REDON HYBRID

USER MANUEL

CONTENTS

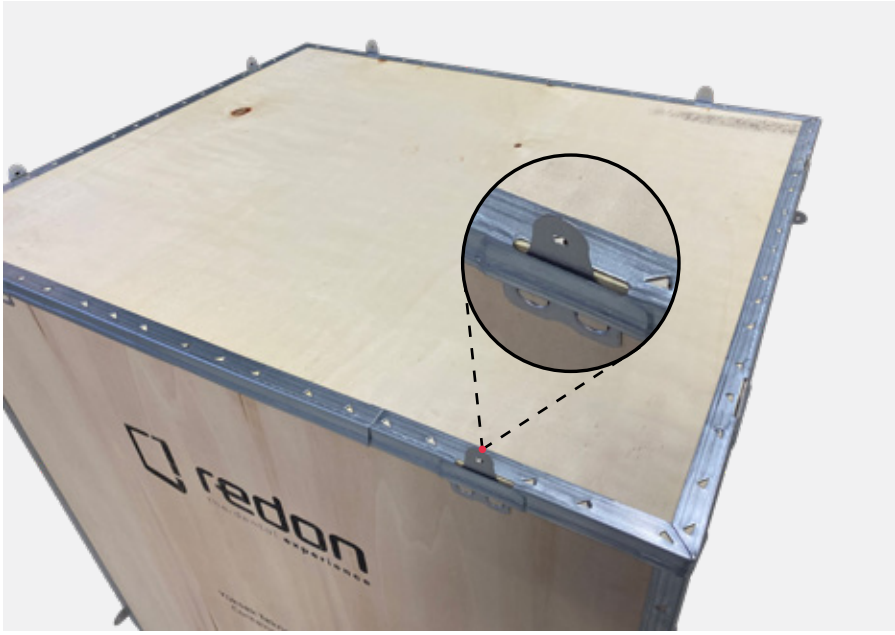
TECHNICAL SPECIFICATIONS

REDON HYBRID	
Country of Origin	Turkey
Axis Motor Technology	Digital AC Servo Motor
Control Unit	B&R, 5 Axis, Digital, Simultaneous
Ball Screw Precision	8µm
Max. Spindle Speed	60.000RPM
Max. Spindle Power	1200W
Number of Axes	5 Axis
Max. Slope Angle of B Axis	±30 Degrees
Max. Tool Shaft Diameter	3 / 4 / 6mm
ATC Capacity	12
Dry Milling	Yes
Wet Milling	Yes
CoCr Milling	Yes
Titanium Milling	Yes
Glass-Ceramic Milling	Yes

Zirconia Milling	Yes
Preform Milling	Yes
Plastic Milling	Yes
Peek Milling	Yes
Composite Milling	Yes
Alumina Milling	Yes
Referencing Milling Requirement	No
Voltage / Frequency	110v-230v / 50-60Hz
Power Consumption	300W
Pressurized Air Requirement (L/Min)	50
Min. Air Pressure (Bar)	6
Volume (m^3)	0.2222
CAM Software	Open System
Device Dimensions	560mm X 630mm X 660mm

UNPACKAGING

Images show the upper cover of the shipping case. The upper cover has 4 lateral surfaces.
With 2 clamps on each lateral surface, there are 8 clamps in total.



To remove the upper cover, move the clamps on the upper cover to the upright position as shown in the image using a screwdriver and a hammer.

←

UNPACKAGING

Removing the upper cover with its clamps in the upright position

1

2

3

This image shows how you can detach the side clamps to remove the side covers. You need to detach all side cover clamps in order to remove the side covers.

UNPACKAGING

1

Open the front panel of the shipping case.

Open the front and side panels of the shipping case.

2

Remove the Redon box and the foam from the left side.

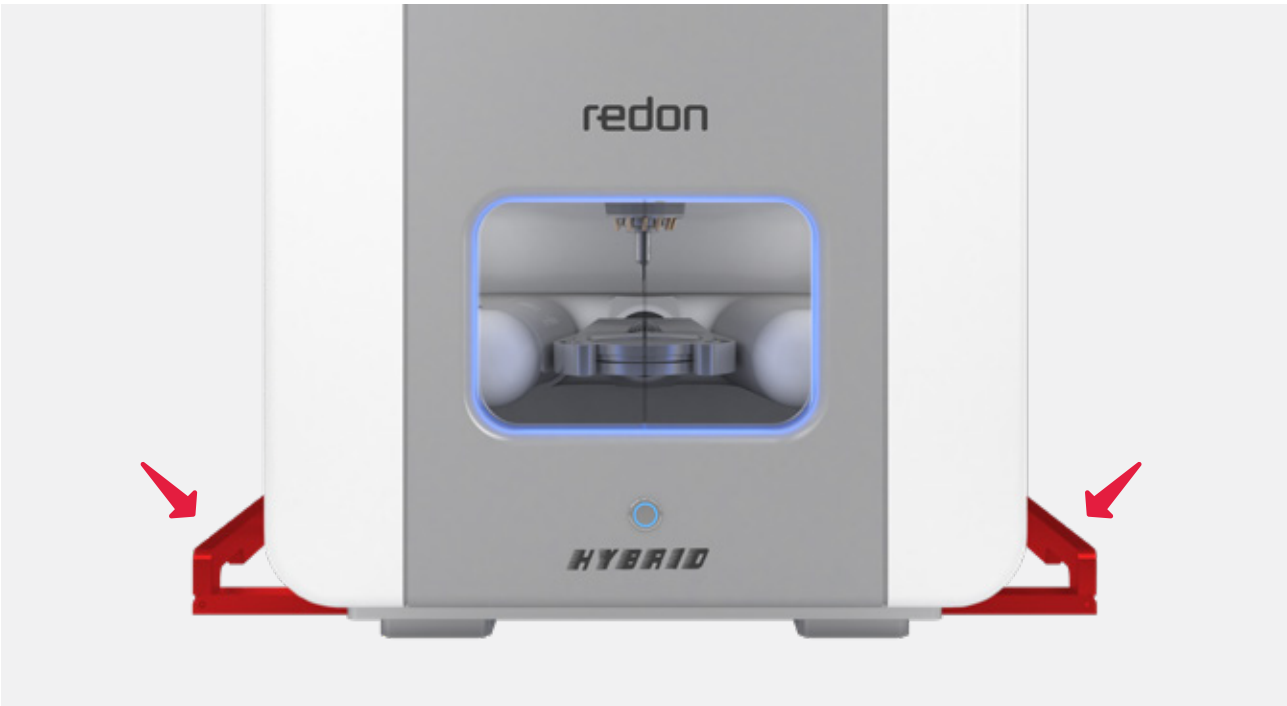
Remove the upper foam.

3

Remove the foam from the right side.

Finally, only the fabric cover remains on the machine.

UNPACKAGING



Move the Redon GTR CAD/ CAM machine onto the Redon machine table by grabbing the right and left carry handles. Lower the machine on the Redon machine table as shown in the image above.

UNPACKAGING

Cut the package wrap with scissors in the direction of the arrows as shown in sample images 1 and 2.

→

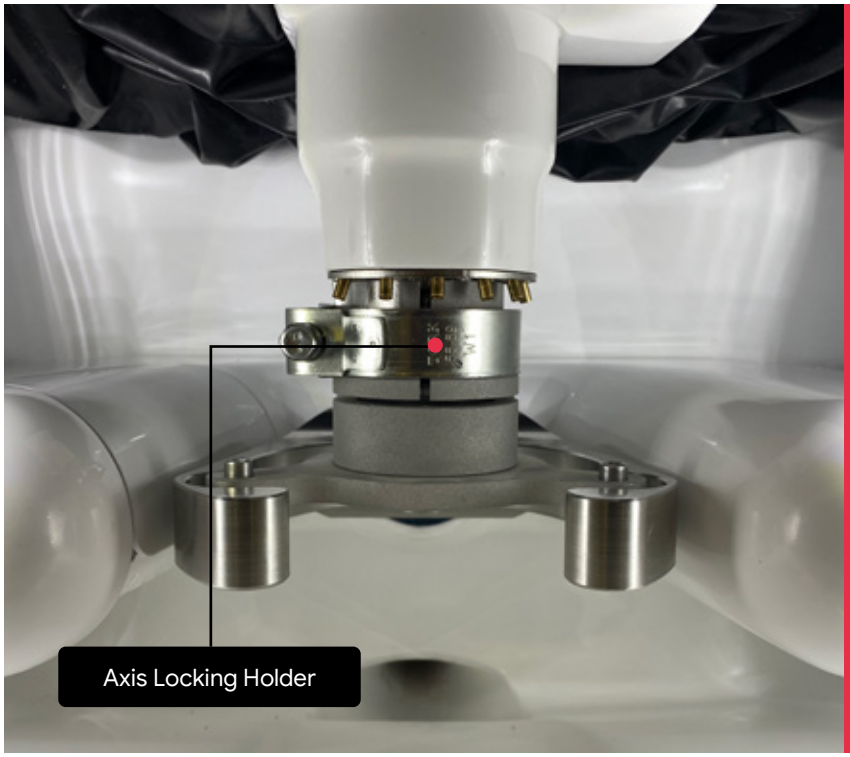
Do not use a box cutter to open the package.

1

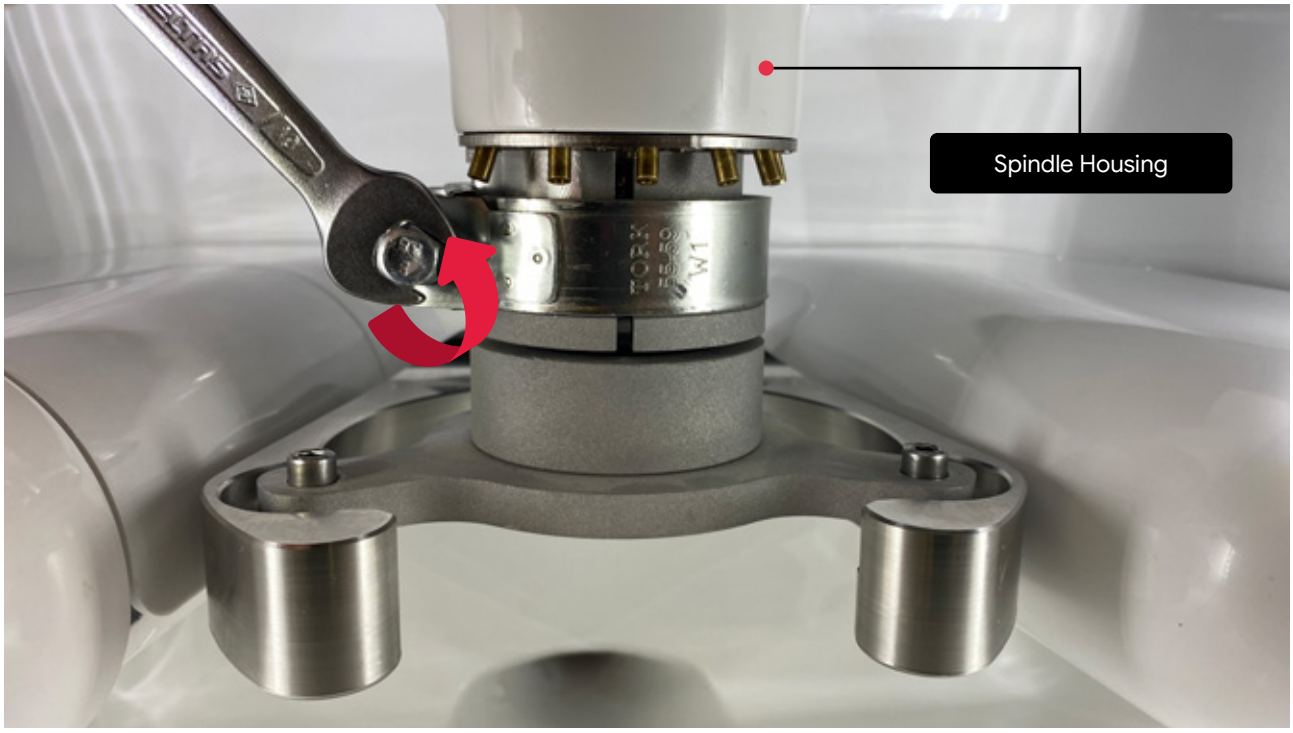
2

Open the package in the direction of the arrows as shown in the sample images.

REMOVING AXIS LOCKING HOLDER



The **“Axis Locking Gear”** is used during shipment of the machine to prevent the axes of the machine from moving. It is the first part that you will see after you open the door following unpackaging.



Remove the axis locking gear from the spindle housing using a pair of pliers. Make sure that you loosen the tensioning bolt of the axis locking gear using an 11-mm open-end wrench. **Then, move the Z axis upward by using the JOG command on the user interface.**

REMOVING AXIS LOCKING HOLDER

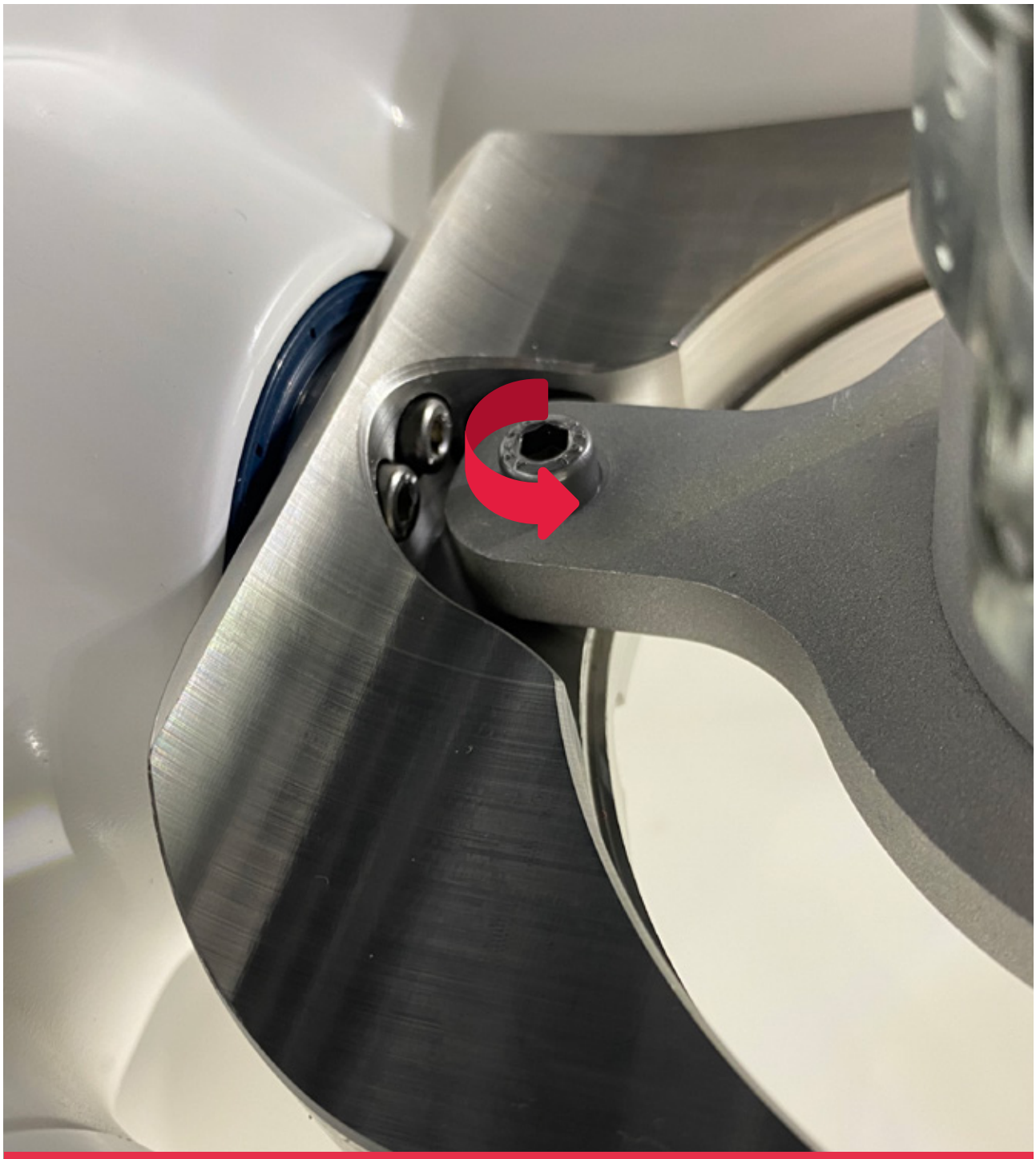
Move the spindle in the Y axis until the limit in the negative direction.

Move the spindle in the X axis until the limit in the negative direction.

REMOVING AXIS LOCKING HOLDER

The axis locking gear is fastened to the block retaining ring with three 5-mm bolts. First, remove the 2 bolts on the front. You can unscrew these bolts by turning them counterclockwise with a 4 mm allen wrench.

REMOVING AXIS LOCKING HOLDER

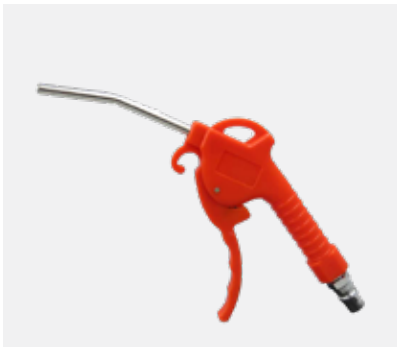


As shown in the image, the 3rd bolt located at the back needs to be removed as well.

