DWX-53DC

User's Manual

Thank you very much for purchasing this product.

- To ensure correct and safe usage with a full understanding of this product's performance, please be sure to read through this manual completely.
- Unauthorized copying or transferal, in whole or in part, of this manual is prohibited.
- The contents of this operation manual and the specifications of this product are subject to change without notice.
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Basic Handling Methods

Basic Information

Part Names and Functions

Front

①	Milling area cover	Covers the milling area. Workpieces are milled in the milling area. It is also a location where machine maintenance, such as cleaning and collet replacement, is performed. [1]
②	Dust-proof cover	Prevents the work area from getting dirty from milling waste ejected from the milling area. Be sure to attach the dust-proof cover before milling with this machine.
③	Adapter area cover	Covers the adapter area. Adapters are installed in and removed from the disc changer in the adapter area. [2]
④	Tool area cover	Covers the tool area. Milling burs used in milling and detection pins are loaded in the ATC magazine in the tool area.[1]
⑤	Built-in panel	The LED lights on the built-in panel display the status of the machine. When the machine is connected to a dust collector with built-in linking function, pressing the touch sensor with a cover open turns the dust collector on.
⑥	Tablet base	Use this part when operating the machine with a tablet. When using a tablet, use the included tablet holders and cushions.
⑦	Bottom storage	Use this area to store items such as replacement tools and maintenance parts.

[1]   For safety, the machine stops if this cover is opened during operation.
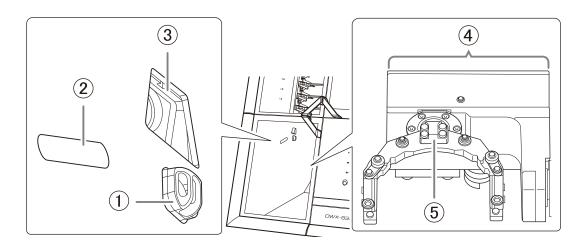
[2]   For safety, the machine stops if this cover is opened during adapter replacement.

⚠ CAUTION

Be careful with the cover.
The edges of the cover are sharp. To avoid injury, exercise caution.

Milling Area
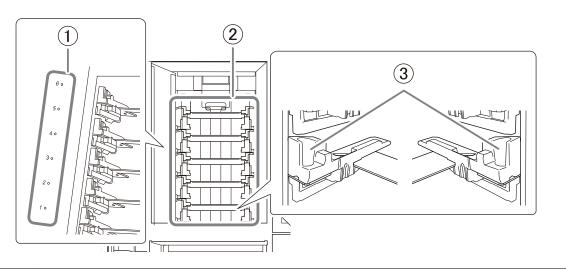
①	Ionizer	The ionizer works to eliminate static electricity from milling waste when cutting PMMA. This makes it easier for the milling waste to move away from the material during milling, which has the effect of maintaining the milling quality. [1]	
②	Status light	This light is linked with the status light at the top of the machine and indicates the status of the machine with its color and depending on whether it is lit or flashing.	
③	Camera	The camera allows the milling status of the machine to be checked from VPanel. When the camera settings are configured, recording starts at the same time as milling. Images are automatically saved only when an error occurs. The images are useful in checking the milling status and in identifying the causes of errors.	
④	Rotary axis unit	Rotates the adapter to which the material to mill is attached, allowing the milling bur to cut the material according to the CAM data sent to the machine.	
⑤	Clamp	Removes the specified adapter from the adapter magazine and holds this adapter until milling is complete.	

[1]   To obtain the optimal ionizer effect, ground this machine.

RELATED LINKS

Adapter Area
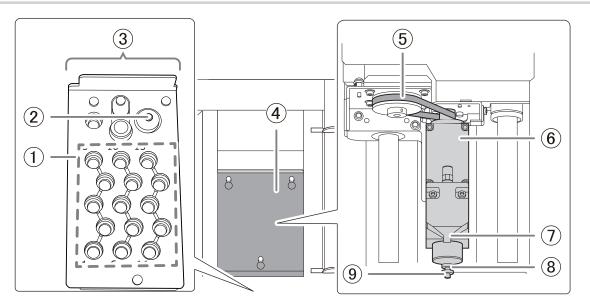
①		Adapter stocker number	Displays the adapter stocker number. Each number has a disc stocker light to indicate the status of the machine and of the adapter installed in the stocker.
②		Adapter magazine	Load adapters, in which the pre-milling workpieces and automatic correction jigs have been set, here. Up to six adapters can be loaded in the machine. When milling data is sent from the computer, the clamp automatically grips the adapter loaded in the magazine, and milling starts.
③		Adapter stocker	Install adapters, in which workpieces have been loaded, and automatic correction jigs here.

RELATED LINKS
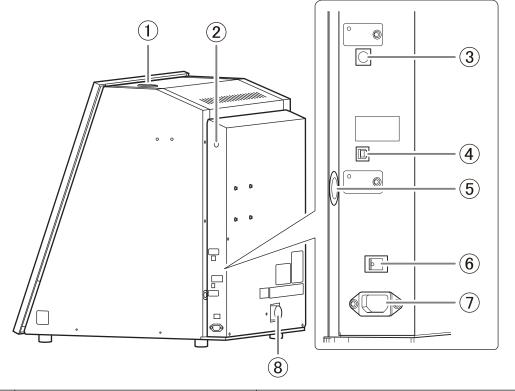
Tool Area

①	Milling bur stockers	Load the milling burs and detection pins to use in milling and correction here.
②	Milling bur sensor	Judges whether the amount of extension of the milling bur gripped by the spindle unit is appropriate. To maintain good sensor accuracy, clean this part periodically.
③	ATC magazine	Transports milling burs and detection pins used in milling to the spindle unit. When milling data is sent from the PC, the spindle unit grips the milling bur in the stocker with the specified number, and milling starts.
④	Maintenance cover	Covers the aperture used for machine maintenance such as spindle unit and spindle belt replacement.
⑤	Spindle belt[*1]	Conveys the rotation of the spindle motor to the spindle unit. The spindle belt is a part that wears out. To maintain highly accurate milling quality, replace it at the appropriate time.
⑥	Spindle unit[*1]	Conveys the rotation of the spindle belt to the milling bur. The spindle unit is a part that wears out. To maintain highly accurate milling quality, replace it at the appropriate time.
⑦	Air nozzle[*1]	Discharges compressed air during milling to blow milling waste away from the workpiece.
⑧	Collet[*1]	This part is attached to the tip of the spindle unit and grips the milling bur or detection pin used in milling and correction. The collet is a part that wears out. To maintain highly accurate milling quality, replace it at the appropriate time.
⑨	Dummy pin[*1]	This is a milling bur dummy. It is attached to the spindle upon shipment. A malfunction may occur if the collet does not grasp anything, so have it grasp the dummy pin when it is not grasping a milling bur.

*1   Inside the maintenance cover

Side/Rear

①	Status light		This light is linked with the status light in the milling area and indicates the status of the machine with its color and depending on whether it is lit or flashing.
②	Compressed air intake		This is the intake for the compressed air adjusted by the regulator. The compressed air is used, for example, to blow away the waste generated when milling workpieces.
③	Expansion port		Use this port to connect a dust collector with built-in linking function. Connect a linking cable to the expansion port.
④	USB connector		Use this connector to connect the USB cable between this machine and the computer.
⑤	Tablet cable insertion port		Pass the cables used to connect this machine and the tablet through this port. Pull the tablet base toward you, and then pull the cables from the aperture on the right side.
⑥	Power switch		Turns the machine's power on and off.
⑦	Power cord connector		Connect the supplied power cord to this connector.
⑧	Dust collection hose attachment port		Attach the dust collection hose to this port. Attach the dust collection hose included with the dust collector you are using.

RELATED LINKS
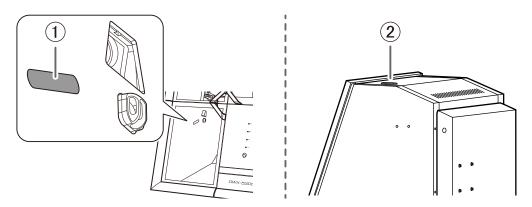
Statuses Indicated by Status Light Color

Status Lights at the Top of the Machine and in the Milling Area

To ensure that operators can determine the status of the machine whether they are right next to it or far away, one status light is provided in the milling area (①) and another on the top of the machine (②). These two synchronized lights display the status of the machine.
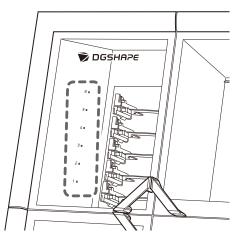
Blue	Lit	The machine is in standby. To reduce power consumption, if no operation is performed for 30 seconds while the machine is in standby, the machine will change to the sleep status, and the status lights will turn off.
	Flashing	The machine is undergoing the initial operation after it turns on. Alternatively, maintenance such as automatic correction and spindle run-in is in progress.
White	Lit	Milling is being performed or has been paused or the milling area cover or tool area cover is open.
	Flashing	The dust collector is in standby.
Yellow	Lit	An error has occurred during milling, and the machine has been paused. Check the error details shown on VPanel. Press the touch sensor on the built-in panel to resume milling.
	Flashing	An error occurred during adapter replacement, and the machine has restarted. Follow the instructions displayed in VPanel to remove the adapter.
Red	When lit or flashing in red, an error has occurred and milling has been stopped. Milling cannot be resumed.	
	Lit	Hold down the touch sensor on the built-in panel to cancel milling and return the machine to the ready status.
	Flashing	Turn the machine off, and then restart it.
Off	The status lights turn off when the machine is in the sleep state or the power is turned off.	

RELATED LINKS

Disc Stocker Lights

White	Lit	A pre-milling adapter has been installed.
	Flashing	During disc changer operation, all status lights flash. Do not open the covers until the lights stop flashing and remain on.
Blue	An adapter for which milling is not scheduled has been installed. Remove adapters for which milling is complete from the adapter stocker.	
Yellow	Adapters attached to the stocker have duplicate IDs or an error occurred when recognizing adapters. Check the adapter IDs.	
Off	The lights turn off in the following situations. • No adapters have been installed in the stocker. • The machine is off.	

What Is VPanel?

VPanel for DWX is an application that allows for milling machine operation on a computer screen. It has functions for outputting milling data, performing maintenance, and making various corrections. It also displays information such as the milling machine status and errors. For information on the windows displayed in this application and for a detailed explanation of its functions, refer to the VPanel for DWX User's Manual. The term "VPanel" is used in this manual to refer to VPanel for DWX.

RELATED LINKS

- VPanel for DWX User's Manual

VPanel display

Displaying VPanel from the Task Tray

Procedure

1. Click [icon] in the task tray on the desktop.

The top window of VPanel will appear. If you cannot find [icon] in the task tray, start the program from the Windows [**Start**] menu.

Starting VPanel from the Start Screen
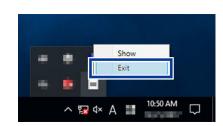
Procedure

1. **Start VPanel from the Start screen.**
   - **Windows 11**
     a. Click [**Start**].
     b. Click [**All Apps**]>[**VPanel for DWX**].
   - **Windows 10**
     a. Click [**Start**].
     b. Click [**VPanel for DWX**]>[**VPanel for DWX**].

Exiting VPanel

Procedure

1. **Right-click 🖳 in the task tray, and then click [Exit].**

Usable Tools

Workpiece

Usable Workpieces and Sizes

The materials that can be milled by this machine are as follows. To prevent machine malfunctions, be sure to check the material before milling.

- Zirconia
- Wax
- PMMA
- Composite resins
- PEEK
- PEKK
- Glass-fiber-reinforced resin
- CoCr sintered metal
- Gypsum
- Polycarbonate
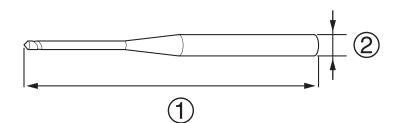
The types and sizes of the workpieces that can be milled by this machine are as follows.

Type		Size
Disc type (with step)		Step section: 98.5 mm (3.88 in.) (diameter), 10 ± 0.3 mm (0.39 ± 0.01 in.) (height) Body section: 95 mm (diameter), 35 mm max. (height)
Pin type		Pin diameter: 6 mm

Milling bur

Usable Milling Bur Sizes

* The shape of the milling bur is merely an example. Select the milling bur that matches the application. Contact your authorized DGSHAPE Corporation dealer or visit our website to purchase items.
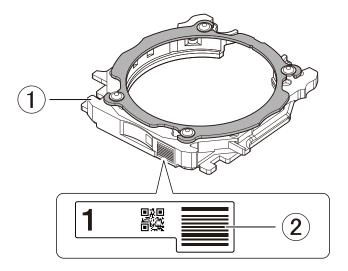
- ①: 40 to 55 mm (1.58 to 2.16 in.)
- ②: ø4 mm (ø0.16 in.)

RELATED LINKS

- https://www.dgshape.com/

Adapter/Adapter ID

Workpieces are used while set in adapters labeled with adapter IDs. Manage the work situations of workpieces by using CAM software to specify the adapter ID. Once you have started using a workpiece, do not remove it from the adapter until you are finished using it. If you remove a workpiece that you have started using from the adapter, you will no longer be able to manage information such as the position information in the CAM data. It may also become impossible to correctly read the position at which to resume milling.

- ①: Adapter
- ②: Adapter ID

When You Want to Use Seven or More Adapters

Six adapters are included with the machine. If you want to use seven or more adapters, purchase optional products. You can manage up to 100 adapters (IDs: 1 to 100).

RELATED LINKS

-

Basic Operation

Power Supply Operations

Switching the Power On
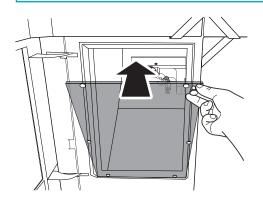
Procedure

1. **Attach the dust-proof cover to the milling area.**

To prevent the work area from getting dirty from milling waste ejected from the milling area, attach the dust-proof cover before using this machine.
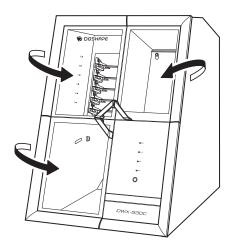
> **MEMO**
>
> Attach the dust-proof cover so the handle is in the upper-right corner. Check that the magnets on the edge of the cover attach to the mounting frame.
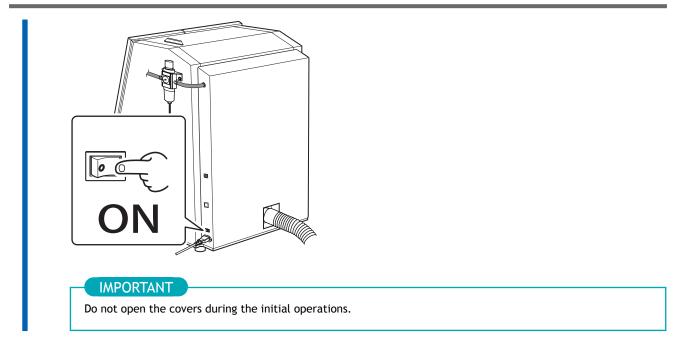
2. **Close the following three covers.**

- Milling area cover
- Adapter area cover
- Tool area cover

3. **Switch on the machine's power switch.**
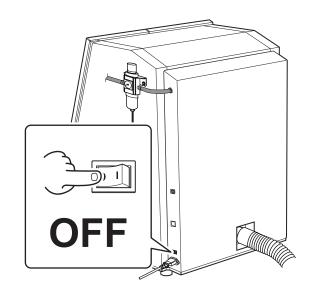
The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.

ON

IMPORTANT

Do not open the covers during the initial operations.

Switching the Power Off

Procedure

1. Switch off the machine's power switch.

OFF

Milling

Milling

Preparing for Milling

CAM Settings Necessary for Milling

The settings shown below must be included in the milling data output to this machine.

