EPSON

ML-32000-340
ML-32000-180 / ML-16000-180
Operation Guide

Original instructions

M00139408EN
Rev.I

Cautions

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Manual Organization

The manuals for the product are organized as shown below.
The latest manuals are available from qualified service personnel.

- ML-32000-340 / ML-32000-180 / ML-16000-180 Safety Precautions:
  This manual explains the safety precautions. Make sure you read this manual to perform operations safely.
- ML-32000-340 / ML-32000-180 / ML-16000-180 Operation Guide:
  This manual explains how to use the printer.
- ML-32000-340 / ML-32000-180 / ML-16000-180 Maintenance Guide:
  This manual explains how to perform maintenance of the printer.
- Leonardo Reference Guide:
  This manual explains how to use Leonardo.

Images Used in this Manual

The images used in this manual may differ from your machine.
Unless otherwise stated, this document uses images of the ML-32000-180.

Important Safety Information

This section describes the symbols that are used both in this manual and on this machine.
Be sure to read this manual and the separate "Safety Precautions" carefully before using this machine. Store this manual in a safe location where it can be easily referred to whenever you have a question.

Symbols in This Manual

The following symbols are used in this manual and on this machine to ensure that this machine is used safely and correctly in order to prevent injury to the user and other persons and damage to property.
Please carefully read and understand these warnings before using this machine.

Symbols in This Manual

 WARNING	This symbol indicates that incorrect operation could result in death or serious injury.
 CAUTION	This symbol indicates that incorrect operation could result in injury and/or damage to property.
	This symbol indicates a supplementary explanation or additional information that the user should know.

				
Indicates actions that must not be taken (prohibited actions).	Indicates actions that must be taken and/or instructions that must be followed.	Do not disassemble	Do not touch	No flames
				
Eye protection required	Protective gloves required	Protective clothing required	Respiratory protection required	Hair net required

User Permissions

	This symbol indicates user permissions for general users who have been trained in the operation of the machine by Epson or an H user, to perform cleaning and simple maintenance procedures while protective devices are engaged and the machine is set to normal operation on the button panel. "L" is assigned to the operator of the machine.
	This symbol indicates user permissions for users who have been officially trained in the operation of this machine by Epson or an H user, to perform some functions and maintenance procedures that are allowed in addition to all of the functions for L. "H" is assigned to the machine administrator, who manages maintenance keys and is in control of jobs in general. This user must inform User L of the information in this manual, and have access to the manual at all times. Checks and maintenance can be performed routinely or in unusual situations only if formal training has been received from Epson or an H user. It is strongly recommended to make all L users aware of their responsibilities when operating this machine. To that end, it is also important to collect from them all information regarding recommendations, complaints, suggestions, and anomalies that might occur.

Contents

Name and Function of Each Part

Front

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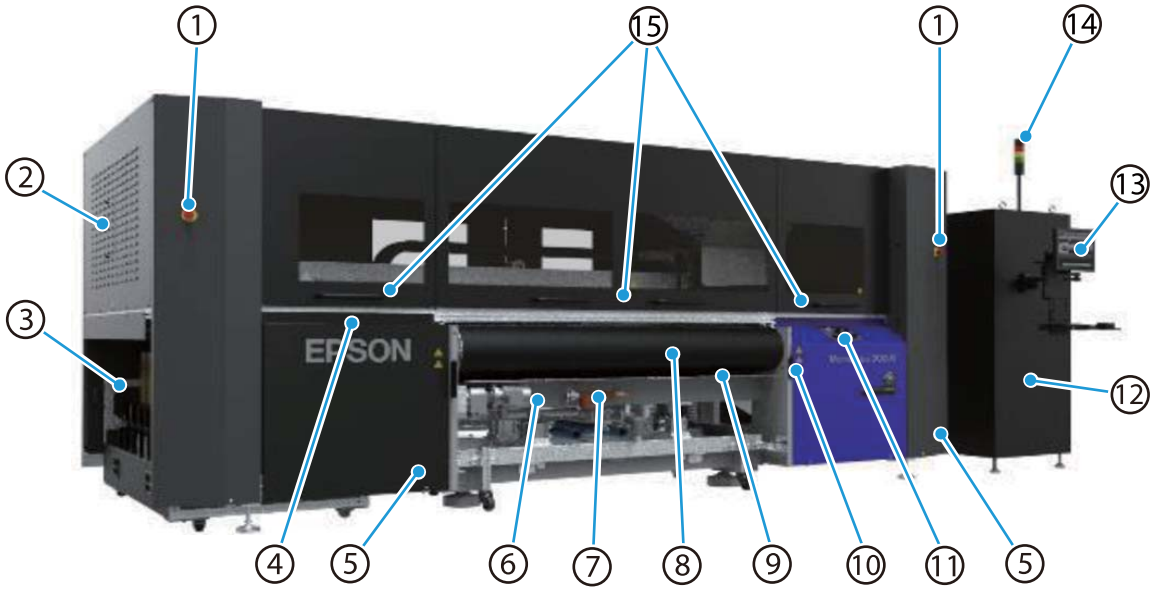

No.	Name	Description
1	Emergency stop button	Stops operation of this machine immediately.
2	Mist filter cover	Use this maintenance window to clean/replace the mist filter.
3	Ink rack	Houses the ink cartridge.
4	Pause button	Printing is paused and the print head comes to a stop either on the flushing plate or at the cleaning station area.
5	Waste ink tank	Waste ink collects in this tank. Two locations: At the bottom of the flushing plate and at the bottom of the cleaning station.
6	Belt cleaning unit	Cleans ink and other foreign material adhering to the belt. Open this cover to clean the cleaning brushes and scrapers.
7	Water supply valve	This is the water supply valve on the belt cleaning unit.
8	Belt	This belt feeds fabric attached to it.
9	Entanglement detection sensor	Located on the lower front side of the belt. Prevents hands and fingers from becoming caught in the belt. It is installed on the belt cleaning unit.
10	Tangled fabric detection sensor	Located on the front side of the belt. Prevents fabric from becoming caught in the belt.
11	Front panel	Location of the operating panel for performing operations on the front of the machine. (Page 23)

No.	Name	Description
12	Main electric box	Supplies power and houses the control PC. (Page 22)
13	Control PC	Used to control Leonardo from the main unit.
14	Tower lamps	These lamps indicate the status of the machine. • Red On: Fault status (Emergency stop or device error) • White Flashing: Machine currently operating • Green On: Printing standby status Flashing: Printing paused status • Blue On: Operator action required
15	Front cover	These are movable covers. Open these covers to clean and perform maintenance on the belt, caps & wipers, scan spindle, and flushing plate.

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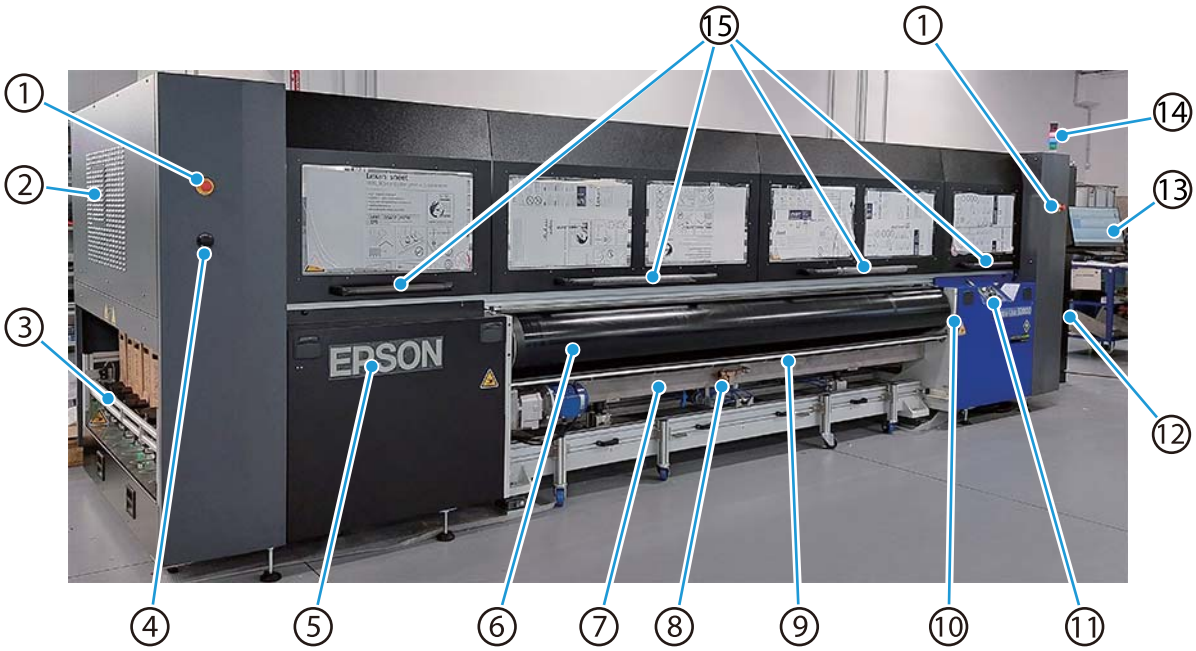

No.	Name	Description
1	Emergency stop button	Stops operation of this machine immediately.
2	Mist filter cover	Use this maintenance window to clean/replace the mist filter.
3	Ink rack	Houses the ink cartridge.
4	Pause button	Printing is paused and the print head comes to a stop either on the flushing plate or at the cleaning station area.
5	Front left cover	
6	Belt	This belt feeds fabric attached to it.
7	Belt cleaning unit	Cleans ink and other foreign material adhering to the belt. Open this cover to clean the cleaning brushes and scrapers.
8	Water supply valve	This is the water supply valve on the belt cleaning unit.
9	Entanglement detection sensor	Located on the lower front side of the belt. Prevents hands and fingers from becoming caught in the belt. It is installed on the belt cleaning unit.
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15	Front cover	These are movable covers. Open these covers to clean and perform maintenance on the belt, caps & wipers, scan spindle, and flushing plate.

Front Section Interior

Parts equipped vary depending on the model. Check your printer and understand how to use it.

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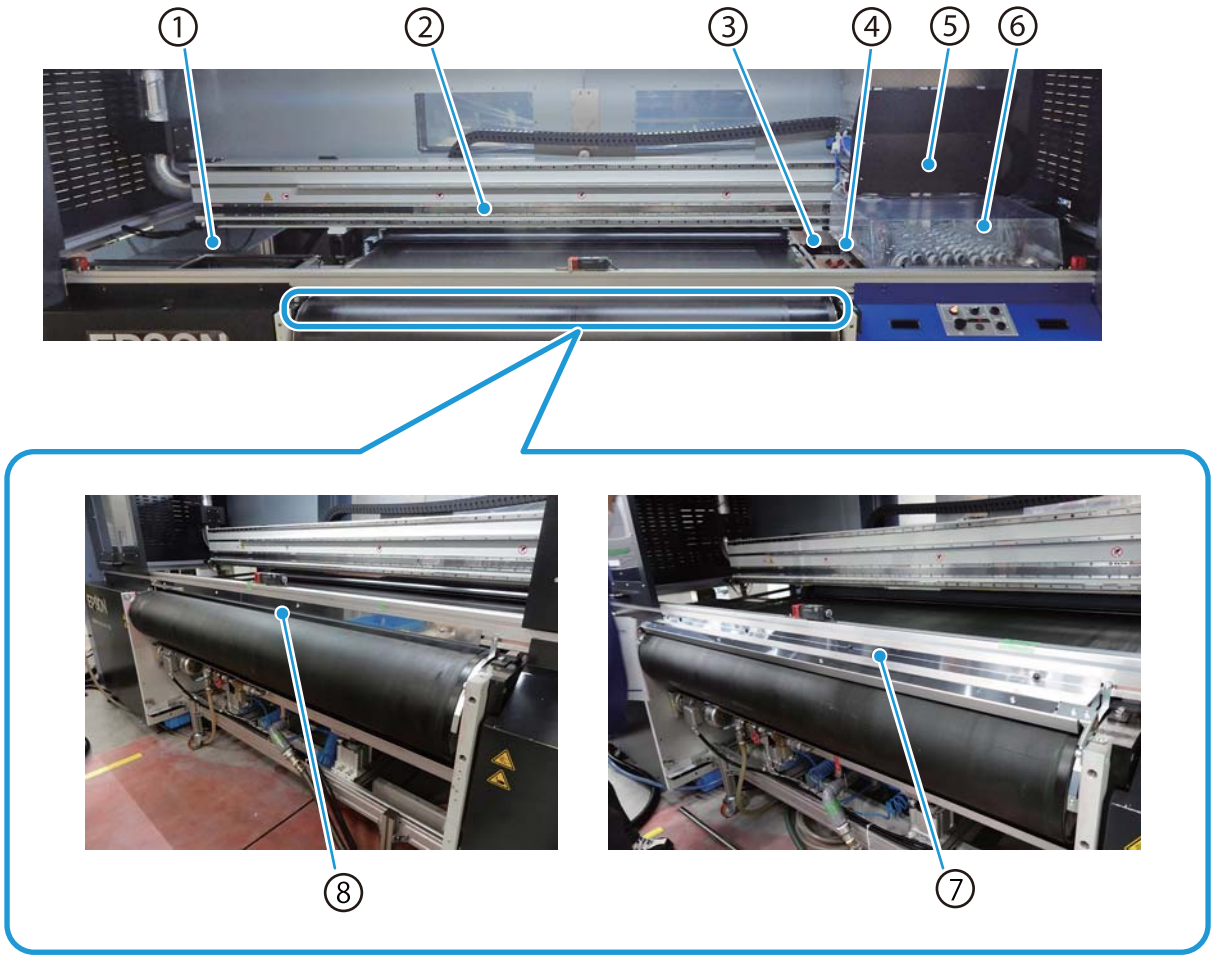

No.	Name	Description
1	Flushing plate	The print head flushes the ink here.
2	Scan spindle	Spindle along which the print head moves from side to side.
3	Cleaning station	Caps and wipers are located at the top, for performing cleaning and replacement. For models with waste ink tanks, a waste ink tank is installed at the bottom of the cleaning station.
4	Head stroke sensor	Detects foreign material on the belt as well as folds and wrinkles in the fabric.
5	Cooling fan	Lowers the temperature of the print head control substrate.
6	Print head	Equipped with the print head used for printing on fabric.

No.	Name	Description
7	Fabric slack prevention unit	This prevents the fabric from floating up when winding the printed fabric in the dryer or the like. Some machines are not equipped with the fabric slack prevention unit. If you would like to install a fabric slack prevention unit, contact qualified service personnel.
8	Fabric peeling prevention bar	This bar prevents the fabric from floating up when winding the printed fabric in the dryer or the like. Some machines are not equipped with the fabric peeling prevention bar.

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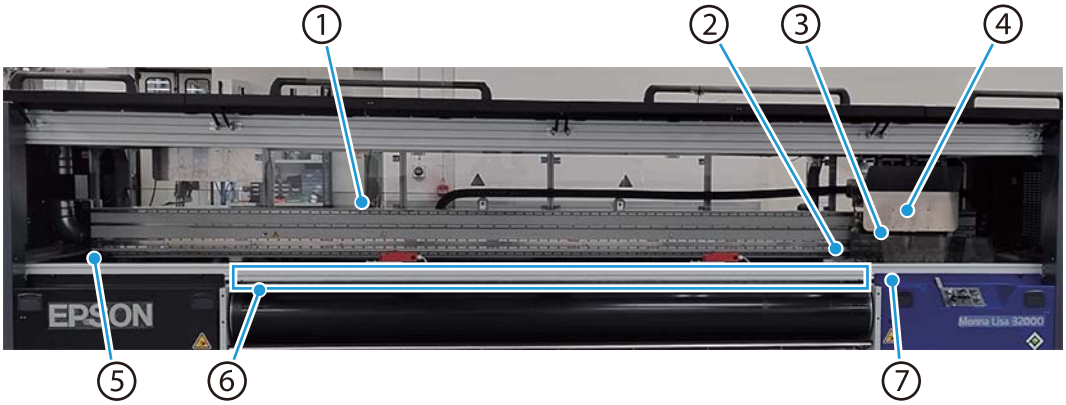

No.	Name	Description
1	Scan spindle	Spindle along which the print head moves from side to side.
2	Head stroke sensor	Detects foreign material on the belt as well as folds and wrinkles in the fabric.
3	Print head	Equipped with the print head used for printing on fabric.
4	Cooling fan	Lowers the temperature of the print head control substrate.
5	Flushing plate	The print head flushes the ink here.
6	Fabric peeling prevention bar	This bar prevents the peeled part of the fabric from floating up when winding the printed fabric in the dryer. Adjust the height of the bar whenever changing the fabric type or thickness. For more information, refer to "Adjusting the Fabric Peeling Prevention Bar" on Page 114.
7	Cleaning station	Caps and wipers are located at the top, for performing cleaning and replacement.