PRODUCT CONTENTS

8 mm x 7.5 mt
Pneumatic Hose 1 Pc

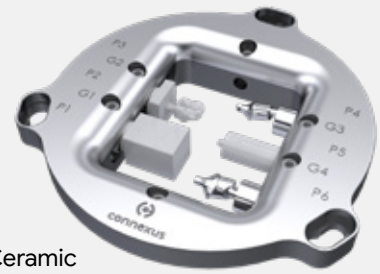
Network Cable
5 mt



Air Gun

OPTIONS

Table



Glass-Ceramic
and Premill Holder

M135 Block Retaining
Ring, Lower – 1 pc

M136 Block Retaining
Ring, Upper – 1 pc

M4 x 16 Socket Head
Cap Screw A3 – 6 pcs

M5 x 20 Socket Head
Cap Screw A3 – 6 pcs

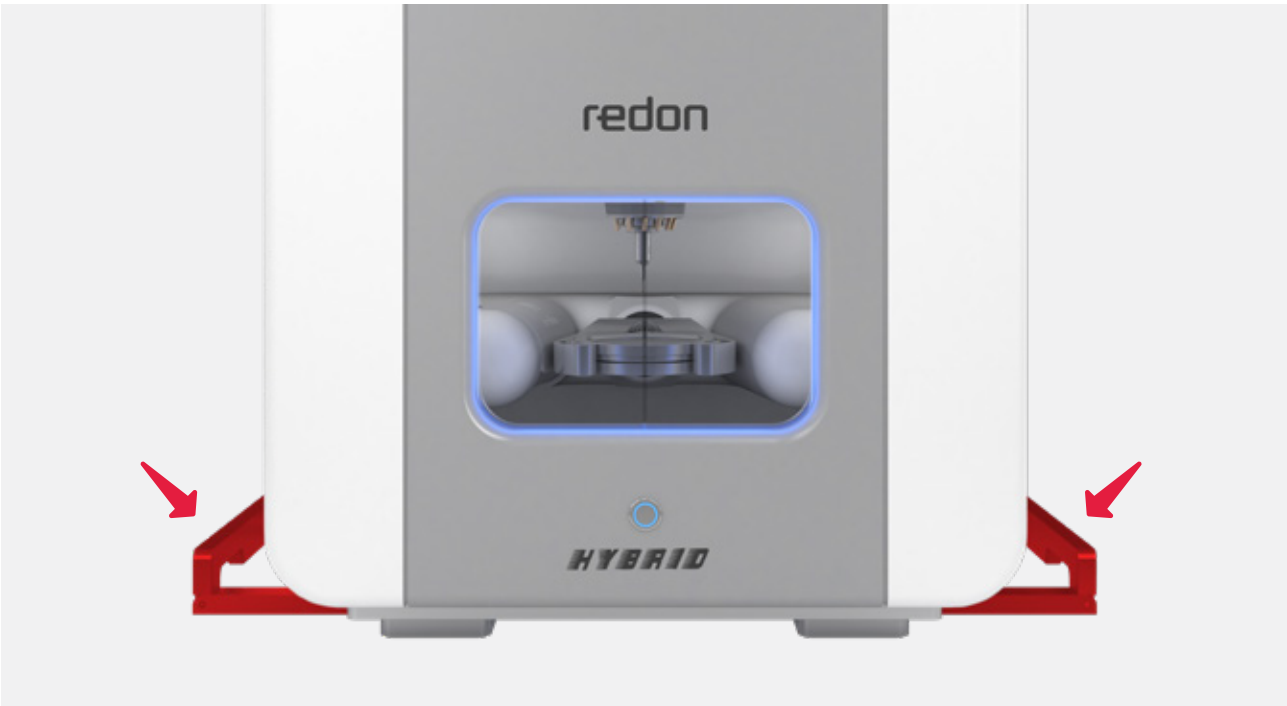
Digital Caliper

Cutting Oil

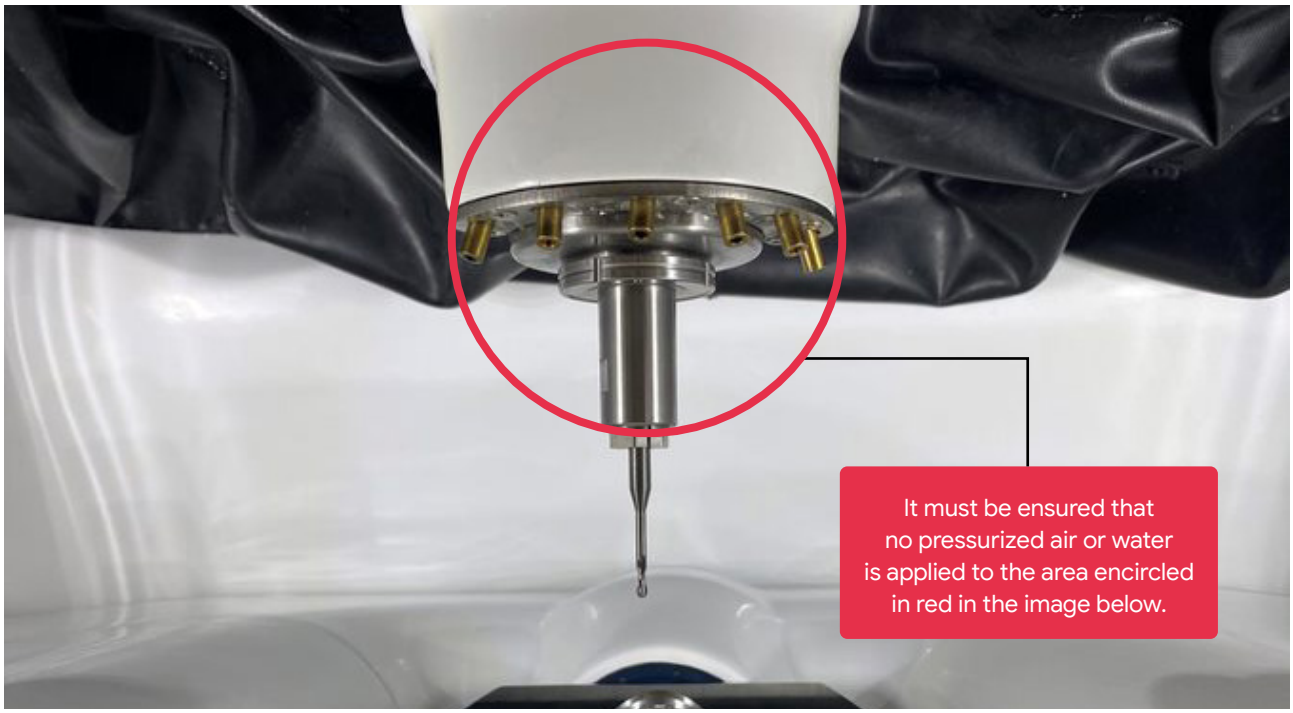
WORKING CONDITIONS

Proper working conditions must be provided for the bench according to the technical specifications sent after purchase.

CONSIDERATIONS



1 When the machine needs to be moved or relocated, the carry handles must be used. Since the machine's body is made of composite materials, it may get broken when moved or lifted.



2 If the machine is to be placed on a table other than its original table, that table must be able to withstand a load of 250 kg. The dimensions of the table must not be smaller than the dimensions of the machine.

PROCESSABLE MATERIALS & TYPES

Abuments

Hybrid Abutment

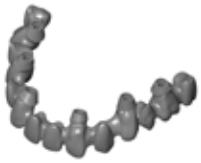
Premill Abutments

Crown Bridge

Inlay, Onlays, Veneer

Model Casting

Model



Screw Retantion Bridge

Splint

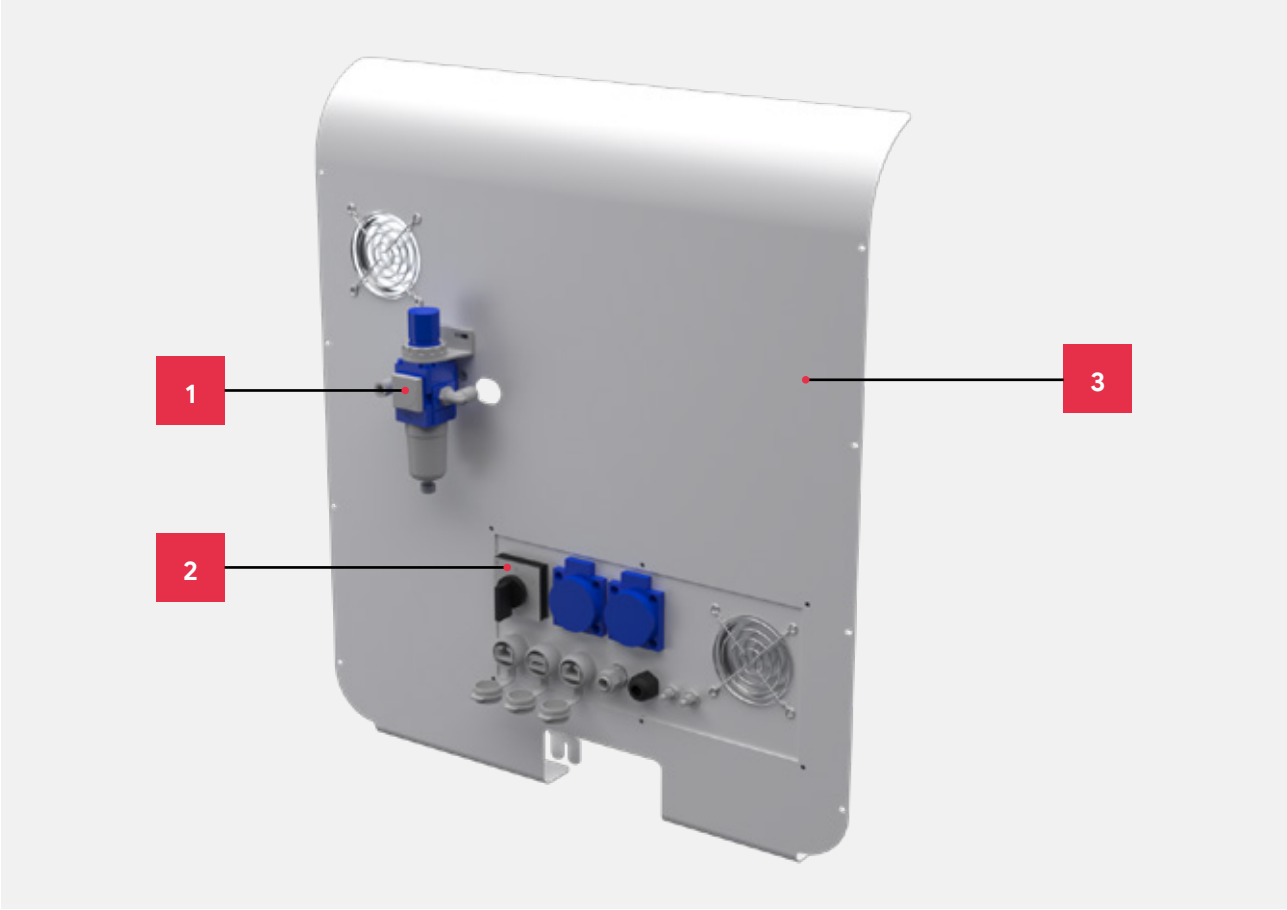
Surgical Guide

Telescope Abutment

Telescope

İmplant Bar

PORTS



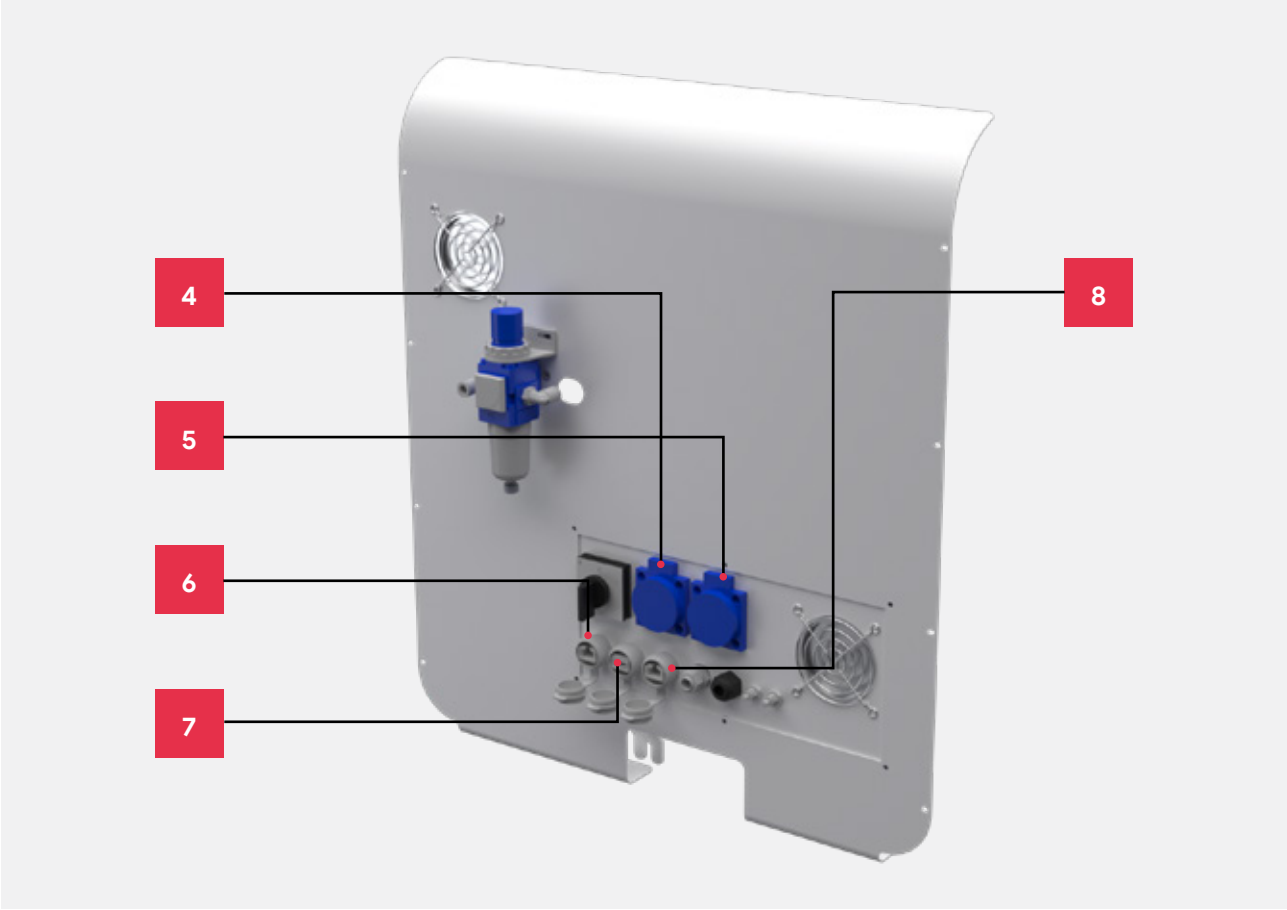
8 mm x 7.5 m Pneumatic Hose – 1 pc

1 **6-Bar Air Inlet. Connect the 8 mm pneumatic hose to the air compressor.**
Ensure that the air is dry and clean. Otherwise, air-operated parts including the spindle motor may be damaged.

2 Power Button (On/Off). When the button is in position **(0)**, the machine is off. When the button is in position **(I)**, the machine is on.

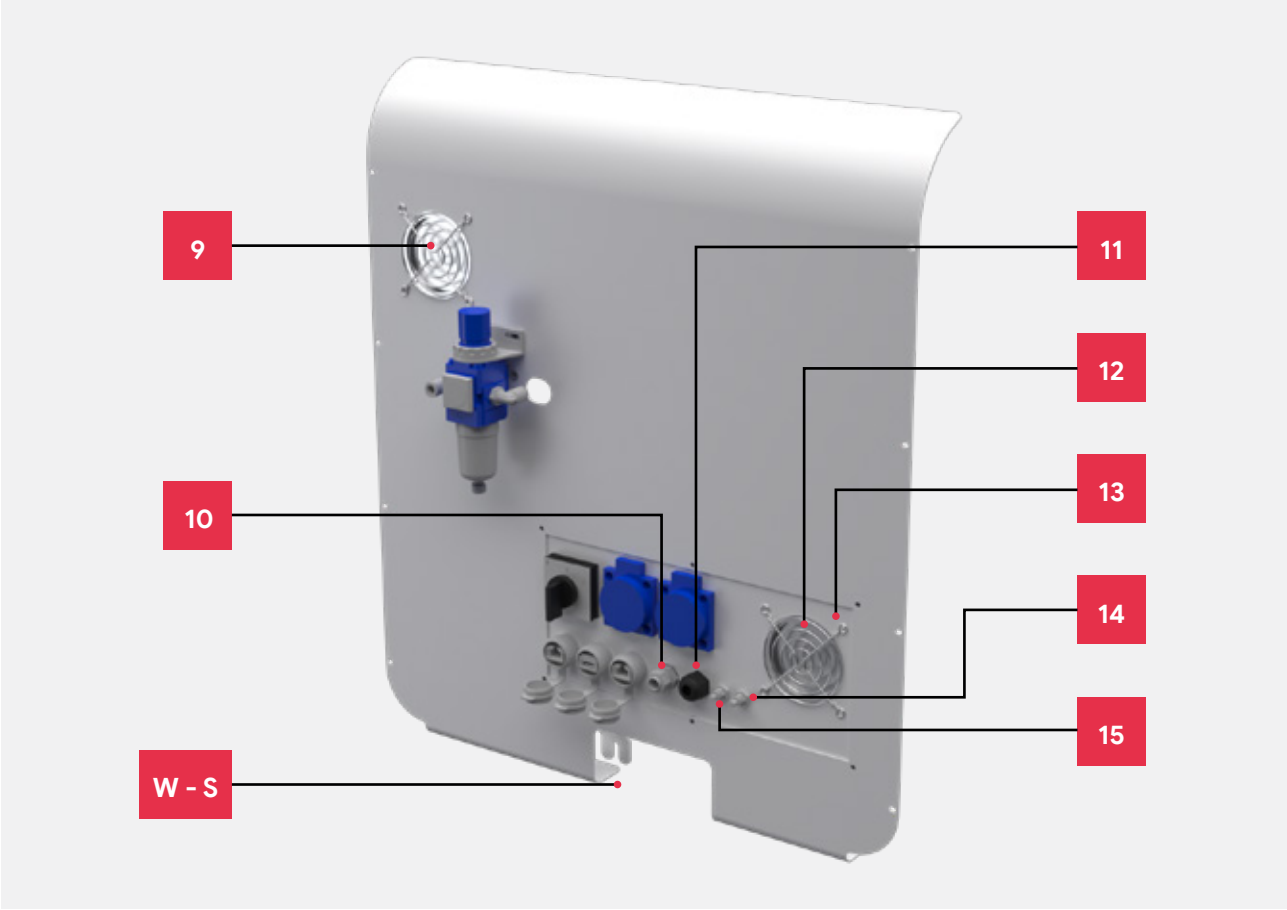
3 **Back Panel**

PORTS



4	Water Pump Power Socket (DIN 49440)	7	Vacuum Ethernet Jack
5	Vacuum Unit Power Socket (DIN 49440)	8	RJ45 CAT6 Network Cable Connector
6	USB Socket		

PORTS

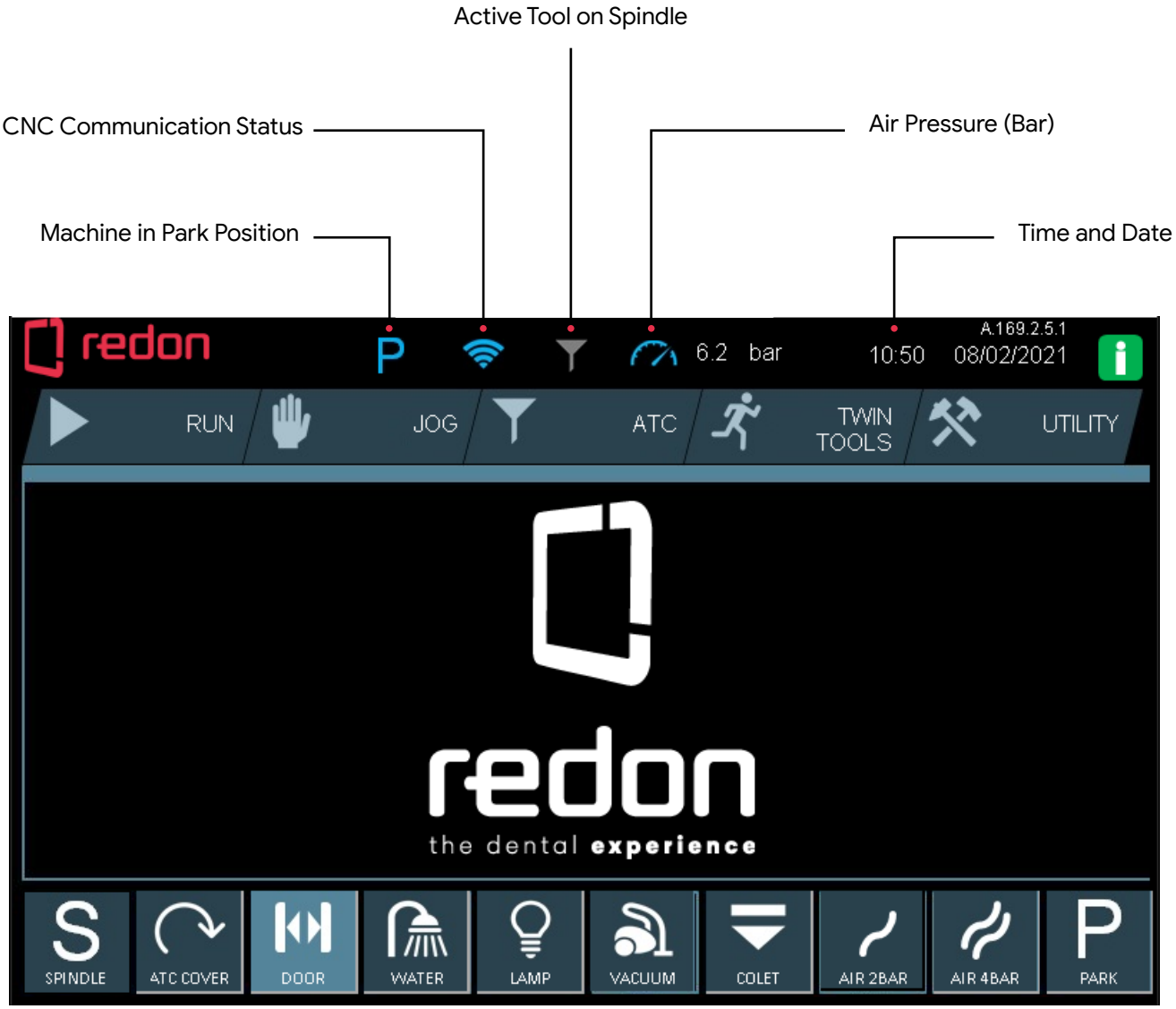


9	Fan	14	ATC Gate Closing Reducer
10	Water Hose Inlet Socket. Connection socket for the 10-mm diameter hose coming from the water tank.	15	ATC Gate Opening Reducer
11	Power Cable Inlet (IEC-320-C14)	W	Water Discharge Outlet
12	Fan	S	Vacuum Discharge Outlet
13	Back Connection Panel		

USER INTERFACE

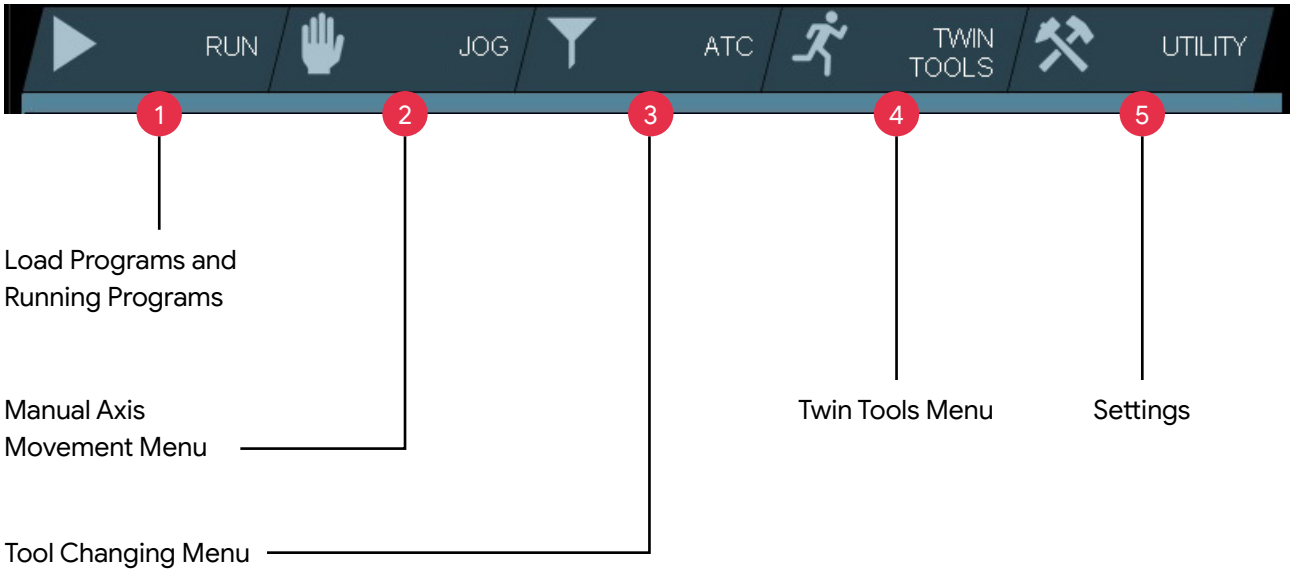
REDON HYBRID has a 7” touchscreen user interface.