Workpiece	Set the type of workpiece to mill. P. 16 Workpiece
Adapter ID	Set the ID of the adapter to use in milling. P. 18 Adapter/Adapter ID
Milling bur	Set all the milling burs to use in milling. P. 17 Milling bur
Milling bur stocker number	Set the numbers of the milling bur stockers in which the milling burs will be loaded. P. 41 Setting the Milling Bur
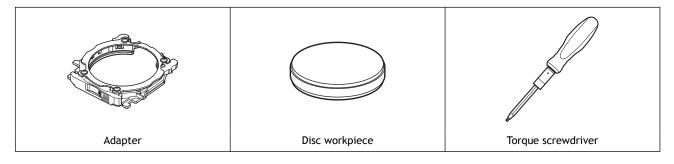
Step 1: Mounting Disc Workpieces on Adapters

Mount workpieces on adapters with unique ID labels. You can mount workpieces on any adapters so long as they have unique ID labels. In CAM software, specify the IDs of the adapters on which workpieces have been mounted to start milling.

> **MEMO**
>
> Adapter ID labels are not affixed to open edge adapters. Affix the adapter ID labels included as an optional product with this machine to the additional adapters before using them.

Required items

Adapter	Disc workpiece	Torque screwdriver

> **IMPORTANT**
>
> Do not loosen screws with a torque screwdriver with the sleeve (①) attached.
> Doing so may damage the sleeve. Before loosening screws, remove the sleeve from the torque screwdriver.
>
>

> **IMPORTANT**
>
> Before tightening a screw that has a specified tightening torque, be sure to attach a sleeve. Check the marking on the sleeve (①) and use a sleeve that matches the tightening torque value.
> Failure to attach a sleeve will cause a torque in excess of the permitted amount to be applied, which may damage parts and materials.
>
>

Procedure

1. **Make sure that no sleeve is attached onto the torque screwdriver.**

If a sleeve has been attached, remove it.

2. **Use a torque screwdriver with the sleeve removed to loosen the adapter screws (in four locations), turning them approximately four times.**

> **IMPORTANT**
>
> Use the included spare screws when a screw is lost or worn.

3. **Remove the adapter cap.**

Turn the adapter cap in the direction of the arrows to remove it.
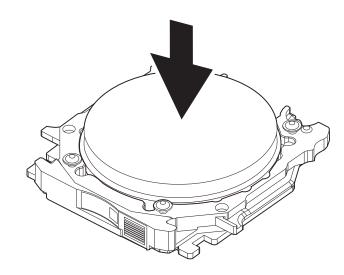
> **MEMO**
>
> If you are using an open edge adapter, turn the adapter cap, and then lift up the adapter cap to remove it.
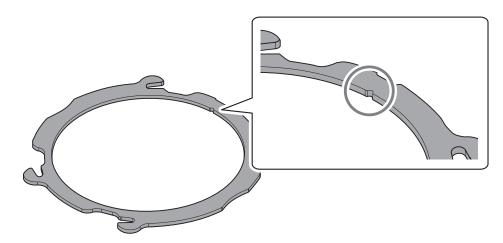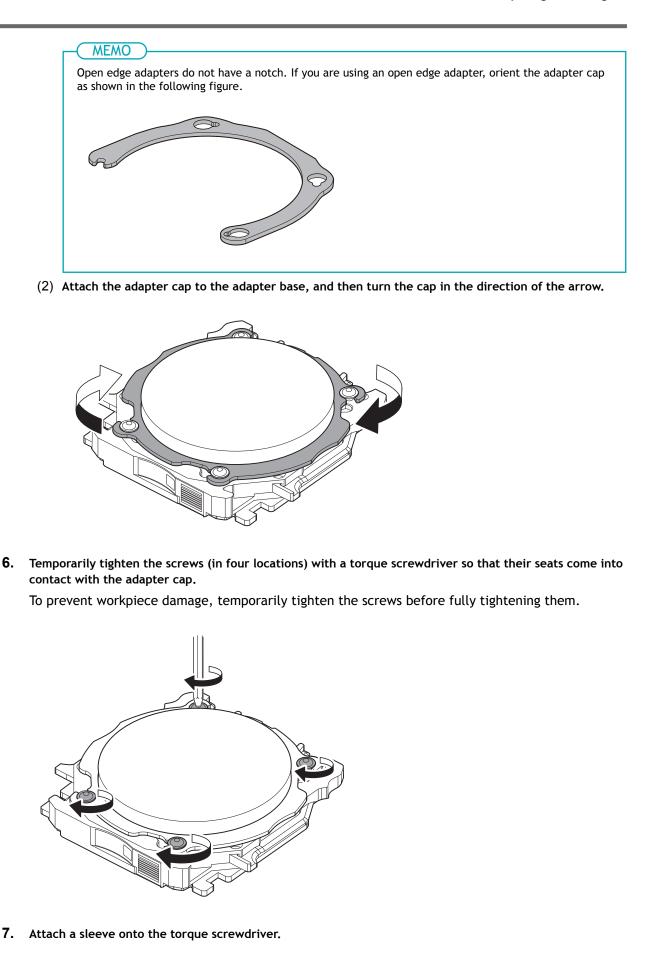
4. **Load the disc workpiece into the adapter base.**

5. **Attach the adapter cap to the adapter base.**

    (1) **Orient the adapter cap removed in step 2 as shown in the following figure.**

    Pay attention to the position of the notch.

Open edge adapters do not have a notch. If you are using an open edge adapter, orient the adapter cap as shown in the following figure.

(2) **Attach the adapter cap to the adapter base, and then turn the cap in the direction of the arrow.**

6. **Temporarily tighten the screws (in four locations) with a torque screwdriver so that their seats come into contact with the adapter cap.**

To prevent workpiece damage, temporarily tighten the screws before fully tightening them.

7. **Attach a sleeve onto the torque screwdriver.**

Select the torque screwdriver sleeve that matches the material you are using. Selecting the incorrect sleeve may damage the workpiece.
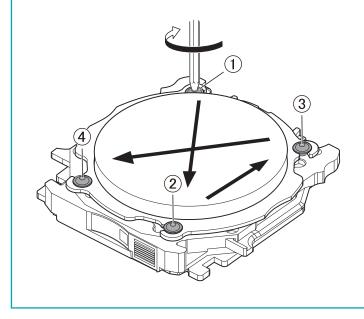
The torques required when attaching workpieces of various materials are as follows.

Material	Torque
Zirconia	0.3 N·m
Wax	0.3 N·m
PMMA	0.6 N·m
Composite resins	0.6 N·m
PEEK	0.6 N·m
PEKK	0.6 N·m
Glass-fiber-reinforced resin	0.6 N·m
CoCr sintered metal	0.3 N·m
Gypsum	0.3 N·m
Polycarbonate	0.6 N·m

8. **Use a torque screwdriver with the sleeve attached to tighten the screws in four locations in the order shown in the following figure.**
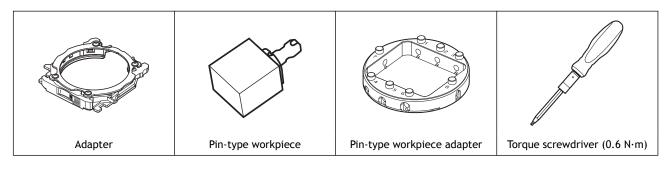
Tighten the screws until turning the handle of the torque screwdriver no longer turns the screw bit.

Also, to prevent workpiece damage, secure the workpiece evenly. Be sure to tighten the screws across the diagonals.

Step 1: Mounting Pin-type Workpieces on Adapters

Use this section to mount the workpiece on the adapter, and then secure the workpiece by tightening the adapter cap. You can mount workpieces on any adapters. Each adapter has a unique ID label, but the CAM software is used to specify the ID of the adapter used in milling.

Required items
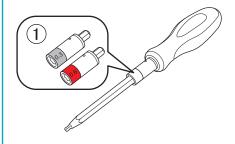
Adapter	Pin-type workpiece	Pin-type workpiece adapter	Torque screwdriver (0.6 N·m)

IMPORTANT

Do not loosen screws with a torque screwdriver with the sleeve (①) attached.
Doing so may damage the sleeve. Before loosening screws, remove the sleeve from the torque screwdriver.

IMPORTANT

Before tightening a screw that has a specified tightening torque, be sure to attach a sleeve. Check the marking on the sleeve (①) and use a sleeve that matches the tightening torque value.
Failure to attach a sleeve will cause a torque in excess of the permitted amount to be applied, which may damage parts and materials.

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1. Mount the pin-type workpiece adapter on the adapter.
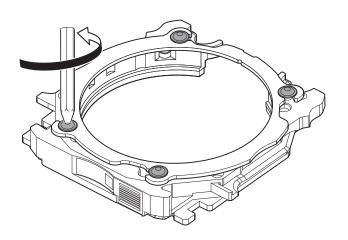
Procedure

1. **Make sure that no sleeve is attached onto the torque screwdriver.**

If a sleeve has been attached, remove it.

2. **Use a torque screwdriver with the sleeve removed to loosen the adapter screws (in four locations), turning them approximately four times.**
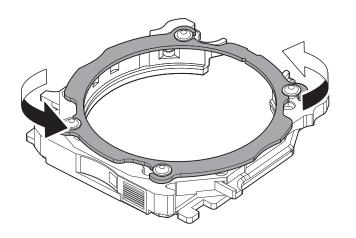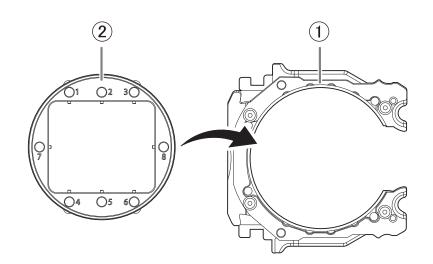
> IMPORTANT
>
> Use the included spare screws when a screw is lost or worn.
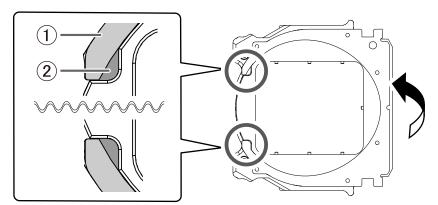
3. **Turn the adapter cap in the direction of the arrows to remove it.**

4. **Mount the pin-type workpiece adapter on the adapter base.**

   (1) **Load the pin-type workpiece adapter (②) on the adapter base (①).**

   - Adapter base (①): Orient this part so that it looks like a "C."
   - Pin-type workpiece adapter (②): Orient this part so the numbers face up.
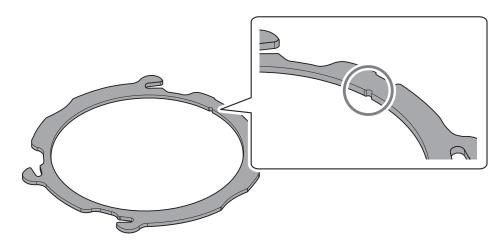
(2) **Turn over the loaded adapter, and then align the positions shown in the following figure.**

Attach the pin-type workpiece adapter so that the protrusions on the adapter base (①) match the positions of the recessed parts on this adapter (②).
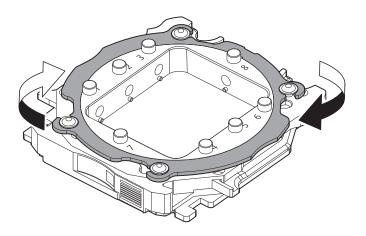
(3) **Turn over the adapter so that its top faces up, and then check whether the pin-type workpiece adapter has been mounted on the adapter base without any gaps.**

If the parts wobble, check whether the protrusions match the positions of the recessed parts again.

5. **Attach the adapter cap to the adapter base.**

(1) **Orient the adapter cap removed in step 2 as shown in the following figure.**

Pay attention to the position of the notch.

(2) **Attach the adapter cap to the adapter base, and then turn the cap in the direction of the arrow.**
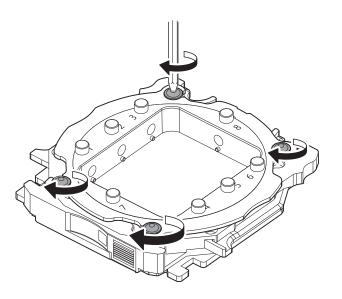
6. **Temporarily tighten the screws (in four locations) with a torque screwdriver so that their seats come into contact with the adapter cap.**

To secure the adapter cap evenly, temporarily tighten the screws before fully tightening them.

7. **Attach the 0.6 N·m, red sleeve onto the torque screwdriver.**
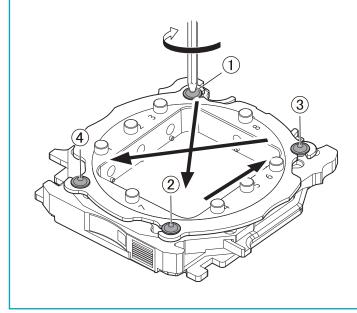
> **IMPORTANT**
>
> Be sure to use the 0.6 N·m torque screwdriver sleeve. Failing to do so may lead to loose screws during milling, which will affect the milling quality.

8. Use a torque screwdriver with the sleeve attached to tighten the screws in four locations in the order shown in the following figure.
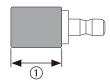
> **IMPORTANT**
>
> Tighten the screws until turning the handle of the torque screwdriver no longer turns the screw bit.
> To maintain milling quality, secure the adapter cap evenly. Be sure to tighten the screws across the diagonals.
>
>

2. Mount the workpiece on the pin-type workpiece adapter.

The following figures show the number of workpieces that can be mounted on the adapter according to their sizes. The maximum number of workpieces that can be mounted on the adapter differs depending on the workpiece length (①).

Example mounting layouts
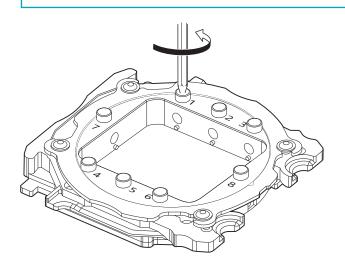
① ≤ 20 mm (0.78 in.)	
20 mm (0.79 in.) < ① ≤ 50 mm (1.96 in.)	
50 mm (1.97 in.) < ①	

Procedure

1. **Make sure that no sleeve is attached onto the torque screwdriver.**

    If a sleeve has been attached, remove it.

2. **Use a torque screwdriver with the sleeve removed to loosen the screw at the mounting position for the pin-type workpiece.**
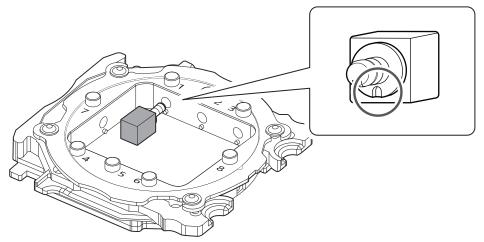
Use the included spare screws when a screw is lost or worn.

3. **Mount the pin-type workpiece on the pin-type workpiece adapter.**

Make sure the recessed portion of the pin-type workpiece is oriented downward, align the protrusion of the pin-type workpiece adapter with this recessed portion, and then insert the workpiece all the way in.

4. **Attach the 0.6 N·m, red sleeve onto the torque screwdriver.**
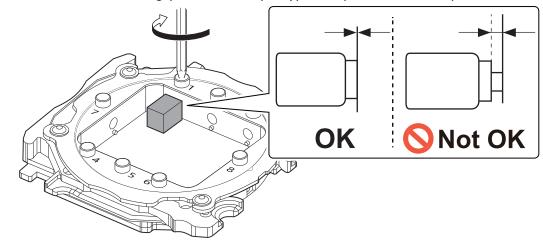
Be sure to use the 0.6 N·m torque screwdriver sleeve. Failing to do so may lead to loose screws during milling, which will affect the milling quality.

5. **Use a torque screwdriver with the sleeve attached to tighten the screw.**

Tighten the screws until turning the handle of the torque screwdriver no longer turns the screw bit.

Check that there is no gap between the pin-type workpiece and the adapter.
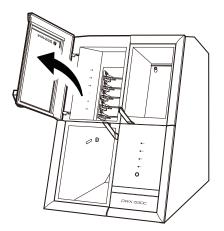
Step 2: Attaching the Adapter to the Machine

Procedure

1. Turn on the machine.

The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.
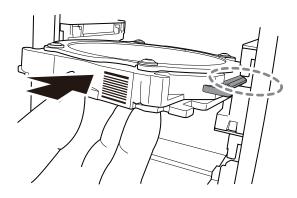
2. When the initial operation is finished, open the adapter area cover.