Rear

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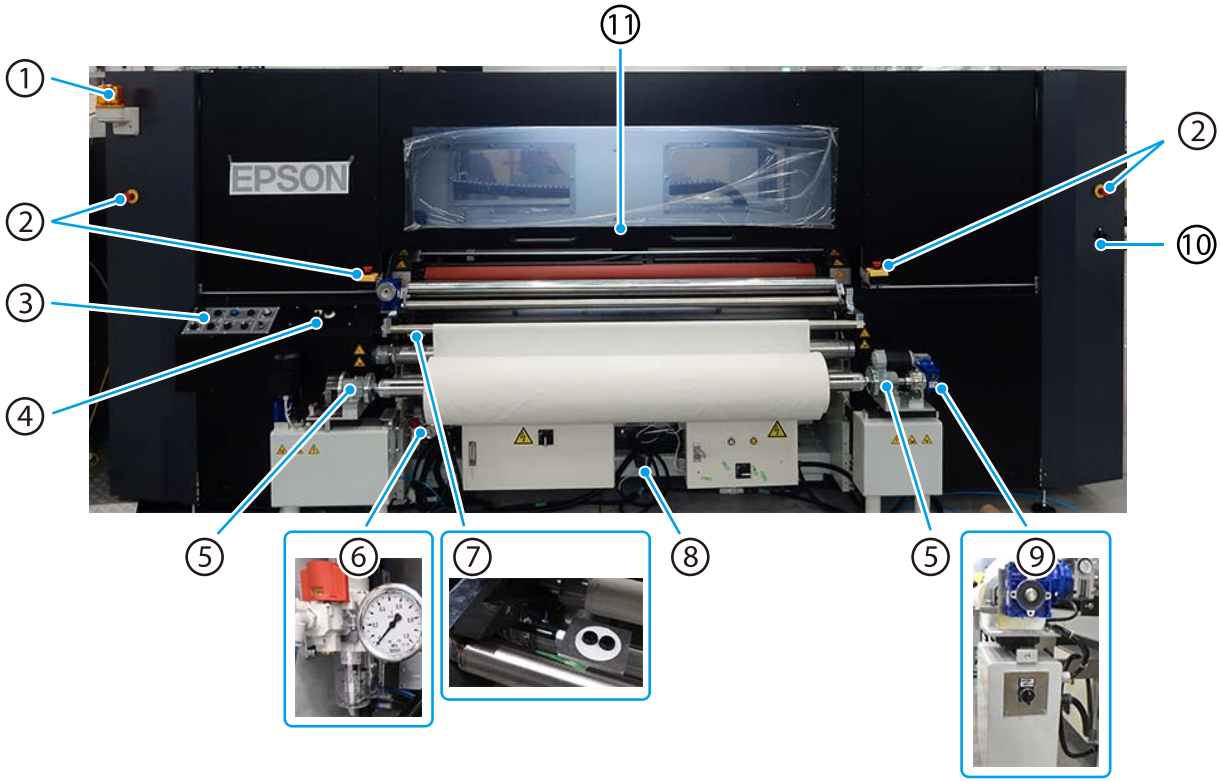

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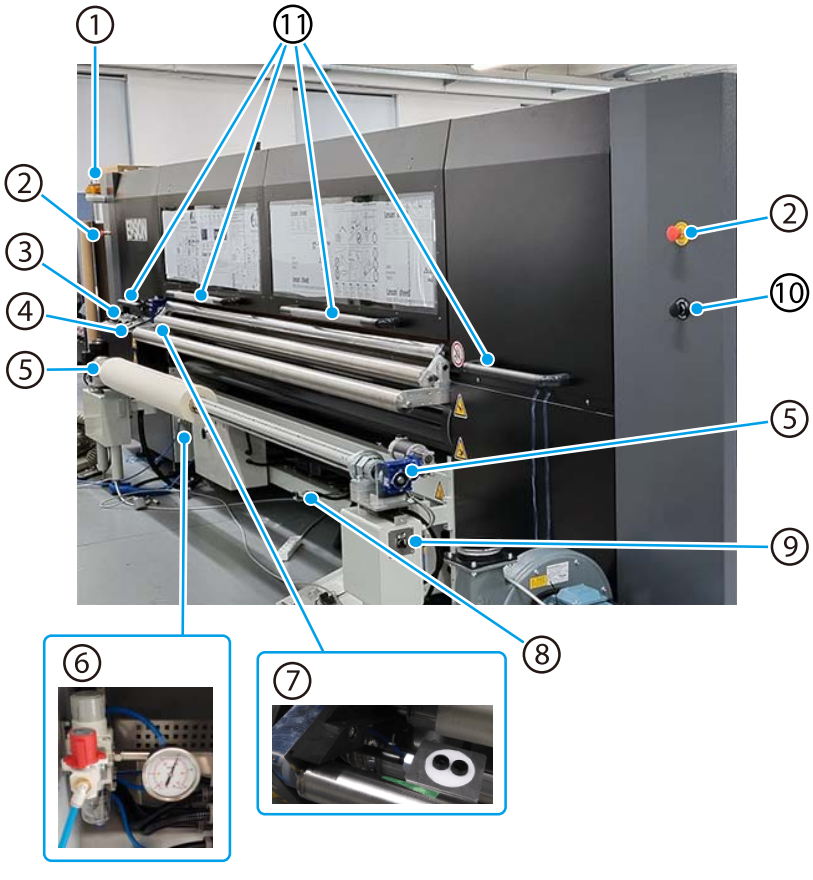

No.	Name	Description
1	Rotary beacon	Lights up and the buzzer sounds if the rear cover is opened while the machine is printing.
2	Emergency stop button	Stops operation of this machine immediately.
3	Rear panel	Location of the operating panel for performing operations on the rear of the machine. (Page 24)
4	Fabric tension adjustment panel	Use this panel to adjust the winding tension of the fabric. (Page 26)
5	Feeding unit	The fabric roll is installed here, and the unit feeds the fabric into the machine.
6	Air supply regulator	This regulator supplies compressed air.
7	Fabric edge sensor unit	This sensor detects the left edge position of the fabric.
8	Slack sensor	This sensor detects slack in the fabric.
9	Slack adjustment switch	In slack mode, the machine feeds out fabric to create slack.
10	Pause button	Printing is paused and the print head comes to a stop either on the flushing plate or at the cleaning station area.
11	Rear cover	These are movable covers. Open these covers to perform maintenance.

Rear Section Interior

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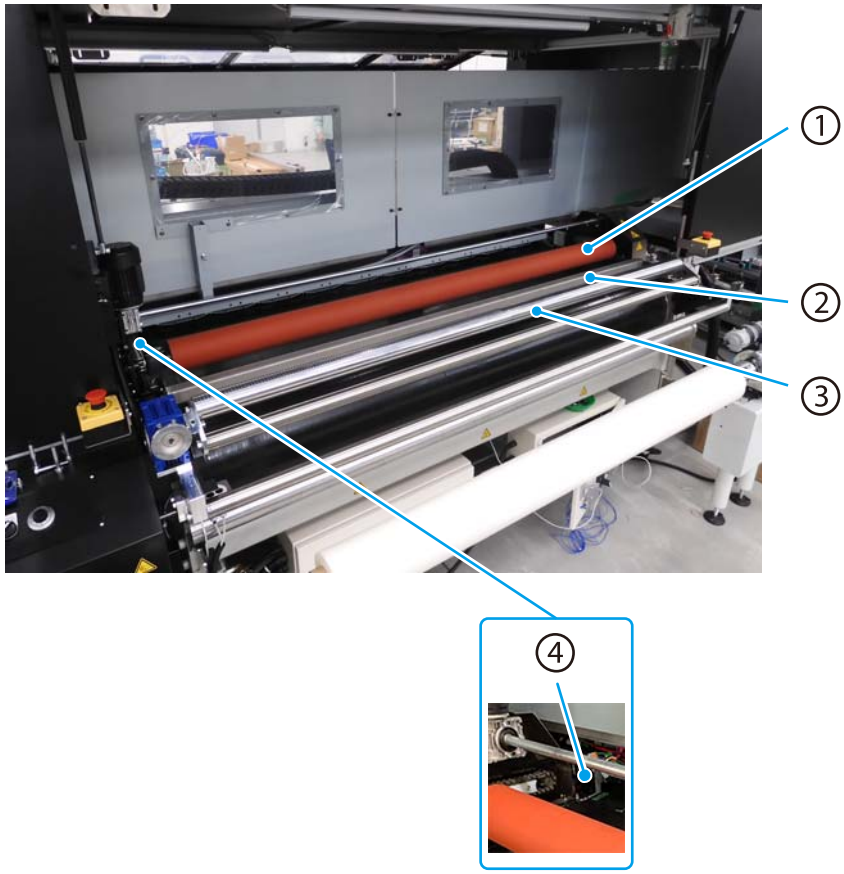

No.	Name	Description
1	Pressure Roller	This roller swings above the fabric that is fed from the fabric guide bar, to affix the fabric to the belt.
2	Fabric guide bar	Fabric that is sent from the dewrinkling roller is lowered to the height of the belt and guided to the pressure roller.
3	Dewrinkling roller	Spreads the fabric side to side to remove wrinkles.
4	Foreign material detection sensor	Detects foreign material on the fabric, or areas where the fabric has been lifted up, and prevents them from colliding with the print head.

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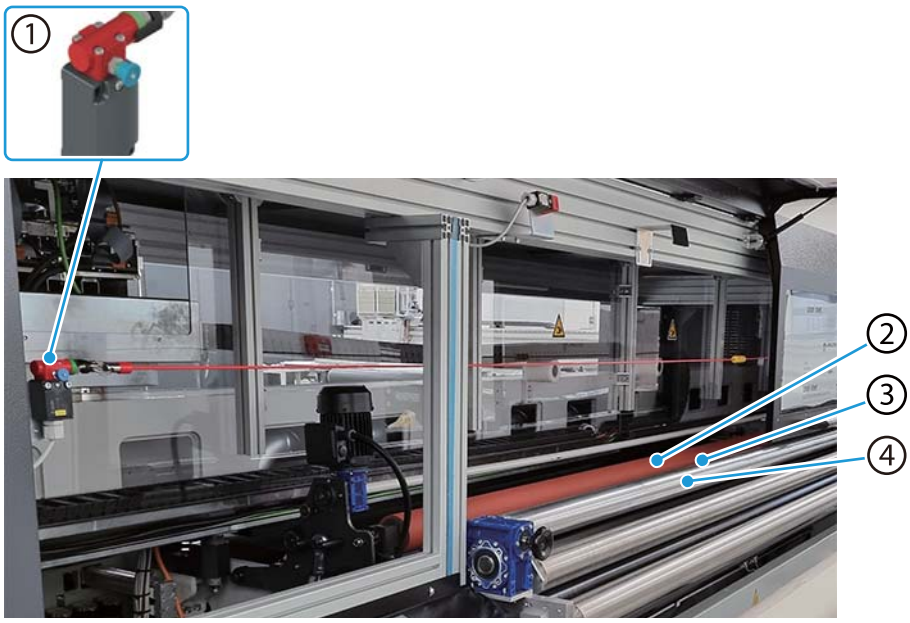
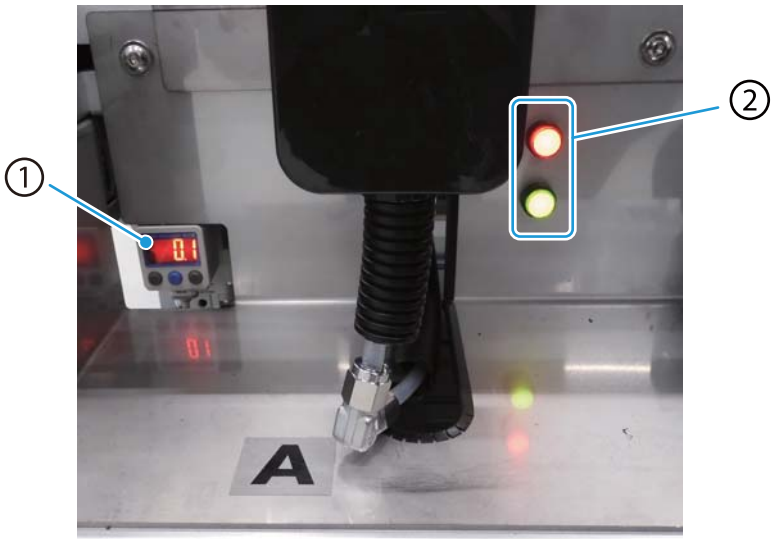


No.	Name	Description
1	Emergency pull-wire switch	If you pull the rope, the operation of this machine will stop immediately. Pull the blue lever to release the emergency stop state. It has the same function as the emergency stop button.
2	Pressure roller	This roller swings above the fabric that is fed from the fabric guide bar, to affix the fabric to the belt.
3	Fabric guide bar	Fabric that is sent from the dewrinkling roller is lowered to the height of the belt and guided to the pressure roller.
4	Dewrinkling roller	Spreads the fabric side to side to remove wrinkles.

Ink rack

No.	Name	Description
1	Ink rack	Supplies ink from the ink cartridges. The amount of ink remaining is shown on Leonardo. If a cartridge needs to be replaced, a message is displayed on Leonardo.
2	Ink cartridges	They are mounted in the ink rack. From the left side, they are positioned in order A through H.
3	Ink rack front bar	Bar to prevent ink cartridges from falling out.

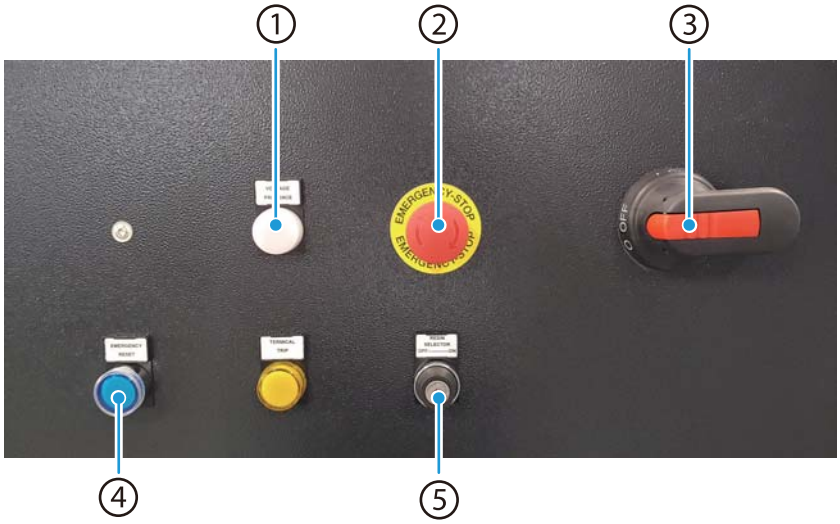
Pressure Regulator for subtanks and cartridge check lamp



No.	Name	Description
1	Pressure regulator for subtanks	Indicates the air pressure that is supplied to the sub tank on each ink path. Specified value is 34±1 kPa.
2	Cartridge check lamp	Indicates the status of the ink cartridges and ink. • Red On: • There is no ink remaining in the cartridge. Replace the ink cartridge. • The ink cartridge is not connected. Connect the ink cartridge. • The ink type or color is not correct. Connect the correct ink cartridge. Flashing: The ink rack front bar is open. • Green On: Ink is being supplied to the ink path. Flashing: The ink rack front bar is open.