Home Page

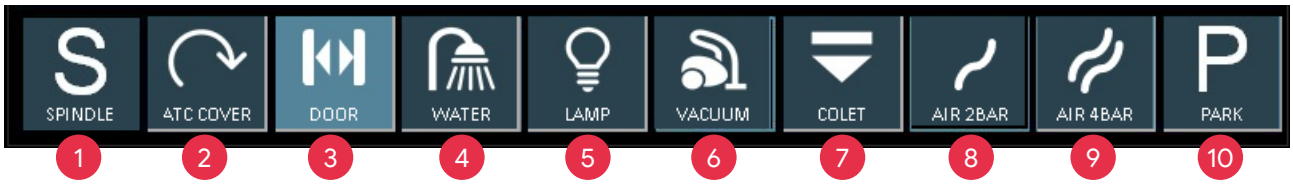


USER INTERFACE

Menu Bar



Function Buttons Bar



1. Spindle On/Off

2. Tool Changer Cover On/Off

3. Door On/Off

4. Water Cooling On/Off

5. Lamp On/Off

6. Vacuum On/Off

7. Collet On/Off

8. 2Bar On/Off

9. 4Bar Air On/Off

10. Park

USER INTERFACE / RUN

RUN Main Screen

* Wireless data transfer is an optional function. A wireless internet network must be available for this function to work.

1 **AUTO:** Enables automatic running of programs, i.e. running one or more programs installed in the machine's memory. You can also use the menu to automatically resume programs after a power failure or resume programs that are stopped by the user starting from the last tool change position.

2 **LOAD:** Enables recalling programs from the memory. Initially, programs calculated in the CAM software are saved in the machine's memory. Data transfer is performed with a USB flash drive or via the network with a cable (Ethernet) or wireless connection*. You must recall a program from the menu so that the machine can automatically run that program.

3 Shows the number and condition of the tool on the spindle.
For detailed information, see **ATC screen**, p. 35.

4 Shows the name of the active program.

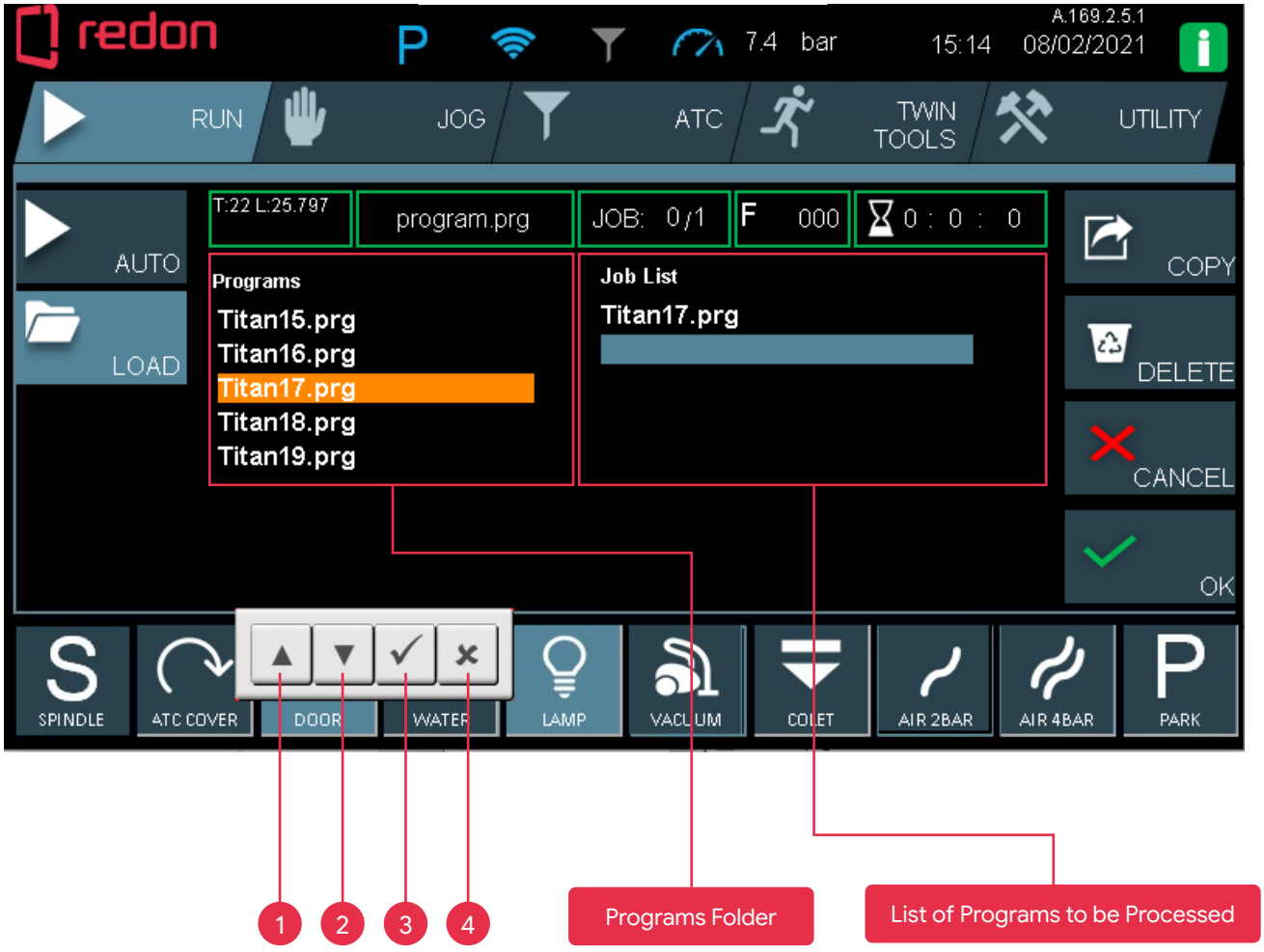
5 Shows the number of programs to be processed and the number of the program in queue that is currently being run. For example, if JOB 1/6 is shown, this means that 6 different programs have been recalled and that the first program in the queue is being run.

6 Shows the progress speed of the program calculated in the cam software in the line of code.

7 Shows the time elapsed since the start of automatic program running.

USER INTERFACE / RUN

RUN Main Screen / LOAD



1 In the **Programs** folder, touch once on the program that you want to select. Press the ▲ button to move up.

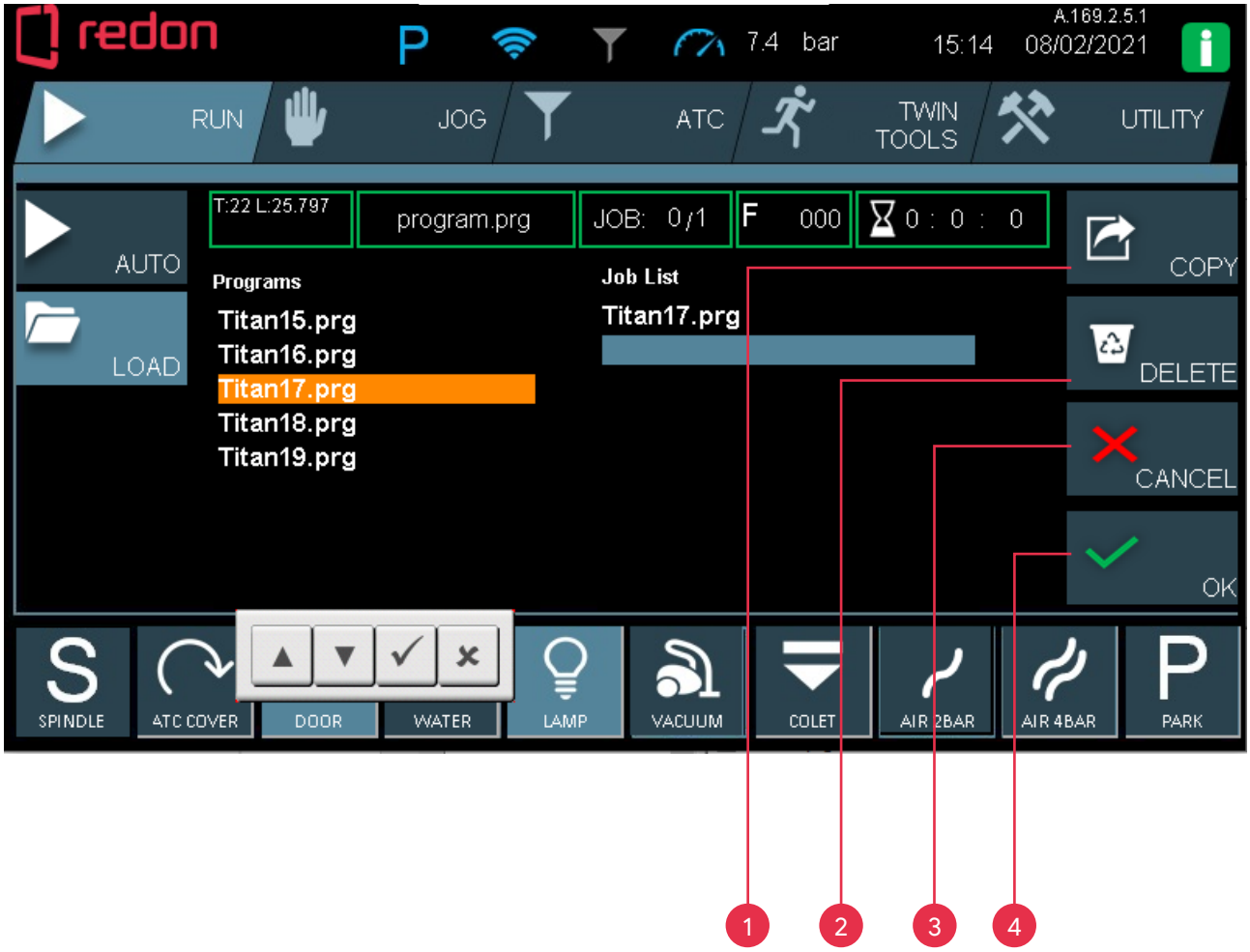
2 In the **Programs** folder, press the ▼ button to move down.

3 In the **Programs** folder, press the ✓ button after you highlight the program that you want to select.

4 In the **Programs** folder, press the ✕ button to cancel the selection.

USER INTERFACE / RUN

RUN Main Screen / LOAD



1 **COPY:** This button allows you to copy programs from the **Programs** folder to the **Job List** (List of Programs to be Processed). In the Programs folder, touch the program that you want to run and press the button. The selected program is copied to the **Job List.**

2 **DELETE:** This button allows you to delete the programs in the **Job List**. In the **Job List**, touch the program that you want to delete and press the button. The selected program is deleted from the **Job List**.

3 **CANCEL:** This button allows you to cancel operations. If at any stage you want to cancel an operation, press the button.

4 **OK:** This button allows you to confirm operations. When you try to delete an item, you will be asked to confirm this operation. In this case, press the button to confirm deletion.

USER INTERFACE / RUN

Installing programs with a USB flash drive

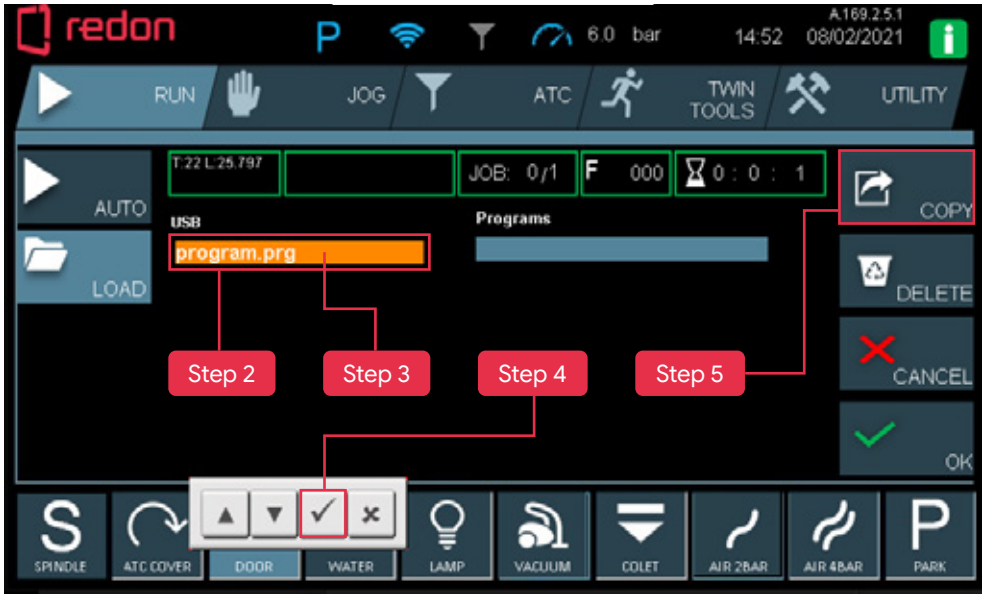
Connect the USB flash drive to the back panel. Make sure that the USB flash drive is properly connected. Follow the instructions on the next page in the order given.

USER INTERFACE / RUN

RUN Main Screen

1

Step 1 : Touch (Programs)
Step 2: Make sure that the program with the (.prg) extension is selected under the USB heading.

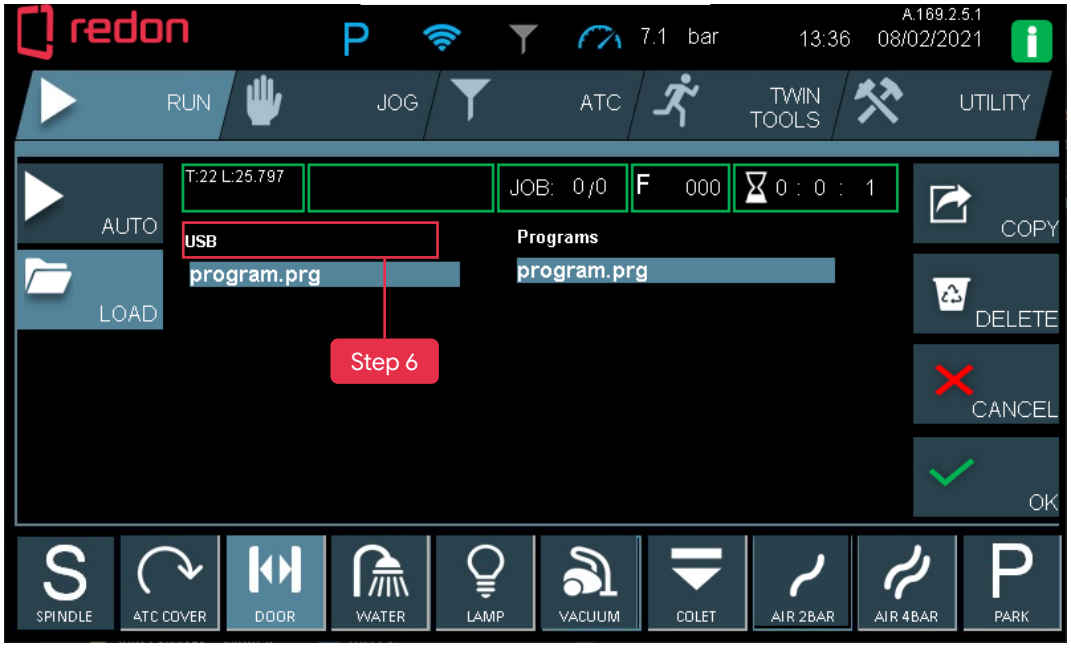


2

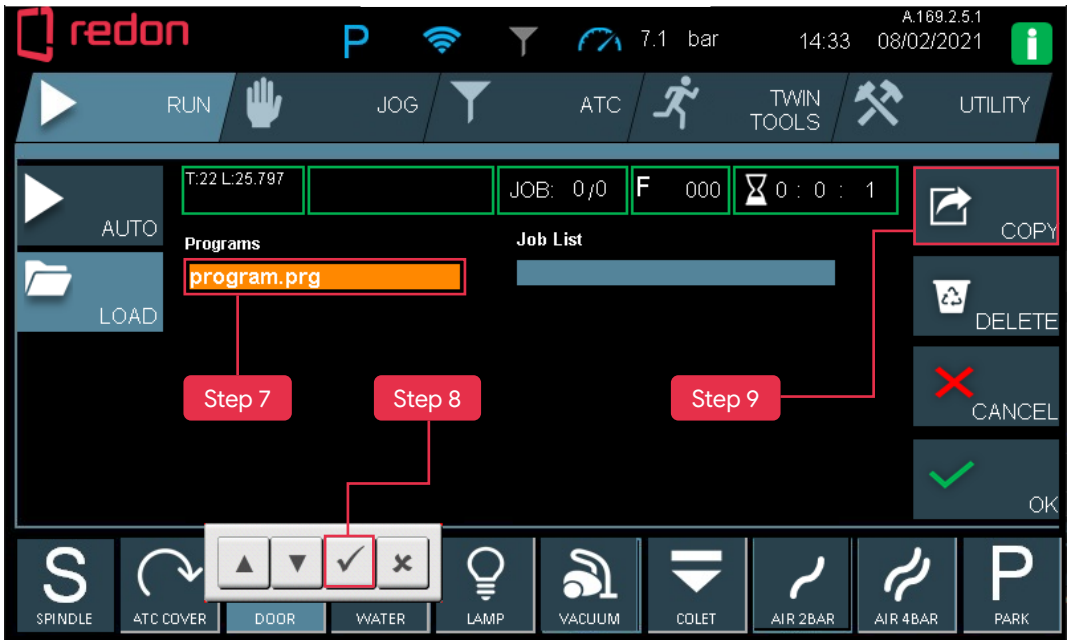
Step 3 : In the USB section, touch (program.prg)
Step 4 : Press the (ok) button to confirm and then press the (copy) button to perform the copying operation.
Step 5 : After you press the Copy button, the file program.prg will be copied to the (Programs) list.