3. With its adapter ID facing you, slowly insert the adapter into the adapter stocker.
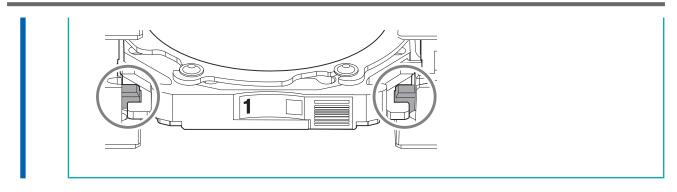
> **IMPORTANT**
>
> Inserting it with too much force will make the adapter strike the inside of the machine, possibly leading to injury and workpiece damage.
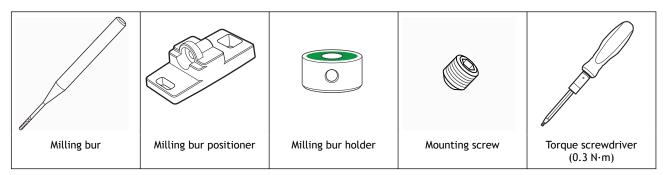
> **MEMO**
>
> To check whether the adapter has been attached correctly, gently pull the adapter toward you.
> It has been attached correctly if the protrusions on the adapter stocker catch on the grooves on the adapter.

4. Close the adapter area cover.

Step 3: Setting the Milling Bur

Required items
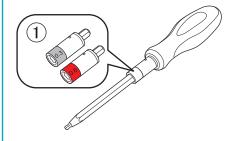
Milling bur	Milling bur positioner	Milling bur holder	Mounting screw	Torque screwdriver (0.3 N·m)

IMPORTANT

Do not loosen screws with a torque screwdriver with the sleeve (①) attached.

Doing so may damage the sleeve. Before loosening screws, remove the sleeve from the torque screwdriver.

①

IMPORTANT

Before tightening a screw that has a specified tightening torque, be sure to attach a sleeve. Check the marking on the sleeve (①) and use a sleeve that matches the tightening torque value.

Failure to attach a sleeve will cause a torque in excess of the permitted amount to be applied, which may damage parts and materials.

①
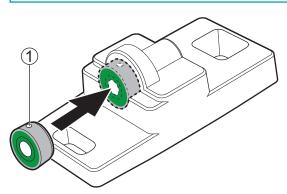
Procedure

1. Attach the milling bur holder to the milling bur positioner.

(1) **Orient the milling bur holder as shown in the figure, and then insert and attach the milling bur holder so that it reaches the back of the hole.**

Attach the milling bur holder with its screw hole (①) on top.
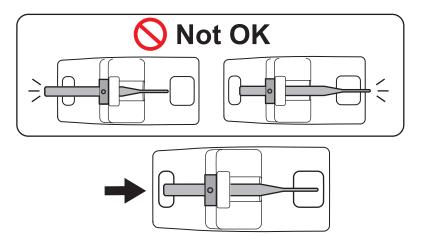
Be sure to use the included milling bur holder. Failing to do so may affect the milling quality or lead to milling bur damage during milling.

(2) **Slide the milling bur through the milling bur holder and determine the proper position.**

Insert the milling bur as shown in the following figure and make sure that both ends are within the areas of the milling bur positioner holes.
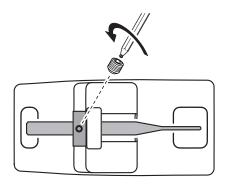
(3) **Attach the 0.3 N·m onto the torque screwdriver.**

Be sure to use the 0.3 N·m torque screwdriver sleeve. Failing to do so may lead to the screw becoming loose during milling or may make it impossible to remove the screw from the milling bur.
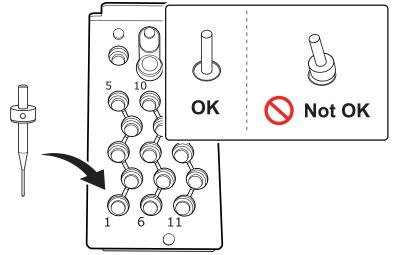
(4) **Use a torque screwdriver with the sleeve attached to tighten the mounting screw.**

2. **Set the milling bur in the ATC magazine.**

Firmly insert the milling bur as far as possible. Up to 15 milling burs can be loaded. The milling bur stocker numbers are inscribed on the surface of the ATC magazine.

OK   🚫 Not OK
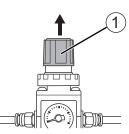
Step 4: Adjusting the Pressure of the Compressed Air

After CAM data is sent to the machine, air is supplied during the following operations. The air pressure is automatically increased or decreased to match the material to mill.

- When the spindle rotates
- When the milling bur is replaced
- When cleaning operations are performed such as those after milling finishes

Procedure

1. **Pull up on the upper knob (the air pressure adjustment knob) (①).**

2. **Adjust the air pressure.**

(1) **Slowly turn the upper knob to adjust the air pressure to 0.3 MPa.**

(2) **Slowly turn the upper knob to increase the air pressure to 0.4 MPa.**
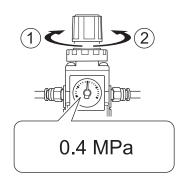
> ⚠ WARNING
>
> **Turn the air pressure adjustment knob slowly and carefully.**
> Otherwise, the machine may move suddenly, posing a risk of injury.

> IMPORTANT
>
> Be sure to adjust the air pressure setting to 0.4 MPa. An air pressure higher than 0.4 MPa may result in a malfunction. If the pressure is too low, the desired results will not be obtained.

0.4 MPa

- ①: Increase the pressure.
- ②: Decrease the pressure.

When the supply of air starts, the air starts to flow and the pressure drops temporarily. However, it is not necessary to increase the air pressure back to 0.4 MPa.

3. **Push down on the upper knob.**

Step 5: Setting Milling Burs to Use in Milling

Use this section to set the milling bur to use in milling from the milling burs loaded in the ATC magazine.

Procedure

1. Show VPanel.

2. Open the [Milling bur registration] window.

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image displayed under [**MACHINE STATUS**].

(2) **Click** [icon].

The [**Milling bur management**] window is displayed.

(3) **Click [Milling bur registration].**

The [**Milling bur registration**] window is displayed.

3. Select [<New Bur>], and then enter under [Milling bur info] the name, work time, and replacement time information of the milling bur to register.

Replacement times depend on the type of milling bur or workpiece as well as the milling conditions. Adjust the replacement time value as necessary.

Milling bur info

Milling bur name: New Bur 01

Work time <1>   Work time <2>   Work time <3>   Replacement time

1 h 5 m   1 h 7 m   0 h 6 m   1 h 0 m

4. **Click [Add milling bur].**

The milling bur is registered to the list and can now be selected in the [**Milling bur management**] window. You can register up to 35 milling burs.

	Add milling bur
	Remove milling bur
Work time <3> Replacement time	Save
0 h 6 m 1 h 0 m	
	Close

5. **Click [Close].**

The [**Milling bur registration**] window closes.

	Add milling bur
	Remove milling bur
Work time <3> Replacement time	Save
0 h 6 m 1 h 0 m	
	Close

6. **Click** ✏ **next to the number of the stocker in which the milling bur has been loaded.**

① ✏ ⑥
↻

Milling bur registration

7. **Select the milling bur to use in milling from the registered burs, and then click [OK].**

The milling bur is assigned, and the work time and replacement time entered at the time of registration are displayed.

MEMO

To perform long-term, continuous milling without changing the type of milling bur, load milling burs with the same specifications in multiple stockers and set the same milling bur name on these stockers.

If you use the ITC (Intelligent Tool Control) function, when the milling bur being used approaches its replacement time, it is automatically switched with the next milling bur, and milling continues.

You can set the same name to up to three milling burs.

RELATED LINKS

- P. 55 Automatically Switching Out the Worn Milling Bur (Intelligent Tool Control)
- VPanel for DWX User's Manual

Starting Milling

Outputting Milling Data and Starting Milling

You can also use commercially available CAM software to output milling data. For information on compatible CAM software, contact your authorized Roland DG Corporation dealer.

> ⚠ WARNING
>
> **Be sure to turn on the dust collector.**
> Milling waste and workpieces are flammable and toxic.

> ⚠ WARNING
>
> **Never use a vacuum cleaner to clean up milling waste.**
> Picking up fine cuttings using an ordinary vacuum cleaner may result in fire or explosion.

> ⚠ WARNING
>
> **Securely fasten the milling tool and workpiece in place. After securing in place, make sure no wrenches or other articles have inadvertently been left behind.**
> Otherwise, such articles may be thrown from the machine with force, posing a risk of injury.

> ⚠ WARNING
>
> **Keep open flame away from the work area.**
> Milling waste may ignite. Powdered material is extremely flammable, and even metal material may catch fire.

Procedure

1. Check the settings of the milling data.

> P. 25 CAM Settings Necessary for Milling

2. Show VPanel.

3. Open the [Output a file] window.

   (1) **In the top window of VPanel, select the machine to operate.**

   When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

   (2) **Click** **.**

   The [**Open**] window is displayed.

4. **Select the milling data, and then click [Open].**

The selected milling data is displayed in the data list of the **[Output a file]** window. Click **[Add]** in the **[Output a file]** window to add files when you want to output milling data continuously.

5. **Verify that the workpiece and the milling bur are set in the milling machine.**

P. 41 Setting the Milling Bur

6. **Click [Output].**

MEMO

- **Changing the data list order**
  You can change the output order by selecting the milling data in the data list and clicking ⌃ or
  ⌄ . (The milling data is output from the top of the data list.)
- **Removing milling data from the data list**
  To remove milling data from the output list, select the milling data in the data list and click **[Delete]**.
- **Adding milling data by dragging and dropping**

> You can add milling data to the data list by dragging the data to the top window or the [**Output a file**] window.

7. **In the confirmation window, click [OK].**

Output a file - DWX-53DC

⚠️

Output a file to DWX-53DC.

| OK |

| Cancel |

The output milling data is displayed in the [**JOB**] of the top window, and then milling starts.

CURRENT PHASE   JOB

IMPORTANT

Do not open the milling area cover or tool area cover during milling. Doing so will cause the machine to come to an emergency stop for safety. Use the information provided at the following link to resolve the error.

MEMO

If the message [**1050-******] [**The operation to read a barcode failed.**] appears, output cannot start because the adapter barcode cannot be read. Use the included cloth for care to wipe clean the barcode sensor and the adapter barcode. Then, perform the output procedure again from the beginning.

RELATED LINKS

· VPanel for DWX User's Manual

Removing the Adapter Cap from the Machine

You can remove the adapter from the machine in the following situations.

- When milling is finished

  Milling is finished when [**READY**] or [**FINISH**] appears under [**MACHINE STATUS**] in VPanel.

- When removing an adapter for which milling is not scheduled while during milling and with the disc changer not operating

> **IMPORTANT**
>
> Do not open the adapter area cover while the disc changer is operating. An error will occur or the machine will pause.
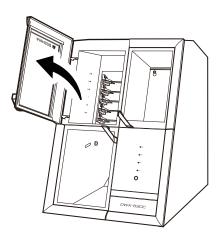
> **MEMO**
>
> If an adapter remains in the clamp even after milling is finished, hold down the touch sensor on the built-in panel.
> The adapter is returned to its adapter stocker.

Procedure
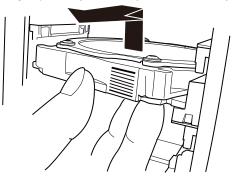
1. **Open the adapter area cover.**

2. **Remove the adapter from the adapter magazine.**

   Slightly lift up the adapter, and then pull it out slowly so it does not catch on the stocker.

Aborting and Canceling Milling

Aborting Output

Procedure

1. In the top window of VPanel, select the machine for which output will be aborted.

2. Click ☒.

3. Click [OK].

   The output of the milling data is canceled.

Removing Milling Data in Standby from the Output List

Procedure

1. In the top window of VPanel, select the machine whose output list you want to edit.

2. Right-click the milling data to remove from the output list.

3. Click [Delete].

You can only remove milling data that is in standby. The milling data displayed at the top of the output list is currently being milled, so it cannot be removed.

Other Milling

Continuous Milling

Automatically Switching Out the Worn Milling Bur (Intelligent Tool Control)

During milling, the milling bur wears out and may need to be replaced. If you want to have the worn milling bur switched out automatically during milling, use Intelligent Tool Control (ITC).

ITC is a function that automatically replaces milling burs that reach their replacement time during use with the next milling bur. This makes it possible to continue milling for a long time without any loss in milling quality.

Use the [**Milling bur management**] window to set the combinations of milling burs that will be switched automatically. Register multiple milling burs with the same name to set them as a single unit.

You can set the same name to up to three milling burs.

Procedure

1. Open the [Milling bur management] window.

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image displayed under [**MACHINE STATUS**].

(2) **Click** .

The [**Milling bur management**] window is displayed.

2. Set the milling burs that you want to use ITC to switch between automatically into two or three milling bur stocker locations.

Milling burs with the same name are set as a single unit. When the milling bur reaches its replacement time during milling, it is automatically switched with the next milling bur.

RELATED LINKS

- P. 108 Replacing Milling Burs
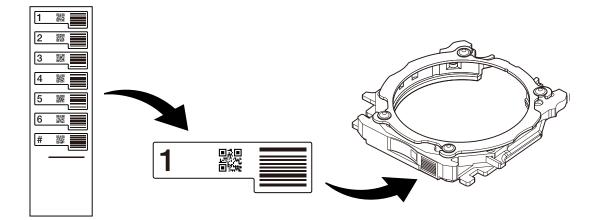
Purchasing Additional Adapters

Six adapters are included with this machine, and this machine can manage all six adapters at the same time. However, you cannot remove workpieces that are being milled from their adapters because doing so will make it impossible to manage information such as the position information in the CAM data.

To use workpieces completely, we recommend that you prepare spare adapters. You can manage up to 100 adapters (IDs: 1 to 100). Contact your authorized DGSHAPE Corporation dealer or visit our website to purchase items.
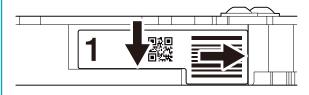
Work That Is Required after Purchasing Adapters

Adapter ID labels are not affixed to adapters that are purchased as optional products. Affix the adapter ID labels included as an optional product with this machine to the additional adapters before using them.

> **MEMO**
>
> Affix the adapter ID labels to the adapters while pressing these labels against the adapters as shown in the following figure. If the label is affixed in the wrong position, it may not be possible to correctly read the adapter ID.
>
>

RELATED LINKS

- https://www.dgshape.com/

Optimizing Quality and Efficiency

Optimizing the Milling Quality

Recommended CAD Data Thickness Values

Front tooth crown	Molar tooth crown
①: 1.0 to 1.2 mm (39.38 to 47.24 mil) ②: 1.5 mm (59.06 mil) or more ③: 0.8 mm (31.50 mil) or more ④: 0.2 mm (7.88 mil) or more	①: 1.5 mm (59.06 mil) or more ②: 1.0 mm (39.38 mil) or more ③: 1.5 mm (59.06 mil) or more ④: 0.8 mm (31.50 mil) or more ⑤: 0.2 mm (7.88 mil) or more

Veneer	Onlay	Inlay
①: 0.4 mm (15.75 mil) or more ②: 0.6 mm (23.63 mil) or more ③: 0.5 to 1.5 mm (19.69 to 59.05 mil) ④: 0.25 mm (9.85 mil) or more	①: 1.5 mm (59.06 mil) or more ②: 1.0 mm (39.38 mil) or more ③: 0.25 mm (9.85 mil) or more	①: 1.0 mm (39.38 mil) or more ②: 0.25 mm (9.85 mil) or more

Correcting the Milling Position According to the Milling Results for Correction (Manual Correction)
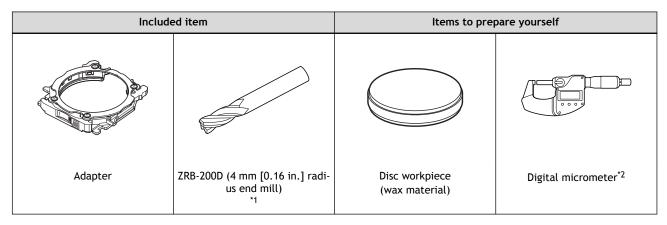
Use this section to mill material for correction and manually measure the milling results. Then, correct the milling position according to the measured results. This operation is called "manual correction." Performing manual correction may reduce variations in milling accuracy. If you need milling results with higher accuracy, we recommend that you perform manual correction.

