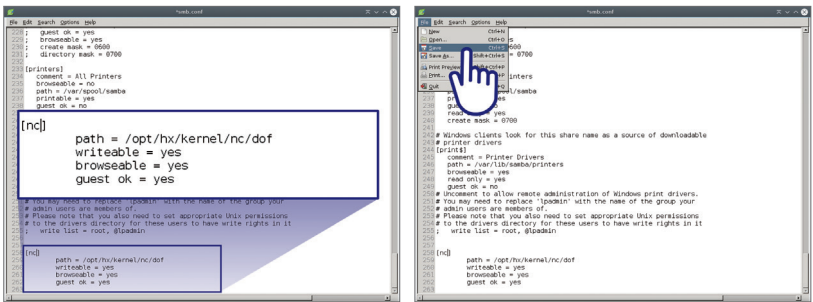
3 Select 'Open as Root' from the top 'Tool' menu.



4 Right click the 'smb.conf' file in the new window and select 'Open with – Leafpad'.

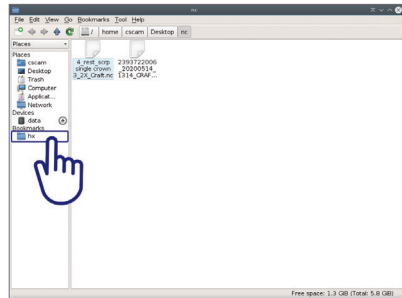


5 Change the path at the bottom of [nc] to '/opt/hx/kernel/nc/dof' and save.

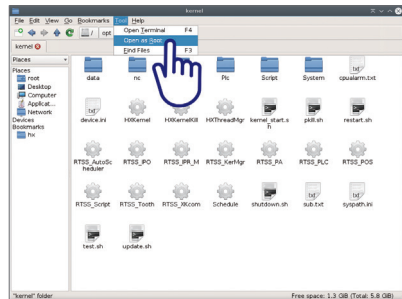
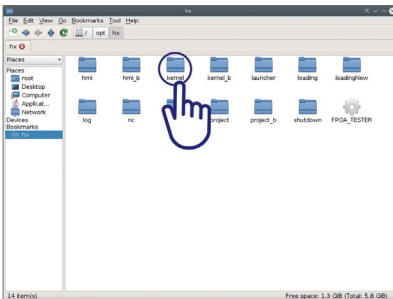


■ Granting Permissions to the Shared NC Folder.

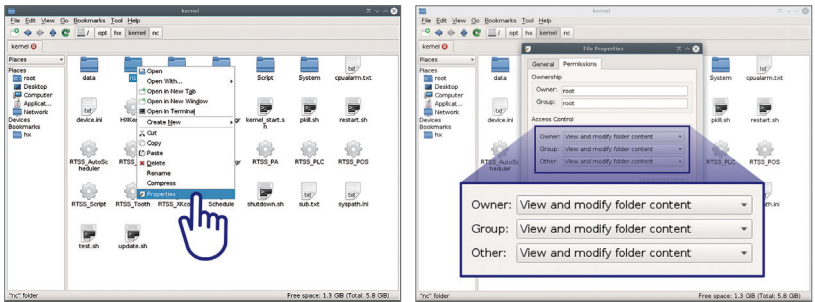
- 1 Double click the NC folder and go to hx under the bookmarks at the bottom left.



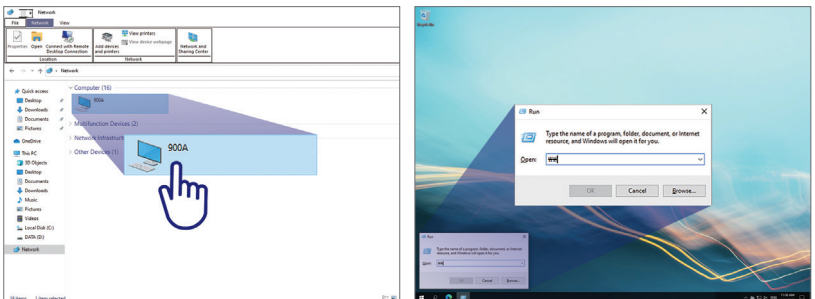
- 2 Go to 'kernel' folder and click 'open as Root' on the top Tool menu to access the authorized window.




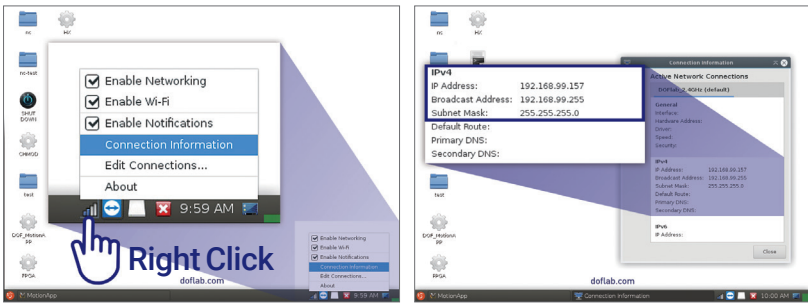
- Right click the NC folder and in the 'Properties – Permissions' tab, change all 'Access Control' to 'View and modify folder content'.