USER INTERFACE / RUN

RUN Main Screen



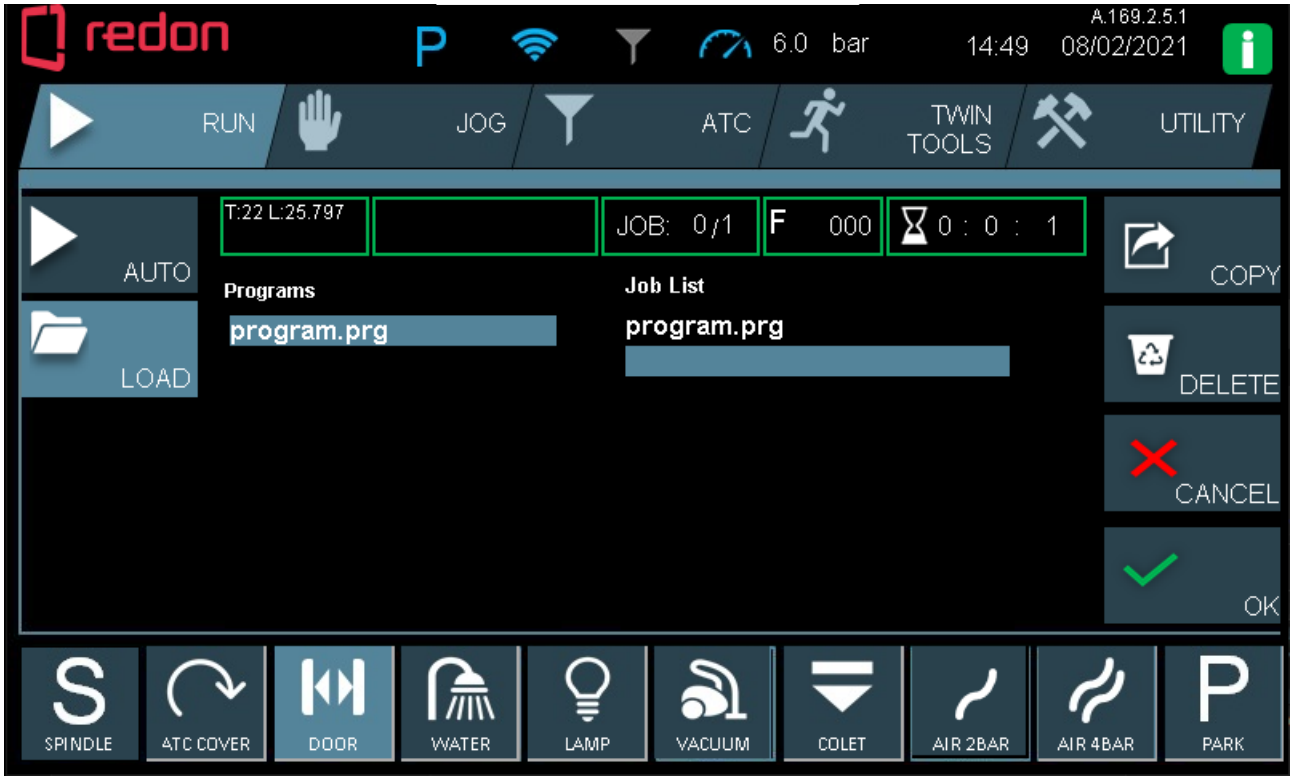
3 **Step 6 :** Press the section titled **USB**. This button will display (Programs) and (Job List) screens.



4 **Step 7:** Touch (program.prg)
Step 8: Press the (ok) button shown in the sample image.
Step 9: Press the Copy button to copy the program from the (Programs) section to the (Job List) section.

USER INTERFACE / RUN

RUN Main Screen



5 **Step 10 :** You will see that the job file titled (program.prg) has been copied to the Job List section.

USER INTERFACE / RUN

The selected menu is shown in a bright color.

Available functions are shown in a dark color. These function buttons can be toggled on/off by the user.

Active functions are shown in a bright color.

Locked functions are shown in black color. For safety reasons, the machine may lock some of the function buttons depending on the active operation.

INSTALLING PROGRAMS WITH FILEZILLA

Filezilla or another equivalent FTP (File Transfer Protocol) program can be used. For this application, (Filezilla) is recommended, and details on how to use Filezilla will be provided in connection with this program.

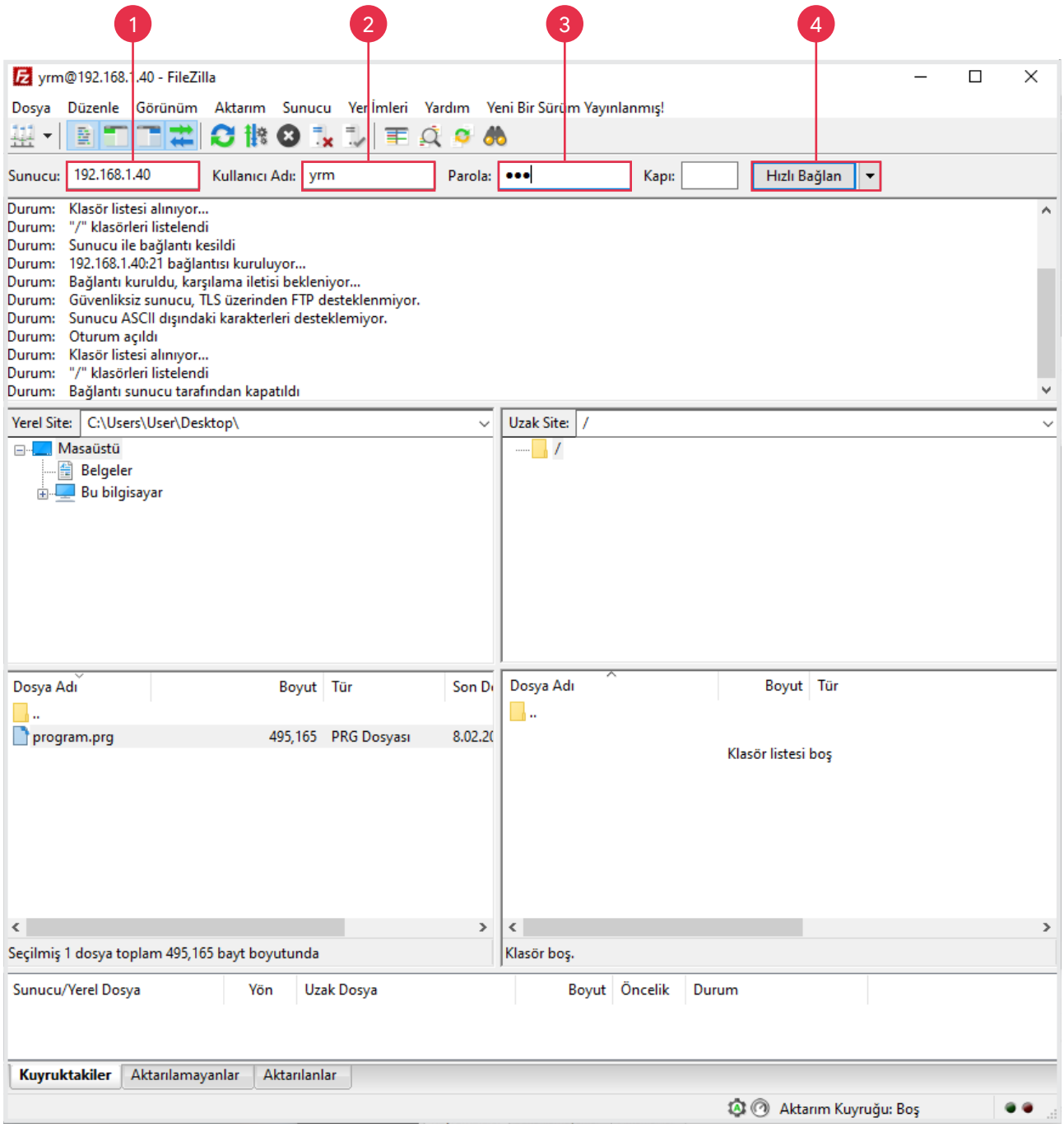
Connect an ethernet cable to the Ethernet jack as shown in the sample image.

1 Vacuum trigger Ethernet jack.

2 Ethernet jack for file access.

Filezilla's logo is shown in the image to the left.
Run the filezilla .exe file.

INSTALLING PROGRAMS WITH FILEZILLA



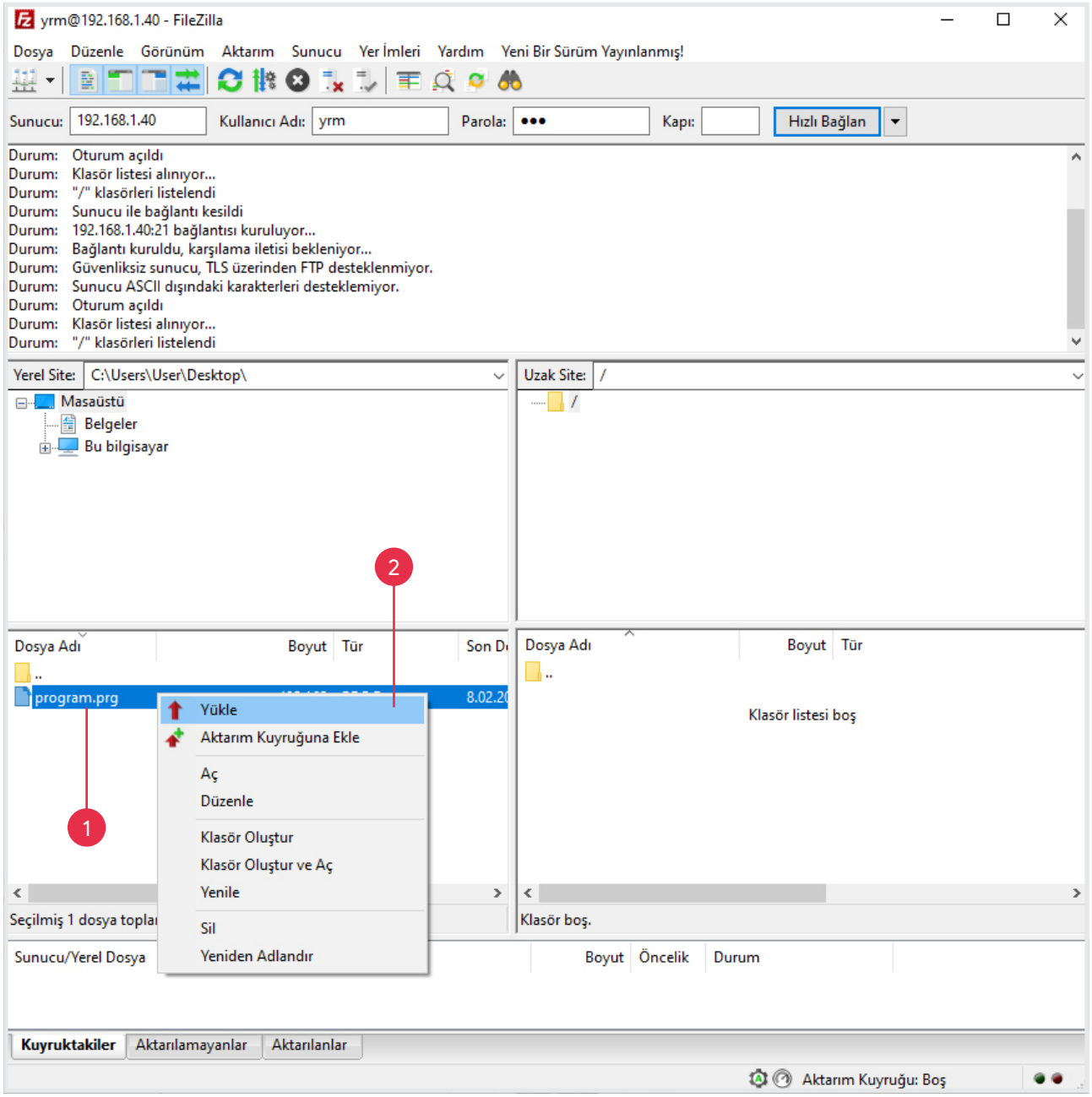
1 Type the machine's IP address in the **(Sunucu) (Server)** field.

2 Type **(yrm)** in the **(Kullanıcı Adı) (Username)** field.

3 Type **(yrm)** in the **(Parola) (Password)** field.

4 Establish a connection by clicking the **(Hızlı Bağlan) (Quick Connect)** button.

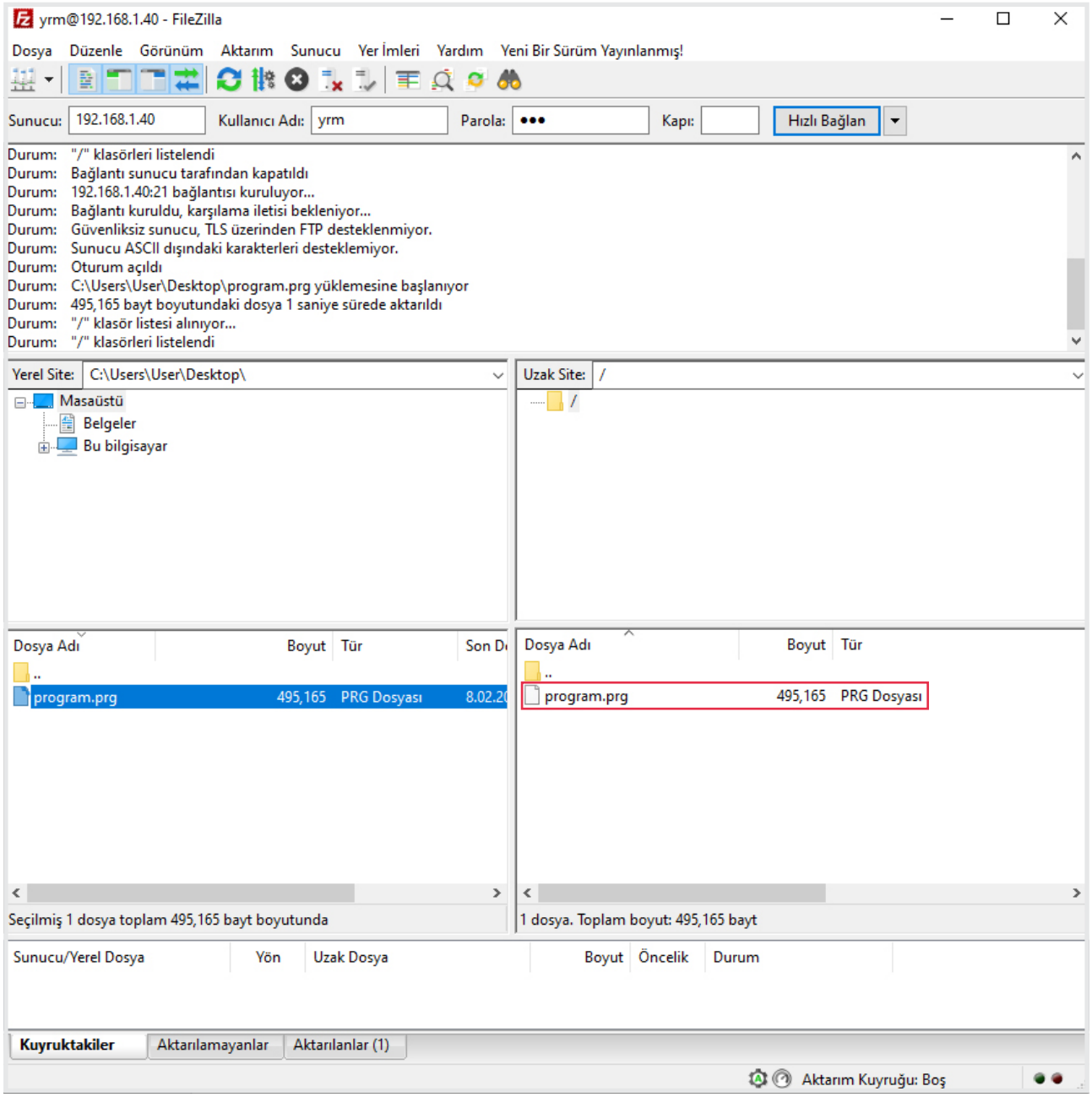
INSTALLING PROGRAMS WITH FILEZILLA



5

Step 1 : Right click the file with the .prg extension.
Step 2 : Click the **(Yükle) (Load)** button in the context menu.

INSTALLING PROGRAMS WITH FILEZILLA



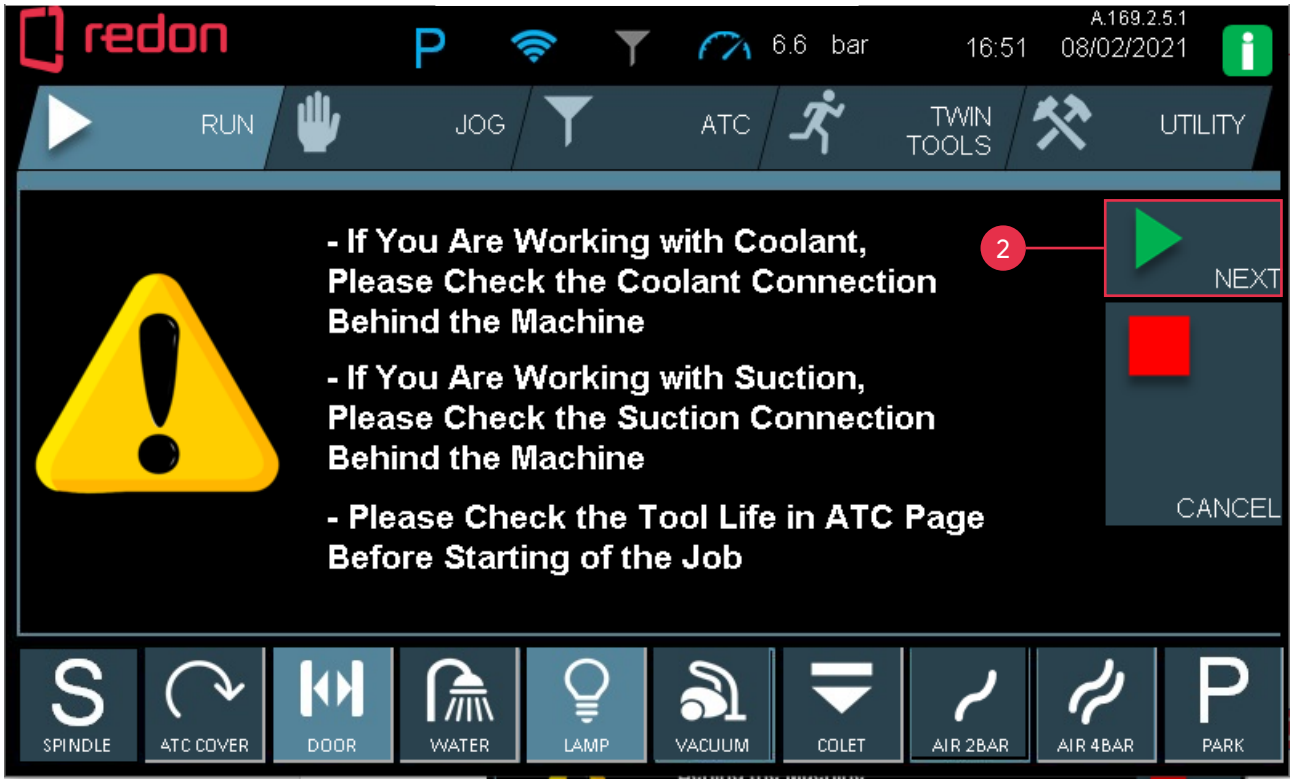
6 You will see that the **program.prg** file is transferred to the **tab on the right.**

USER INTERFACE / RUN

RUN Main Screen / START

1

In the **RUN/Auto** tab, press the **NEXT** button to start the installed program. However, the machine does not immediately start when you press the **NEXT** button. At this point, warning prompts are displayed to warn the user about relevant issues.

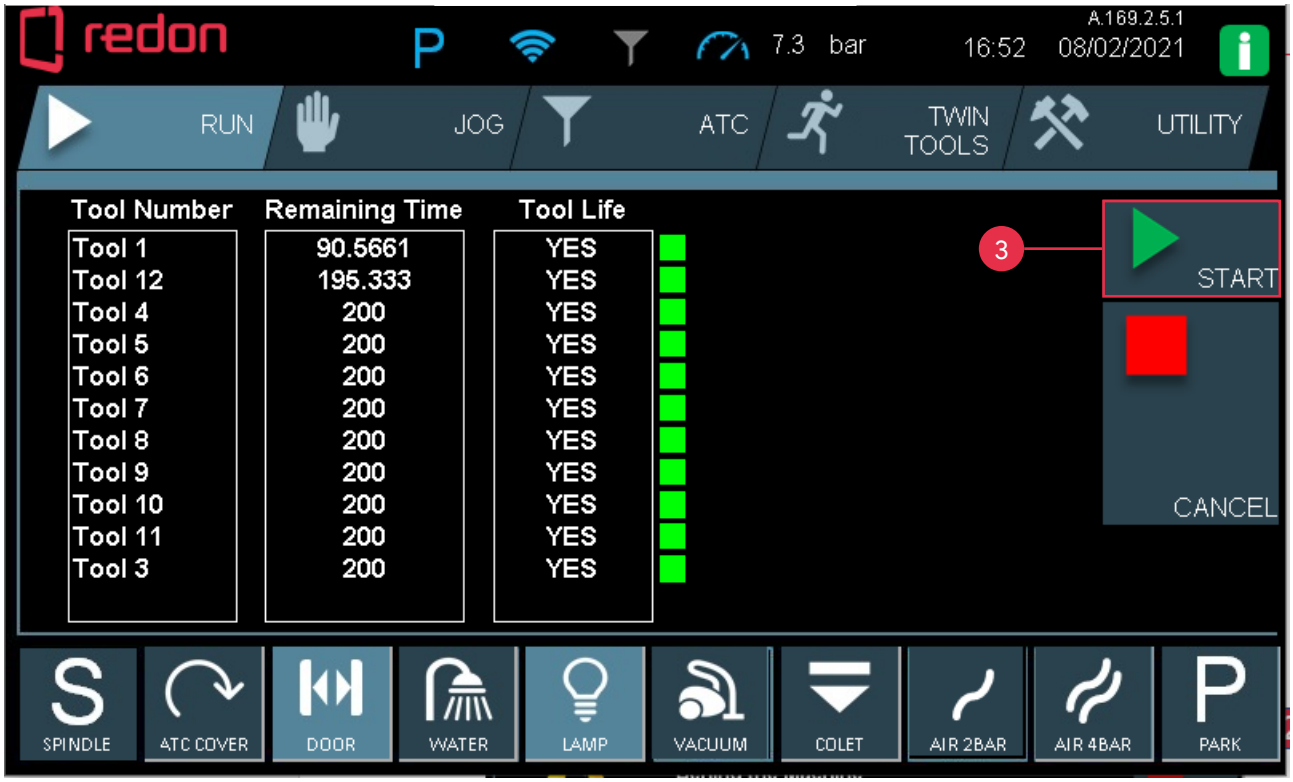


2

- If wet processing will be performed, check the connection between the water outlet at the back of the machine and the water tank.
- If dry processing will be performed, check the connection between the air outlet at the back of the machine and the vacuum.
- Tool life details provided on the tool ATC page should be checked before processing is started.