> **IMPORTANT**
>
> Before performing manual correction, be sure to complete automatic correction.
> If you perform automatic correction after manual correction, the correction value of manual correction will be initialized.
>
> P. 87 Automatic correction

Required items

Included item		Items to prepare yourself	
Adapter	ZRB-200D (4 mm [0.16 in.] radius end mill) *1	Disc workpiece (wax material)	Digital micrometer*2

*1   You can also use a 4 mm (0.16 in.) square end mill (not included).

*2   Prepare a digital micrometer that meets the following specifications.
  - Measurement range: 0 to 25 mm (0 to 0.98 in.) or more
  - Measurement surface dimensions: Diameter: 6 mm (0.23 in.) or less

> **IMPORTANT**
>
> When performing manual correction, give attention to the following two points.
> - Use wax material.
>   Manual correction has been designed assuming that it will be performed with wax material. You may not obtain correct correction results if you use other material.
> - Measure in a short period of time, continuously, and fully.
>   Wax material is affected by temperature, which makes the dimensions of this material change easily. This can lead to incorrect correction results, so we recommend that you wear gloves when handling this material.

Procedure

1. **Show VPanel.**

2. **Open the [Machine settings] window.**

    (1) **In the top window of VPanel, select the machine to operate.**

    When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

    (2) **Click** 🔧.

    The [**Machine settings**] window is displayed.

3. **On the [Maintenance] tab, click [Manual correction].**
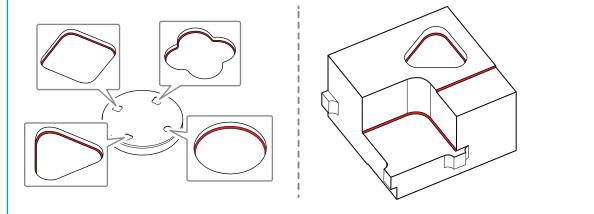
4. **Follow the on-screen instructions to perform manual correction.**

   Use a digital micrometer to accurately measure the thickness of the milled locations. The machine automatically performs correction on the basis of the measured values entered into VPanel. For information on how to use the digital micrometer, refer to the documentation for the device you're using.

   > **IMPORTANT**
   >
   > If you are milling using the ZRB-200D (4 mm [0.16 in.] radius end mill), avoid the sections indicated with red in the following figure when measuring the thickness.
   > The shape of the end mill tip results in 0.2 mm (7.87 mil) curved surfaces in the sections indicated with red. To accurately correct the milling position, enter in VPanel the thickness measured while avoiding these curved surfaces.
   >
   >

5. **When manual correction is finished, click [Complete].**

   The [**Manual correction**] window closes. Perform actual milling and check its results.

RELATED LINKS

- P. 87 Automatic correction

Correcting for Errors Caused by Temperature Changes (Temperature Change Correction)

Large fluctuations in temperature in the machine's installation environment from the temperature when automatic correction was performed may affect the milling quality. Performing [**Temperature change correction**] corrects for milling errors caused by temperature changes, which may improve the milling quality.
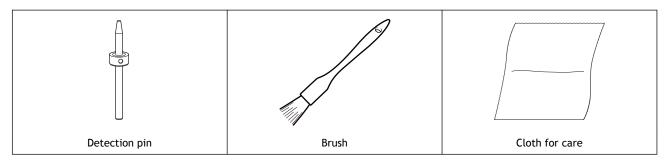
If a message prompting you to perform [**Temperature change correction**] appears in VPanel in the following situations, perform [**Temperature change correction**].

- When VPanel starts
- During standby
- When milling starts

┌─ IMPORTANT ───┐

If you perform automatic correction after temperature change correction, the correction value of temperature change correction will be initialized.

└──┘

Required items

Detection pin	Brush	Cloth for care

Procedure

1. Show VPanel.

2. Open the [Temperature change correction] window.

- **When VPanel starts or during standby**

    a. Click 🔧.

    The [**Machine settings**] window is displayed.

    b. On the [**Maintenance**] tab, click [**Temperature change correction**].

Machine settings -		✕
	Maintenance	
Automatic correction	Manual correction	
Temperature change correction		

- **When milling starts**

    a. If a message prompting you to perform [**Temperature change correction**] appears when milling starts, click [**Yes**].

    ┌─ MEMO ──┐

    If you click [**No**], milling will start without performing [**Temperature change correction**]. However, the milling quality may decrease.

    └──┘

3. **Follow the on-screen instructions to perform temperature change correction.**

When cleaning, first use the included brush, and then use the included cloth for care to carefully wipe away the milling waste. Any milling waste not removed may affect the correction results.

4. **When temperature change correction is complete, click [OK].**

RELATED LINKS

- P. 87 Automatic correction

Optimizing Operation Management

Checking the Workpiece Milling Status

A camera is installed in the milling area of the machine, making it possible to check the workpiece milling status in VPanel. Images are automatically saved to the computer only when an error occurs. The images are useful in checking the milling status and in identifying the causes of errors.

Procedure

1. Start VPanel.

2. Click [camera icon].

The [**Camera**] window is displayed.

The following window may appear the first time you click this icon.

If the following window appears, click [**OK**].

3. Select the type and resolution of the camera to use.

The image of the milling area is displayed in the [**Camera**] window.

Maintenance

Getting Started

Maintenance Precautions

Maintenance Precautions

> ⚠ WARNING
>
> **Never use a pneumatic blower.**
> This machine is not compatible with a pneumatic blower. Milling waste may get inside the machine and cause fire or electrical shock.

> ⚠ WARNING
>
> **Never use a solvent such as gasoline, alcohol, or thinner to perform cleaning.**
> Doing so may cause a fire.

> ⚠ WARNING
>
> **Never use a vacuum cleaner to clean up milling waste.**
> Picking up fine cuttings using an ordinary vacuum cleaner may result in fire or explosion.

> ⚠ WARNING
>
> **Do not touch the spindle unit or the surrounding areas immediately after milling has ended.**
> Doing so may result in burns.

> ⚠ CAUTION
>
> **Be careful around the milling tool.**
> The milling tool is sharp. Broken milling tools are also dangerous. To avoid injury, exercise caution.

- This machine is a precision device. Carry out daily care and maintenance.
- Carefully clean away milling waste. Operating the machine with milling waste present may cause a malfunction.
- Never install this machine in an environment where silicone substances (oil, grease, spray, etc.) are present. Doing so may cause poor switch contact or ionizer damage.
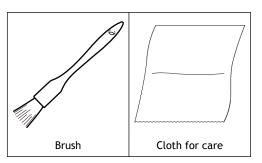
Daily Maintenance

Cleaning after Milling Finishes

Clean this machine every day after milling finishes. Using this machine without maintaining it sufficiently may affect the milling results and may even damage the machine.

Required items

| Brush | Cloth for care |

Milling area cleaning

Procedure

1. **Check that the machine is in the ready status.**

   If the status light at the top of the machine or in the milling area is lit in blue, the machine is in standby.
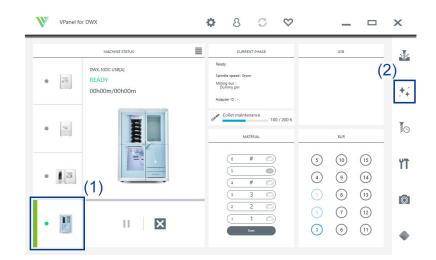
2. **Show VPanel.**

3. **Open the [Milling area cleaning] window.**

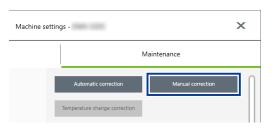   (1) **In the top window of VPanel, select the machine to operate.**

   When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

   (2) **Click ✦✦.**

   The [**Milling area cleaning**] window is displayed.

4. **Turn the dust collector on.**

   • **When using a dust collector with built-in linking function**

a. Check that the linking cable is connected to the expansion port.

b. Click [**Dust collector**] to turn it on.

c. Open the milling area cover.
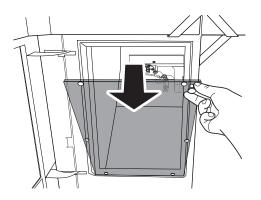
> MEMO
>
> When the milling area cover is open, you can also turn the dust collector on by pressing the touch sensor on the built-in panel.

- **When using other dust collectors**
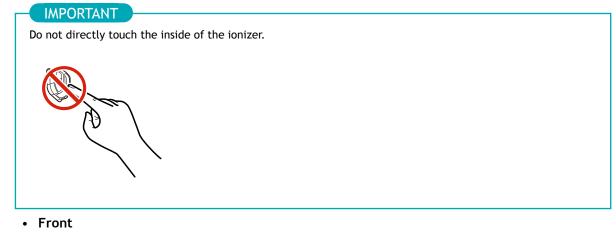
    a. Manually turn the dust collector on.

    b. Open the milling area cover.

5. Remove the dust-proof cover.
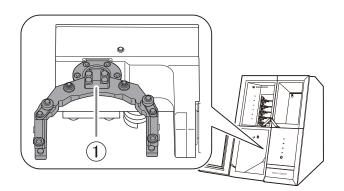
6. Follow the on-screen instructions to clean each part.

Use the included brush to carefully remove the milling waste. Any milling waste not removed may affect the milling quality. Use the dust collector to pick up the removed milling waste.

> IMPORTANT
>
> Do not directly touch the inside of the ionizer.

- **Front**
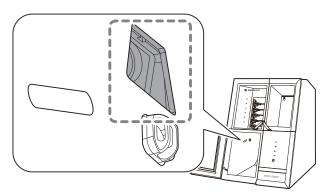
    Clean the clamp (①).

- **Rear**
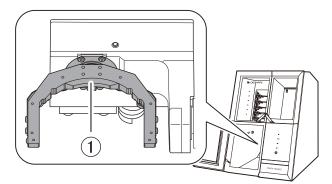
    Use the included cloth for care to wipe off the camera cover.

    If it is dirty, the captured images will be indistinct, which may make it impossible to check the milling status and the situation when an error occurs.
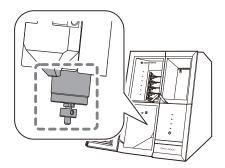
- **Reverse side**

    Clean the reverse side of the clamp (①).

- **Spindle**

    Clean the tip of the spindle. Also remove any milling waste that remains in the gap between the dummy pin or collet and the milling bur holder.
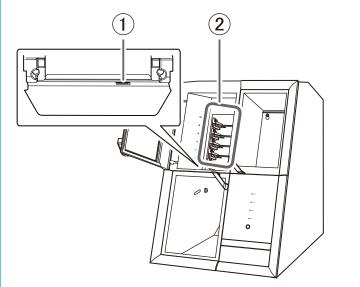
- **Disc changer**

  Clean the barcode sensor (①) and adapter stocker (②).

  IMPORTANT

  Milling waste affixing to the barcode sensor will prevent it from reading the adapter IDs correctly. Use the included cloth for care to lightly wipe clean the barcode sensor.

7. **Turn the dust collector off.**

   - **When using a dust collector with built-in linking function**

     Turn the dust collector off with one of the following operations.
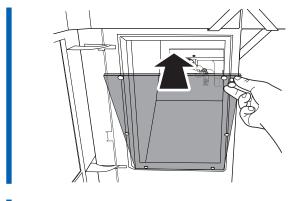
     - Click [**Dust collector**] to turn it off.
     - Press the touch sensor on the built-in panel.

   - **When using other dust collectors**

     Manually turn the dust collector off.

8. **Attach the dust-proof cover to the milling area.**

   MEMO

   Attach the dust-proof cover so the handle is in the upper-right corner. Check that the magnets on the edge of the cover attach to the mounting frame.

9. Close the milling area cover.

10. Click [Close].

RELATED LINKS
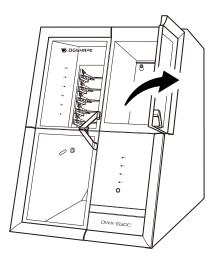
- DWX-53DC Setup Guide

Cleaning the Tool Area

Procedure
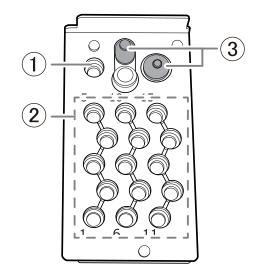
1. **Check that the machine is in the ready status.**

   P. 12 Statuses Indicated by Status Light Color

2. **Open the tool area cover.**

3. **Clean the tool area.**

   Use the included brush when cleaning. Use the included brush when cleaning. Use the included cloth for care to carefully wipe away the milling waste from the dummy pin stocker (①), milling bur stocker (②), and around the milling bur sensor (③). Any milling waste not removed may affect the milling quality.

4. **Close the tool area cover.**

RELATED LINKS
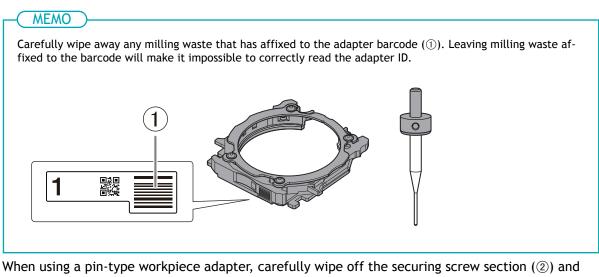
・ DWX-53DC Setup Guide

Cleaning the Milling Bur/Adapter

Procedure
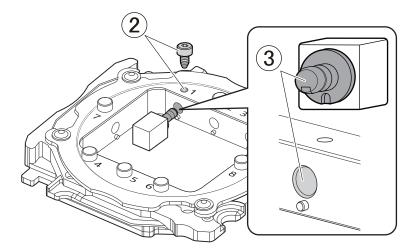
1. Use the included cloth for care to wipe off any dirt from the gray portions indicated in the following figures.

> **MEMO**
>
> Carefully wipe away any milling waste that has affixed to the adapter barcode (①). Leaving milling waste affixed to the barcode will make it impossible to correctly read the adapter ID.

When using a pin-type workpiece adapter, carefully wipe off the securing screw section (②) and the pin insertion section (③). Exercise special care when cleaning the securing screw and the hole in which the pin is inserted because it is easy for milling waste to remain in these areas.
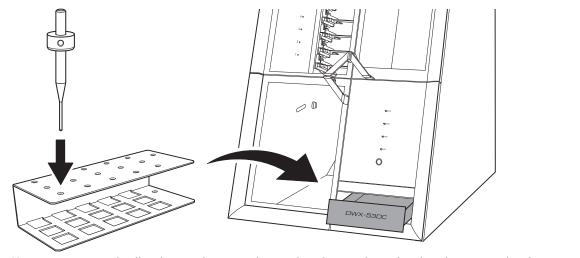
Any milling waste not removed may prevent the material from being secured correctly, affecting the milling quality.

2. Store the milling bur and the adapter.

> **MEMO**
>
> The milling bur in the milling bur holder can be stored in the bottom storage by standing it in the tool rack with it oriented with its circular holes on the top.

You can store unused milling burs in their cases by standing them in the tool rack with it oriented with its square holes on the top. In this situation, the tool rack will not fit in the bottom storage, so place it next to the machine.

Care and Storage of Detection Pin and Automatic Correction Jig
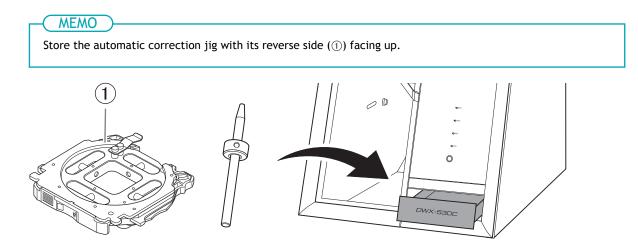
For automatic correction, use the detection pin and the automatic correction jig. The presence of rust, scratches, or grime on the detection pin or the automatic correction jig makes accurate correction impossible, which in turn may affect the milling results or damage the machine.

Procedure

1. **Use the included cloth for care to carefully wipe off the entirety of the detection pin and the automatic correction jig.**

   Check that the parts are free of rust, scratches, and grime.

2. **Press the bottom storage cover at the bottom of the machine to open this cover.**

3. **Insert the detection pin and the automatic correction jig into this storage to store them there.**

   > **MEMO**
   >
   > Store the automatic correction jig with its reverse side (①) facing up.