Control Panel

Main electric panel



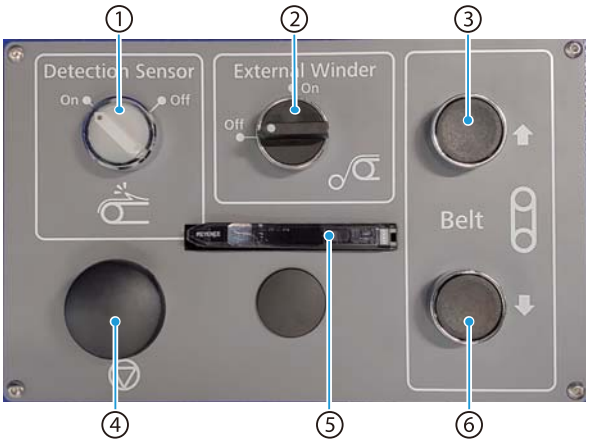
No.	Name	Description
1	Power lamp	Displays the printer's operational status. On: The power is on. Off:The power is off.
2	Emergency stop button	Stops operation of this machine immediately.
3	Main power switch	Turns the power on and off. 0: Turns the power off. 1: Turns the power on.
4	Reset button	Press this button after selecting Setpoint to start the Set-point operation.
5	Maintenance key switch	Insert the maintenance key when reapplying the glue. For more information, refer to "Glue Re-Application" in the Maintenance Guide.

CAUTION	If the power is turned on while the maintenance key is still inserted in the maintenance key switch, the belt operation safety function during printing (device operation) will be disabled, resulting in a dangerous situation. Therefore, do not insert the maintenance key except for when applying glue. The maintenance key should be managed by someone who has been authorized by the person in charge at the company. Do not leave it inserted in the maintenance key switch of the main electric panel. The person in charge is responsible for storing the maintenance key in a safe, locked location.

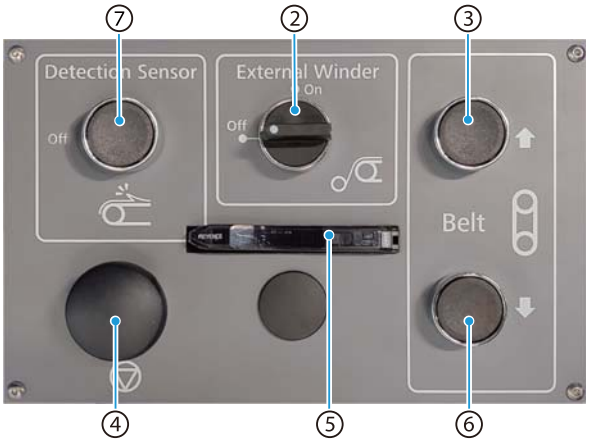
Front panel

Buttons and switches equipped vary depending on the model. (Pattern A or B) Check your printer and understand how to use it.

Pattern A



Pattern B



No.	Name	Description
1	Foreign material detection sensor switch	Use this switch to change the operation the foreign material detection sensor. Off: Disable On: Enable Note that Epson shall bear no responsibility for any outcome that occurs as a result of how the foreign material detection sensor is set. Do not turn this function off, except when removing an impediment.
2	External winder switch	Use this switch to change the signal from an external winder. Off: Disable On: Enable
3	Back feed button	Press and hold this button to feed the belt in the reverse direction (from front to rear).
4	Pause button	Printing is paused and the print head comes to a stop either on the flushing plate or at the cleaning station area. Press the [Start] icon for Leonardo to resume printing.
5	Foreign material detection sensor controller	Use this to set and display the detection threshold value of the foreign material detection sensor. For the threshold value, refer to "Set the Foreign Material Detection Sensor" on Page 73.
6	Feed button	Press and hold this button to feed the belt in the forward direction (from rear to front).
7	Foreign material detection sensor off button	The foreign material detection sensor is turned off (disabled) while this button is pressed. Note that Epson shall bear no responsibility for any outcome that occurs as a result of how the foreign material detection sensor is set. Do not push this button, except when removing an impediment.

Rear panel

No.	Name	Description
1	Pause button	Printing is paused and the print head comes to a stop either on the flushing plate or at the cleaning station area. Press the [Start] icon for Leonardo to resume printing.
2	Feed button	Press and hold this button to feed the belt in the forward direction (from rear to front).
3	Feeding unit button (On)	Press this button to turn ON (enable) the feeding unit. (Turn ON when adjusting the fabric position and when the slack mode is enabled.)
4	Feeding unit button (Off)	Press this button to turn OFF (disable) the feeding unit.
5	Slack detection switch	Use this switch to change the operation of the Slack sensor. Off:Disable On: Enable
6	Pressure roller switch	Use this switch to change the operation of the pressure roller. If you spin it to the left then let go, the switch automatically returns to the standby position (center). If you spin it to the right, the switch stays in that position and continues operation. To stop operation, manually return the switch to the standby position (center). Left: Moves the pressure roller up/down. Each time the switch is turned to the left, the pressure roller moves up/down. However, the roller moves up automatically if it was down for a given amount of time when the belt is stopped. Right: Moves the pressure roller forward/backward. Turn to the right to operate, or to the center to stop the pressure roller. The roller stops in the up position when stopped.
7	Back feed button	Press and hold this button to feed the belt in the reverse direction (from front to rear).

No.	Name	Description
8	Fabric position adjustment switch (Auto)	Set the fabric position adjustment operation. Auto: Fabric position adjusted automatically. Man: Fabric position adjusted manually.
9	Fabric position adjustment switch (LR)	Use this switch to move the fabric position left and right. This switch is enabled when the fabric position adjustment switch (Auto) is set to Man. Left: Moves to the left. Right: Moves to the right.
10	Belt speed volume	Use this control to adjust the belt speed while glue is applied. For more information, refer to "Glue Re-Application" in the Maintenance Guide.

Fabric tension adjustment panel

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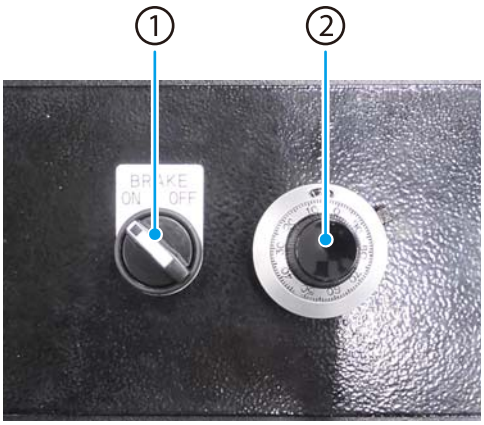

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No.	Name	Description
1	Feeding unit tension switch	Use this switch to enable/disable the tension. OFF: Disable ON: Enable
2	Tension adjustment dial	Adjusts the tension applied to the fabric. Raise the tension if wrinkles still occur in the fabric. Turn to right: Raises the tension. Turn to left: Lowers the tension.

Belt Cleaning Unit

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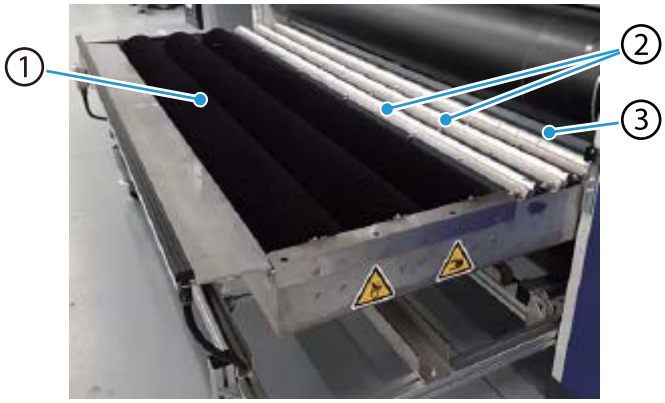

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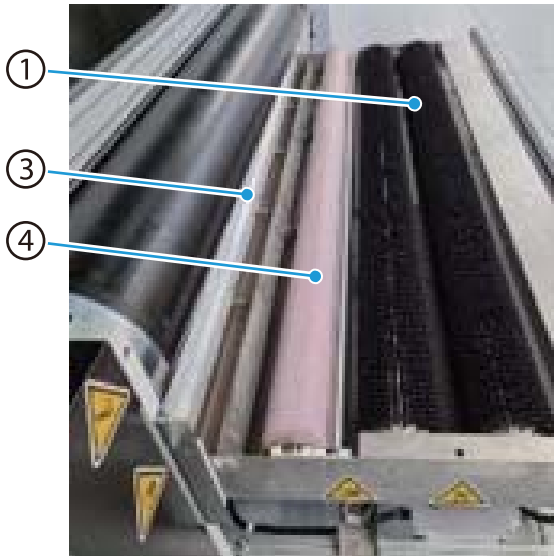


No.	Name	Description
1	Cleaning brush	Brushes away ink and other foreign material adhering to the belt.
2	Washing T-shaped scraper	Wipes away water droplets after belt cleaning. This is equipped on ML-32000-180 / ML-16000-180.
3	Washing silicone scraper	Wipes away water droplets after belt cleaning.
4	Sponge roller	Wipes away water droplets after belt cleaning. This is equipped on ML-32000-340.

Workflow before Beginning Work

This section describes the items to be checked before beginning work.

Workflow

Operations and Check Items for Rear Side

1. Supplying and Adjusting Compressed Air (Page 29)
2. Removing the Stopper Pin of the Pressure Roller (Page 31)
3. Lowering the Towel Roller (Page 32)

Workflow for Front Side

1. Supplying Water to the Belt Cleaning Unit (Page 34)
2. Check the Amount of Waste Ink Remaining in the Waste Ink Tank (for Models with Waste Ink Tanks) (Page 35)

Other

1. Checking Operating Parts (Page 36)
2. Checking the Exhaust Equipment (Page 37)

Procedure for Turning on the Power

1. Pushing an Emergency Stop Button for an Emergency Stop (Page 38)
2. Turning On the Power (Page 38)
3. Starting Leonardo (Page 39)
4. Releasing an Emergency Stop Button (Page 40)
5. Executing Setpoint (Page 42)

Operations and Check Items After Turning on the Power

1. Checking the Operation of the Emergency Stop Equipment (Page 43)
2. Inspecting for Leaks in the Ink Path (Page 44)
3. Inspecting the Open Cover Detection (Page 45)
4. Nozzle Check (Page 46)
5. Head Cleaning (Page 49)

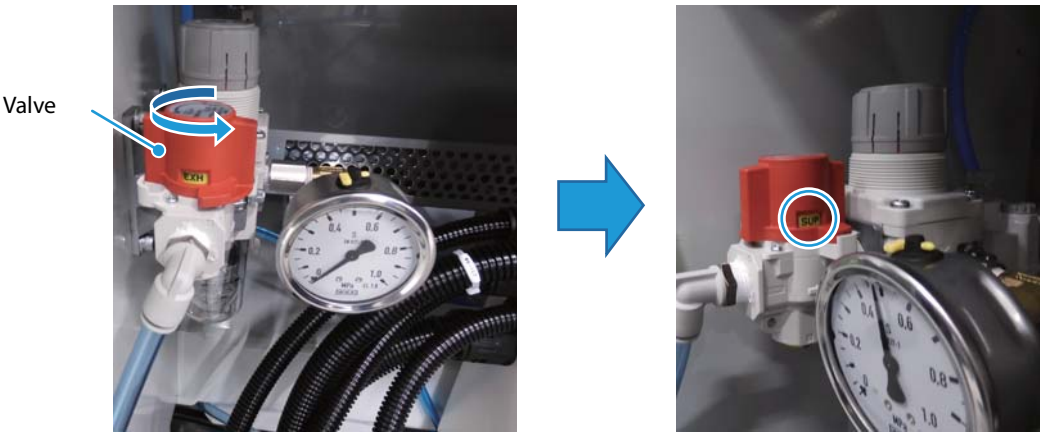
Supplying and Adjusting Compressed Air

Compressed air is supplied in order for the machine to operate. The machine will not operate if the specified air pressure is not supplied. An air pressure that is higher than the specified air pressure could cause the machine to malfunction. Please check the air pressure before operating the machine.

Supplying the air pressure

Turn the red valve on the air supply regulator counterclockwise to change the indicator for the valve from "EXH" to "SUP".

Confirm that the meter moves and that air is supplied.



Checking and adjusting the air pressure

Confirm that the pressure indicated by the meter on the air supply regulator is within the range stipulated in the specifications. For air pressure specifications, refer to "Power" on Page 132.

Use the pressure adjustment handle to adjust the air pressure as necessary.

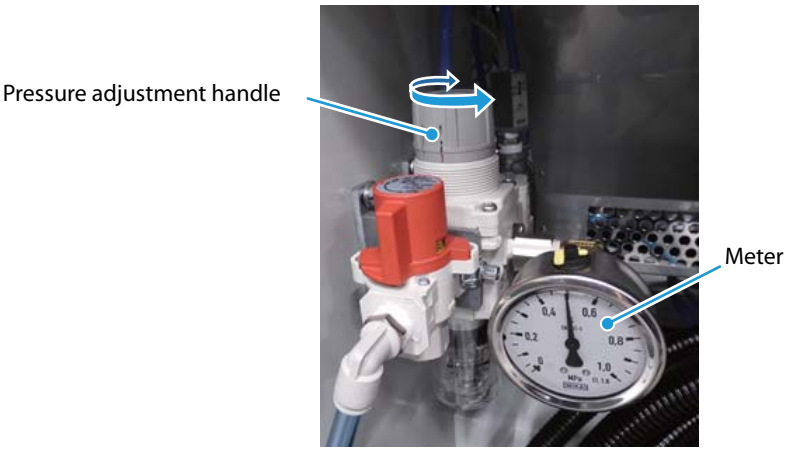
1 **Make sure that the valve is set to "SUP" (air pressure is applied).**

2 **Check the pressure indicated by the meter, and use the pressure adjustment handle to adjust the air pressure as necessary.**

Clockwise: Raises the pressure.

Counterclockwise: Lowers the pressure.

If the pressure does not rise to the specified value, adjust the pressure in the factory.

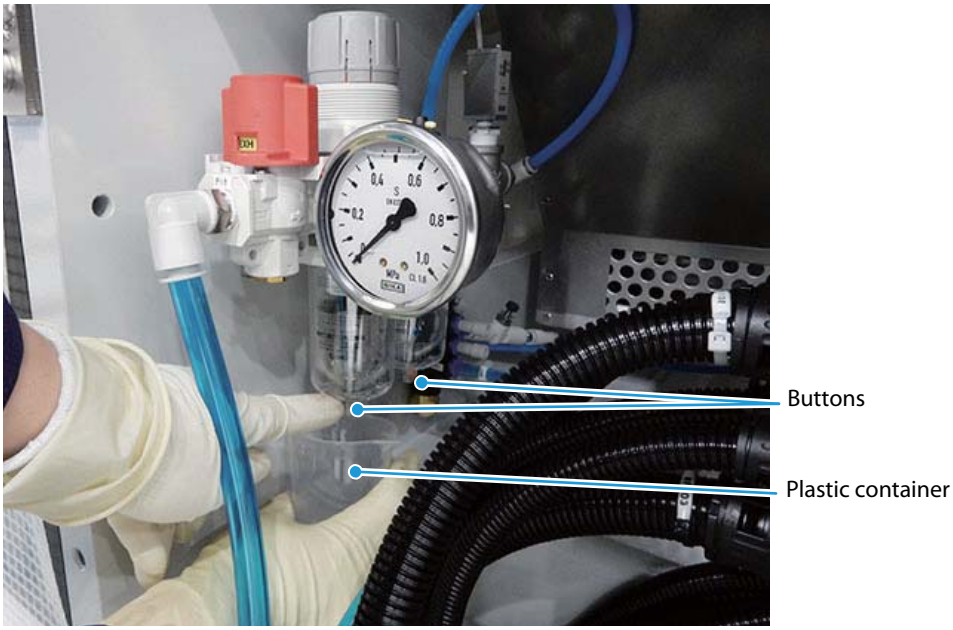


Removing Impurities from the Air Filter

The air filter removes impurities and water in the compressed air. Follow the procedures below to remove any impurities and water that have accumulated in the filter.