USER INTERFACE / RUN

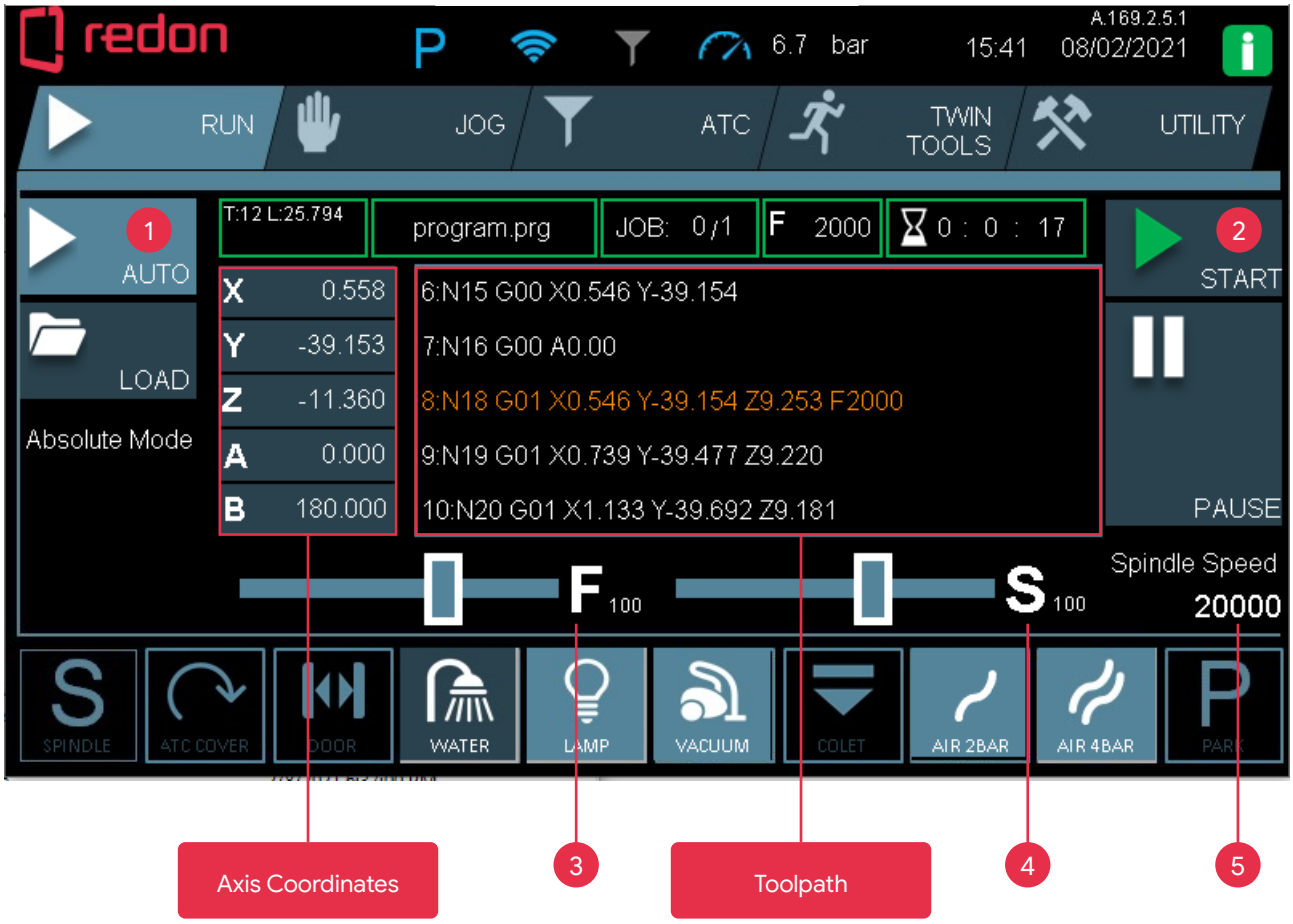
RUN Main Screen / START



3	Details about the remaining tool life and tool health are provided to the user. This is the last warning tab. After this point, the job file can be run by pressing the **(START)** button.

USER INTERFACE / RUN

RUN Main Screen / AUTO



1 After selecting the programs to be run in the **LOAD** section, press the **AUTO** menu button.

2 Press the **START** button. Then, the machine will start to run in fully automatic mode. The doors will automatically close, the required tool will be automatically received, and its height will be measured. Cooling will be automatically turned on as necessary, and the machine will start milling.

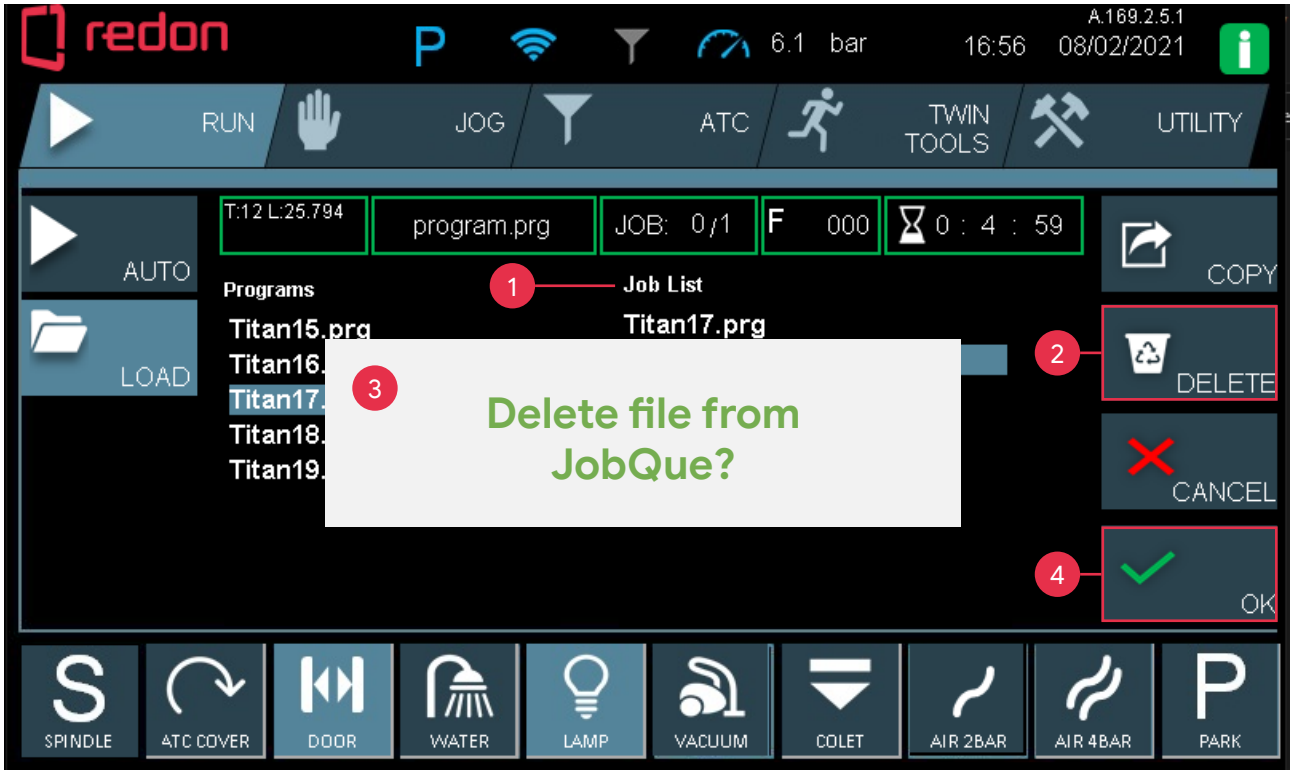
3 The **F** bar represents the Feed which proportionally increases or reduces the machine's speed. The **F** bar's range of value is between 0% and 100%. When it is set to 0%, the axes of the machine completely stop. In normal operation, this value must be set to **100%.**

4 The **S** bar represents the Speed which proportionally increases or reduces the spindle speed. The **S** bar's range of value is between 0% and 100%. When it is set to 0%, the spindle completely stops. In normal operation, this value must be set to **100%**.

5 The Spindle Speed indicator shows the current speed of the spindle. The value is shown in rpm.

USER INTERFACE / RUN

RUN Main Screen / LOAD / Deleting a Program



1 If you want to delete a program from the **Job List** column, select the program by touching it in the list.

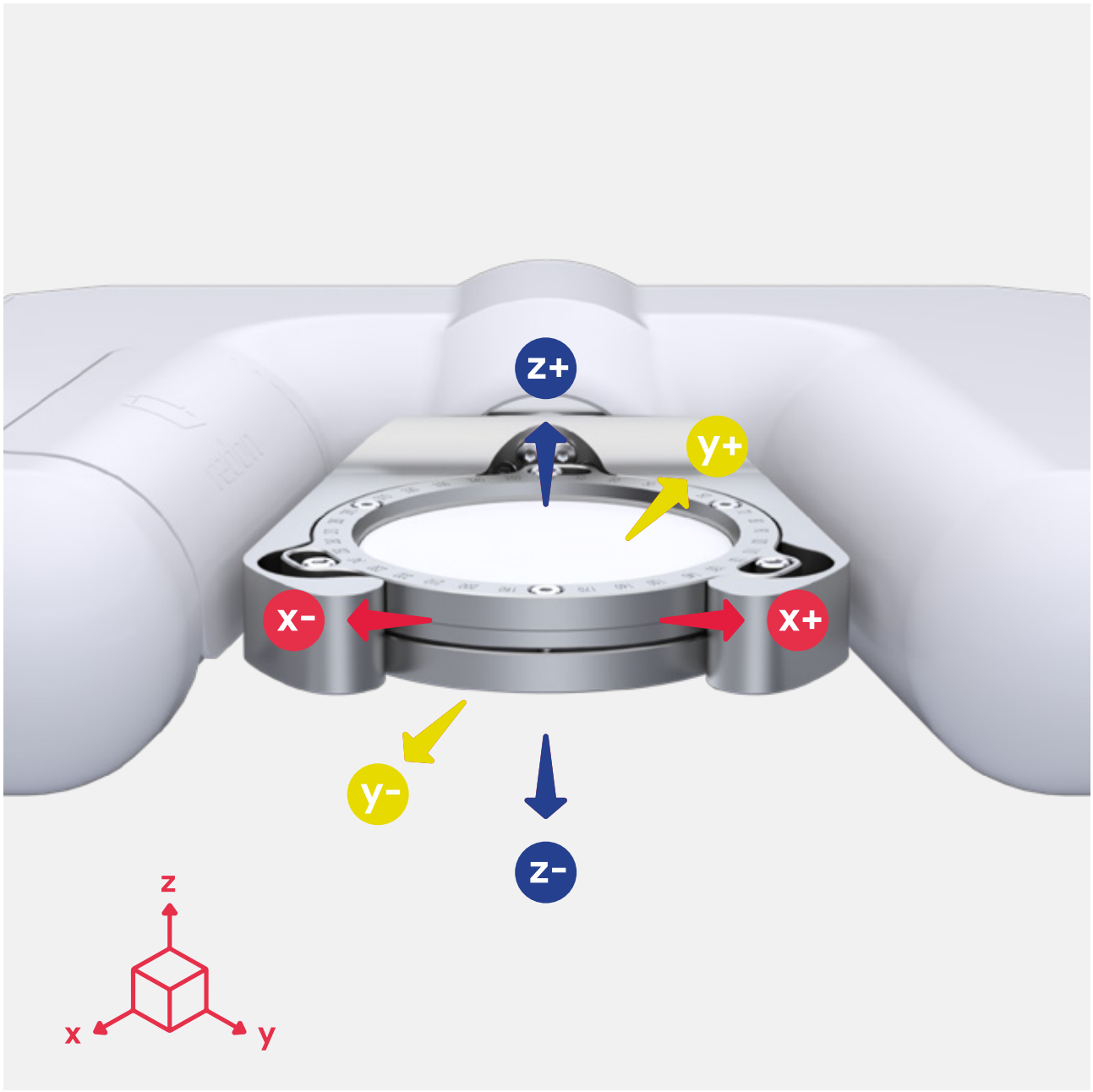
2 After selecting the program, you can delete it by pressing the **DELETE** button.

3 A confirmation pop-up appears and shows the prompt **(Delete file from JobQue?)**

4 Press the **OK** button to complete the deletion operation. If you want to cancel the operation, press the **CANCEL** button.

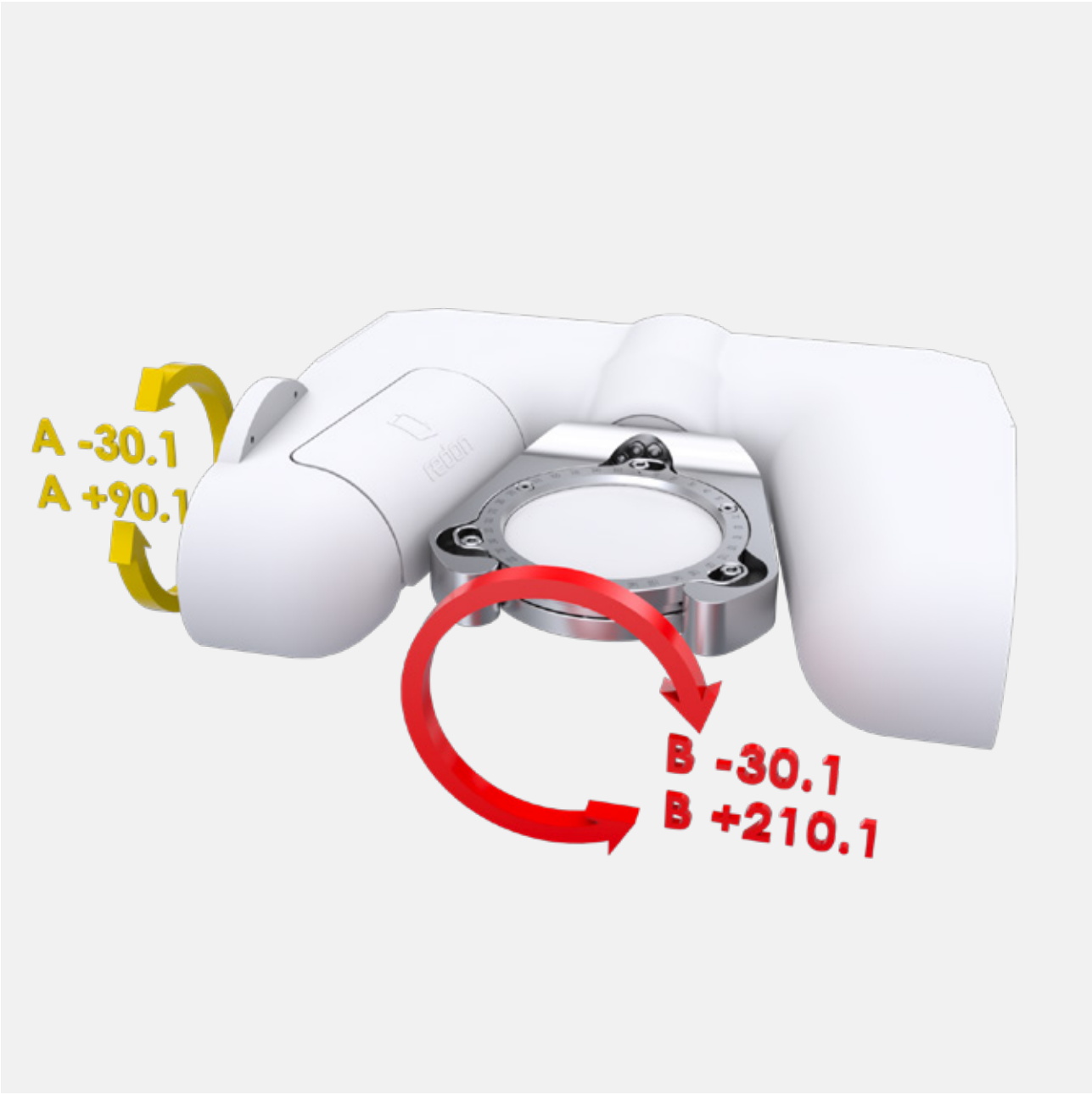
USER INTERFACE / JOG

JOG (Manuel Movement)



USER INTERFACE / JOG

JOG (Manuel Movement)



USER INTERFACE / JOG

JOG (Manuel Movement)

1 Use the **JOG** function to move the axes manually.

2 Axis buttons are listed as X, Y, Z, A, and B in ascending order. Numerical values shown next to an axis letter indicate the coordinates of the respective axis. Press the axis that you want to move. In the sample image, the X axis has been selected.

3 To move the axes in increments of 0.001mm, 0.01mm, 0.1mm and 1mm, touch the respective increment value. (In the sample image, 0.001 is shown.) When you press the movement buttons, the selected axis is moved by that amount and then it is stopped.

4 If you want to move the axes continuously, click the **CONTINUOUS MODE OFF** button. The button will now read **CONTINUOUS MODE ON**, and continuous movement will be activated. If you press the movement buttons when the **CONTINUOUS** tab is selected in the right part of the screen, the axis moves continuously. When you take your finger off the button or the axis has reached its limits, the movement stops. **CONTINUOUS MODE OFF** allows intermittent movement. If you press the movement buttons when the **CONTINUOUS** tab is selected in the right part of the screen, the axis moves intermittently. When you take your finger off the button or the axis has reached its limits, the movement stops. Intermittent movement has been added to the user interface for safety purposes.

⚠ **CAUTION!** When moving the machine axes, the covers must be closed. Movement with a reduced F speed prevents risks such as collision. When the **CONTINUOUS MODE OFF** button is active, progression of intermittent movement is also reduced. Pay close attention to ensure that no foreign object is present inside the machine when the axes are moved. Foreign objects inside the machine may damage the machine by causing jams or collisions.

5 Movement button when moving the axis in the negative direction.

6 Movement button when moving the axis in the positive direction.

USER INTERFACE / ATC

ATC Main Menu (Tool Changing)

USER INTERFACE / ATC

ATC Main Menu (Tool Changing)

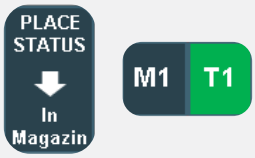
1 **ATC MAIN MENU** (Tool Changing menu). Use the **"ATC MAIN MENU"** to change old or broken tools, empty the tool on the spindle, determine or reset tool life, and measure tool lengths. The tool capacity of the magazine is 12, and there is a separate button for each tool. Although the number of tool nests in the magazine is 12, tools can be optionally assigned to any magazine nest.
***M1:** Field indicating the magazine number. ***T1:** Field indicating the tool number.

2 Use this tab to change old or broken tools, send the tool on the spindle to the magazine and determine or reset tool life.

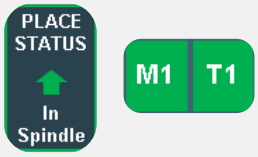
3 **Place status :** Indicates the place of the tool. It shows 3 different statuses. Assuming that the T1 tool is available, 3 different statuses of M1 are shown as in the sample images when the Place Status button is pressed.

M1 - BLACK
Magazine is empty

M1 - DARK BLUE
Tool is in the magazine



M1 - GREEN
Tool is on the spindle

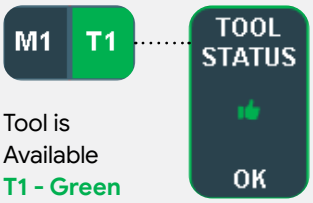


USER INTERFACE / ATC

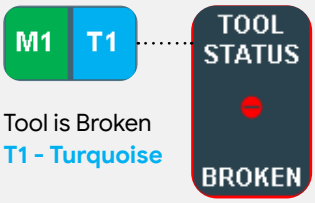
3.1 **M1:** Represents the tool position.

Empty Magazine	In Magazine	In Spindle
		
When M1 is black, the magazine is empty.	When M1 is dark blue, the tool is in the magazine.	When M1 is green, the tool is on the spindle.