Periodic Maintenance

When Maintenance Is Required

When installing the machine	P. 83 Spindle Run-in (Warm-up)
When replacing the spindle unit	P. 87 Correcting the Milling Position

When the machine has not been used for a prolonged period	P. 83 Spindle Run-in (Warm-up)
Before milling on days when the ambient temperature is low	

When moving the machine to a different installation site	P. 87 Correcting the Milling Position
When the milling position is misaligned	
When symptoms such as a hole in the Z direction occur	

Once a month	P. 95 Collet Maintenance
When the working time of the spindle exceeds 200 hours	

When water or dust accumulates on the regulator	P. 103 Cleaning the Bowl

When adapter IDs cannot be read	P. 72 Milling area cleaning P. 78 Cleaning the Milling Bur/Adapter

Spindle Run-in (Warm-up)

Spindle run-in (warm-up) may be required to stabilize the rotation of the spindle.

Situations Requiring This Work

- When installing the machine
- When replacing the spindle unit
- When the machine has not been used for a prolonged period
- Before use on days when the ambient temperature is low

Procedure

1. **Close all the covers.**

2. **Turn on the machine.**

The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.

3. **Show VPanel.**

4. **Open the [Machine settings] window.**

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

(2) **Click** 🔧 **.**

The [**Machine settings**] window is displayed.

5. **On the [Maintenance] tab, click [****-****].**

6. **When the window shown in the following figure appears, click [OK].**

Run-in will begin.

Spindle run-in - DWX-53DC

⚠️

Spindle run-in will be started (approx. 60 min.).

| OK |
| Cancel |

When a message indicating that work is complete appears, the spindle run-in is complete.

RELATED LINKS

- VPanel for DWX User's Manual

Disc Changer Run-in

Disc changer run-in may be required to stabilize the ascending and descending operations of the disc changer.

Situations Requiring This Work

- When installing the machine
- When the machine has not been used for a prolonged period

Procedure

1. **Close all the covers.**

2. **Turn on the machine.**

The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.

3. **Show VPanel.**

4. **Open the [Machine settings] window.**

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

(2) **Click** 🔧.

The [**Machine settings**] window is displayed.

5. **On the [Maintenance] tab, click [****-****].**

6. **When the window shown in the following figure appears, click [OK].**

Run-in will begin.

```
┌─────────────────────────────────────┐
│  Disc changer run-in - DWX-53DC      │
├─────────────────────────────────────┤
│                                       │
│              ⚠                        │
│                                       │
│   Disc changer run-in will be started.│
│                                       │
│   ┌───────────────────────────────┐  │
│   │             OK                │  │
│   └───────────────────────────────┘  │
│   ┌───────────────────────────────┐  │
│   │           Cancel              │  │
│   └───────────────────────────────┘  │
│                                       │
└─────────────────────────────────────┘
```

When a message indicating that work is complete appears, the disc changer run-in is complete.

RELATED LINKS

· VPanel for DWX User's Manual
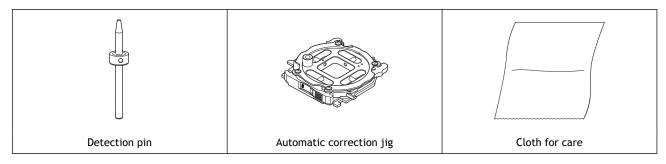
Correcting the Milling Position

The accuracy of the milling machine may change if it is used for a long period of time or the surrounding environment changes. Performing automatic correction will correct the ATC magazine and rotary axis positions.

Situations Requiring This Work

- When installing or moving the machine
- When replacing the spindle unit
- When the milling position is misaligned
- When symptoms such as a level difference or a hole in the Z direction occur in the milling results

Required items

Detection pin	Automatic correction jig	Cloth for care

> **IMPORTANT**
>
> If automatic correction does not correct the milling position or if you need milling results with higher accuracy, we recommend that you perform manual correction.
> If you perform automatic correction after manual correction, the correction value of manual correction will be initialized.

RELATED LINKS

Automatic correction

1. Install the detection pin.

Procedure

1. **Close all the covers.**
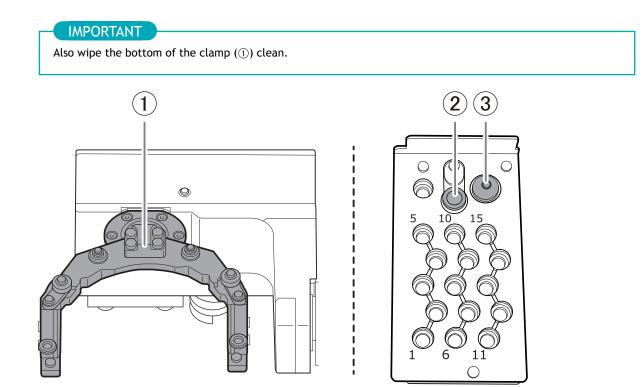
2. **Turn on the machine.**

   The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.

3. **Clean off any milling waste from the rotary axis unit and ATC magazine.**
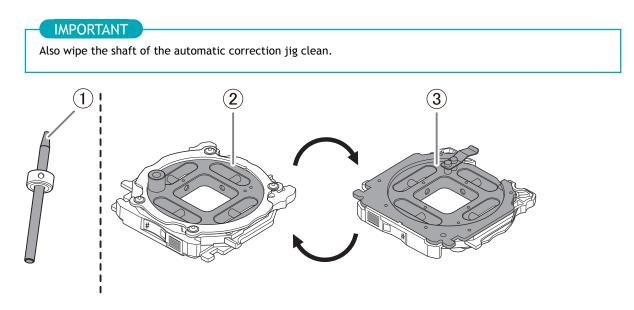
4. **Use the included cloth for maintenance and care to wipe the clamp (①), correction protrusion (②), and milling bur sensor (③) clean.**
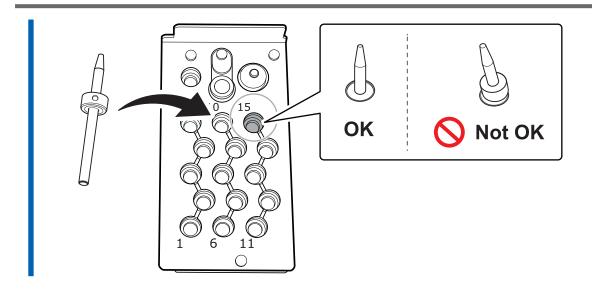
If any dirt is present in these locations, it may not be possible to perform the correction properly.

> **IMPORTANT**
>
> Also wipe the bottom of the clamp (①) clean.

5. **Wipe the detection pin (①) and the top (②) and bottom (③) of the automatic correction jig clean.**

Clean the gray parts in the following figure. If any dirt is present in these locations, it may not be possible to perform the correction properly.

> **IMPORTANT**
>
> Also wipe the shaft of the automatic correction jig clean.

6. **Load the detection pin in the ATC magazine's number 15 position.**

Insert the detection pin firmly into the ATC magazine.

OK

🚫 Not OK

1   6   11
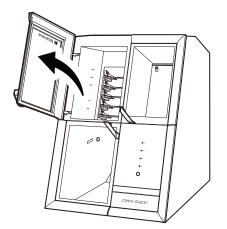
2. Attach the automatic correction jig.

> **MEMO**
>
> The automatic correction jig can be attached to all adapter stockers.

Procedure
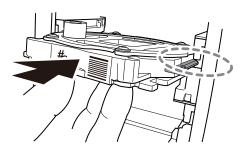
1. **Open the adapter area cover.**

2. **With its adapter ID facing you, insert the automatic correction jig into the adapter stocker.**

Insert the adapter slowly.
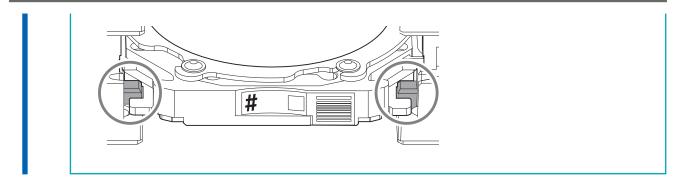
> **IMPORTANT**
>
> Inserting it with too much force will make the adapter strike the inside of the machine, possibly leading to injury and workpiece damage.

> **MEMO**
>
> To check whether the adapter has been attached correctly, gently pull the adapter toward you.
> It has been attached correctly if the protrusions on the adapter stocker catch on the grooves on the adapter.

3. Close the adapter area cover.

3. Perform automatic correction.

Procedure

1. **Show VPanel.**

2. **Open the [Machine settings] window.**

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

(2) **Click** 🔧 **.**

The [**Machine settings**] window is displayed.
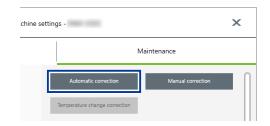
3. **On the [Maintenance] tab, click [Automatic correction].**

4. **Follow the on-screen instructions to perform automatic correction.**

After performing the work displayed in the window, click [**OK**] to proceed to the next window.

5. **The automatic correction is finished when the operation complete message is displayed.**

4. Remove the detection pin and the automatic correction jig.

Once correction is complete, remove the detection pin and the automatic correction jig, clean them, and then store them.

> ⚠ **CAUTION**
>
> **Do not pull the adapter with excessive force when removing it.**
> Doing so may result in injury arising from your hand or arm hitting something.
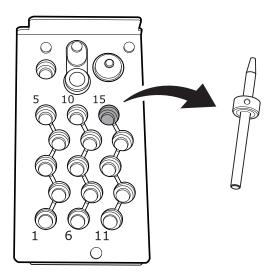
> **MEMO**
>
> If an adapter remains in the clamp even after correction is finished, hold down the touch sensor on the built-in panel. The adapter is returned to its adapter stocker.
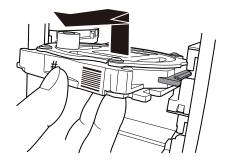
Procedure

1. **Open the tool area cover and the adapter area cover.**

2. **Remove the detection pin from the tool stocker.**
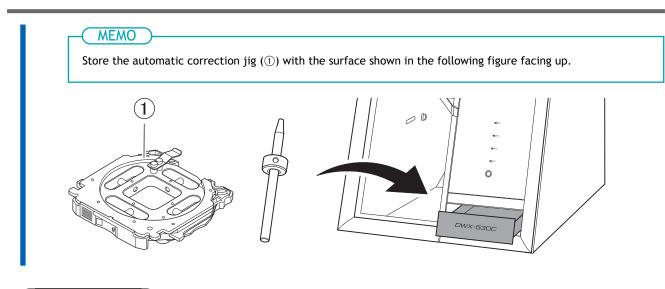
3. **Remove the automatic correction jig from the adapter magazine.**

Slightly lift up the automatic correction jig, and then pull it out slowly so it does not catch on the stocker.

4. **Store the detection pin and the automatic correction jig in the bottom storage.**

> **MEMO**
>
> Store the automatic correction jig (①) with the surface shown in the following figure facing up.

RELATED LINKS

- P. 80 Care and Storage of Detection Pin and Automatic Correction Jig
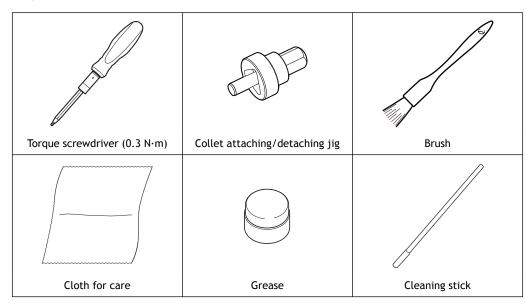
Collet Maintenance

If the collet or spindle is dirty, it may not grip the milling bur correctly, which may affect the milling quality. Perform collet maintenance on a regular basis.

Recommended Interval for This Work
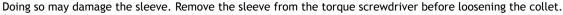
- Once a month, or when the total work time of the spindle exceeds 200 hours (with slight variation depending on the work situation).

Required items
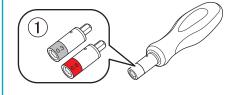
Torque screwdriver (0.3 N·m)	Collet attaching/detaching jig	Brush
Cloth for care	Grease	Cleaning stick

> **IMPORTANT**
>
> Do not loosen the collet with the torque screwdriver with the sleeve (①) attached.
> Doing so may damage the sleeve. Remove the sleeve from the torque screwdriver before loosening the collet.
>
> ①

> **IMPORTANT**
>
> The collet must be tightened at the specified tightening torque. Before tightening the collet with the torque screwdriver, be sure to attach a sleeve. Check the marking on the sleeve (①) and use a sleeve that matches the tightening torque value.
> Failure to attach a sleeve will cause a torque in excess of the permitted amount to be applied, which may damage parts and materials.
>
> ①
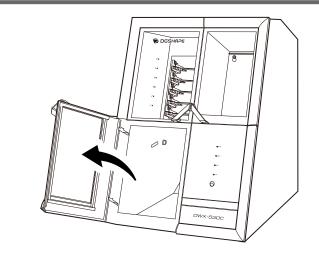
Step 1: Removing the Collet
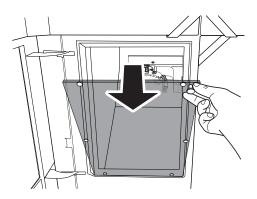
Procedure

1. Show VPanel.

2. Click ![collet icon] .

3. When the window in the following figure is displayed, click [OK].

The spindle unit will move to the milling area.

4. Open the milling area cover.
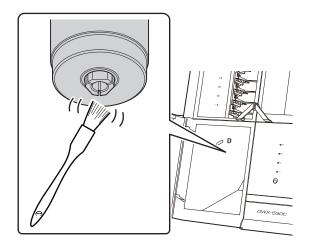
5. Remove the dust-proof cover.
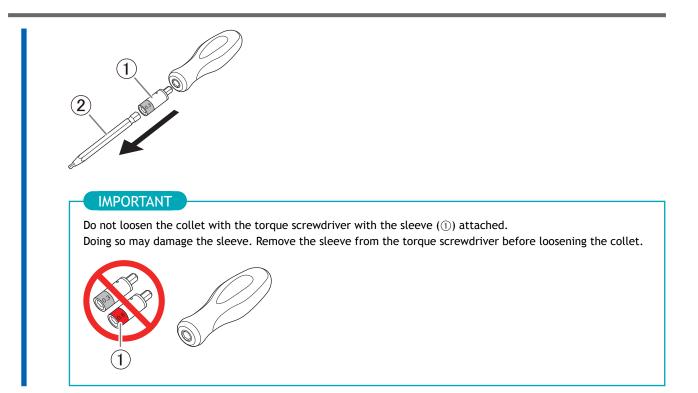
6. Clean the spindle unit.
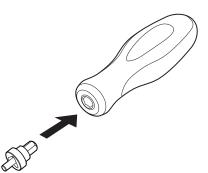
Use the included brush to remove any milling waste from the tip of the spindle unit.
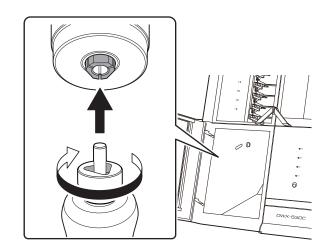
7. Remove the torque screwdriver sleeve (①) and bit (②).

> **IMPORTANT**
>
> Do not loosen the collet with the torque screwdriver with the sleeve (①) attached.
> Doing so may damage the sleeve. Remove the sleeve from the torque screwdriver before loosening the collet.
>
>

8. **Attach the collet attaching/detaching jig onto the torque screwdriver with the sleeve removed.**
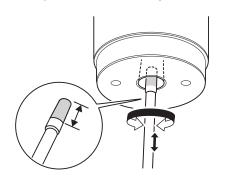
9. **While gently pressing the torque screwdriver upward, rotate it in the direction indicated in the figure.**

Align the collet with the groove in the collet attaching/detaching jig. Turn the torque screwdriver to loosen the collet, and then turn it by hand to remove it.
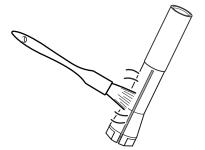
Step 2: Cleaning the Collet

Procedure
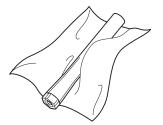
1.   **Clean the inside of the spindle (where contact with the collet is made) with the included cleaning stick.**

Insert about 2/3 of the cleaning stick tip into the spindle and clean the entirety of the inside of the spindle while moving the cleaning stick up and down aligned with the tapered (slanted) part.
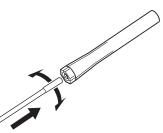
2.   **Clean the grooves on the side of the collet.**

Use the included brush to remove any milling waste in the grooves.