1 **Turn the red valve on the air supply regulator clockwise to change the indicator for the valve from "SUP" to "EXH".**
Make sure that the meter indicates 0 (zero).

2 **Set the plastic container under the drain and press the two orange buttons.**
Check to see that the accumulated water was discharged.



3 **Turn the red valve on the air supply regulator counterclockwise to change the indicator for the valve from "EXH" to "SUP".**
Confirm that the meter moves and that air is supplied.

If impurities and water are not discharged

1 **Turn the red valve on the air supply regulator counterclockwise to change the indicator for the valve from "EXH" to "SUP".**

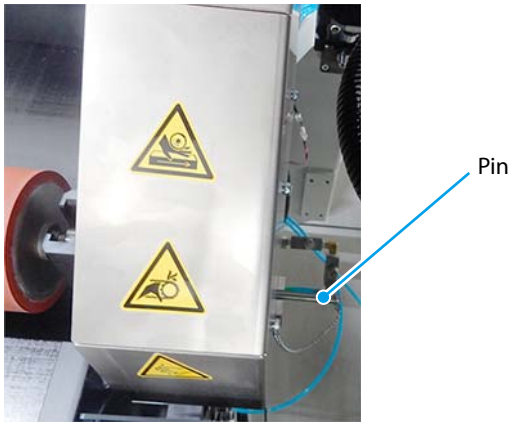
2 **Set the plastic container under the air filter drain.**

3 **Press the two orange buttons. The water and impurities that have accumulated in the air filter will be discharged with force.**

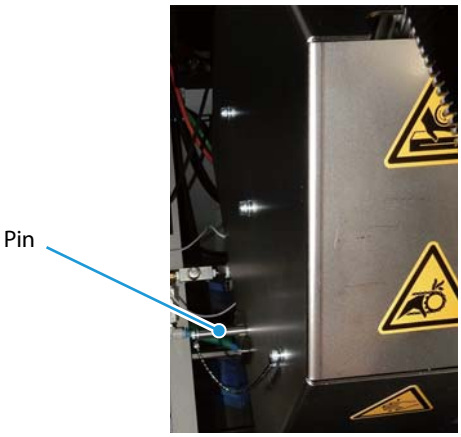
Removing the Stopper Pin of the Pressure Roller

1 **Open the rear cover.**

2 **Remove the stopper pin located at the lower part on the right side of the pressure roller.**



3 **Remove the stopper pin on the left side of the pressure roller.**



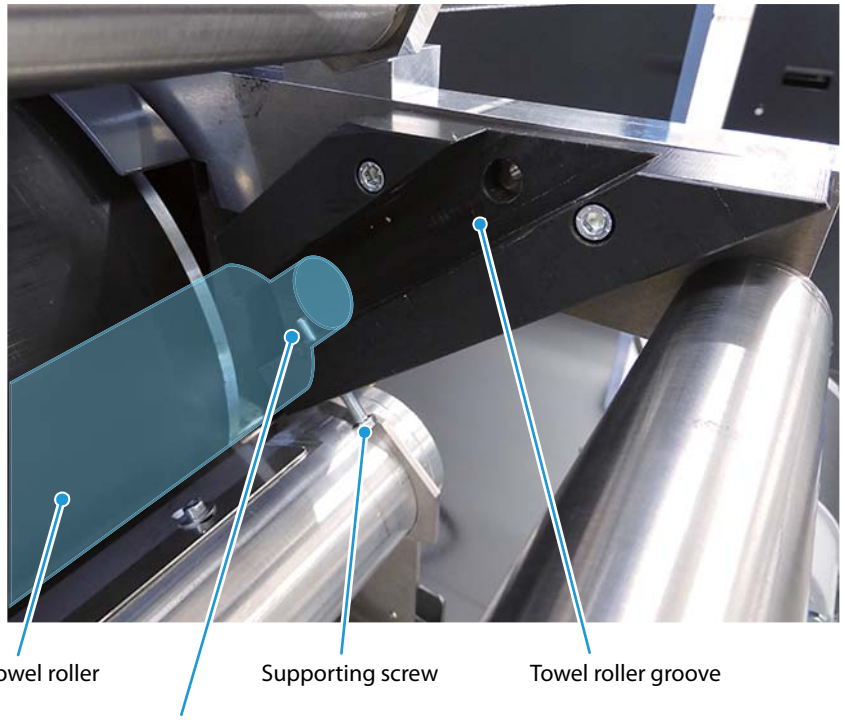
4 **Close the rear cover.**

Lowering the Towel Roller

Lower the towel roller until it touches the belt.

The supporting screw sticking out into the towel roller groove supports the towel roller spindle and prevents it from lowering.
While the towel roller is in the upper position, it is placed on the supporting screw sticking out into the groove to prevent the spindle from lowering.

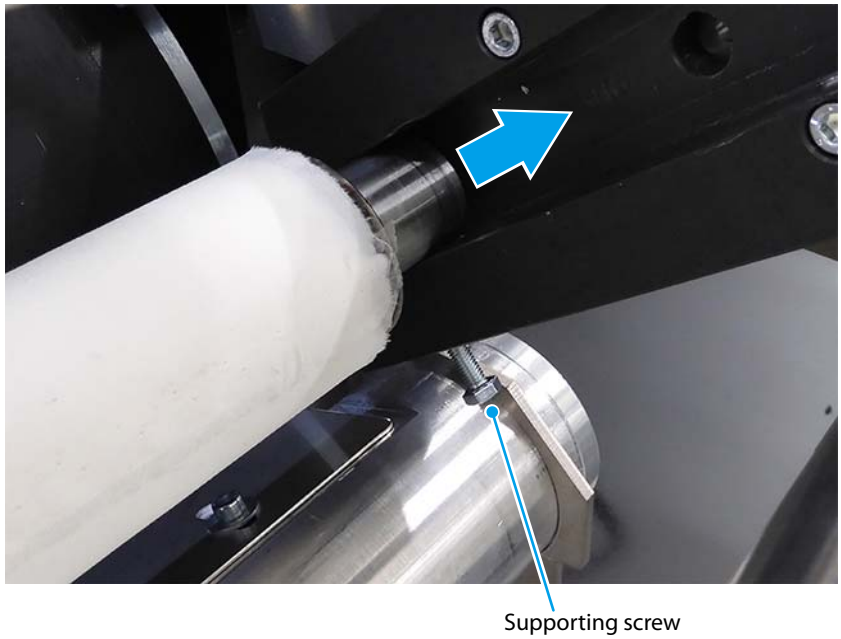
Towel roller in upper position



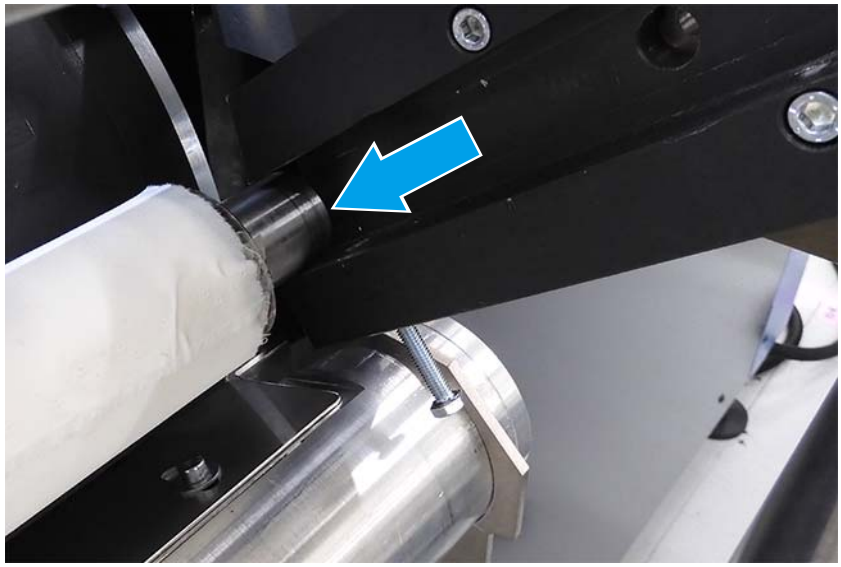
To lower the towel roller, loosen the supporting screw so that the towel roller spindle can pass through the groove.

1 While lifting up the right side of the towel roller toward you, loosen the supporting screw (right) by hand.

CAUTION	When the supporting screw is loosened, the towel roller automatically lowers under its own weight. Be careful not to get your fingers caught between the towel roller and the belt.
	There is no need to remove the supporting screw. You can lower the towel roller only by loosening the screw.



2 Lower the towel roller gradually along the groove until it touches the belt.



3 Repeat procedures 1 and 2 on the left side of the towel roller.

Supplying Water to the Belt Cleaning Unit

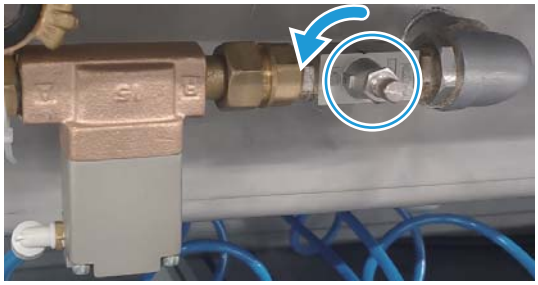
The belt cleaning unit washes ink from the belt and dries the belt.

Opening the Water Supply Valve

Open the water supply valve at the bottom of the front of the machine. Adjust the open/close amount to match the use conditions.

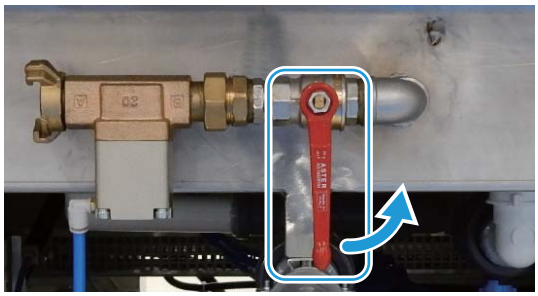
ML-32000-340 / ML-16000-180

Using a flat-head screwdriver, open the water supply valve.



ML-32000-180

Operate the lever to open the water supply valve.



CAUTION	The belt cleaning unit will not operate until printing starts. For operation check, refer to "Check the Belt Cleaning Unit Operation" on Page 96. For the pressure of the water supply, refer to "Power" on Page 132.

Checking the Amount of Waste Ink Remaining in the Waste Ink Tank

Implement this procedure when using an ML-32000-180 equipped with a waste ink tank.

Check if there is room remaining in the waste ink tanks. If there is little room remaining in a waste ink tank, dispose of the waste ink before beginning work. For more information about how to dispose of waste ink, refer to the "Maintenance Guide".

	This step is not required if there are no waste ink tanks (if the waste ink is connected directly to the drainage path).

Check the amount of waste ink in the waste ink tanks located on the cleaning station and flushing plate.

Cleaning Station Side

Waste ink tank on the cleaning station side

Flushing plate side

Open the front cover and check the amount of waste ink in the waste ink tank from the side of the flushing plate.

Waste ink tank on the flushing plate side

Checking Operating Parts

Do not place tools, fasteners, or the like on the belt or near the pressure roller or print head. Doing so could cause them to be entangled in the belt, pressure roller, or print head, damaging this machine. Before turning the power on, check that there is nothing left near the moving parts, such as on the belt or near the print head.

Front

1 **Open the front cover of the machine.**

2 **Check that there are no tools, fasteners, or the like left on the belt or near the carriage or print head.**

CAUTION	Do not touch the moving parts of the carriage. Doing so may cause device breakage or failures.

3 **Close the front cover.**

Rear

1 **Open the rear cover of the machine.**

2 **Check that there are no tools, fasteners, or the like left near the belt or the pressure roller.**

3 **Close the rear cover of this machine.**

Checking the Exhaust Equipment

Check if the exhaust is flowing while the machine is running, in order to adjust the temperature and humidity of the machine.

The location and method of checking exhaust ducts will vary depending on the equipment that is used. For details, please check with the factory manager.

Pushing an Emergency Stop Button for an Emergency Stop

Push the emergency stop button to put the machine in emergency stop status, so that the print heads and motor do not operate suddenly when the power is turned on.

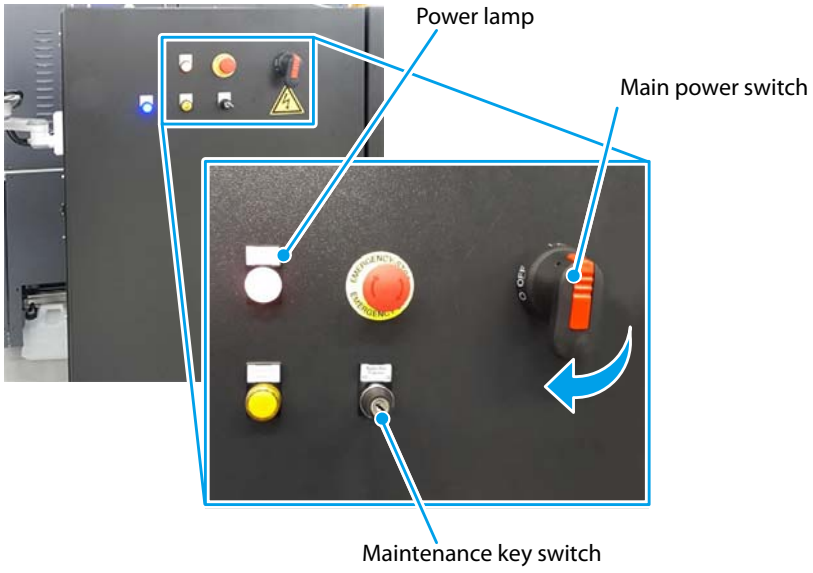
For the locations of the emergency stop buttons, refer to "Safety Precautions". Firmly press one of these emergency stop buttons.

Turning On the Power

CAUTION	Confirm that the key is not inserted in the maintenance key switch. If the power is turned on while the maintenance key is still inserted, the belt operation safety function during printing (device operation) will be disabled, resulting in a dangerous situation. Therefore, do not insert the maintenance key except for when applying glue for maintenance work. The maintenance key should be stored by someone who has been authorized by the person in charge at the company. Store it in a safe location that can be locked.
	Make sure that the front and rear covers are closed before turning the power on.

Turn the main power switch on the main electric panel to 1 (ON).

Confirm that the power lamp lights up.



Red on the tower lamp is lit up.

Starting Leonardo

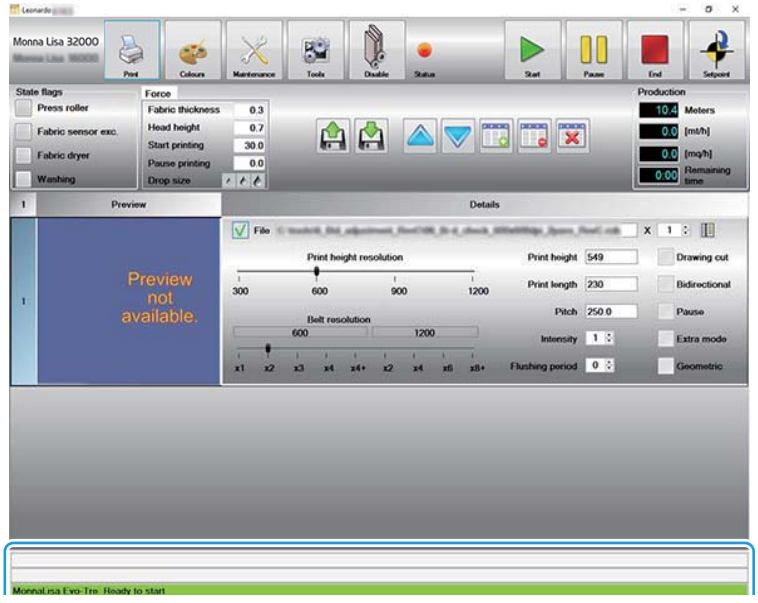
This machine is controlled by Leonardo on a control PC.