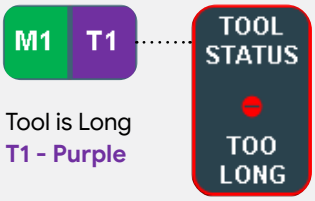
4 The section containing the tool numbers is represented with 4 different colors depending on 4 different statuses. The tool status button changes the status of the tools. Green indicates that the tool is available, turquoise indicates that the tool is broken, purple indicates that the tool is long, yellow indicates that the shorter tool is longer than 15 mm, and black indicates that there is no tool. The descriptions above apply to all tools in the magazine. For example, if you want to measure or change the T1 tool, you will need to first indicate on the machine that the tool is available by setting the button to green.



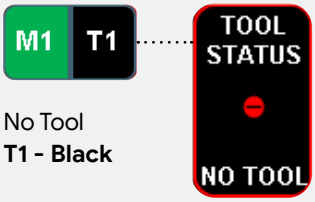
Tool is Available
T1 - Green



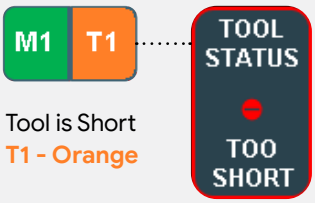
Tool is Broken
T1 - Turquoise



Tool is Long
T1 - Purple



No Tool
T1 - Black



Tool is Short
T1 - Orange

USER INTERFACE / ATC

5 Identifying the active tool; The active tool is the one that is on the spindle.
In the sample image, the T2 tool in M2 is on the spindle and active.

CAUTION! Place Status must be In Spindle, and Tool Status must be OK.

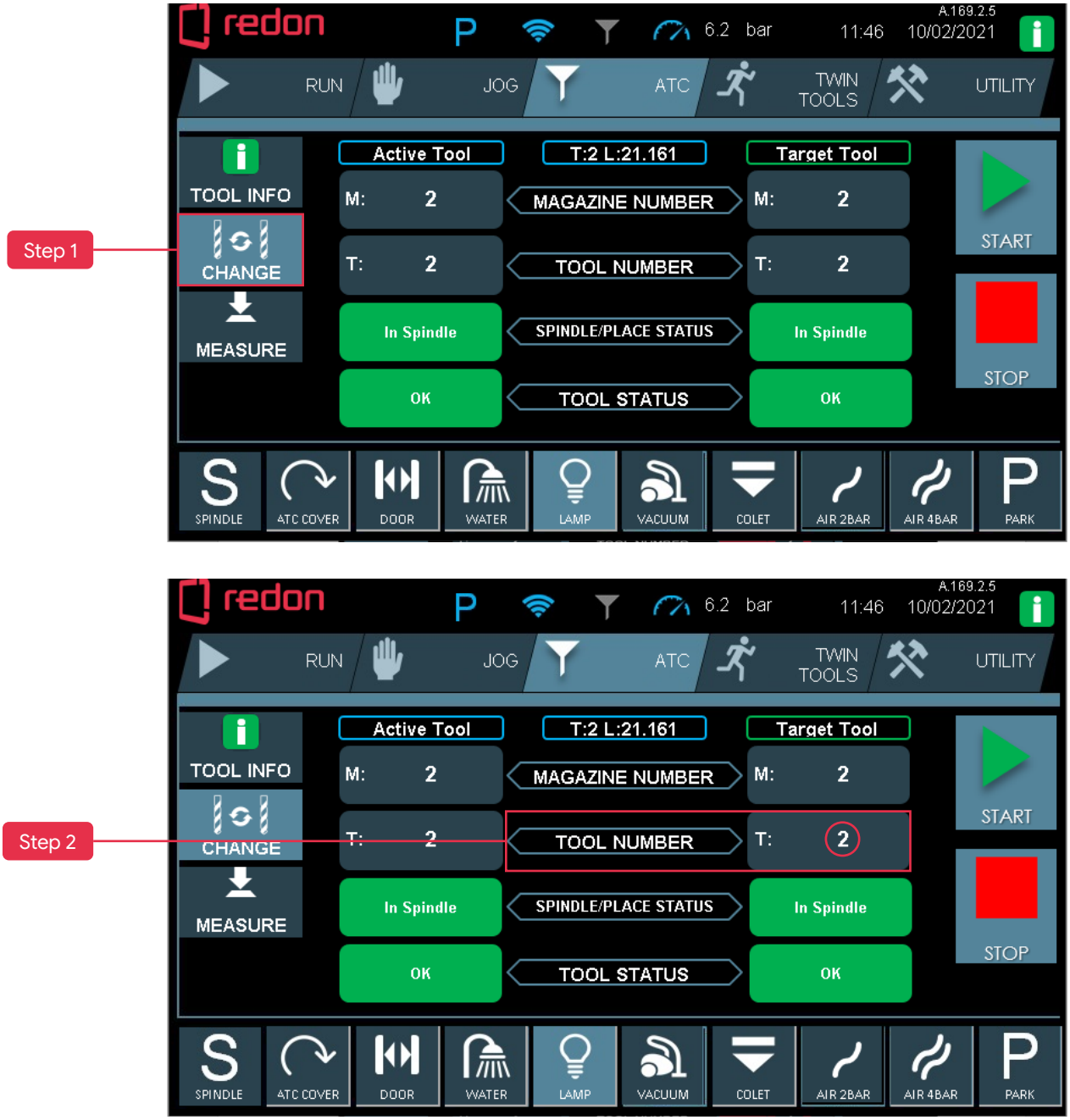
USER INTERFACE / ATC

6

Let's change Tool 2 with Tool 1.

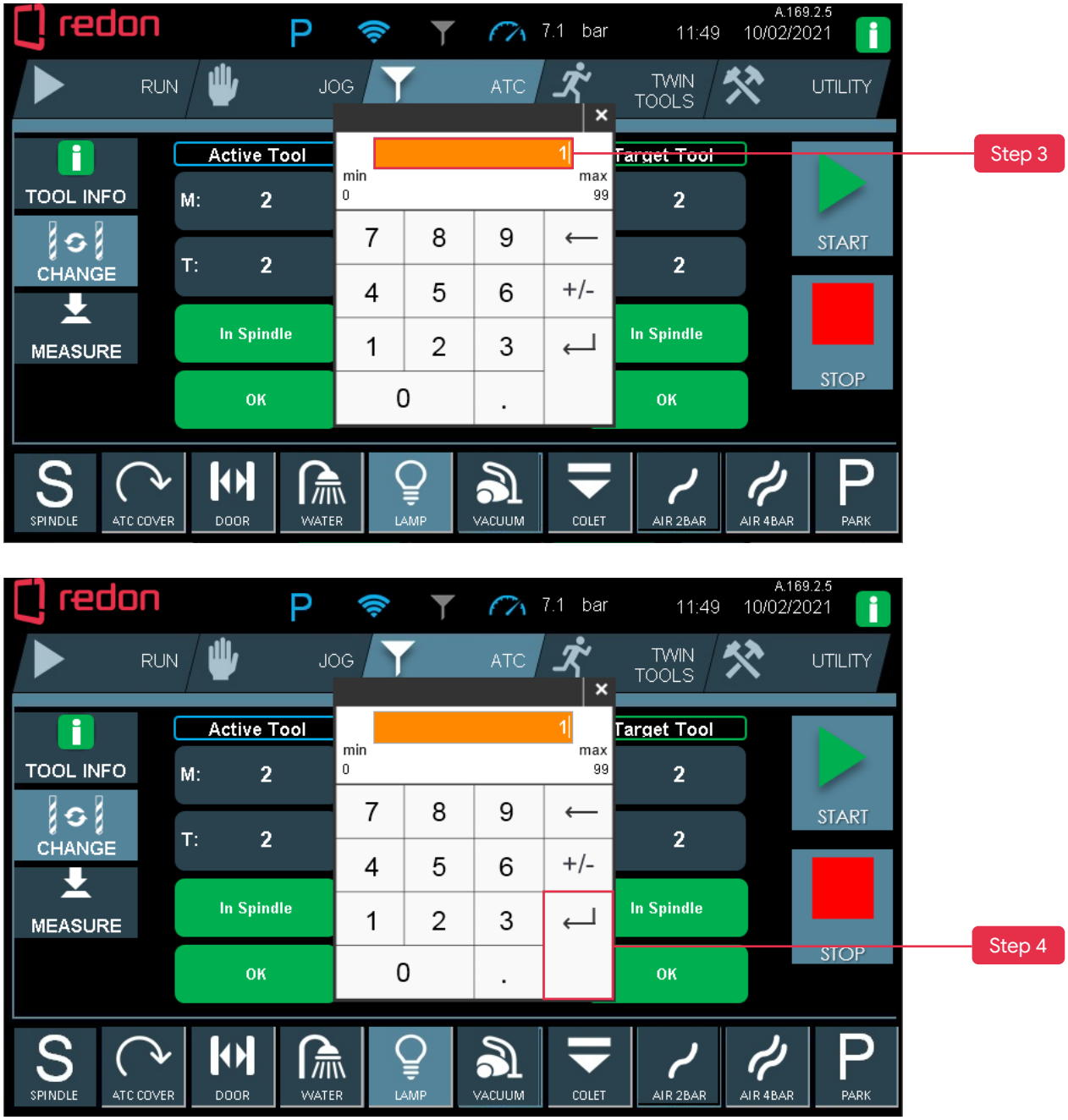
Step 1 : Press the Change button.

Step 2 : Press the area which contains the target tool number next to **TOOL NUMBER**. Then, a pop-up window with Numlock keys is displayed. Enter 1 in this window and then press **(Enter)**



USER INTERFACE / ATC

6.1 For example, if active tool 2 is to be replaced with tool 1;
Step 3 : The current tool is tool 2. Press the area encircled in red.
Step 4 : Type 1 in the window that is displayed and confirm.

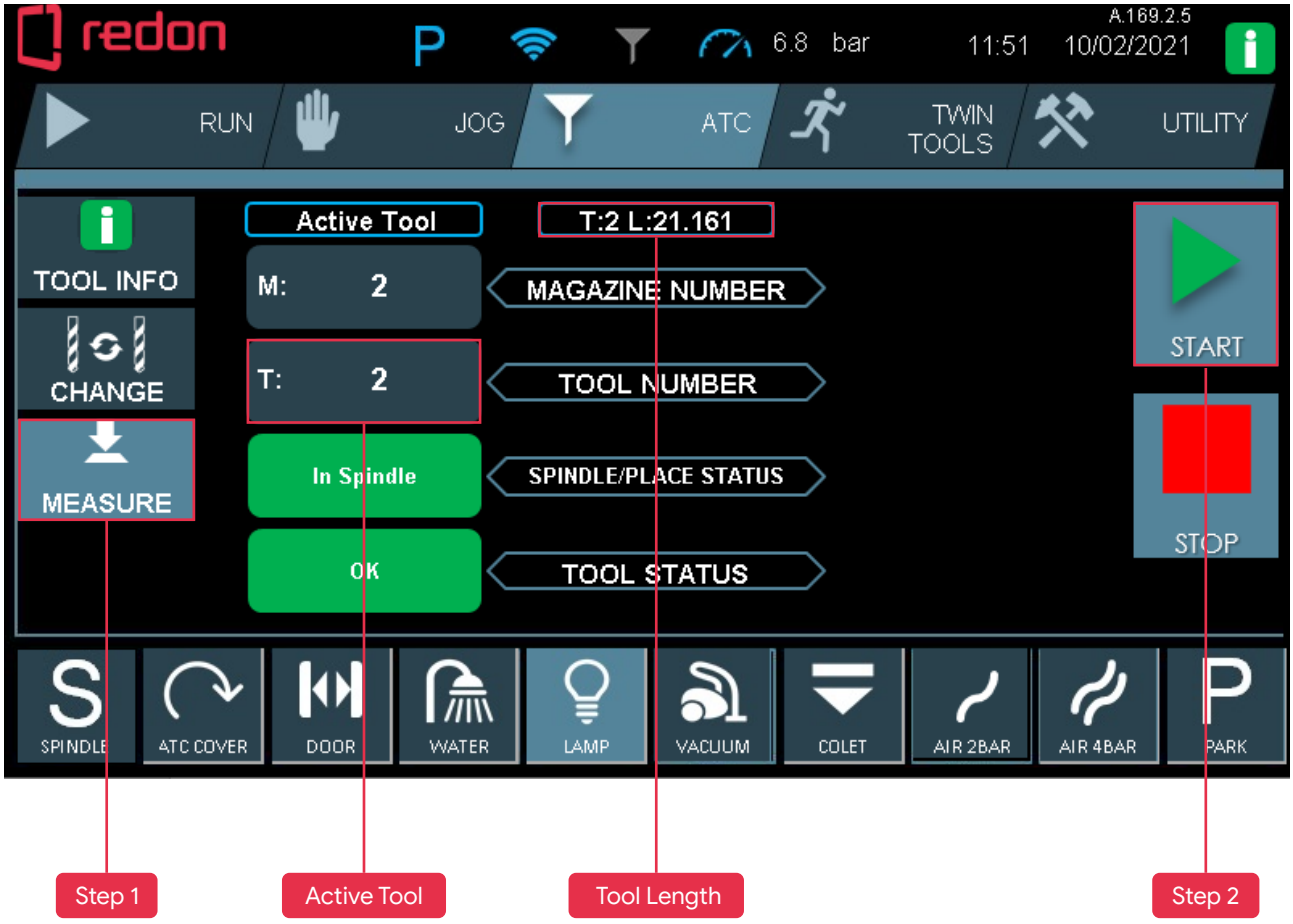


USER INTERFACE / ATC

6.2 The following screen appears when all of these operations are completed. Press the button after ensuring that the operation has been properly completed.

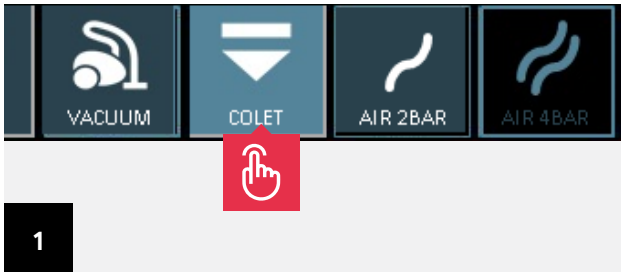
USER INTERFACE / ATC

7 The buttons located in red frames in the sample image above are completed in two steps: **Step 1 (MEASURE) and Step 2 (START). For example:** Since the active tool in the screenshot is tool 2, tool 2 will be measured.



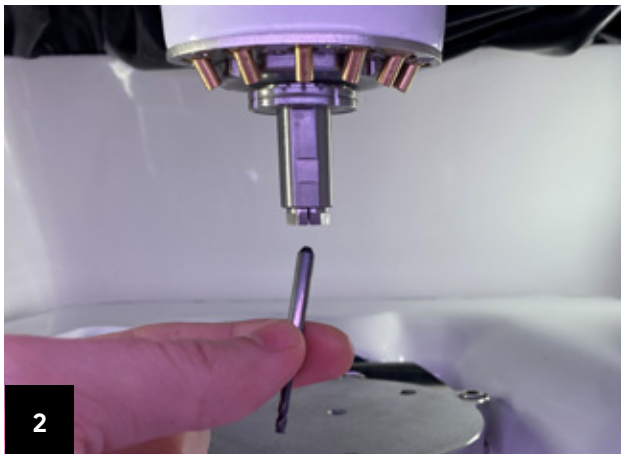
USER INTERFACE / ATC

ATC / CHANGE / Loading a Tool



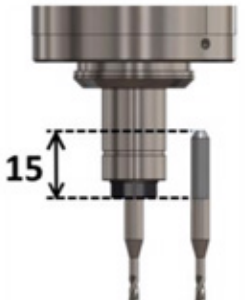
1 Press the **COLLET** button on the function bar. After the confirmation pop-up window is confirmed, the spindle collet will open.

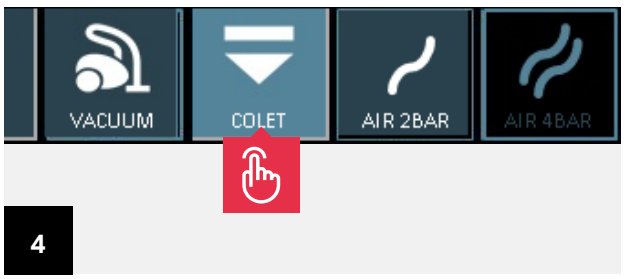
CAUTION! Please note that if there is a tool on the spindle and you do not hold it, it will fall to the ground when the collet opens.



2 Attach the new tool to the collet as shown in the image.

3 The back end of the tool must enter inside the collet up to a length of 15 mm.



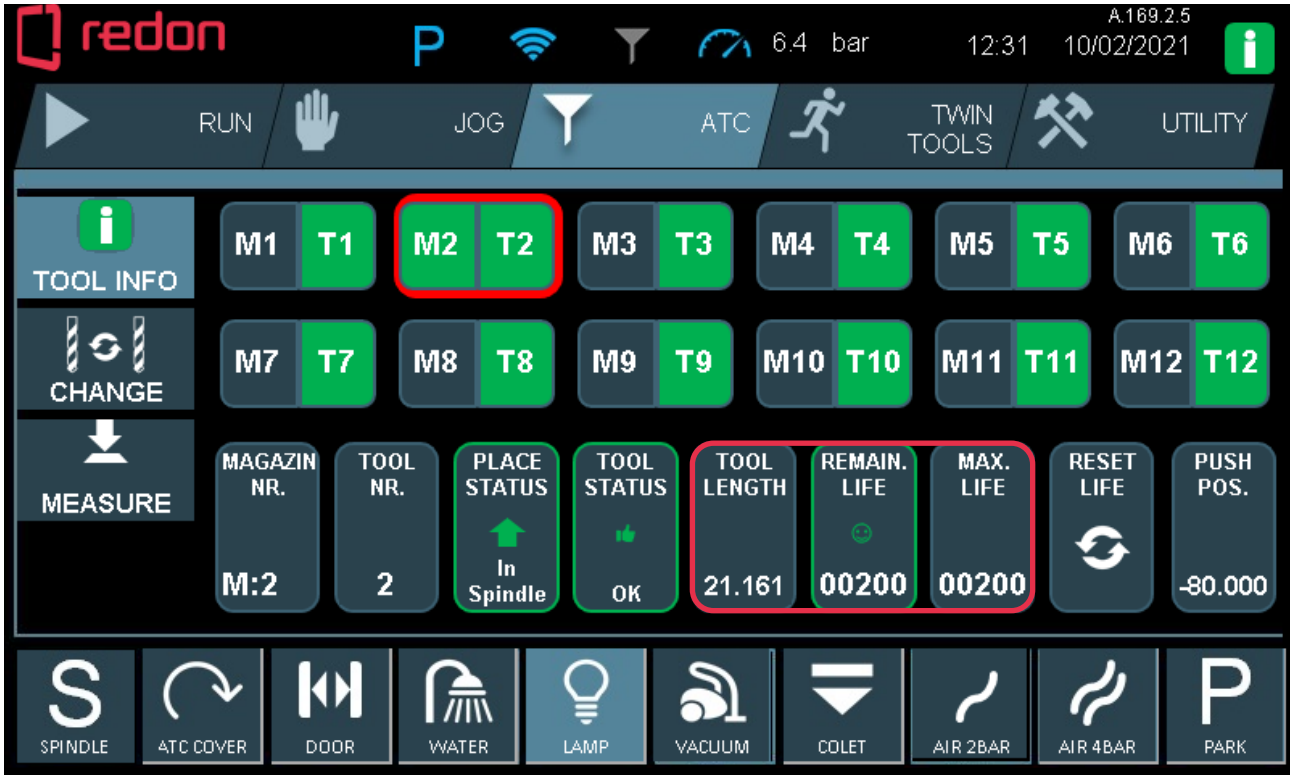


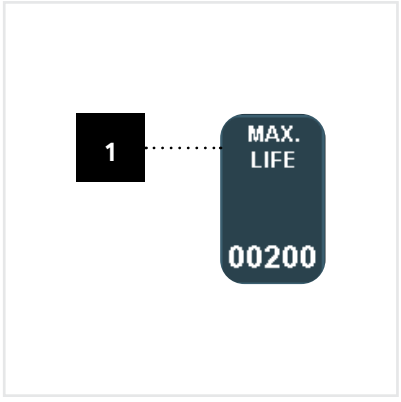
4 Press the COLLET button on the function bar again to close the spindle collet.

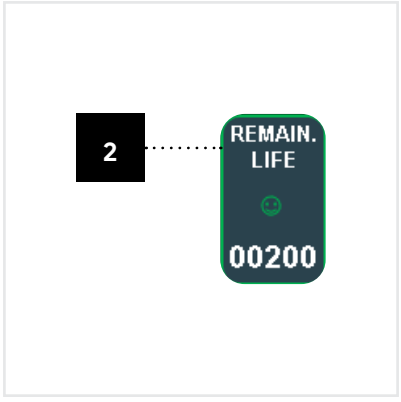
The tool loading operation has been completed.