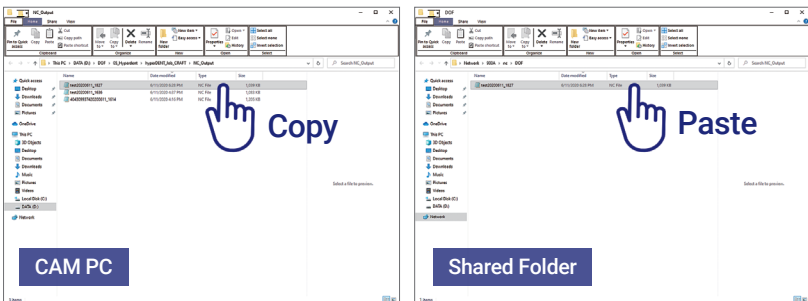
- Check if the CAM PC is connected by network path.
(If the network is not connected, access **Win** + R > '\\ipAddress')



- 5 On the desktop task bar, right click  icon, select 'connection information', and then check IP address of the machine.



- 6 Copy and paste NC files from the CAM PC to the shared folder.





ERROR MESSAGE

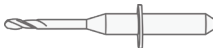
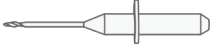
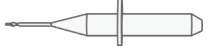
Error Message	Texts
EMERGENCY STOP	Emergency stop button has been activated.
SPINDLE NOT READY	The spindle is not ready. Check the spindle cable.
Water Handle ON CHECK	Turn the wet & dry lever to wet.
Suction Handle ON CHECK	Turn the wet & dry lever to dry.
PROBE SENSOR CHECK IT OUT	The tool sensor is working. Check the sensor.
SPINDLE ERROR	Spindle is not working properly. Check whether the spindle is overloaded.
Stop the spindle and unclamp it	The collet button was activated during the spindle rotation.
Tool had been broken	A tool is broken. Replace the tool.
Tool is too Long, It will focess	Tool length is not correct. Check the tool.
Tool release didn't work properly	A tool is not removed from the spindle. Check the tool.
Remove the tool	The tool number is 0. Remove the tool from the spindle or change the tool number.
Tool number command error	The tool number was entered incorrectly.

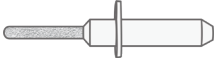
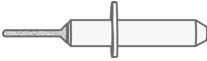
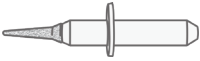
Error Message	Texts
X AUTO CAL ERROR	An error of 2/100 mm or more occurred on the X axis. Perform calibration again.
Y AUTO CAL ERROR	An error of 2/100 mm or more occurred on the Y axis. Perform calibration again.
Z AUTO CAL ERROR	An error of 2/100 mm or more occurred on the Z axis. Perform calibration again.
A AUTO CAL ERROR	An error of 2/100 mm or more occurred on the A axis. Perform calibration again.
B AUTO CAL ERROR	An error of 2/100 mm or more occurred on the B axis. Perform calibration again.
NO TOUCH PROBE	Calibration did not perform properly. Contact the service center.
AUTO Calibration Mode	This is the calibration mode. Please be careful.
Please return zero	Home operation is required. Connect the power or press HOME button.
ZERO RETURNING	Home operation is working. Don't click other buttons.
DOOR OPENED!	The door is open. Close the door.
Replace the bag filter, please	The bag filter of the dust collector has reached the end of its life. Replace the bag filter.
Replace the cartridge filter, please	The cartridge filter of the dust collector has reached the end of its life. Replace the cartridge filter.
Please replenish the water	Water and lubricant replacement is required.


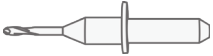
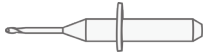
* If any other message appears, please contact the service center immediately.


TOOL DETAILS.

Tool Name	NC20	NC10
Appearance		
Material	WAX	WAX
Diameter	2.0mm	1.0mm
Length	27.0mm	27.0mm
Shank Diameter	4.0mm	4.0mm
Chamfer Length	4.0mm	4.0mm
Tip Length	16.0mm	16.0mm
Tool Number	1	2

Tool Name	DC20	DC10	DC06
Appearance			
Material	Zirconia PMMA	Zirconia PMMA	Zirconia PMMA, WAX
Diameter	2.0mm	1.0mm	0.6mm
Length	27.0mm	27.0mm	25.0mm
Shank Diameter	4.0mm	4.0mm	4.0mm
Chamfer Length	4.0mm	4.0mm	10.0mm
Tip Length	16.0mm	16.0mm	8.0mm
Tool Number	4 (Zirconia) 16 (PMMA)	5 (Zirconia) 17 (PMMA)	6 (Zirconia, WAX) 18 (PMMA)

Tool Name	HC20	HC10	HC06
Appearance			
Material	Hybrid Ceramic	Hybrid Ceramic	Hybrid Ceramic
Diameter	2.0mm	1.0mm	0.6mm
Length	17.0mm	17.0mm	17.0mm
Shank Diameter	4.0mm	4.0mm	4.0mm
Chamfer Length	1.0mm	1.0mm	3.0mm
Tip Length	10.0mm	10.0mm	8.0mm
Tool Number	7	8	9

Tool Name	MT20	MT15	MT10
Appearance			
Material	Titanium	Titanium	Titanium
Diameter	2.0mm	1.5mm	1.0mm
Length	20.0mm	20.0mm	20.0mm
Shank Diameter	4.0mm	4.0mm	4.0mm
Chamfer Length	4.0mm	4.0mm	4.0mm
Tip Length	10.0mm	10.0mm	10.0mm
Tool Number	10 / 11	12	13

Tool Name	GC25	GC10	GC06
Appearance			
Material	Glass Ceramic	Glass Ceramic	Glass Ceramic
Diameter	2.5mm	1.0mm	0.6mm
Length	21.0mm	17.0mm	17.0mm
Shank Diameter	4.0mm	4.0mm	4.0mm
Chamfer Length	4.0mm	1.0mm	3.0mm
Tip Length	13.0mm	10.0mm	8.0mm
Tool Number	19	20	21



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