3.   **Use the included cloth for care to wipe the outside of the collet.**

Do not hold the tapered portion tightly. This part being deformed may result in malfunctions.

4.   **Clean the inside of the collet with the cleaning stick.**

Rotate the cleaning stick left and right as if you are brushing the inner portion of the collet.
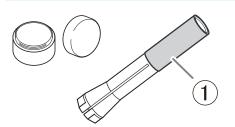
Step 3: Attaching the Collet

Procedure
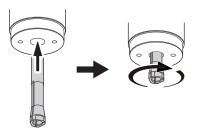
1. **Lightly apply grease to the top portion (①) on the outside of the collet.**

A thin application of grease is sufficient. Do not apply excessively.

> **MEMO**
>
> Be careful not to allow grease to get into the grooves on the sides of the collet.
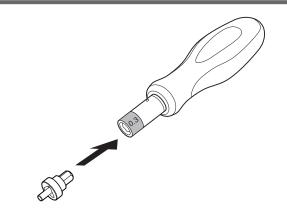
2. **Insert the collet (①) into the spindle and rotate it in the direction shown in the figure.**

Rotate the collet by hand until it no longer naturally falls.

3. **Attach the 0.3 N·m sleeve onto the torque screwdriver.**
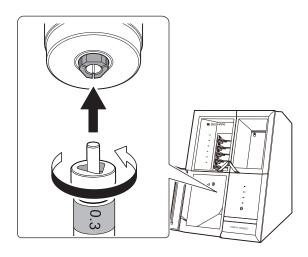
> **IMPORTANT**
>
> Be sure to use the 0.3 N·m torque screwdriver sleeve. Failing to do so may lead to a loose collet during milling, which will affect the milling quality and damage the collet.

4. **Attach the collet attaching/detaching jig onto the torque screwdriver with the sleeve attached.**
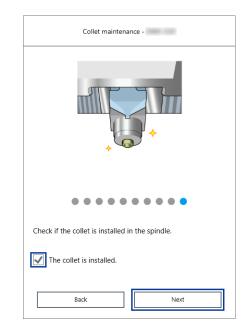
5. **Use the torque screwdriver to retighten the collet.**

Align the collet with the groove in the collet attaching/detaching jig. Tighten the screws until turning the handle of the torque screwdriver no longer turns the screw bit.
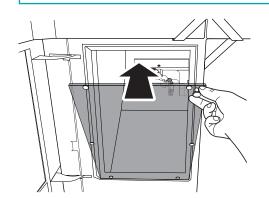
6. **Confirm that the collet is installed in the spindle, and then click [Next].**

7. **Attach the dust-proof cover to the milling area.**

Attach the dust-proof cover so the handle is in the upper-right corner. Check that the magnets on the edge of the cover attach to the mounting frame.

8. **Close the milling area cover.**
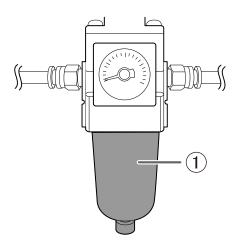
   Collet maintenance is complete when the spindle unit moves to its original position and [**The operation is complete.**] is displayed.

Regulator Maintenance

Cleaning the Bowl

The regulator is equipped with a filter that becomes filled with drainage (moisture and dust) over time. When a certain amount of drainage collects, it drains automatically from the drain hose, but dirt remains inside the bowl (①).

In the following situations, remove the bowl from the regulator and clean the bowl.

- When drainage remains in the bowl.
- When the inside of the bowl is dirty.

> ⚠ WARNING
>
> **Be sure to bleed off the air pressure before removing the regulator bowl.**
> Failure to do so may result in a rupture or components flying off.

> ⚠ WARNING
>
> **Before removing or attaching the regulator and before performing maintenance, make sure that the bowl is securely attached.**
> If the bowl is not properly attached, it may come flying off when compressed air is supplied.

> ⚠ WARNING
>
> **Clean the regulator bowl using a neutral detergent. Never use solvents such as gasoline, alcohol, or thinner.**
> Using solvents may degrade the bowl and may result in a rupture.

Required item

Torque screwdriver (0.6 N·m)

IMPORTANT

Do not loosen screws with a torque screwdriver with the sleeve (①) attached.
Doing so may damage the sleeve. Before loosening screws, remove the sleeve from the torque screwdriver.

IMPORTANT
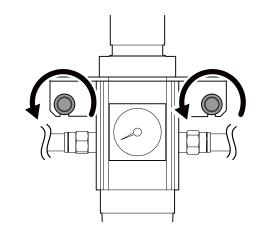
Before tightening a screw that has a specified tightening torque, be sure to attach a sleeve. Check the marking on the sleeve (①) and use a sleeve that matches the tightening torque value.
Failure to attach a sleeve will cause a torque in excess of the permitted amount to be applied, which may damage parts and materials.
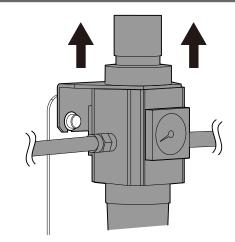
Procedure
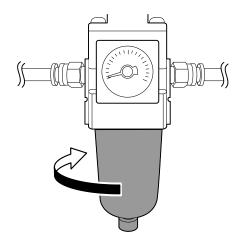
1. Stop the supply of compressed air.

2. Make sure that no sleeve is attached onto the torque screwdriver.

If a sleeve has been attached, remove it.

3. Use a torque screwdriver with the sleeve removed to loosen the screws in the two locations shown in the following figure by approximately three turns.
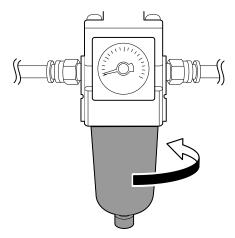
4. Remove the regulator.

5. Remove the bowl from the regulator.
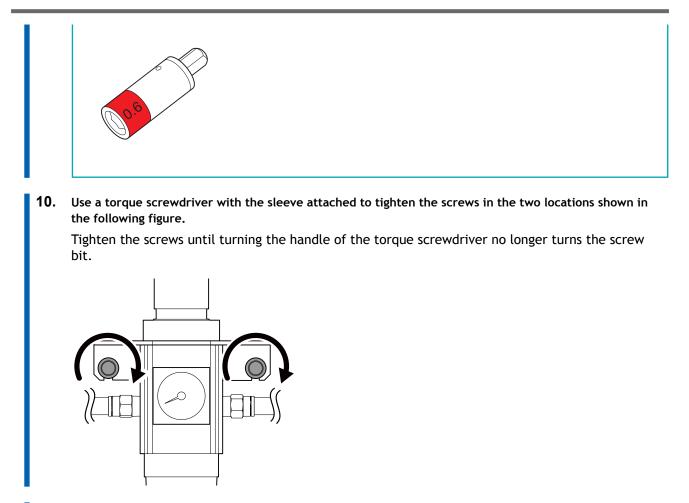
6. Wash the bowl using a neutral detergent.

7. After making sure that the bowl is completely dry, attach the bowl to the regulator.

8. Attach the regulator to the machine.

9. Attach the 0.6 N·m, red sleeve onto the torque screwdriver.

IMPORTANT

Be sure to use the 0.6 N·m torque screwdriver sleeve. Failing to do so may cause the regulator to come loose from the machine, damaging it and injuring the operator.

10. **Use a torque screwdriver with the sleeve attached to tighten the screws in the two locations shown in the following figure.**

Tighten the screws until turning the handle of the torque screwdriver no longer turns the screw bit.

11. **Resume the supplying of compressed air.**

Replacing Consumable Parts

Replacing Parts Used in Milling

Contact your authorized DGSHAPE Corporation dealer or visit our website to purchase items.

Part name	Replacement time/Guideline
Spindle unit	**When the total work time of the spindle exceeds 2,000 hours (with variation depending on the work situation).** You can use VPanel to view the working time of the spindle. For information on how to perform replacement, refer to the replacement instruction manual included with the part. • The replacement spindle unit comes with a collet and belt.
Collet	**If the collet is deformed.** If an overload error or other error occurs, the collet may be deformed. For information on how to perform replacement, refer to the replacement instruction manual included with the part.
Spindle belt	**If the spindle belt is worn.** For information on how to perform replacement, refer to the replacement instruction manual included with the part.

RELATED LINKS

• https://www.dgshape.com/

Replacing Milling Burs

Replace milling burs at appropriate intervals.

The milling bur replacement time can be checked in VPanel. Milling burs that have been used for longer than the time set when they were registered have reached their replacement time.

IMPORTANT

Do not use milling burs that have reached their replacement time.
Continuing to use such milling burs may affect the milling quality and lead to machine malfunctions.

Replacing the Dummy Pin Cleaner

Replace the dummy pin cleaner if it becomes damaged and when the recommended replacement time is reached.

When the dummy pin cleaner reaches the recommended replacement time, a message reminding the user to replace the cleaner will be displayed in VPanel.

> **IMPORTANT**
>
> Do not continue using the dummy pin cleaner if it is damaged or if the recommended replacement time has passed. Continuing to use the cleaner may affect the milling quality and lead to machine malfunctions.

Procedure

1. **Close all the covers.**

2. **Turn on the machine.**

The machine starts the initial operations. When the status light stops flashing and remains steadily lit, initialization is complete.

3. **Show VPanel.**

4. **Open the [Machine settings] window.**

(1) **In the top window of VPanel, select the machine to operate.**

When you have connected multiple machines, you can switch to a different machine to operate by clicking its image under [**MACHINE STATUS**].

(2) **Click** 🔧 **.**

The [**Machine settings**] window is displayed.
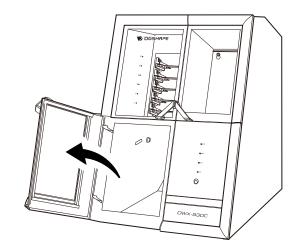
5. **On the [Maintenance] tab, click [Dummy Pin Cleaner Replacement].**

6. **When the window shown in the following figure appears, click [OK].**

   The spindle unit will move to the milling area.

7. **Open the milling area cover.**

8. **Remove the dust-proof cover.**

9. **Slowly peel off the dummy pin cleaner affixed to the clamp.**
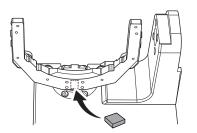
   If milling waste is found where the dummy pin cleaner was removed, wipe it off with the included cloth for care.

10. **Remove the backing paper protecting the adhesive surface of the new dummy pin cleaner and affix the cleaner in the position indicated below.**

    > **MEMO**
    >
    > Affix the dummy pin cleaner so that the adhesive surface does not protrude from the clamp.
    > If the adhesive surface protrudes from the clamp, it may interfere with operation of the machine during milling, which may affect milling quality.
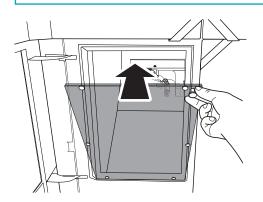
11. **After affixing the new dummy pin cleaner to the clamp, click [Complete].**

Dummy pin cleaner replacement -

Replace the dummy pin cleaner.

Complete

12. **Attach the dust-proof cover to the milling area.**

> **MEMO**
>
> Attach the dust-proof cover so the handle is in the upper-right corner. Check that the magnets on the edge of the cover attach to the mounting frame.

13. **Close the milling area cover.**

Dummy pin cleaner replacement is complete when the rotary axis unit moves to its original position and [**The operation is complete.**] is displayed.

Troubleshooting Methods

Machine Trouble

Initialization is Not Performed or Initialization Fails

Are any covers open?

Keep the covers closed during startup. For safety, the initial operations are not performed if a cover is open when the machine starts.

Is the milling bur caught on anything?

The milling bur gripped by the spindle unit may fail to perform the initial operations if it is caught on the workpiece or something similar. Try to detach the milling bur using the **[Emergency tool release]** function in VPanel.

> RELATED LINKS
> * VPanel for DWX User's Manual

Is anything caught on the spindle unit or rotary axis unit?

Open the maintenance cover and make sure that no workpiece or milling waste is caught on these units.

Non-responsive Built-in Panel Touch Sensor

Is the milling area cover or tool area cover open?

This machine restricts some operations when the milling area cover or tool area cover is open. Close these covers.

Are you wearing gloves?

The touch sensor will not respond if you are wearing gloves. Operate the touch sensor with a bare hand.

VPanel Does Not Recognize the Machine

Is the cable connected?

Make sure that the cables are connected. Refer to the "Setup Guide" ("Connecting the Power Cord") to perform the work.

> **RELATED LINKS**
> · DWX-53DC Setup Guide

Is the driver installed correctly?

If the connection to the computer is not made according to the procedure described, the driver will not be installed correctly. VPanel will not function normally if the driver is not configured correctly. Check again to ensure that the connection was made using the correct procedure.

Refer to the "Setup Guide" ("Installing the Software") to perform the work.

> **RELATED LINKS**
> · DWX-53DC Setup Guide

Did you verify the connection procedure when connecting more than one machine?

There is a possibility that the connection procedure was performed incorrectly. Make sure that connections were performed correctly. Refer to the "Setup Guide" ("Connecting Multiple Units") to perform the work.

> **RELATED LINKS**
> · DWX-53DC Setup Guide

Was the machine ID changed?

When you change the machine ID, restart VPanel.

> **RELATED LINKS**
> · VPanel for DWX User's Manual

Adapter IDs Cannot Be Read

Is part of the barcode on the adapter ID label missing or is this barcode dirty?

Clean the barcode. If part of the barcode is missing or if the barcode is excessively dirty, affix a new label from the sheet of labels included with the machine.

> **RELATED LINKS**
> - P. 78 Cleaning the Milling Bur/Adapter

Has milling waste affixed to the barcode sensor?

Clean the barcode sensor inside the adapter area cover, and then read the adapter ID.

> **RELATED LINKS**
> - P. 72 Milling area cleaning

No Data Can Be Output to the Machine or the Machine Does Not Operate Even Though Data Is Being Output

Are any covers open?

If a cover is open, the machine will not start milling even if milling data is being received. Close the cover, and then press the touch sensor to start milling.

Does VPanel recognize the machine?

Verify that a message other than [**OFFLINE**] is shown in VPanel.

If multiple machines are connected, is the correct machine selected?

Select the machine to output milling data to on the VPanel window.

Is operation paused?

When the "PAUSE" LED is lit, operation is paused. When the machine is paused, milling stops and some operations are restricted. You can press the touch sensor on the machine to cancel the pause. Holding down the touch sensor will abort milling.

> **RELATED LINKS**
> · P. 7 Front

Is initialization or a data cancel in progress?

Milling data received during the initial operations or during a data cancel will be canceled. Output milling data after confirming that the machine is in the ready status.

> **RELATED LINKS**
> · P. 12 Statuses Indicated by Status Light Color

Is the milling data correct?

Check the milling data.

Has an error occurred?

The "ERROR" LED will flash if an error occurs. Check the error details shown in VPanel, resolve the error, and then perform output again.

> **RELATED LINKS**
> · P. 141 VPanel Error Messages

The Computer Shuts Down When Connecting Multiple Machines

Are machines with the same ID connected to the computer at the same time?

Connecting more than one machine with the same ID to a computer at the same time may cause the computer to shut down. In this situation, carry out the following procedure to set the machine IDs again.

Refer to the "Setup Guide" ("Connecting Multiple Units") to perform the work.

1. Turn off the power of all the connected machines.

2. Remove the USB cable from the computer.

3. Restart the computer.

4. Start VPanel.

   If VPanel will not start, reinstall it.

5. Set the machine IDs again so there are no duplicates.

RELATED LINKS

- DWX-53DC Setup Guide

The spindle does not rotate.

Is the spindle belt damaged or disconnected?

Check inside the maintenance cover. If the spindle belt is damaged, replace it.

The Ionizer Is Ineffective

Is the workpiece being milled a PMMA workpiece?

The ionizer (static electricity eliminator) is only effective with PMMA. It has no effect on zirconia and wax workpieces.

Is there milling waste around the ionizer?

If milling waste is found around the ionizer, remove the waste with the included brush, and then clean up the milling waste with a dust collector. The ionizer's effectiveness will decrease if milling waste is present. Do not touch the inside of the ionizer.