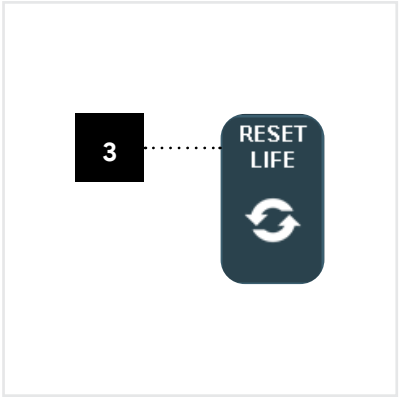
The same operation can also be performed for old or broken tools.

USER INTERFACE / ATC









1 **MAXIMUM LIFE:** Press the MAX. LIFE button and enter the tool life.

2 **REMAIN LIFE:** Indicates the remaining tool life.

3 **RESET LIFE:** Resets the tool life.

USER INTERFACE / ATC

Twin Tool

1 On the ATC-Twin Tool page, tools assigned to the magazines are shown. You can add or remove twin tools on the ATC page.

In the image, all tools are positioned on the magazine. Tool no. 12 is on the spindle.

The tools assigned on the ATC page are shown on the twin tool page. Since tool no. 12 is on the spindle in the image, M12 is highlighted in green. All other tools from 1 to 11 that are on the magazine are shown in dark blue.

USER INTERFACE / ATC

Twin Tool

2 After you finish adding tools on the ATC page, go to the TWIN TOOLS page to assign twin tools.

For example, if you want to assign tool no. T5 in place of tool no. T1; When you touch any tool button, the selection is encircled with red. The area encircled in red on the touchscreen corresponds to tool no. 1. When you select tool no. 1, the twin tools menu appears on the left side. The image shows that no selection has been made in the dropdown menu.

←

The image shows that M5 (5th position within the magazine) has been selected. This selection is indicated in orange. Once you make your selection, press the “OK” button to confirm the assignment operation.

USER INTERFACE / ATC

Twin Tool

T1 TW OF T5
indicates that T5 in M1 has been assigned to T1 as the twin tool.

T1 TW OF T5
indicates that T5 in M5 has been assigned to tool no. T1.

USER INTERFACE / ATC

Twin Tool

3 If you want to delete assigned twin tools; Touch the twin tool that you want to delete, and the magazine page will be displayed. When you click the green “OK” button, the twin tool deletion operation is performed.

After the twin tool is deleted, the touchscreen will appear as shown below.

←

USER INTERFACE / UTILITY

UTILITY

1 **UTILITY** This menu contains machine maintenance instructions, cleaning programs calibration menu, cover menu (to manually and independently open covers) and parameters menu (which includes machine parameters).

2 **MAINTENANCE:** This menu contains the maintenance instructions, wet automatic cleaning and dry automatic cleaning programs.

3 **CALIBRATION:** This menu allows you to perform automatic machine calibration. Calibration needs to be done upon ambient temperature changes of ± 5°C.

4 **DOOR ASYMETRIC:** This menu allows you to open and close the machine covers individually.

5 **PARAMETERS:** This menu includes the machine parameters.

USER INTERFACE / UTILITY

UTILITY / MAINTENANCE

When you select **MAINTENANCE** under **UTILITY**, a list of daily, weekly and yearly maintenance activities is shown.

1 **COLET CLEANING:** The COLLET is the sleeve attached to the end of the spindle. It allows tools to be automatically received and released. Cleanliness of the COLLET is very important and affects the precision of workpieces. If the COLLET is not kept clean, the COLLET and its housing will wear out over time. The COLLET can be replaced with a new one, but a highly worn out COLLET may damage the spindle housing, in which case the spindle will require replacement.

- **It should be cleaned every day.**
- **It should be cleaned when switching from dry to wet or from wet to dry processing.**

2 **MACHINING ROOM CLEANING:** Cleaning of the machine processing area. The machine processing area should be cleaned at the end of each work day. The tool changer and tools should also be included in this cleaning task. Places such as the vacuum channel and water drains should be cleaned on a daily basis to prevent clogging.

- **It should be cleaned every day.**
- **It should be cleaned when switching from dry to wet or from wet to dry processing.**

3 **TOOL CHANGER CLEANING:** Cleaning tools in the tool changers. Remove the tools from their nest and clean them away from substances such as dust, burrs and oil. Attach them to their nests again after cleaning.

- **They must be cleaned on a weekly basis.**

CAUTION! Tools must be attached to the same nests from which they were originally removed.

4 **AXIS LUBRICATION:** Lubrication of machine axes. This task must be performed by authorized service personnel.

- **It must be performed every year.**

USER INTERFACE / UTILITY

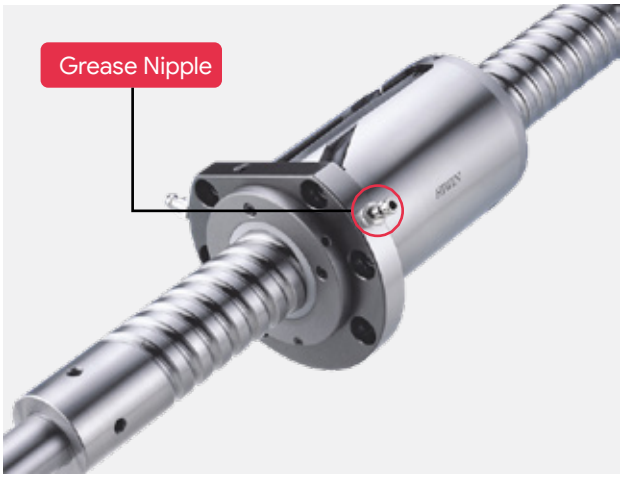
UTILITY / MAINTENANCE

1 **AUTO CLEAN BY AIR:** This function enables the machine to clean itself by 40%. While an automatic program moves the machine axes in all areas, the 6-bar air and the vacuum functions also automatically run at the same time.

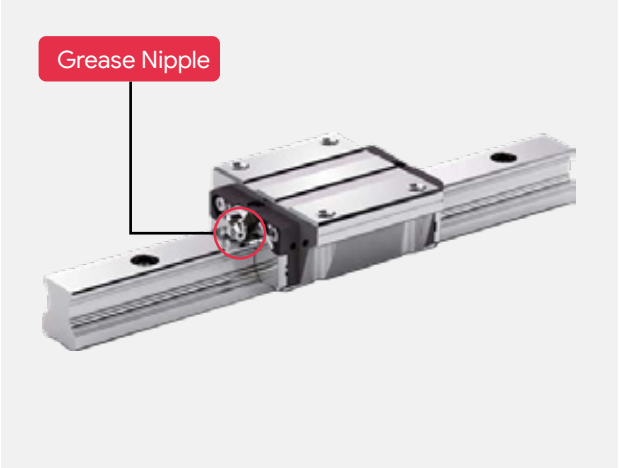
2 **AUTO CLEAN BY WATER:** This function enables the machine to clean itself by 60%. While an automatic program moves the machine axes in all areas, the water pump also automatically runs at the same time.

UTILITY / MAINTENANCE

YEARLY MAINTENANCE



1 Yearly maintenance must be performed for the ball screws. The grease nipples shown in the figure to the left must be lubricated every year.



2 Yearly maintenance must be performed for the rails. The grease nipples shown in the figure to the left must be lubricated every year.

3 The belts must be inspected every year, and if any problem is detected during yearly maintenance, they should be replaced.

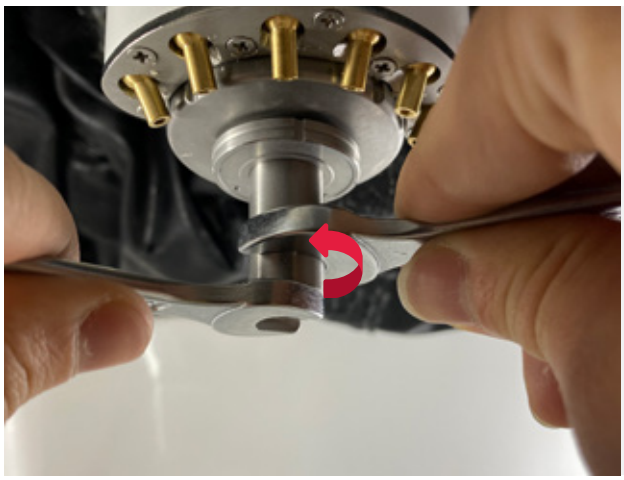
UTILITY / MAINTENANCE

DAILY MAINTENANCE

COLLET MAINTENANCE KIT

1. Brush
2. 17-mm open-end wrench
3. 22-mm open-end wrench
4. Ramrod

1 **Brush**
Use the brush to clean the collet.

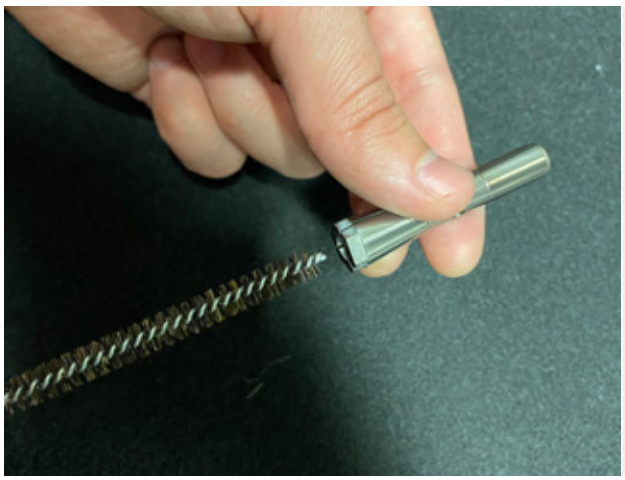


2 **Removing the Collet**
The collet is loosened by turning an 17-mm open-end wrench and 22-mm open-end wrench in opposite directions as shown in the image.

UTILITY / MAINTENANCE

DAILY MAINTENANCE

3 **Cleaning**
Use the ramrod to clean the spindle collet housing.



4 With the air supply on, the collet is removed by using the wrench included in the spindle maintenance kit. Use the ramrod to clean the collet.

UTILITY / MAINTENANCE

CLEANING / DRY CLEANING

1 The brush must not be used to clean the dust off the machine while the vacuum device is running.

2 While cleaning with the brush, the vacuum device must be turned on during the air cleaning stage. Dry cleaning should be thoroughly completed before switching to wet running.

UTILITY / MAINTENANCE

CLEANING / DRY CLEANING

3 After the air cleaning stage is completed, cleaning should be done with a clean damp cloth.

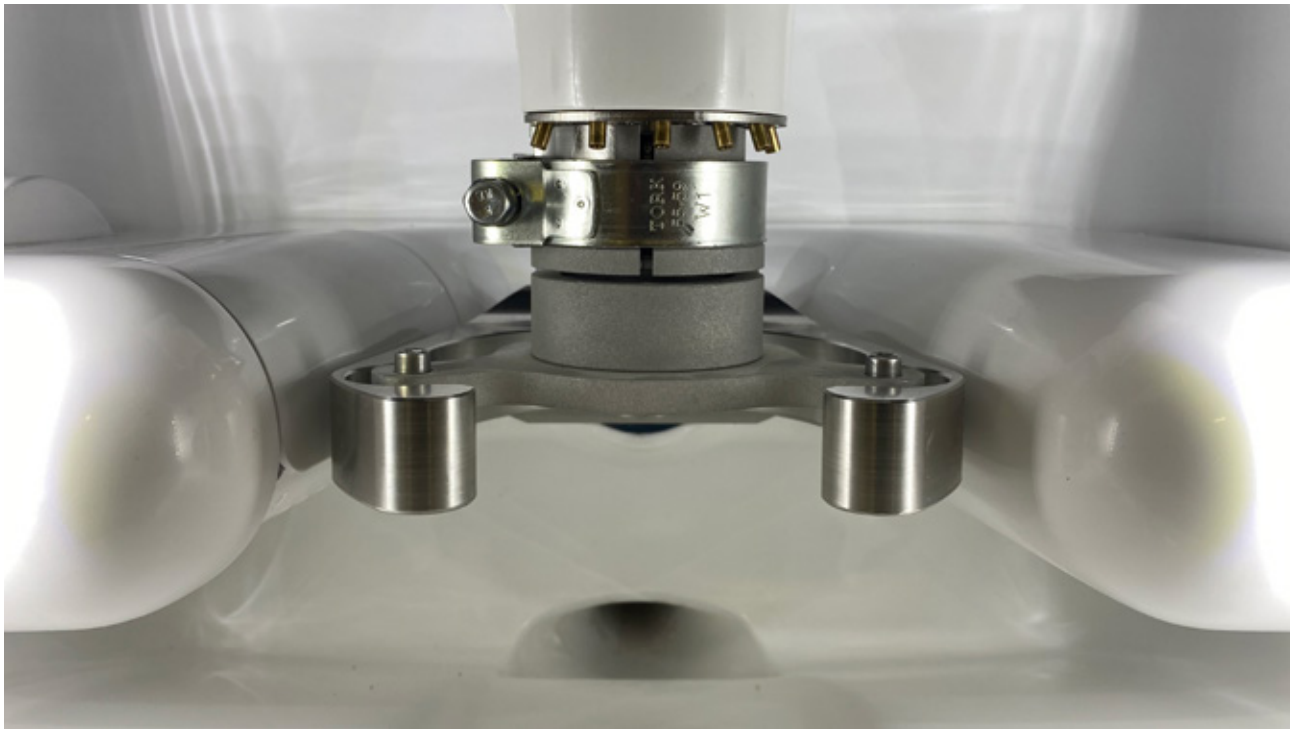
UTILITY / MAINTENANCE

CLEANING / WET CLEANING

1 The magazine area and the chips inside the machine should be washed away with water.
During cleaning, ensure that the water tank is connected to the water outlet of the machine.

EQUIPMENT

AXIS LOCKING GEAR



EQUIPMENT

WORKPIECE RETAINER

1 The lower ring is positioned as shown in the image. The workpiece is placed on the lower ring.

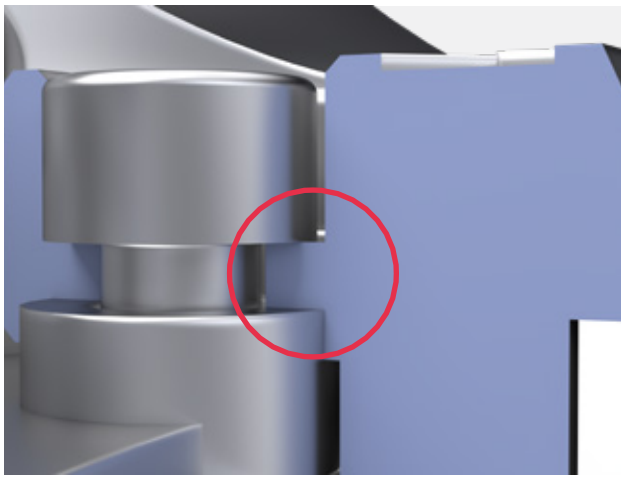
2 The workpiece and the lower and upper rings are fastened to each other with screws.

3 Ensure that there is no dirt or debris between the lower and upper rings and then join them as shown in the image.

EQUIPMENT

WORKPIECE RETAINER

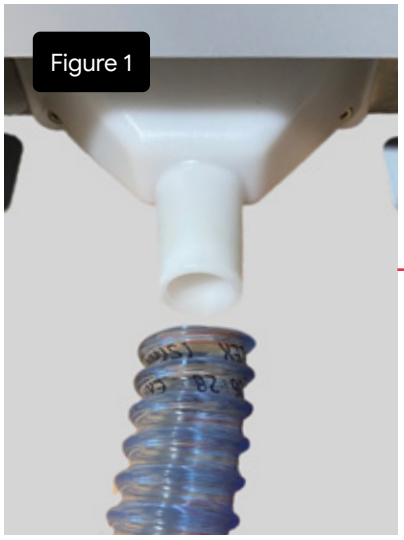
4 Attach the workpiece joined with the lower and upper rings to the block retainer with bolts as shown in the image.

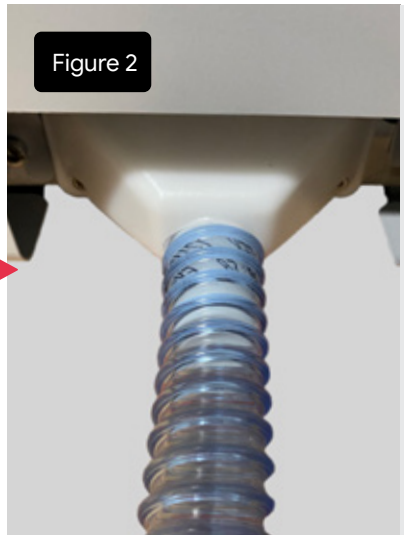


5 When attaching the workpiece fastened by the lower and upper rings to the block retainer, ensure that the bolts are secured to the surface on which they are tightened. The bolts must be tightened in a balanced manner.

EQUIPMENT

ATTACHING THE WATER HOSE

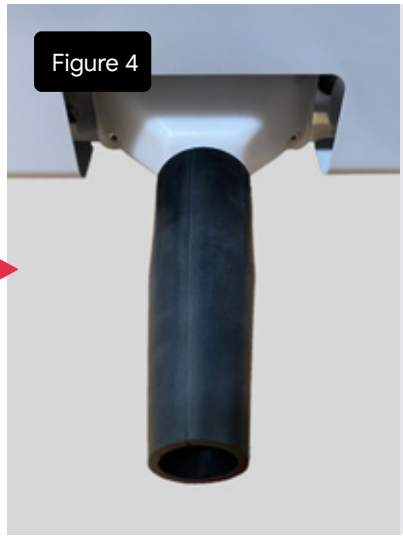




AIR AND WATER OUTLET APPARATUS

1 The air and water outlet apparatus has 1 outlet. When you want to work with water, connect the water hose to this outlet. When you want to work with air, connect the air hose to this outlet.

2 Position the water hose as shown in figure 1 and attach it as shown in figure 2. When the water process is complete, press the **Auto Air Clean** button under the **Utility/Maintenance** tab and run the machine in air cleaning mode for 15 minutes. After this operation, wipe the interior of the machine with a dry cloth. When all of these operations are completed, you can switch to dry running.



INSTALLING AIR HOSE APPARATUS

3 The air hose apparatus is shown in Figures 3 and 4. This apparatus is used when connecting the vacuum device to the machine. After dry running, the interior of the machine is cleaned by using the vacuum device. If you want to switch to wet running, the interior of the machine must be thoroughly cleaned before operation.

EQUIPMENT

AXIS LOCKING GEAR

The axis locking gear is used during shipment of the machine to prevent the axes of the machine from moving.

USER INTERFACE / UTILITY

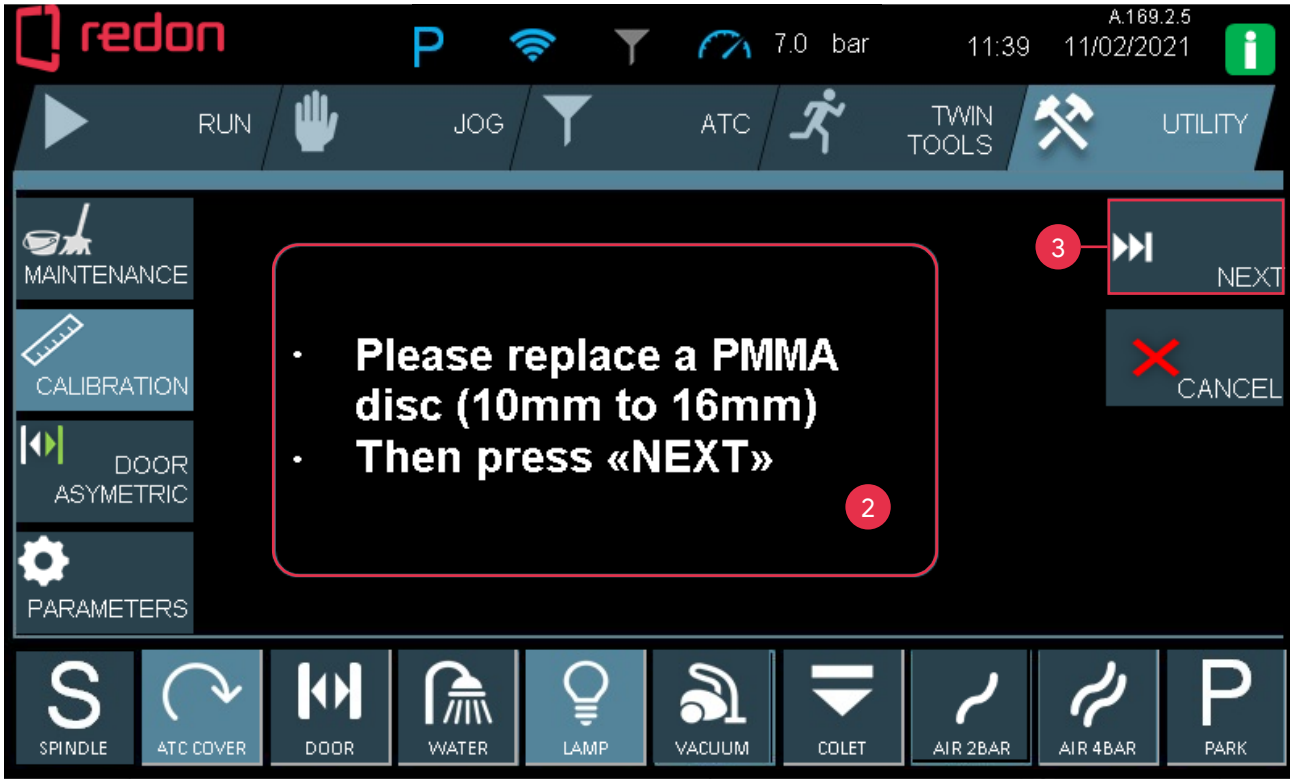
UTILITY / CALIBRATION

The machines are calibrated at an ambient temperature of 24°C. Any deviation of ±5°C from this ambient temperature requires calibration for precision purposes. Calibration is performed by measuring a special automatically processed part with a digital caliper and entering the measured values into the screen.