1 **When the power to the machine is turned on, the control PC starts. Wait for Windows to start on the PC.**

2 **The Windows startup screen appears on the display of the control PC. After Windows starts, Double-click the Leonardo icon on the desktop to start Leonardo.**

CAUTION	Do not add Leonardo to the Startup settings. Leonardo may not function properly if added to the Startup settings.

3 **When Leonardo starts, the "Machine in Emergency" and "Ready to start" messages are displayed on the status bar.**



Releasing an Emergency Stop Button

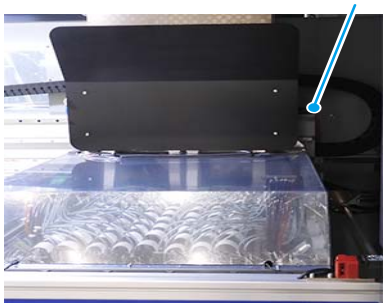
Turn the emergency stop button to the right to release the emergency stop status.

Setpoint cannot be executed if any emergency stop function has been detected, because the emergency stop status has not been released.
Confirm that all of the following emergency stop functions have been released.

- Emergency stop button, Emergency pull-wire switch
  For the locations of the emergency stop buttons and emergency stop rope switch, refer to "Safety Precautions".
- Print head
  Flushing plate side: The print head has shifted to the left side, where it has been detected by the sensor.
  Push it to the right by hand to return it to the print area.
  Cleaning station side: The print head has shifted to the right side, where it has been detected by the sensor.
  Push it to the left by hand to return it to the print area.

Flushing plate side

Cleaning Station Side



- Belt cleaning unit
  The belt cleaning unit is not set in the predetermined position. The belt cleaning unit position sensor is unable to detect it. Push the belt cleaning unit straight all the way to the back until it is detected by the sensor.

Belt cleaning unit position sensor

- Emergency stop buttons for devices linked to this machine (If there are linked devices)

Executing Setpoint

Set a Setpoint (origin position) before printing in order to print at the correct coordinates.

Immediately after turning on the power, releasing an emergency stop button, replacing fabric, adjusting the print heads, and/or performing head cleaning, be sure to execute Setpoint before printing.

1 **Click the [Setpoint] icon in Leonardo.**

2 **Press the Reset button on the main electric panel for 1 second.**

3 **The print heads move, and the origin position is set. At this time, "Setpoint in progress" is displayed in the status bar of Leonardo and the tower lamp changes to white. When Set Point is completed, the tower lamp changes to green.**

	If the print head does not operate even after executing Setpoint, confirm that all emergency stop statuses have been released. For more information, refer to "Releasing an Emergency Stop Button" on Page 40.

Check the Operation of the Emergency Stop Equipment

Check all emergency stop functions in the system.

Checking the Emergency Stop Buttons on the Machine

1 **Press the emergency stop button.**

2 **Confirm that "Machine in emergency" is displayed on the status bar in Leonardo, and that the tower lamp is red.**

3 **Turn the emergency stop button to the right to release the emergency stop status.**

4 **Execute Setpoint.**
Refer to "Executing Setpoint" on Page 42.

5 **Confirm that the tower lamp is green.**

6 **Repeat steps 1 to 5 to check the operation of each emergency stop button. When using the ML-32000-340 / ML-16000-180, also confirm the operation of the emergency stop rope switch.**
For the locations of the emergency stop buttons and the emergency stop rope, refer to "Safety Precautions".

Checking the Emergency Stop Functions in the System

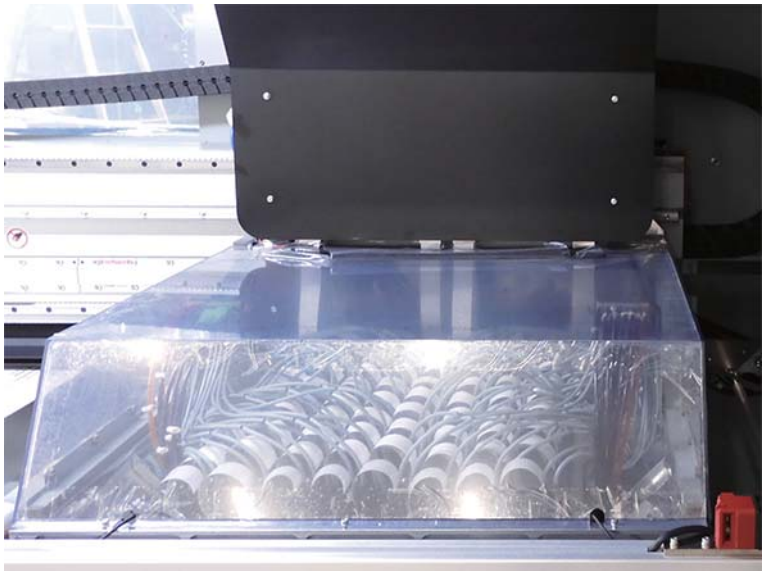
If the system is linked with the emergency stop system of other equipment, check if the system's emergency stop function for that equipment is operating normally.

Inspect for Leaks in the Ink Path

Inspect if there are any ink leaks in each ink path.

Print head

Visually check the area round the print heads on the front of the machine.



Ink rack

Visually check the area round the ink rack.

Inspect the Open Cover Detection

Front cover

Open each of the three front covers of this machine and confirm that "Front protection open" is displayed on the status bar in Leonardo.

Rear cover

Open the rear cover of this machine and confirm that "Rear protection open" is displayed on the status bar in Leonardo.

Nozzle Check

Before printing, perform a nozzle check to make sure the nozzles are engaged. If a nozzle is not engaged, perform head cleaning.

	Use an acrylic board for the nozzle check, because the ink grains are very fine. Fabric can also be used, but makes it difficult to determine if there are clogged nozzles. Items required: • Acrylic board • Ruler / tape measure (to measure the distance from the edge of the print area to the edge of the paper)

Setting the Acrylic Board

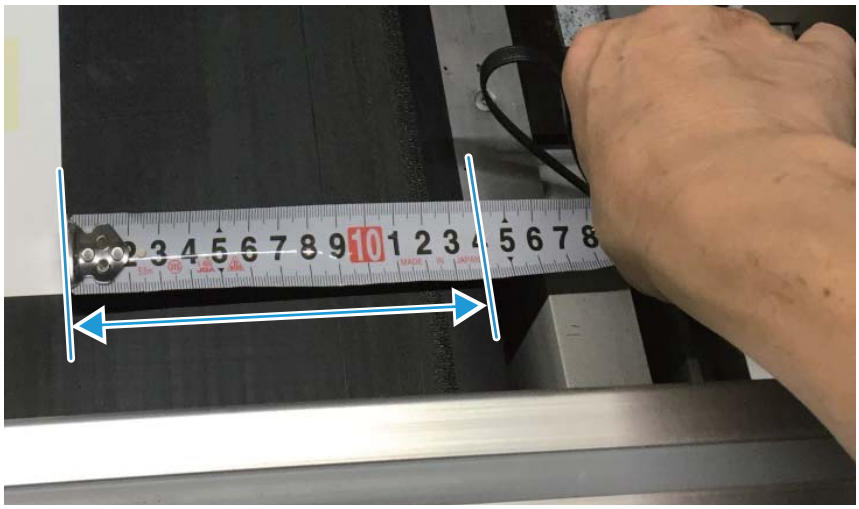
This step is not necessary when printing directly on fabric.

1 **Open the front cover.**

2 **Affix the acrylic board to the printing area. Affix the acrylic board along the right edge, because the origin of the print heads is on the right side.**

	The horizontal printing margin can be set in Leonardo, and therefore it is not necessary to affix the acrylic board precisely to the right edge of the printing area. 

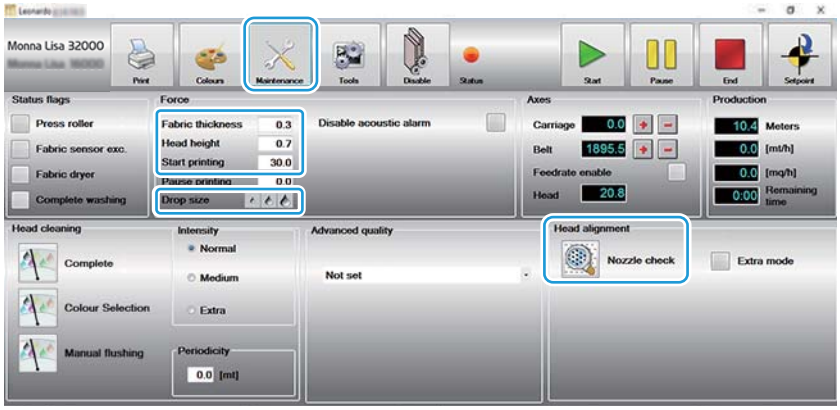
3 **Measure the distance from the edge of the belt (right side).**



4 **Close the front cover.**

Printing the Nozzle Check Pattern

Set the print start position and settings in [Maintenance].



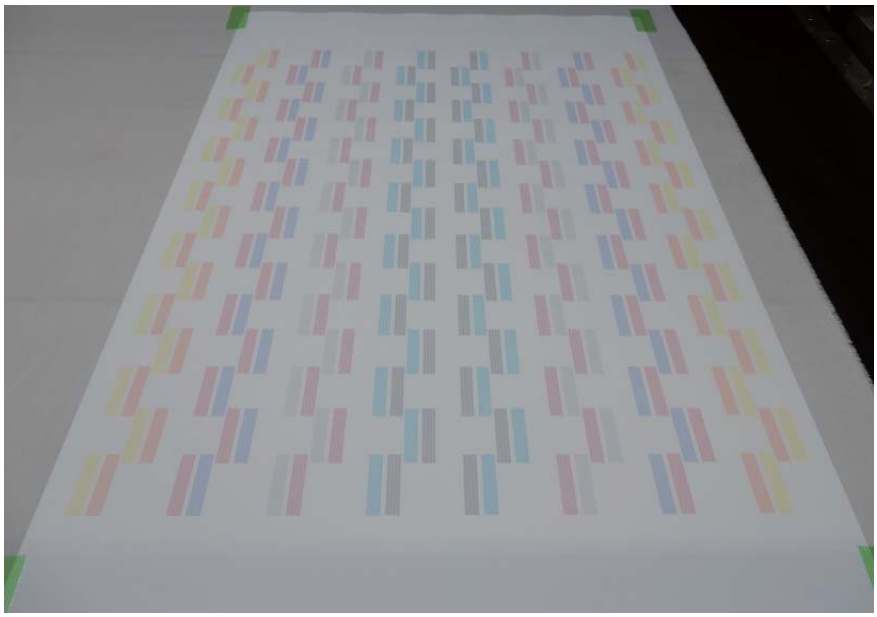
Item	Description
Fabric thickness	Set the fabric and acrylic board thickness.
Head height	Set the print head height.
Start printing	Enter the length from the right edge of the printing area to the point where printing begins. (Units: mm)
Drop size	Select the drop size. Normally, select Large size.
Nozzle check	Prints the check pattern.

Click [Nozzle check] to print the check pattern.

Confirmation Method

Check the nozzle check pattern that is printed.

If all nozzles are engaged and operation is normal, all of the lines will be printed.



If a nozzle is not engaged (there are areas that are not printed), actual printing could be affected. In that case, perform head cleaning.

	Performing a nozzle check does not guarantee that good print quality will be achieved.

If the nozzle check pattern has mixed colors, perform manual flushing. For more information, refer to "Manual flushing" on Page 113.

Head Cleaning

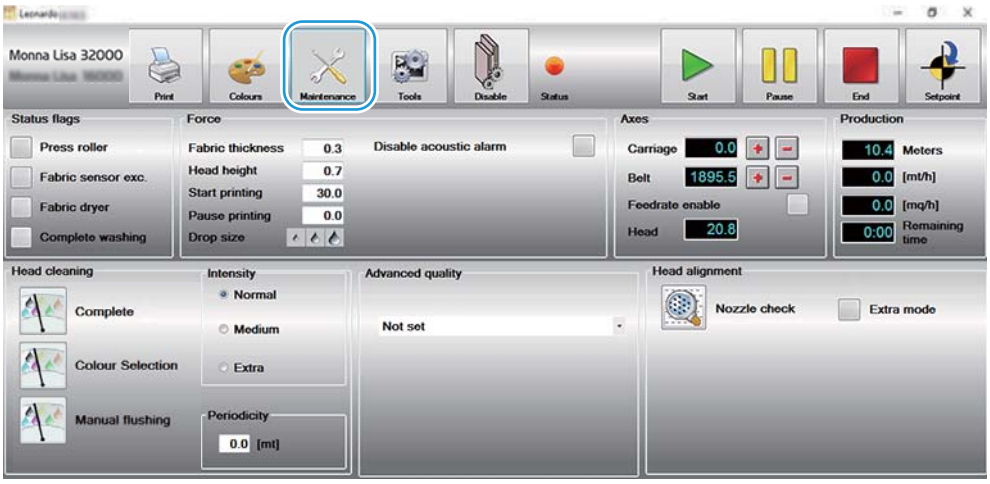
Use one of the following procedures to perform head cleaning.

- Cleaning with Leonardo (recommended)
- Manual cleaning: Refer to the "Maintenance Guide".

Cleaning with Leonardo

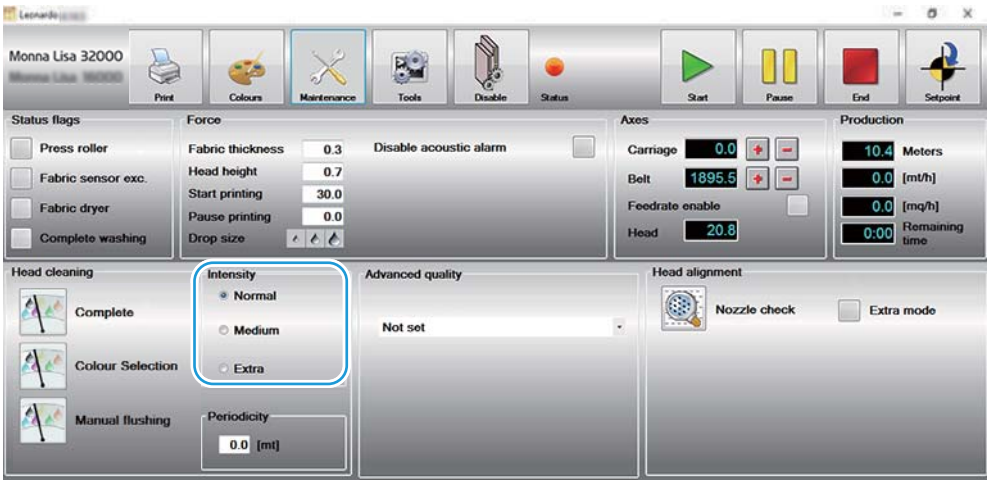
Make the required settings in the [Maintenance] menu to perform cleaning.

1 Click [Maintenance].



2 Under [Intensity], select the strength of head cleaning.

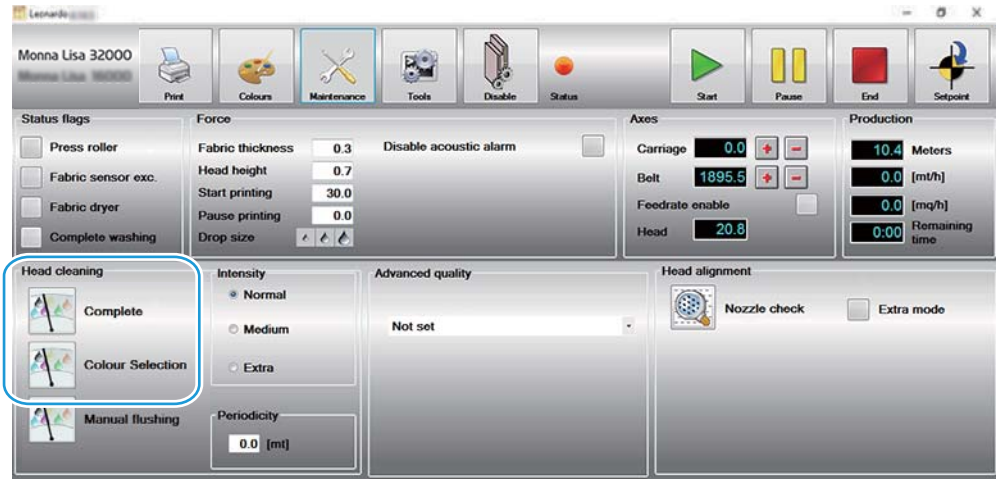
First, perform cleaning in [Normal]. If it does not recover, try cleaning in [Medium]. If it still does not recover, clean in [Extra].