> **RELATED LINKS**
> - P. 72 Milling area cleaning

Is the machine grounded?

Ground the unit with the ground wire. The ionizer will not function properly if the machine is not grounded.

> **RELATED LINKS**
> - DWX-53DC Setup Guide

Compressed Air Does Not Come Out

Does the operation require compressed air?

Compressed air is only supplied during some operations, such as when the spindle is rotating or when replacing the milling bur.

Is the regulator properly connected and are the pressure settings correctly configured?

- Check the regulator's connection.
- Check that the pressure has been set to 0.4 MPa.
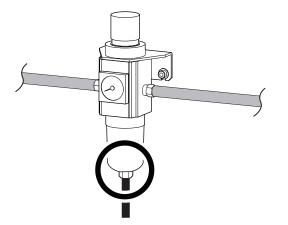
If the set pressure of the regulator is zero, compressed air will not be supplied.

RELATED LINKS

- P. 44 Adjusting the Pressure of the Compressed Air

Is the knob at the bottom of the regulator open?

The compressed air will escape if the knob at the bottom of the regulator is open.

Automatic Correction Fails

Is the automatic correction jig, detection pin, ATC magazine, or clamp dirty?

Clean away any grime on the automatic correction jig, the detection pin, the ATC magazine, and the clamp. These items being dirty due to a buildup of milling waste or the like may impede correct sensor operation, making detection impossible.

RELATED LINKS

- P. 87 Automatic correction

Is the automatic correction jig properly attached?

Verify that the automatic correction jig is properly attached.

RELATED LINKS

- P. 90 Attach the automatic correction jig.

Is the detection pin properly attached?

Verify that the detection pin is properly attached. Check the position of the milling bur holder on the detection pin. Refer to the "Setup Guide" ("Dimensional Drawings" (Detection Pin Dimensions)).

RELATED LINKS

- "Setup Guide" ("Dimensional Drawings" (Detection Pin Dimensions))

Milling Quality Problems

The Milled Surface Is Not Attractive

Is the workpiece secured loosely?

Check the mounting condition of the workpiece. If the workpiece is not mounted on the machine correctly, the screws may come loose during milling, possibly leading to misalignment.

> **RELATED LINKS**
>
> - P. 26 Mounting Disc Workpieces on Adapters
> - P. 31 Mounting Pin-type Workpieces on Adapters

Is the milling bur worn?

If the same milling bur is used for milling for a long period of time, it will become worn and affect milling results. The work time of the milling bur can be managed in VPanel. Replacing the milling bur may improve the milling results.

> **RELATED LINKS**
>
> - VPanel for DWX User's Manual

Are the milling conditions too strict?

Strict milling conditions may affect milling results. Review the CAM milling conditions.

There Is a Line of Level Difference in the Milling Results

Is the machine out of correction?

The origin point may become out of position due to prolonged use or relocating the machine, which can result in a line of level difference. Perform automatic correction. If the expected results cannot be obtained even after performing automatic correction, perform manual correction.

> **RELATED LINKS**
> - VPanel for DWX User's Manual
> - P. 87 Correcting the Milling Position

Are the CAM milling conditions correct?

If the milling conditions are not appropriate, a level difference may occur. Review the CAM milling conditions.

Chipping (edges of milling products become chipped) occurs.

Is the installation base of the machine secure?

The vibration from milling can shake the installation base. Install the machine in a stable location.

> **RELATED LINKS**
> - DWX-53DC Setup Guide

Is the workpiece secured loosely?

Check the mounting condition of the workpiece. If the workpiece is not mounted on the machine correctly, the screws may come loose during milling, possibly leading to misalignment.

> **RELATED LINKS**
> - P. 26 Mounting Disc Workpieces on Adapters
> - P. 31 Mounting Pin-type Workpieces on Adapters

Is the milling bur worn?

If the same milling bur is used for milling for a long period of time, it will become worn and affect milling results. The work time of the milling bur can be managed in VPanel. Replacing the milling bur may improve the milling results.

> **RELATED LINKS**
> - VPanel for DWX User's Manual

Are the milling conditions too strict?

Strict milling conditions may affect milling results. Review the CAM milling conditions.

Is the thickness specified in the CAD data excessively thin?

If the specified thickness is excessively thin, chipping is likely to occur. Review the shape specified in the CAD data.

> **RELATED LINKS**
> - P. 60 Recommended CAD Data Thickness Values

A Hole Opens in the Milling Results

Do the milling bur diameter and the milling bur stocker number match the CAM settings?

Check the CAM's milling bur settings.

Is the machine out of correction?

The origin point may become out of position due to prolonged use or relocating the machine, which can affect milling results. Perform automatic correction. If the expected results cannot be obtained even after performing automatic correction, perform manual correction.

> **RELATED LINKS**
> - VPanel for DWX User's Manual
> - P. 87 Correcting the Milling Position

Are the milling conditions too strict?

Strict milling conditions may affect milling results. Review the CAM milling conditions.

The Dimensions of the Milling Results Do Not Match

Does the milling bur diameter match the CAM settings?

Check the CAM settings.

Is the CAM shrinkage factor setting appropriate for the workpiece?

Check the CAM settings.

Do the settings of the sintering program match the workpiece?

Check the sintering program settings to see if they match the manufacturer's workpiece being used.

Installation Trouble

Driver Installation Is Impossible

If installation quits partway through or when VPanel does not recognize the machine, the driver may not have been installed correctly. In such cases, perform the following procedures. (If procedure A does not solve your problem, perform procedure B.)

Installing the Driver in Windows 11 (Procedure A)

Procedure

1. Connect the machine to the computer with the USB cable and turn on the machine.

2. Click [Desktop].

3. Click [Start]>[All Apps]>[Windows Tool].

4. Click [Control Panel].

5. Click [Devices and Printers].

6. Check that the model you are using is displayed under [Unspecified].

7. Right-click the icon of the model you are using, and then click [Remove device].

8. When the message [Are you sure you want to remove this device?] is displayed, click [Yes].

9. Check that the icon for the model you are using is no longer displayed under [Unspecified].

10. Disconnect the USB cable connecting the machine to the computer, and then reconnect these devices.

    If the printer icon for the machine you are using is displayed under [**Printers**], the driver has been successfully installed.

    If this does not solve the problem, perform procedure B for Windows 11.

Installing the Driver in Windows 11 (Procedure B)

Procedure

1. Connect the machine to the computer with the USB cable and turn on the machine.

2. If the [Found New Hardware] message appears, click [Close] to close it.

Disconnect any USB cables for printers or other such equipment other than this machine.

3. Click [Desktop].

4. Right-click the [Start] button, and then click [Device Manager].

5. When the [User Account Control] window appears, click [Continue].

[**Device Manager**] appears.

6. From the [View] menu, click [Show hidden devices].

7. Search the list for [Printers] or [Other devices], and then double-click it.

The name of your machine or [**Unknown device**] appears below the selected item. Click the name to select it.

8. From the [Action] menu, click [Uninstall].

9. In the [Confirm Device Uninstall] window, click [OK].

The [**Device Manager**] will close automatically.

10. Remove the USB cable from the computer, and then restart Windows.

11. Uninstall the driver.

Carry out the steps from step 3 in the following topic to uninstall the driver.

12. Reinstall the driver according to the procedure in the Setup Guide ("Installing the Software").

Installing the Driver in Windows 10 (Procedure A)

Procedure

1. Connect the machine to the computer with the USB cable and turn on the machine.

2. Click [Desktop].

3. Right-click the [Start] button, and then click [Control Panel].

4. Click [View devices and printers] or [Devices and Printers].

5. Check that the model you are using is displayed under [Unspecified].

6. Right-click the icon of the model you are using, and then click [Remove device].

7. When the message [Are you sure you want to remove this device?] is displayed, click [Yes].

8. Check that the icon for the model you are using is no longer displayed under [Unspecified].

9. Disconnect the USB cable connecting the machine to the computer, and then reconnect these devices.

If the printer icon for the machine you are using is displayed under [**Printers**], the driver has been successfully installed.

If this does not solve the problem, perform procedure B for Windows 10.

Installing the Driver in Windows 10 (Procedure B)

Procedure

1. Connect the machine to the computer with the USB cable and turn on the machine.

2. If the [Found New Hardware] message appears, click [Close] to close it.

Disconnect any USB cables for printers or other such equipment other than this machine.

3. Click [Desktop].

4. Right-click the [Start] button, and then click [Device Manager].

5. When the [User Account Control] window appears, click [Continue].

[**Device Manager**] appears.

6. From the [View] menu, click [Show hidden devices].

7. Search the list for [Printers] or [Other devices], and then double-click it.

The name of your machine or [**Unknown device**] appears below the selected item. Click the name to select it.

8. From the [Action] menu, click [Uninstall].

9. In the [Confirm Device Uninstall] window, click [OK].

The [**Device Manager**] will close automatically.

10. Remove the USB cable from the computer, and then restart Windows.

11. Uninstall the driver.

Carry out the steps from step 3 in the following topic to uninstall the driver.

12. Reinstall the driver according to the procedure in the Setup Guide ("Installing the Software").

RELATED LINKS

• DWX-53DC Setup Guide ("Installing the Software")

Uninstalling the Driver

When uninstalling the driver, perform the following procedure.

Uninstalling the Driver in Windows 11

> **IMPORTANT**
>
> If the driver is uninstalled without following the procedure given below, it may not be possible to reinstall the driver.

Procedure

1. **Switch off the machine, and then disconnect the connector cable between the computer and the machine.**

2. **Log on to Windows as [the computer's administrator].**

3. **Click [Start]>[All Apps]>[Windows Tool].**

4. **Click [Control Panel].**

5. **Click [Uninstall a program] (or [Programs and Features]).**

6. **Select the driver of the machine to delete by clicking it, and then click [Uninstall].**

   If the [**User Account Control**] window appears, click [**Allow**].

7. **If a message prompting you to confirm deletion appears, click [Yes].**

8. **Click [Start]>[Desktop].**

9. **Start Explorer, and open the drive and folder where the driver is stored.**

   Go to the DGSHAPE Corporation website, download the driver for the machine you want to remove, and then specify the folder where you want to extract the downloaded file.
   https://www.dgshape.com/

10. **Double-click [SETUP64.EXE].**

11. **If the [User Account Control] window appears, click [Allow].**

    The setup program for the driver starts.

12. **Click [Uninstall]. Select the machine you want to delete, and then click [Start].**

13. **If you need to restart the computer, a window prompting you to do so is displayed. Click [Yes].**

14. **After the computer has restarted, open Control Panel again, and then click [View devices and printers] or [Devices and Printers].**

15. **If you can see the icon of the machine to delete, right-click it, and then click [Remove device].**

Uninstalling the Driver in Windows 10

IMPORTANT

If the driver is uninstalled without following the procedure given below, it may not be possible to reinstall the driver.

Procedure

1. Switch off the machine, and then disconnect the connector cable between the computer and the machine.

2. Log on to Windows as [the computer's administrator].

3. Click [Desktop].

4. Right-click the [Start] button, and then click [Control Panel].

5. Click [Uninstall a program] (or [Programs and Features]).

6. Select the driver of the machine to delete by clicking it, and then click [Uninstall].

   If the [**User Account Control**] window appears, click [**Allow**].

7. If a message prompting you to confirm deletion appears, click [Yes].

8. Click [Start]>[Desktop].

9. Start Explorer, and open the drive and folder where the driver is stored.

   Go to the DGSHAPE Corporation website, download the driver for the machine you want to remove, and then specify the folder where you want to extract the downloaded file.
   https://www.dgshape.com/

10. Double-click [SETUP64.EXE] (64-bit version) or [SETUP.EXE] (32-bit version).

11. If the [User Account Control] window appears, click [Allow].

    The setup program for the driver starts.

12. Click [Uninstall]. Select the machine you want to delete, and then click [Start].

13. If you need to restart the computer, a window prompting you to do so is displayed. Click [Yes].

14. After the computer has restarted, open Control Panel again, and then click [View devices and printers] or [Devices and Printers].

15. If you can see the icon of the machine to delete, right-click it, and then click [Remove device].

Uninstalling VPanel

When uninstalling VPanel, perform the following procedure.

Uninstalling VPanel in Windows 11

Procedure

1. **Exit VPanel.**

   (Right-click ▣ in the task tray and select [**Exit**].)

2. **Click [Start]>[All Apps]>[Windows Tool].**

3. **Click [Control Panel].**

4. **Click [Uninstall a program].**

5. **Select [VPanel for DWX], and then click [Uninstall].**

6. **Follow the on-screen instructions to uninstall VPanel.**

Uninstalling VPanel in Windows 10

Procedure

1. **Exit VPanel.**
   (Right-click ▣ in the task tray and select [**Exit**].)

2. **Right-click the [Start] button, and then click [Control Panel].**

3. **Click [Uninstall a program] (or [Programs and Features]).**

4. **Select [VPanel for DWX], and then click [Uninstall].**

5. **Follow the on-screen instructions to uninstall VPanel.**

Message Handling

VPanel Error Messages

This section describes the error messages that may appear in VPanel and how to take action to remedy the problem. If the action described here does not correct the problem or if an error message not described here appears, contact your authorized Roland DG Corporation dealer.

[%] in these messages indicates information such as axis [X], [Y], [Z], [A], [B], or [L][*1] or a milling bur stocker number from 1 to 15.

> ### RELATED LINKS
> - https://www.dgshape.com/

[1000-****][The % limit switch was not found.]

The name of the axis ([X], [Y], [Z], [A], [B] or a combination of these axes) is displayed for [%].

Situation/Error Cause

The operation may be inhibited by milling waste or an obstruction.

Procedure

1. **Turn off the power.**

2. **Remove any objects blocking the operation of the machine and any accumulated milling waste.**

3. **Turn on the power, and then resume operation.**

[1006-02**][The % axis position has been shifted.]

The name of the axis ([X], [Y], [Z], [A], [B] or a combination of these axes) is displayed for [%].

Situation/Error Cause 1

The motor position may have been lost.

Procedure

1. **Remove any objects blocking the operation of the machine and any accumulated milling waste.**

2. **Hold down the touch sensor on the built-in panel.**
   This will clear the error.

Situation/Error Cause 2

The milling conditions may be excessively strict.

Procedure

1. **Hold down the touch sensor on the built-in panel.**
   This will clear the error.

---

*1   [L]: The vertical movement axis of the lift

2. Review the CAM settings and the shape specified in the CAD data.

[1017-0000][The milling area cover or tool area cover was opened.]

Situation/Error Cause

The milling area cover or tool area cover was opened during spindle rotation. For safety, the machine comes to an emergency stop if the milling area cover or tool area cover is opened while the spindle is rotating.
Do not open the milling area cover or tool area cover while the spindle is rotating. Doing so may affect the milling results.

- **To continue milling**

  Close the covers, and then click [**Continue**].

  Milling will resume.

- **To abort milling**

  Click [**Cancel**].

[1017-0001][The milling area cover, tool area cover, or adapter cover was opened.]

Situation/Error Cause

One of the following covers was opened while the disc changer was operating.

- Milling area cover
- Adapter area cover
- Tool area cover

For safety, the machine comes to an emergency stop if a cover is opened during disc replacement. Do not open the covers during disc replacement.

- **To continue operation**

  Close the covers, and then click [**Continue**].

  Resume operation.

- **To abort operation**

  Click [**Cancel**].

[1017-0002][The milling area cover, tool area cover, or adapter area cover is open. Milling cannot continue.]

Situation/Error Cause

One of the following covers was opened when the disc changer started to operate.

- Milling area cover
- Adapter area cover
- Tool area cover

For safety, this machine cannot continue operation if a cover is open when disc changer operation starts. Close the covers before starting disc changer operation.

- **To continue operation**

  Close the covers, and then click [**Continue**].

  Resume operation.

- **To abort operation**

  Click [**Cancel**].

[101C-0000][The milling bur sensor was not found.]

Situation/Error Cause

The operation may be inhibited by milling waste or an obstruction.

Procedure

1. Turn off the power.

2. Remove any objects blocking the operation of the machine and any accumulated milling waste.

3. Turn on the power, and then resume operation.

[101D-00**][The % milling bur cannot be released.]

[%] indicates a milling bur stocker number from [**1**] to [**16**] or [**0**].