1 If you want to start the calibration process, press the **NEXT** button.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION

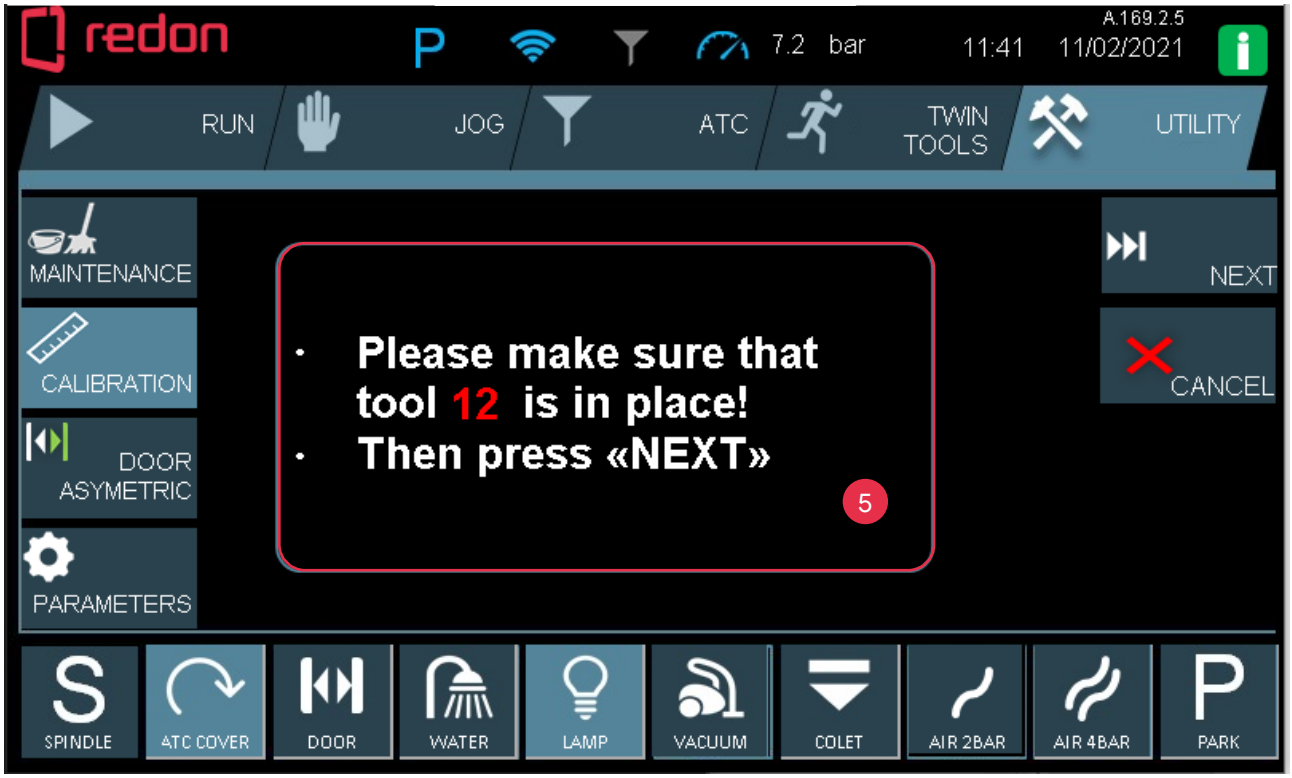


2 The calibration program will extract an 8 mm-long part from the 16 mm-thick PMMA block. Therefore, a PMMA block of any thickness between 16 mm and 10 mm must be used. The block is fastened to the holder.

3 Press the **NEXT** button to continue.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION

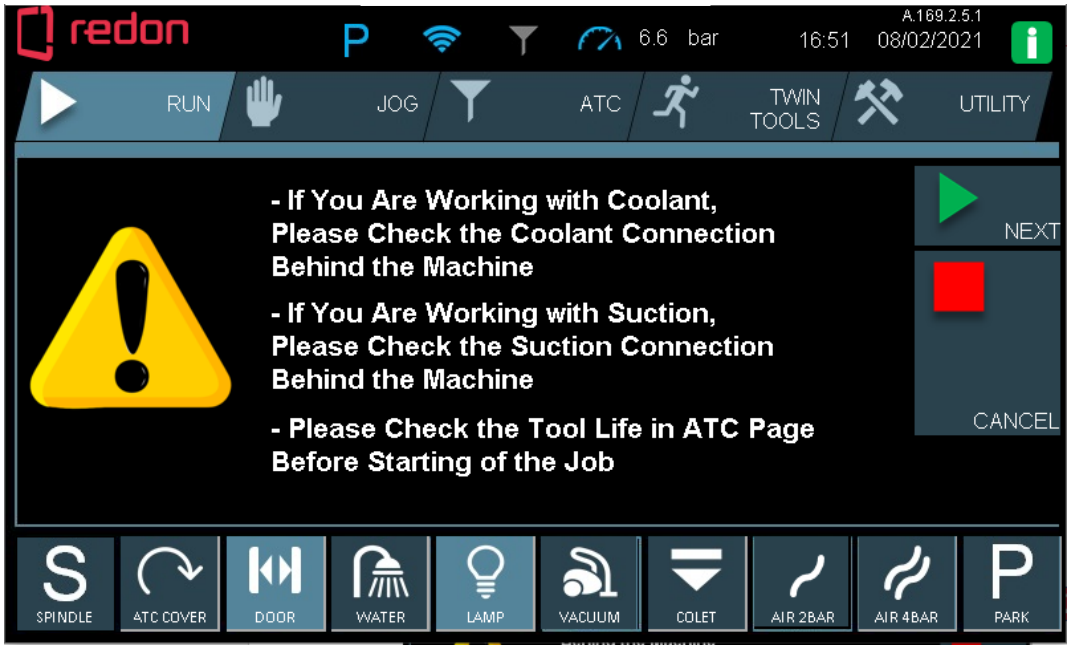


5 The calibration program uses tool number **12** (D2mm, L14mm Flat). Therefore, ensure that tool number 12 is in place before operation. If it is not in place, cancel the operation by pressing **CANCEL**, and then manually load tool number 12. After that, restart the operation.

6 Press the **NEXT** button to continue.

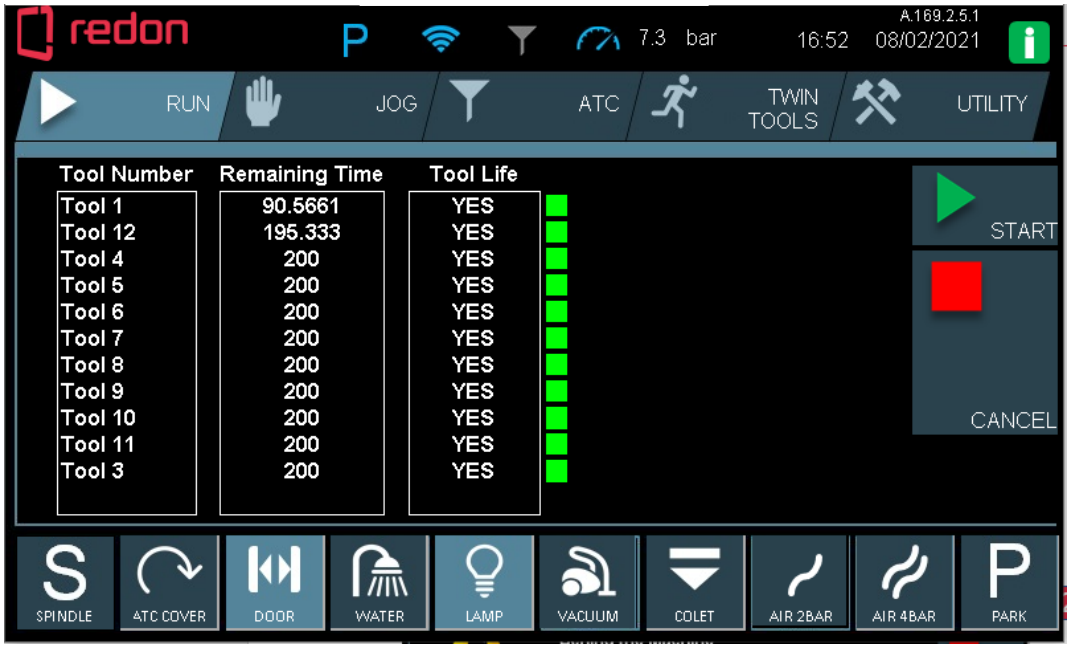
USER INTERFACE / UTILITY

UTILITY / CALIBRATION



WARNING 1

7 Press the **NEXT** button to continue.

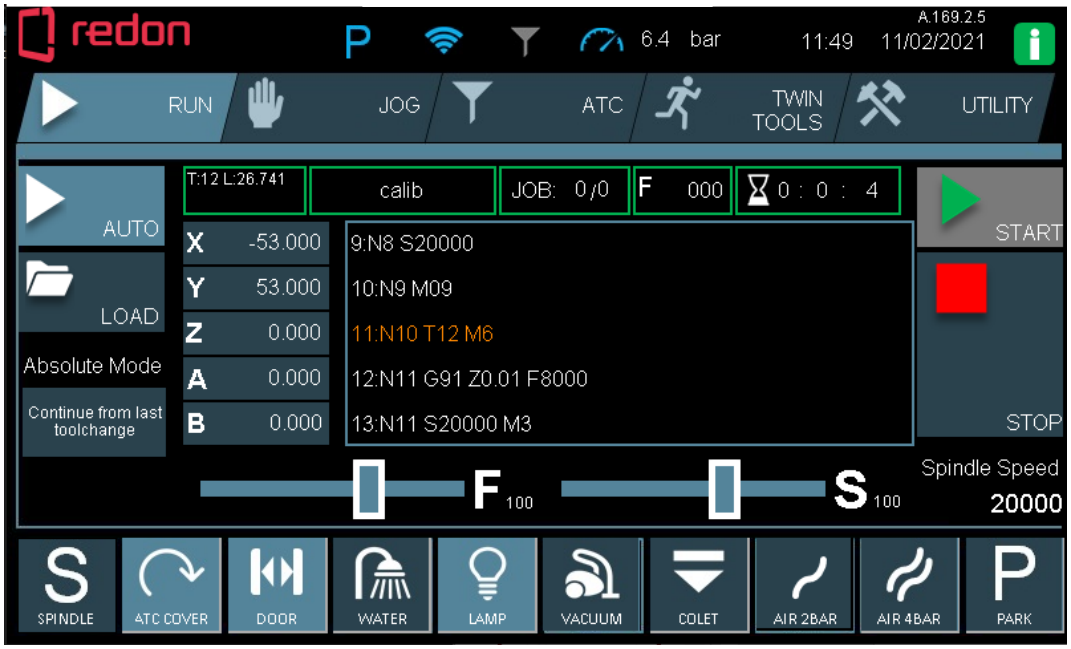


WARNING 2

8 Press the **START** button to initiate calibration.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION



7 Press the **START** button to start processing.

8 Press the **STOP** button to stop processing.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION

The caliper must be reset before starting the calibration process.

Ensure that the caliper is fully closed and that there is no dust or dirt between the fixed jaw and moving jaw.
Reset the caliper.

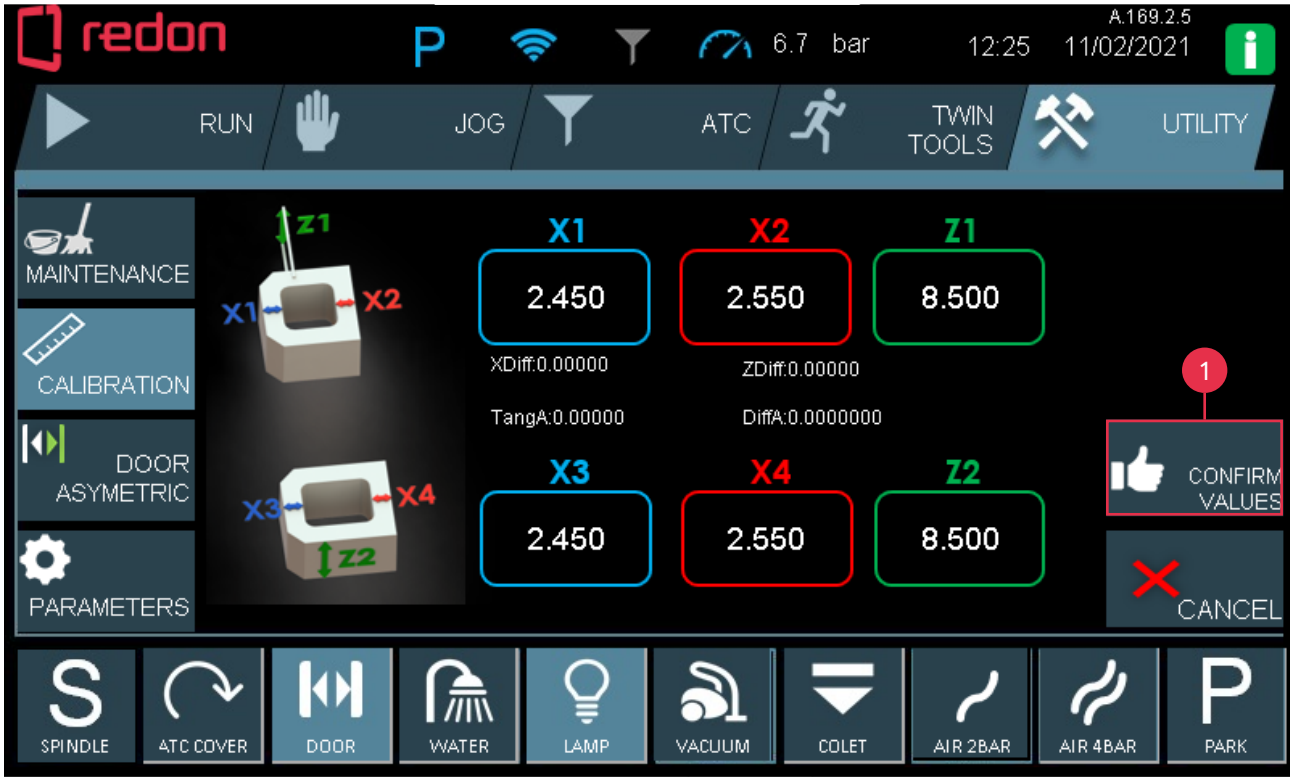
←

The caliper's screen will appear as above.

←

USER INTERFACE / UTILITY

UTILITY / CALIBRATION



After processing is completed, the above screen is displayed. **X1, X2 and Z** values are measured with a digital caliper. The values are entered in the respective windows on the screen.

CAUTION

- The digital caliper must be reset before use.
- Ensure that there are no burrs anywhere on the calibration piece. (Burrs may result in inaccurate measurements.)
- Each measurement must be taken at least 3 times.
- Ensure that the right values are entered in the right windows.
- The values entered must be reviewed.
- Please note that any incorrect value may cause the machine to hit the workpiece or any part of it.

1 After entering the values, press the **CONFIRM VALUES** button.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION

The warning screen will alert you as to whether the entered values are correct or not.

1 If you are not sure about whether you entered the correct values or not, press the **CANCEL** button and then enter the values again.

2 If you are sure that you have entered the correct values, press the **CONFIRM VALUES** button. If you select the (Confirm) button, the calibration process will start. After the calibration is finished, the piece will be measured. This process continues until X1, X2 and Z values are within the ±0.01 tolerance range.

USER INTERFACE / UTILITY

UTILITY / CALIBRATION

1 Press the **CONFIRM VALUES** button to confirm the process.

USER INTERFACE / UTILITY

TOOL LIST

MILL NO	CODE	DESCRIPTION
T1	ZRB2-15	Ø2 mm BallMill - Zirconia
T2	ZRB1-15	Ø1 mm BallMill - Zirconia
T3	ZRB0.6-10	Ø0.6 mm BallMill - Zirconia
T4	PMB2-15-KRC	Ø2 mm BallMill - PMMA
T5	PMB1-15-KRC	Ø1 mm BallMill - PMMA
T11	GCB2.5-18-MDN	Ø2.5 mm BallMill - Glass Ceramic
T14	GCB1-10-MDN	Ø1 mm BallMill - Glass Ceramic
T15	GCC1-15-WNC	Ø1 mm Conical Ballmill - Glass Ceramic
T16	GCC1-11-MDN	Ø0.6 mm Conical Ballmill - Glass Ceramic
T21	MET4-12-N	Ø4-R1 mm Torus - Metal
T22	MET2.5-10-N	Ø2.5-R1 Torus - Metal
T23	MEB2-12-N	Ø2 mm BallMill - Metal
T24	MEB1.5-10-N	Ø1.5 mm BallMill - Metal
T25	MET1.5-6-N	Ø1.5-R0.2 mm Torus - Metal
T26	MEF1.5-6-N	Ø1.5 mm Flat - Metal
T27	MEF1.5-20-N	Ø1.5 mm Flat Long - Metal
T28	MEF1-10-N	Ø1 mm Flat - Metal
T29	MEB1-8-N	Ø1 mm Ballmill - Metal
T30	MEB0.6-3-N	Ø0.6 mm Ballmill - Metal
T31	MEF0.5-3-N	Ø0.5 mm Flat - Metal
T32	MEB0.3-2-N	Ø0.3 mm BallMill - Metal
T33	MEF0.3-1.5-N	Ø0.3 mm Flat - Metal

USER INTERFACE / UTILITY

TOOL LIST

MILL NO	CODE	DESCRIPTION
T51	2002 145-230-5-45S	Astra Tech Implant System™ 3,0 / Xive® 3,0
T52	2003 165-250-5-90S	Astra Tech Implant System™ 3,5-4,5 / Intralock Multiunit / Imp.Direct 3,0 / Osstem® Mini / Nobel Active™ NP (Flat Screw
T53	2004 205-265-6-90S	Astra Tech Implant System™ 4,5-5,5 / Nobel Replace Select™ 4,3-6,0 / Intralock SQ / Intralock STD / Biolok / Nobel Active™ RP (Flat Screw)
T54	2005 165-240-5-35S	Nobel Active™ NP
T55	2006 205-260-5-35S	Nobel Active™ RP
T56	2007 185-260-5-90S	Zimmer® 3,5-5,7 / Nobel Replace Select™ 3,5
T57	2008 165-240-5-15S	Straumann / Bone Level®
T58	2009 205-260-5-45S	SynOcta® RN / Osstem® Regular / Implance 4,3
T59	2010 185-240-6-60S	Bredent Medical® 3,5-5,5
T60	2011 165-265-5-15S	ICX®
T61	2012 71 240 165 5S	Isy by Camlog
T62	2013 165-240-5-55S	Biomet 3i® 3i 4,1
T63	2014 165-240-5-45S	SynOcta® NN / Tapered Screw-Vent® / Xive® 3,5-5,5 /Osstem® Mini
T64	2015 165-240-6-60S	Bredent Medical® Mini 2,8-3,2 / Argon K3 3mm
T65	2016 148-230-4-35S	Nobel Active™ 3,0 / Straumann ProArch® / BEGO Semados® Multiunit
T66	2017 145-230-4-90S	Nobel Active™ Multiunit
T67	2018 205-265-5-22S	TBR Octagon
T68	2019 205-265-5-15S	SynOcta® WN 6,5
T69	2020 190-265-5-15S	Dyna
T70	2021 185-260-5-35S	BEGO Semados®
T71	2022 145-220-5-30S	Thommen Medical® 3,5
T72	2023 165-240-5-30S	Thommen Medical® 4,0 -5,0
T73	2024 205-265-5-60S	Megagen
T74	2001 45 240 165 8S	Alphatech

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