Item	Description
Normal	Use this setting for standard head cleaning.
Medium	Use this setting if the problem is not resolved on the Normal setting. A greater amount of ink is used than for the Normal setting.

Item	Description
Extra	Use this setting if there are bubbles in the ink tube. Because most of the ink in the ink path is discharged, this setting uses a very large volume of ink.

3 Under [Head Cleaning], select the heads to be cleaned, and then start head cleaning.



Item	Description
Complete	This setting cleans all of the heads.
Colour Selection	This setting cleans the ink selected for cleaning.

Print Workflow

This section describes the workflow for printing.

Workflow

Setting the Fabric

1. Preparing the Fabric(Page 52)
2. Setting the Fabric (Page 53)
3. Setting the Foreign Material Detection Sensor (Page 73)
4. Setting the Printer (Page 79)

Printing

1. Loading Print Data (Page 82)
2. Setting the Print Data (Page 84)
3. Printing (Test Print) (Page 86)
4. Adjust Printing (if there are problems, such as resetting the print screens and adjusting connections in the advanced settings)
5. Print (Test Print)
6. Mass Production Printing (when test printing is OK)

Preparing the Fabric

Before setting the fabric, be sure to confirm the following status.

- Fabric edge: Confirm that there are no folds or protrusions and that the fabric is not lifted up or frayed.
  If the fabric is frayed, perform overcasting.
- Seams: Confirm that there are no protrusions and that the fabric is not frayed.

WARNING	If the fabric touches the print head, the print head may be damaged. The fabric must be fed and adhere to the belt without any folds, protrusions, seams, or lifting in the fabric edge whatsoever.
CAUTION	An incorrect fabric thickness and print head height settings can cause collisions with the fabric, resulting in print head failure. Set the fabric thickness and the foreign material detection sensor when loading the fabric for the first time or changing the fabric type or thickness. If the fabric is thicker than 2 mm, the threshold value must also be adjusted. Fabric Thickness(Page 79) Foreign material detection sensor (Page 73)

If fiber containing moisture from the ink lifts up, it may come into contact with the print head passing over the fabric. To avoid this, make the fabric edge firmly adhere to the belt.

Setting the Fabric

Loading the Fabric

WARNING	The fabric must be as smooth and firm as possible. If the fabric edge is fraying and threads are loose, the fiber may come into contact with the print head, damaging the print head. In the same way, be sufficiently careful to prevent protrusions and fraying at the seam between pieces of fabric.

1 **Open the rear cover.**

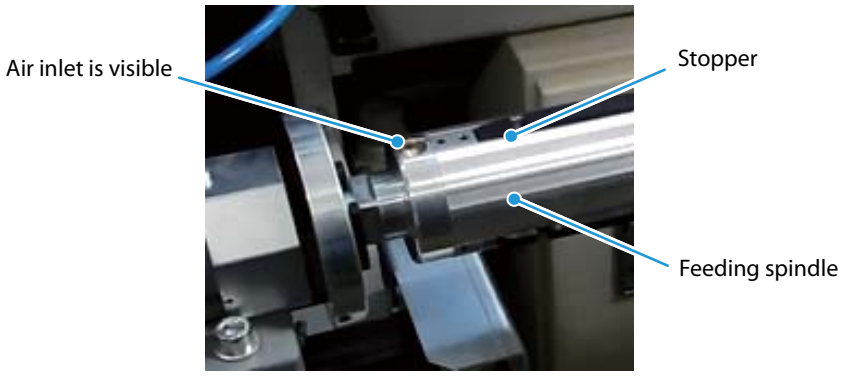
WARNING	The machine can operate at a decelerated rate even when the rear cover is open. However, use this only in special circumstances. Be particularly careful to avoid your finger being pulled or crushed by the moving pressure roller.

When you open the rear cover, the machine decelerates for operation, and the rotary beacon light flashes in orange to notify you.

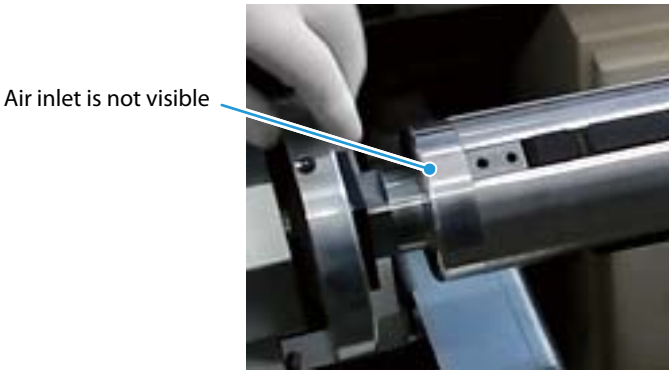
2 **Confirm that the pressure roller is lifted up. If the pressure roller is not lifted up, move the pressure roller switch to the left to lift it.**

3 **Remove the feeding spindle for procedures 3 to 6. Rotate the feeding spindle and align it with the lock release position.**

Correct position

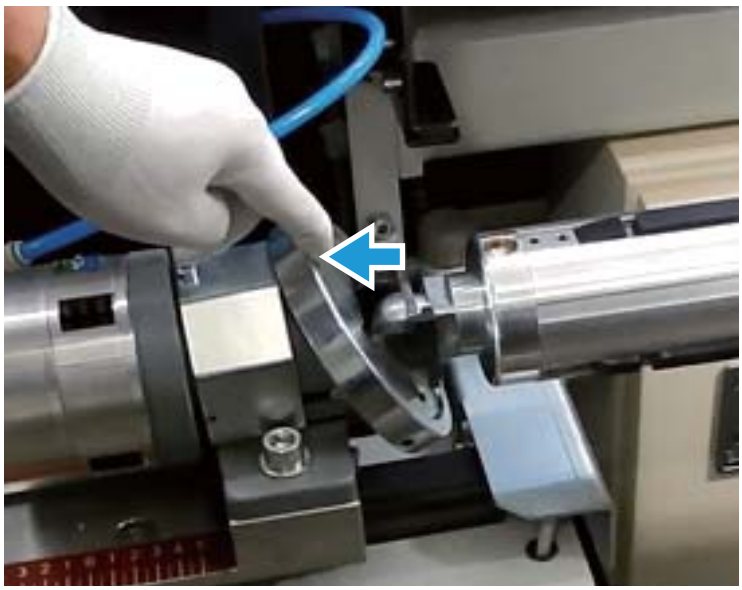


Incorrect position



4 **Press the center of the air inlet of the spindle to release the air and loosen the spindle stopper.**

5 **Release the locks on the left and right sides of the feeding unit. This allows the feeding spindle to be removed.**



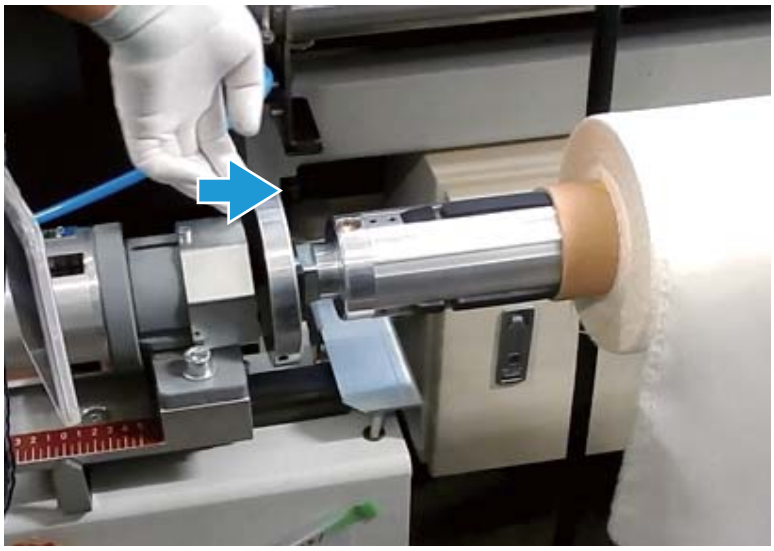
6 **Remove the feeding spindle, and replace the fabric.**

7 **Set the new fabric on the spindle.**

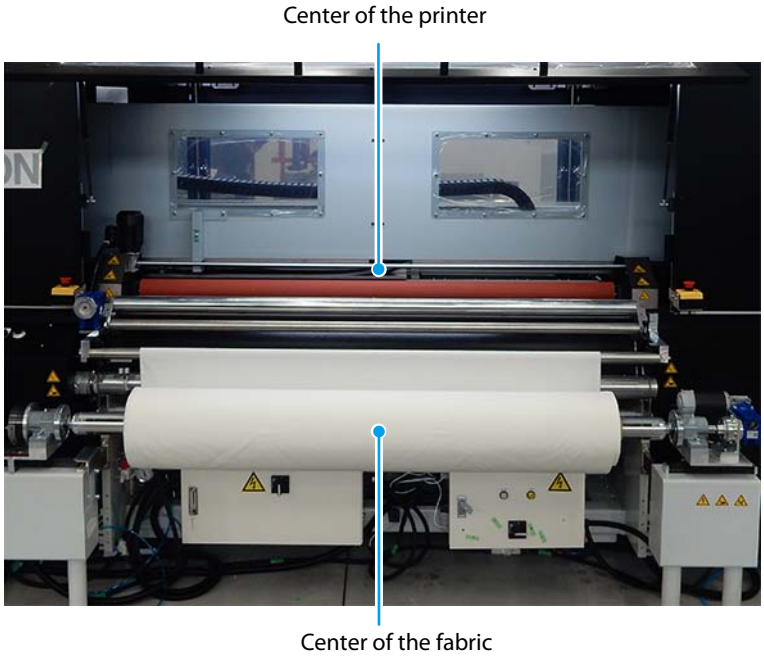
CAUTION	Fabric that weigh 20 kg or more should be set by two people.

8 **Set the fabric in the feeding unit. Fit the feeding spindle into the groove on the feeding unit.**

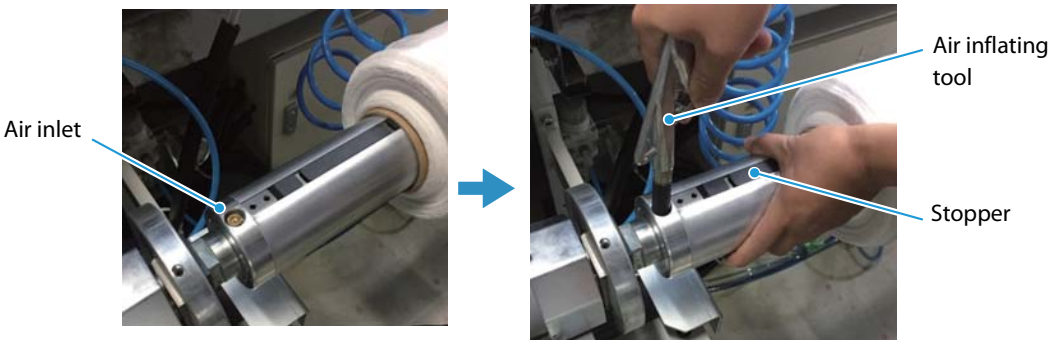
9 **Lock the feeding spindle.**



10 **Adjust the lateral position of the fabric. Align the center of the fabric with the center of the printer.**

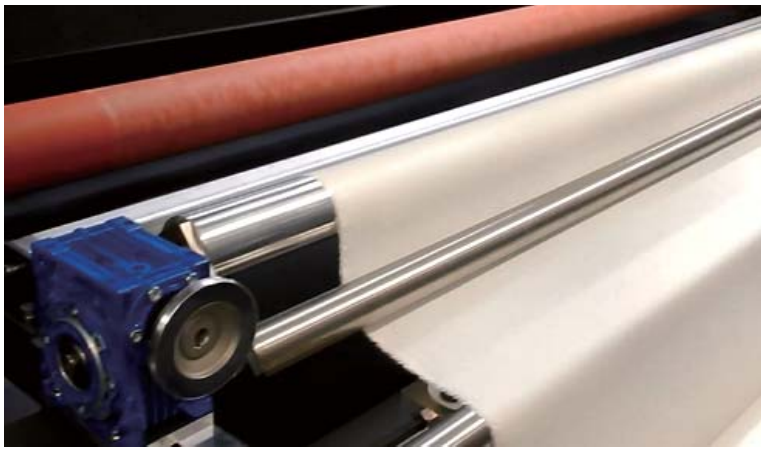


11 **Insert the air inflating tool into the air inlet and inject air. The stopper on the spindle swells to fix the fabric.**

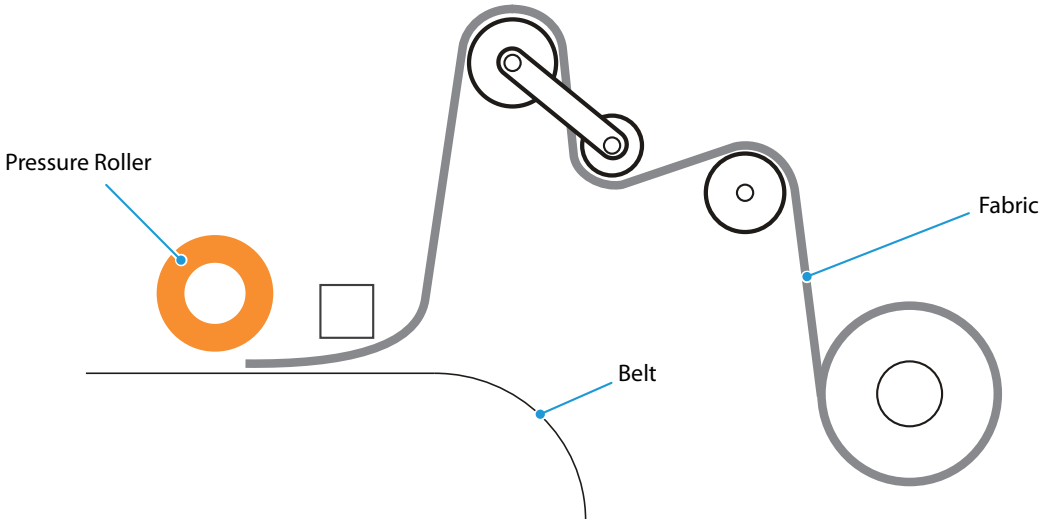


12 Feed the fabric through the roller as shown in the following image.

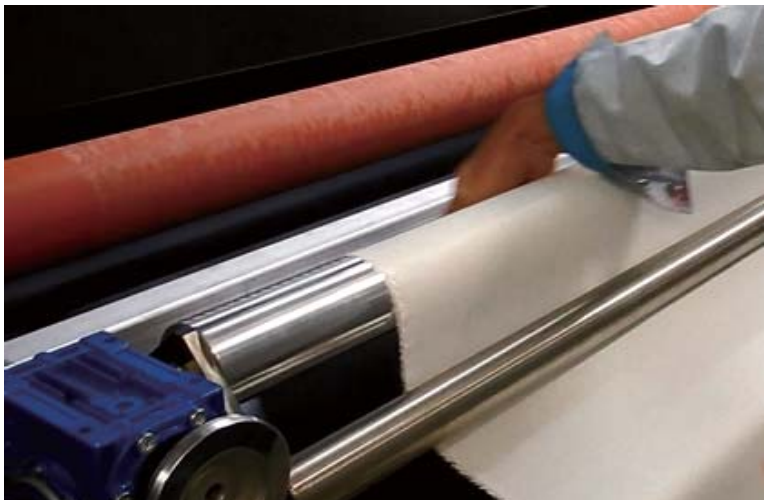
WARNING	Keep your hands away from the following moving parts while the machine is operating. Otherwise, there is a risk of your hands, hair, or clothing becoming caught in the machine. • Between the fabric guide bar and the fabric • Fabric feeding belt • Pressure Roller



Cross-section of fabric path



13 Affix the fabric to the belt.



14 Press the feed button on the rear panel to feed the fabric to the edge of the pressure roller.

15 Turn the pressure roller switch to the left to lift up the pressure roller.

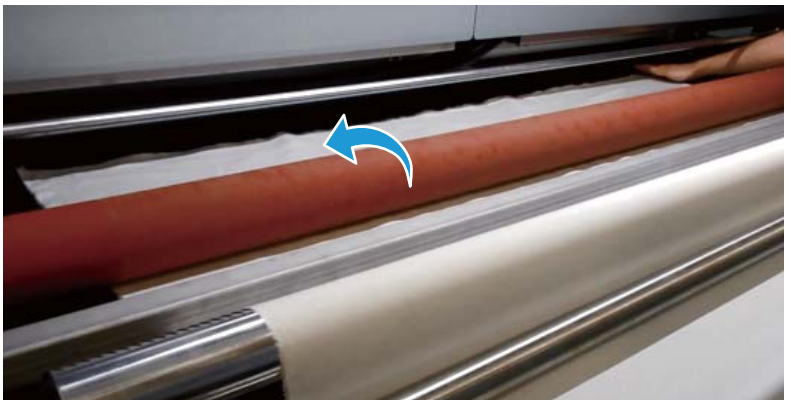
16 Turn the feeding unit tension switch on the fabric tension adjustment panel to the right to lock the spindle. The spindle does not move even if the fabric is pulled.