Situation/Error Cause 1

The returning of the milling bur failed. The inside of the collet or the ATC magazine might be dirty.

Procedure

1. Hold down the touch sensor on the built-in panel.
This will clear the error.

2. Carry out [Forced tool release] in VPanel.
The collet will open.

3. Remove the milling bur.

4. Clean the ATC magazine.
P. 72 Cleaning after Milling Finishes

Situation/Error Cause 2

The collet and milling bur are affixed together and cannot be separated. The inside of the collet might be dirty.

Procedure

1. Retighten the collet.
P. 95 Collet Maintenance

Situation/Error Cause 3

The milling bur may not have been removed from the spindle unit after [**Forced tool release**] was executed.
Be sure to remove the milling bur before cleaning the ATC magazine.

If the Error Occurs Again

The collet may be deformed. In this case, replace the collet.
P. 107 Replacing Consumable Parts

[101D-01**] [The % milling bur cannot be released. It might be broken from the root.]

[%] indicates a milling bur stocker number from [1] to [16].

Situation/Error Cause 1

The milling bur may be broken from the root due to use exceeding its service life.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

   This will clear the error.

2. **Carry out [Forced tool release] in VPanel.**

   The collet will open.

3. **Remove the milling bur.**

4. **Clean the ATC magazine.**

   P. 72 Cleaning after Milling Finishes

Situation/Error Cause 2

The milling conditions may be excessively strict.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

   This will clear the error.

2. **Review the CAM settings and the shape specified in the CAD data.**

If the Error Occurs Again

The collet may be deformed. In this case, replace the collet.
P. 107 Replacing Consumable Parts

[101E-****][The % milling bur might be broken.]

[%] indicates a milling bur stocker number from [1] to [16].

Situation/Error Cause 1

- The milling bur is broken.
- The milling bur holder is out of position.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

   This will clear the error.

2. **Check the status of the milling bur.**

   - **When the milling bur is broken**

Replace the milling bur with a new one.

- **When the installation position of the milling bur holder is not appropriate**

    Install the milling bur holder in the correct position.
    P. 41 Setting the Milling Bur

Situation/Error Cause 2

The milling conditions may be excessively strict.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

    This will clear the error.

2. **Review the CAM settings and the shape specified in the CAD data.**

If the Error Occurs Again

The collet may have worn out and its ability to retain the milling bur may have deteriorated. Replace the collet with a new one.
    P. 107 Replacing Consumable Parts

[101F-****][The % milling bur chucking has slipped out.]

[%] indicates a milling bur stocker number from [1] to [16].

Situation/Error Cause 1

The collet may have come loose.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

    This will clear the error.

2. **Retighten the collet.**

    P. 95 Collet Maintenance

Situation/Error Cause 2

The milling conditions may be excessively strict.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

    This will clear the error.

2. **Review the CAM settings and the shape specified in the CAD data.**

If the Error Occurs Again

The collet may have worn out and its ability to retain the milling bur may have deteriorated. Replace the collet with a new one.
    P. 107 Replacing Consumable Parts

[1020-****][The % milling bur is too long.]

[%] indicates a milling bur stocker number from [1] to [16].

Situation/Error Cause

There is a possibility that the position of the milling bur holder is not correct.

Procedure

1. Check the milling bur.

Check that the milling bur length is appropriate (40 to 55 mm [1.58 to 2.16 in.]).

2. Check the position of the milling bur holder.

P. 41 Setting the Milling Bur

[1021-****][The % milling bur is too short.]

[%] indicates a milling bur stocker number from [1] to [15].

Situation/Error Cause

There is a possibility that the position of the milling bur holder is not correct.

Procedure

1. Check the milling bur.

Check that the milling bur length is appropriate (40 to 55 mm [1.58 to 2.16 in.]).

2. Check the position of the milling bur holder.

P. 41 Setting the Milling Bur

3. Clearing Errors

- **If the error occurred during milling**

    Click [**Continue**] in the error display window in VPanel.

    Milling will resume.

- **If the error occurred while the machine was on standby**

    Click [**OK**] in the error display window in VPanel.

    This will clear the error.

[1022-****][The % milling bur was not found.]

[%] indicates a milling bur stocker number from [1] to [16].

Situation/Error Cause 1

The milling bur has not been set or it may have been set on an incorrect stocker number.

Procedure

1. Load the milling bur in the correct position again.

2. Clearing Errors

- **If the error occurred during milling**

  Click [**Continue**] in the error display window in VPanel.

  Milling will resume.

- **If the error occurred while the machine was on standby**

  Click [**OK**] in the error display window in VPanel.

  This will clear the error.

Situation/Error Cause 2

There is a possibility that the ATC magazine is out of position. Perform automatic correction.

P. 87 Correcting the Milling Position

If the Error Occurs Again

The collet may have worn out. Replace the collet. If the error occurs again even after you replace the collet, replace the spindle unit.

P. 107 Replacing Consumable Parts

[1023-0000] to [1028-0000] [Milling data error.]

- [**1023-0000**]: Milling data error. The number of the parameters is incorrect.
- [**1024-0000**]: Milling data error. The parameter is out of range.
- [**1025-0000**]: Milling data error. A wrong command is detected.
- [**1026-0000**]: Milling data error. The address is not defined.
- [**1027-0000**]: Milling data error. The parameter is not defined.
- [**1028-0000**]: Milling data error. The operation cannot be executed.

Situation/Error Cause 1

There may be a problem with the milling data received from the computer.

Procedure

1. Click [Cancel].

This will clear the error.

2. Review the CAM settings and the shape specified in the CAD data.

- **If there are no problems with the milling data**

  Restart the computer, and then perform milling again.

Situation/Error Cause 2

When using CAM to select the stocker number, the stocker number set as the second or third milling bur in Intelligent Tool Control may have been selected.

When using CAM to select the stocker number, select the stocker number set as the first milling bur in Intelligent Tool Control.

RELATED LINKS

- P. 55 Automatically Switching Out the Worn Milling Bur (Intelligent Tool Control)

[1029-0000][The spindle experienced an overload.]

Situation/Error Cause

- The spindle unit is overloaded.
- The milling bur is worn.
- A workpiece that cannot be milled by the machine is being used.
- The milling conditions are too strict.

Procedure

1. **Turn off the power.**

2. **Check the milling bur, the workpiece, and the CAM settings as well as the shape specified in the CAD data.**

3. **Allow the machine to rest for some time before turning the power on.**

   The motor may have overheated.

[102A-0000][The spindle experienced an overload.]

Situation/Error Cause

- The spindle unit is overloaded.
- The milling bur is worn.
- A workpiece that cannot be milled by the machine is being used.
- The milling conditions are too strict.

Procedure

1. **Turn off the power.**

2. **Check the milling bur, the workpiece, and the CAM settings as well as the shape specified in the CAD data.**

3. **Allow the machine to rest for some time before turning the power on.**

   The motor may have overheated.

[102B-0000][The spindle motor temperature is too high.]

Situation/Error Cause

- The spindle unit is overloaded.
- The milling bur is worn.
- A workpiece that cannot be milled by the machine is being used.
- The milling conditions are too strict.

Procedure

1. **Turn off the power.**

2. **Check the milling bur, the workpiece, and the CAM settings as well as the shape specified in the CAD data.**

3. **Allow the machine to rest for some time before turning the power on.**

   The motor may have overheated.

[102D-0000][The spindle can not be turned.]

Situation/Error Cause

The cable may be broken or the spindle unit may be defective.
Turn off the power and contact your authorized Roland DG Corporation dealer.

[102E-0000][A moving part has collided with other components.]

Procedure

1. **Turn off the power.**

2. **Check the milling bur, the workpiece, and the CAM settings as well as the shape specified in the CAD data.**

   Remove any pieces of cutting waste and foreign objects that have affixed to the adapter stocker.

3. **Turn on the power.**

[102E-0001][The changer has collided with the adapter.]

Procedure

1. **Install the adapter in the adapter stocker again.**

   Remove any pieces of cutting waste and foreign objects that have affixed to the adapter stocker.
   P. 39 Attaching the Adapter to the Machine

2. **Clear the error or resume milling.**

   - **If the error occurred during milling**

     Press the touch sensor on the built-in panel.

     Milling will resume.

   - **If the error occurred while the machine was on standby**

     Hold down the touch sensor on the built-in panel.

     This will clear the error.

[1030-0000][The dust collector is not working.]

Situation/Error Cause

The dust collector may not be operating correctly. Turn the dust collector on, and then check for the following issues.
- The dust collector is not turned on.
- The machine and dust collector are not connected correctly.
- The dust collector filter has deteriorated.
- The dust collector tray is full.

[1030-0001][The dust collector filter needs to be replaced.]

Situation/Error Cause

- The dust collector filter has deteriorated.
- There is a problem with the connection between the machine and the dust collector.

Procedure

1. Replace the dust collector filter.

For information on how to replace the dust collector filter, refer to the dust collector's documentation.

2. Restart the dust collector.

3. Press the touch sensor on the built-in panel.

Milling will resume.

[1038-0000][Milling data error. No milling bur is selected.]

Situation/Error Cause

An attempt was made to start milling without a milling bur. There may be a problem with the milling data received from the computer.

Procedure

1. Hold down the touch sensor on the built-in panel.

This will clear the error.

2. Review the CAM settings and the shape specified in the CAD data.

3. Restart the computer, and then perform milling again.

[103B-0000][The automatic correction is not yet finished.]

Situation/Error Cause 1

- Automatic correction has not been performed.
- Automatic correction was canceled before it could finish.
- Automatic correction was not performed after updating the firmware to a version that required automatic correction to be performed again.

Procedure

1. Hold down the touch sensor on the built-in panel.

This will clear the error.

2. Perform automatic correction.

P. 87 Correcting the Milling Position

Situation/Error Cause 2

The versions of VPanel and the machine's firmware may not match.
Download the latest versions of VPanel and the machine's firmware, install these versions, and then perform automatic correction.

[103D-0000][Milling data error. The milling bur cannot reach the milling position.]

Situation/Error Cause

If the milling bur is too short, or if the angle of the A axis and B axis are too large, the milling bur may not reach the milling position in the Z direction.

Procedure

1. Hold down the touch sensor on the built-in panel.

This will clear the error.

2. Review the milling bur length and the position of the milling bur holder.

3. Review the CAM settings and decrease the angles of the A axis and the B axis.

[1049-****][The adapter with ID number % cannot be released.]

[%] indicates the ID of the adapter ([1] to [100]) or of the automatic correction jig ([#]).

$$\underbrace{1049\text{-}\overbrace{**}^{a}\,\overbrace{**}^{b}}$$

a (storage destination)	00	Clamp
	01 to 06	Adapter stocker (number 1 to number 6)
b (adapter ID)	01 to 64[*1]	1 to 100
	7C	ID unknown
	7F	Automatic correction jig

*1 Hexadecimal notation

Situation/Error Cause

The returning of the adapter failed.

Procedure

1. **Restart the machine.**

2. **Clean the adapter stocker.**
   P. 72 Milling area cleaning

3. **Hold down the touch sensor on the built-in panel.**
   The adapter is returned to its adapter stocker.
   If the adapter is not returned automatically when the sensor is held down, manually remove the adapter.
   P. 51 Removing the Adapter Cap from the Machine

[104A-****][The adapter with ID number % could not be grasped.]

[%] indicates the ID of the adapter ([1] to [100]) or of the automatic correction jig ([#]).

$$\overset{a}{\overset{\frown}{}}\ \overset{b}{\overset{\frown}{}}$$
$$104A\text{-}****$$

a (storage destination)	00	Clamp
	01 to 06	Adapter stocker (number 1 to number 6)
b (adapter ID)	01 to 64*1	1 to 100
	7C	ID unknown
	7F	Automatic correction jig

*1 Hexadecimal notation

Situation/Error Cause

The acquisition of the adapter failed.

Procedure

1. **Restart the machine.**

2. **Remove the adapter from its adapter stocker.**
   P. 51 Removing the Adapter Cap from the Machine

3. **Clean the adapter stocker.**
   P. 72 Milling area cleaning

[104B-****][The adapter with ID number {0} was not found.]

[%] indicates the ID of the adapter ([1] to [100]) or of the automatic correction jig ([#]).

Situation/Error Cause 1

The adapter to use has not been installed in the adapter stocker. Install the adapter in the adapter stocker.

Situation/Error Cause 2

The adapter ID label may not have been affixed to the adapter correctly. Check whether the adapter ID has been affixed to the adapter correctly.

[104C-****][All stockers are full, so the adapter could not be returned.]

Procedure

1. **Check the adapters that are not in use and remove them from their adapter stockers.**

- **If the error occurred during milling**

  Press the touch sensor on the built-in panel.

  Milling will resume.

- **If the error occurred while the machine was on standby**

  Hold down the touch sensor on the built-in panel.

  This will clear the error.

[104D-****][An adapter with the same ID was found.]

Install the adapters again so that there are no duplicate adapter IDs.

[104E-****][The L limit switch was not found.]

Situation/Error Cause

A foreign object may be present along the movement path of the disc changer.

Procedure

1. **Remove any foreign objects that are present along the movement path of the disc changer.**

2. **Restart the machine.**

3. **Follow the instructions displayed in VPanel to clear the error.**

If the Error Occurs Again

Contact your authorized Roland DG Corporation dealer.

[104F-02**][The L axis position has been shifted.]

Situation/Error Cause

The position of the motor on the disc changer side may have been lost.

Procedure

1. **Restart the machine.**

2. **Remove any foreign objects that are present along the movement path of the disc changer.**

3. **If an adapter remains in the clamp, hold down the touch sensor on the built-in panel.**
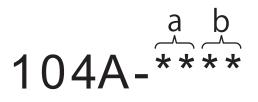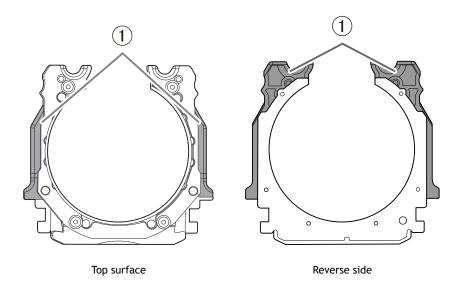
   The adapter is returned to its adapter stocker.

   If the adapter is not returned automatically when the sensor is held down, manually remove the adapter.

   P. 51 Removing the Adapter Cap from the Machine

4. **Check the parts of the adapter (①) that come into contact with the clamp. Replace the adapter if it is scratched or deformed.**

Top surface   Reverse side

[1050-****][The operation to read a barcode failed.]

Situation/Error Cause

- The adapter ID has not been affixed to the adapter.
- Dirt has affixed to the adapter ID.
- Dirt has affixed to the barcode sensor.

Procedure

1. **Hold down the touch sensor on the built-in panel.**

   This will clear the error.

2. **Check the status of the adapter ID.**

   Check that the adapter ID label has been affixed to the adapter. Remove any dirt that has affixed to the barcode of the adapter ID label.

3. **Clean the barcode sensor.**

   P. 72 Milling area cleaning

[105F-****][The pressure of the compressed air for blowing away the milling waste is out of range.]

Situation/Error Cause

The air pressure in the milling area may not be appropriate.

Procedure

1. Review the regulator settings.

> P. 44 Adjusting the Pressure of the Compressed Air

2. Clear the error or resume milling.

- **If the error occurred during milling**

  Press the touch sensor on the built-in panel.

  Milling resumes.

- **If the error occurred while the machine was on standby**

  Hold down the touch sensor on the built-in panel.

  This will clear the error.

If the Error Occurs Again

Contact your authorized Roland DG Corporation dealer.

[****-****][An unknown error occurred.]

Restart the machine.

If the Error Occurs Again

Contact your authorized Roland DG Corporation dealer.

Other Error Messages

[A machine that has the same ID has been connected.]

Procedure

1. Remove all the USB cables that are connected to the computer.

2. Delete unnecessary devices from [Devices and Printers].

   Delete the unnecessary devices according to the following procedure.
   P. 132 Driver Installation Is Impossible

3. Refer to the Setup Guide to redo the settings for connecting multiple units.

   RELATED LINKS
   - DWX-53DC Setup Guide

[The adapter to use during milling has not been set.]

Procedure

1. Install the adapter to use in the adapter stocker.

2. Transfer the milling data again.