17 Pull the fabric from the front of the pressure roller to remove any slack in the fabric on the left and right.

18 Turn the pressure roller switch to the left to lower the pressure roller.

WARNING	The descent speed of the pressure roller is slow, and it comes down gradually. However, be sufficiently careful not to place your hands or fingers under the roller.

19 **Affix the fabric that was pulled from the top of the pressure roller to the belt.**



20 **Close the rear cover.**

21 **Turn the pressure roller switch to the right so that the fabric is affixed to the belt, without any areas where the fabric has lifted up. Move the pressure roller forward and back to affix the fabric to the belt.**

This completes the work on the rear. Next, perform the work on the front.

22 **Press the feed button to feed the fabric forward.**

When using a machine equipped with a fabric peeling prevention bar, refer to the following if the fabric cannot be fed below the fabric peeling prevention bar.

"Adjusting the Fabric Peeling Prevention Bar" on Page 114

When using a machine equipped with a fabric slack prevention unit, refer to the following if the fabric cannot be fed below the fabric slack prevention unit.

"Removing the fabric slack prevention unit" on Page 117

23 Install the fabric on the winder. Feed the fabric as necessary.

	If there is enough length in the fabric edge, feed the fabric until the dryer and hold the fabric edge down with the winding core installed in advance on the take-up device or take-up unit. (If taking up, use adhesive tape.)

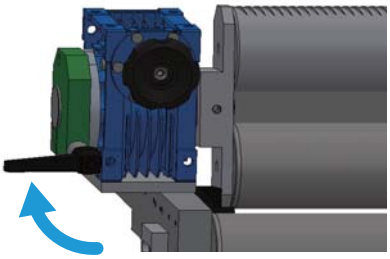
This completes the procedure for installing the fabric.

Dewrinkling the Fabric

Adjust the tension applied to the fabric to dewrinkle the fabric before printing.

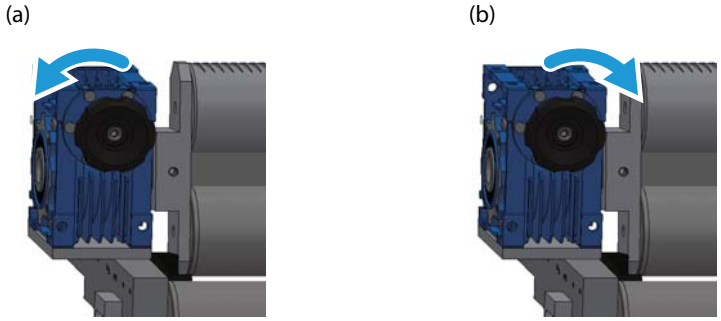
Use the dewrinkling roller handle to change the angle of the dewrinkling roller and adjust the tension applied to the fabric.

1 **For the ML-32000-340, unlock the lock lever for the dewrinkling roller.**

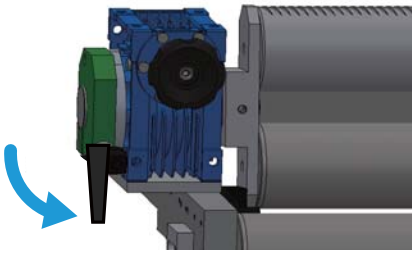


2 **Turn the dewrinkling roller handle to adjust the tension applied to the fabric.**

Turning toward (a) reduces the tension applied to the fabric. Turning toward (b) increases the tension applied to the fabric.



3 **For the ML-32000-340, lock the lock lever for the dewrinkling roller.**

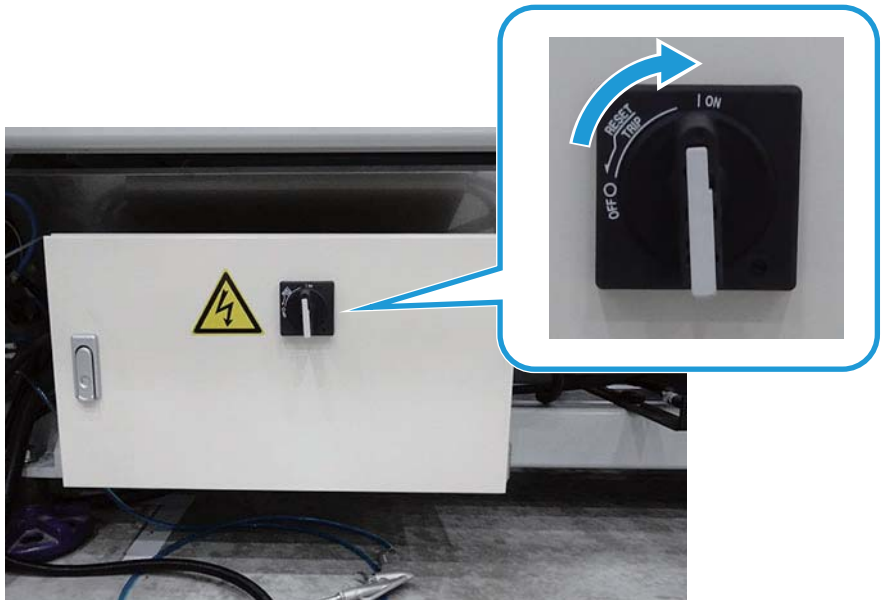


Slack Mode

Printing on knits and other fabrics that stretch and shrink can cause the fabric to be pulled and stretched.
Use slack mode when printing on fabrics that stretch and shrink.

	In the following cases, slack mode might not function correctly because the sensors fail to detect the slack part of the fabric when it sways from moving air. • When moving air is generated around the machine due to exhaust from peripheral devices or the passage of people • When printing on thin fabrics Under such conditions, put a core into the slack of the fabric to prevent the fabric from swaying. Use a core that is heavy enough to prevent the fabric from stretching. If the core is too heavy, the fabric will stretch and wrinkle when printing.

1 **Turn on the power at the electric box on the left rear side of the machine.**



2 **Press the feeding unit button (On) on the rear panel.**
The button lights up.

3 **Turn the slack detection switch to On**

The switch lights up.

4 **Turn the feeding unit tension switch on the fabric tension adjustment panel to the right to turn on fabric tension adjustment.**

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ML-32000-180

5 **Load a fabric roll onto the feeding unit.**

For more information, refer to "Setting the Fabric" on Page 53.

6 **Turn the tension adjustment dial on the fabric tension adjustment panel to the right, adjusting the fabric tension until the spindle does not rotate from the weight of the fabric roll and the fabric can be pulled out without resistance.**

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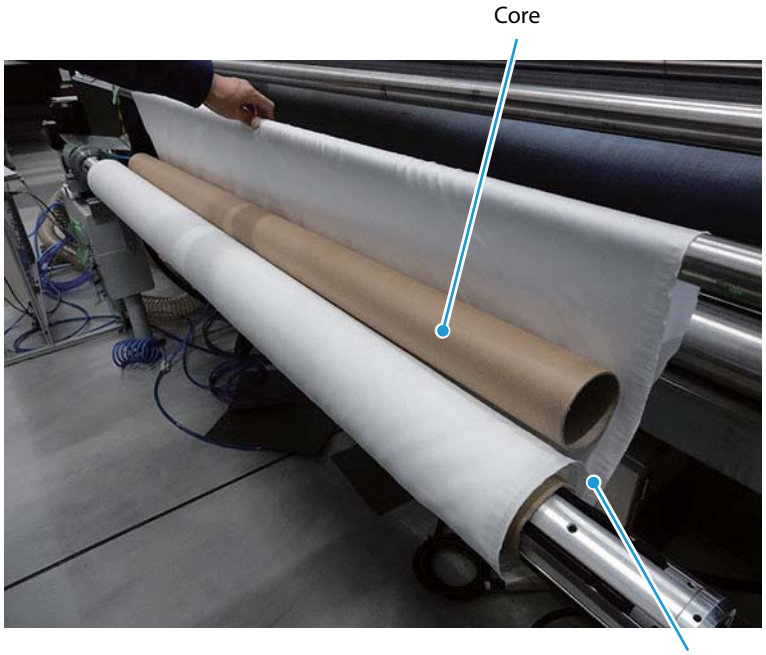
ML-32000-180

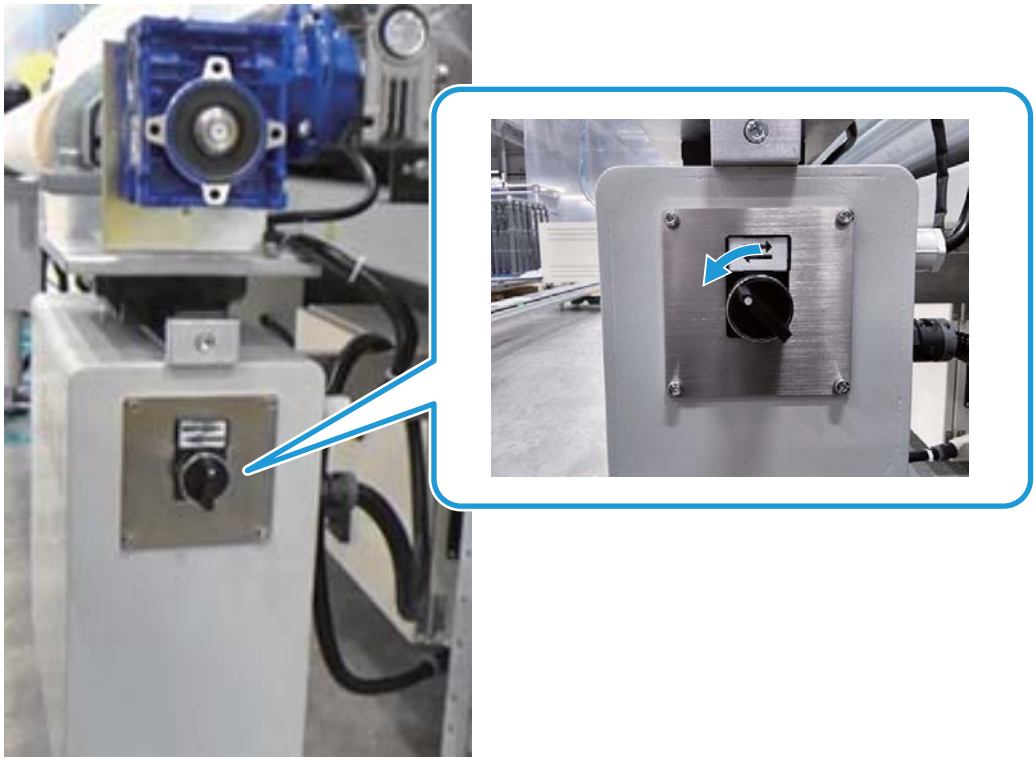
7 Put the core into the slack of the fabric.



8 When printing on the inner side of the fabric, turn the slack adjustment switch to the left. When printing on the outer side of the fabric, turn the slack adjustment switch to the right.

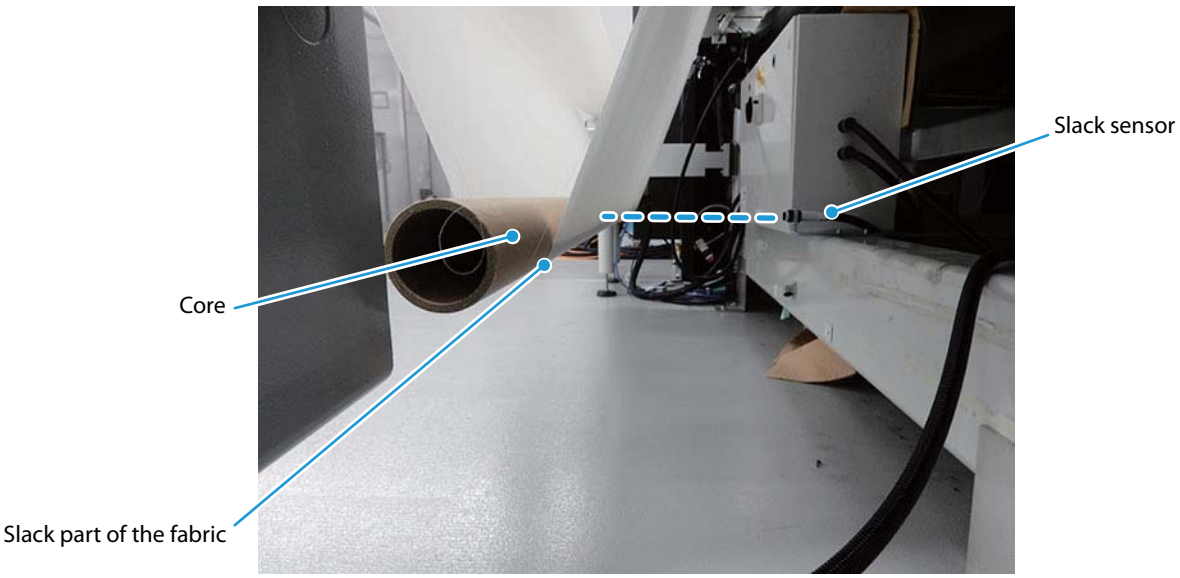
The spindle for the feeding device will rotate and the fabric will begin to have slack.

The following procedures describe how to print on the inner side of the fabric.



9 **When the fabric hangs down to the height of the slack sensor, the machine automatically stops.**

The amount of slack is detected by the slack sensor in the rear lower center. If the belt moves and lifts up the fabric causing there to be not enough slack, slack is given to the fabric until the sensor detects the fabric.

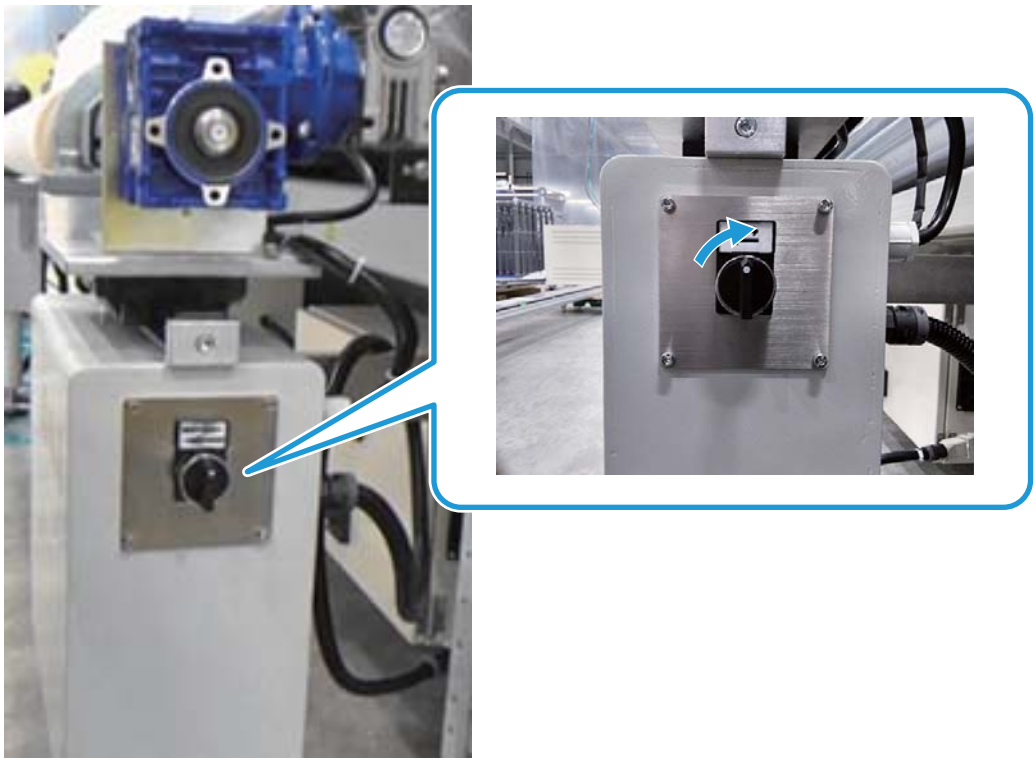


When the slack sensor does not detect the fabric

If the machine does not stop automatically even though the fabric hangs down to the height of the sensor, the fabric might be too far from or too close to the sensor. Adjust the distance between the sensor and the fabric.

1 **Turn the slack adjustment switch to the center.**

Slack mode stops.

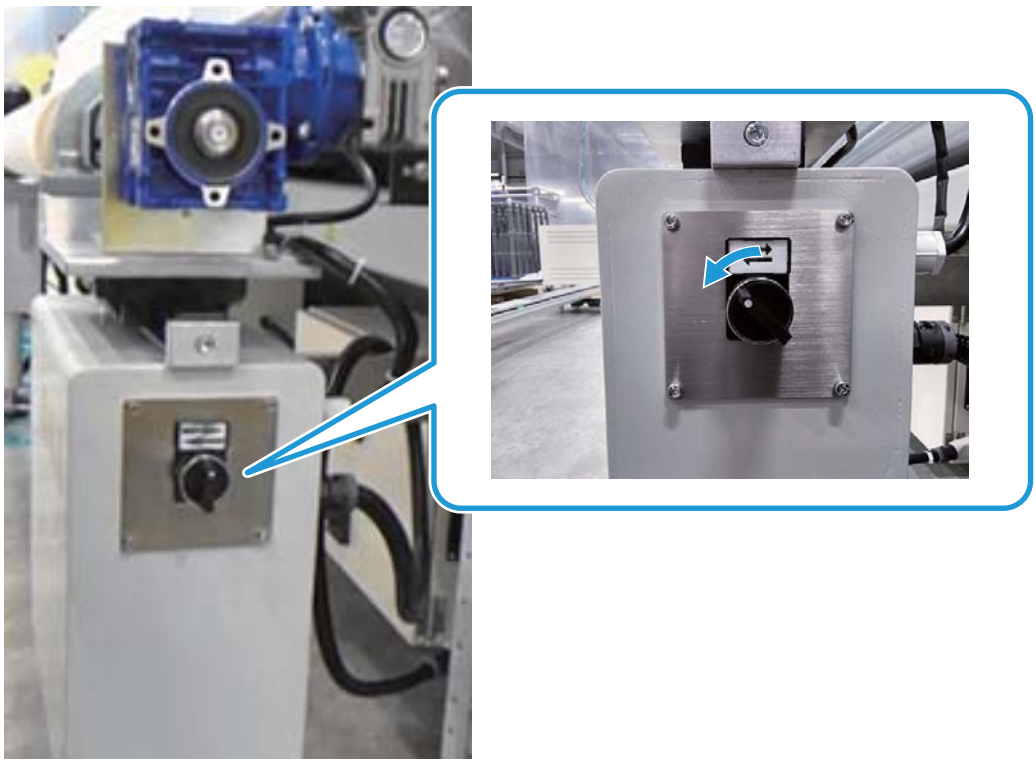


2 **Loosen the two knob screws on the slack sensor.**

3 **Adjust the distance between the slack sensor and the fabric to between 50 and 150 mm {1.97 and 5.9 in}.**

4 **Tighten the two knob screws on the slack sensor.**

5 **Turn the slack adjustment switch to the left.**
The spindle for the feeding device will rotate and the fabric will begin to have slack.

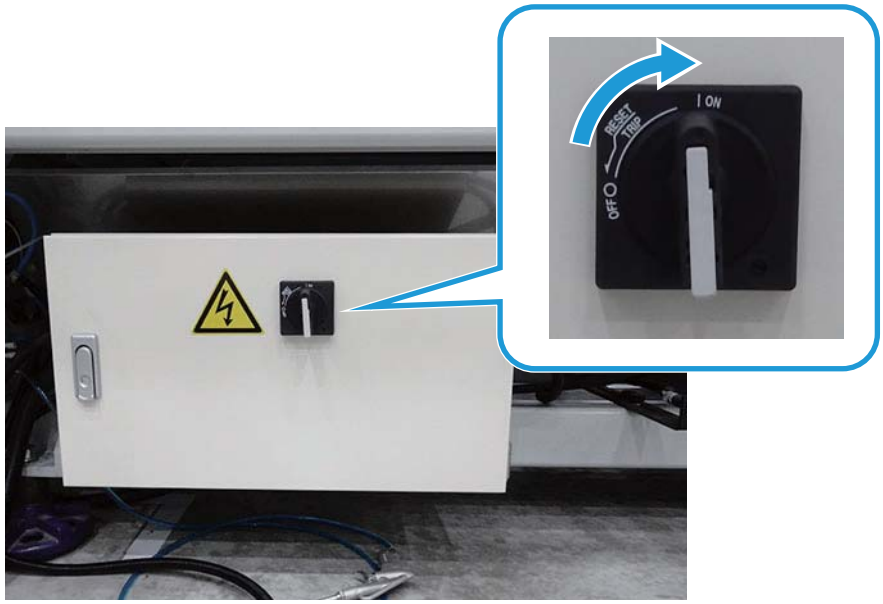


6 **Confirm that the machine automatically stops when the fabric hangs down to the height of the slack sensor.**

Fabric Meandering Correction

If you load a fabric roll with uneven edges, the fabric will meander. Either wind the fabric again or follow the procedures below. If the unevenness for edges of the fabric is severe, wind the fabric again.

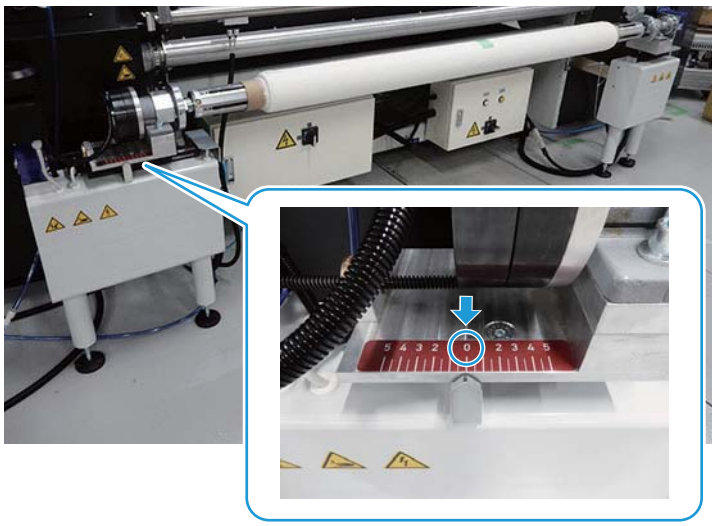
1 **Turn on the power at the electric box on the left rear side of the machine.**



2 **Press the feeding unit button (On) on the rear panel.**
The button lights up.

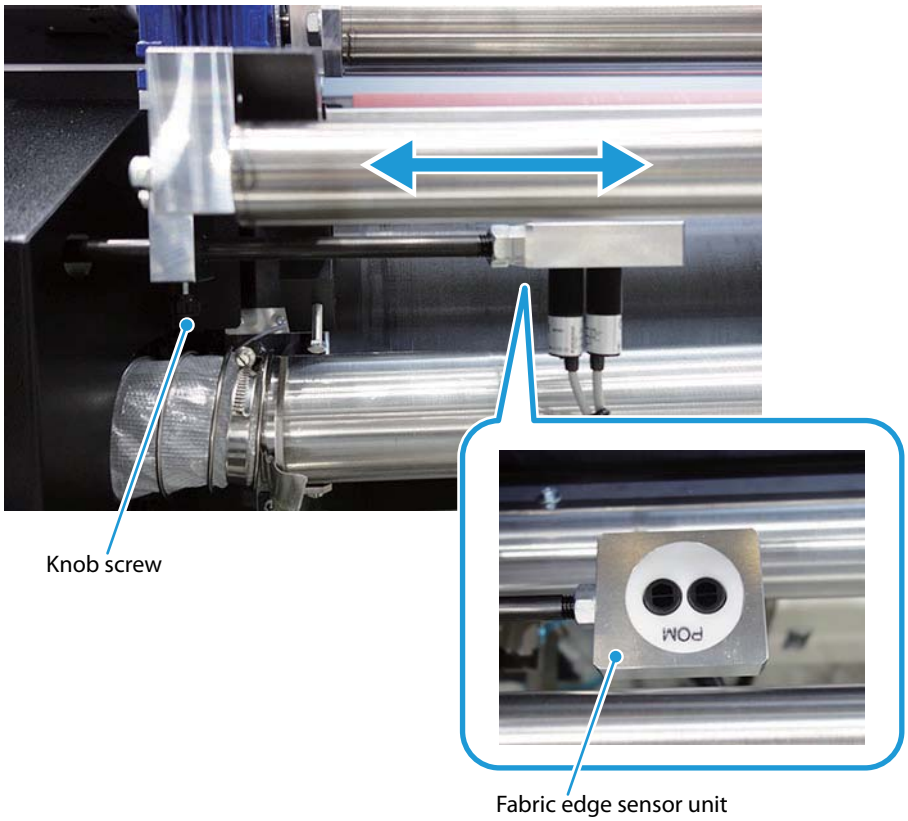
3 **Turn the fabric position adjustment switch (Auto) on the rear panel to Man.**

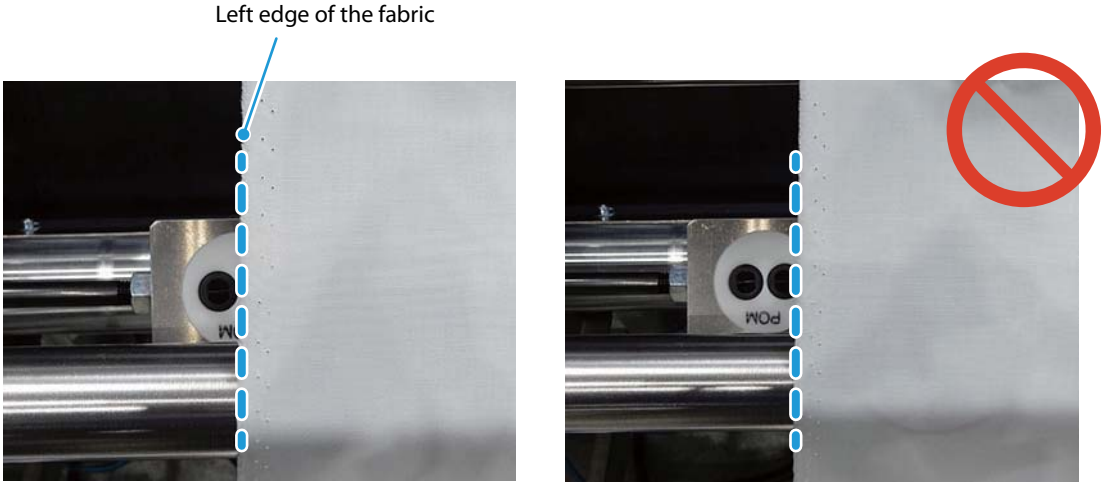
4 **Use the fabric position adjustment switch (LR) to set the memory of the feeding unit to 0.**



5 Adjust the position of the fabric edge sensor unit so that the left edge of the fabric is centered between the two sensors.

Loosen the knob screw to move the fabric edge sensor unit to the left or right. Align the fabric edge sensor unit with the left edge of the fabric, and then tighten the knob screw to secure it.





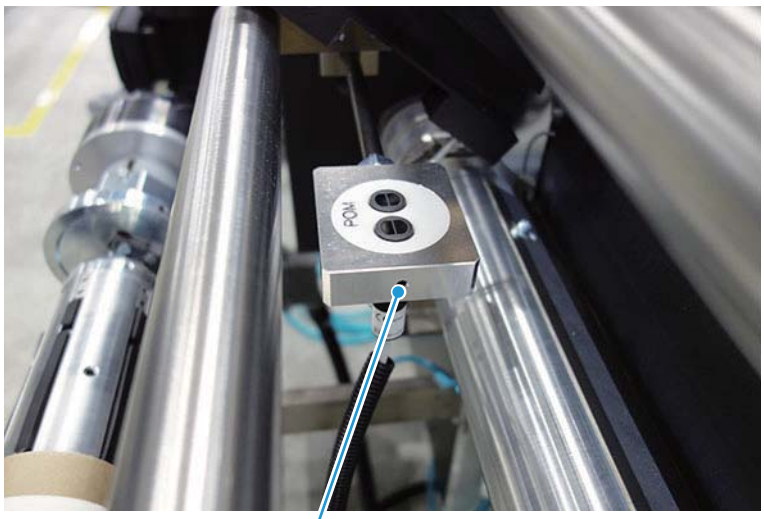
6 **Turn the fabric position adjustment switch (Auto) on the rear panel to Auto.**

The meandering of the fabric is automatically adjusted when printing starts.

Precise correction of meandering fabric

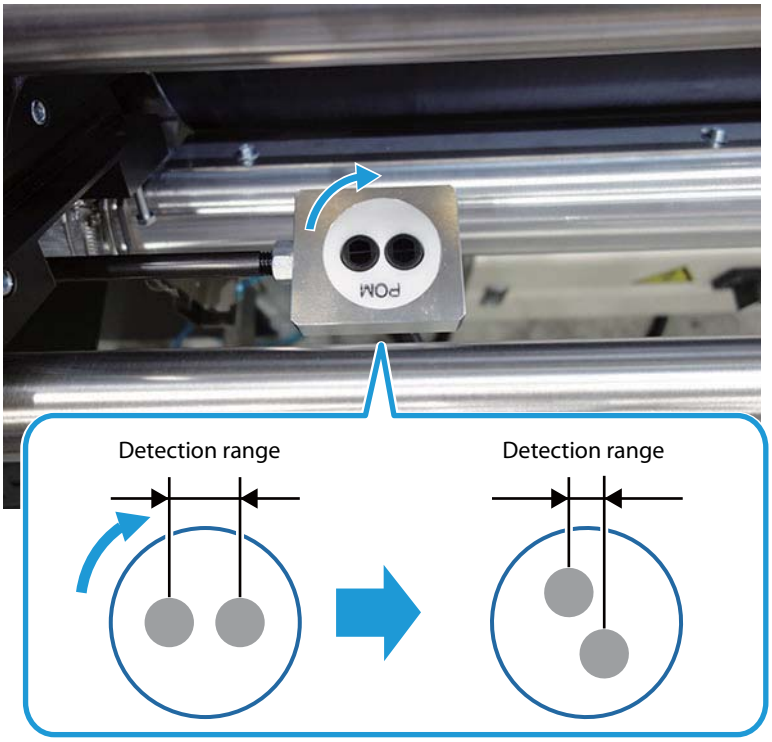
Use the following procedures to more precisely correct meandering fabric.

1 **Use a hex wrench (2.5 mm {0.1 in}) to loosen the sensor adjustment screw.**



2 Rotate the fabric edge sensors to the right to make the detection range more narrow.

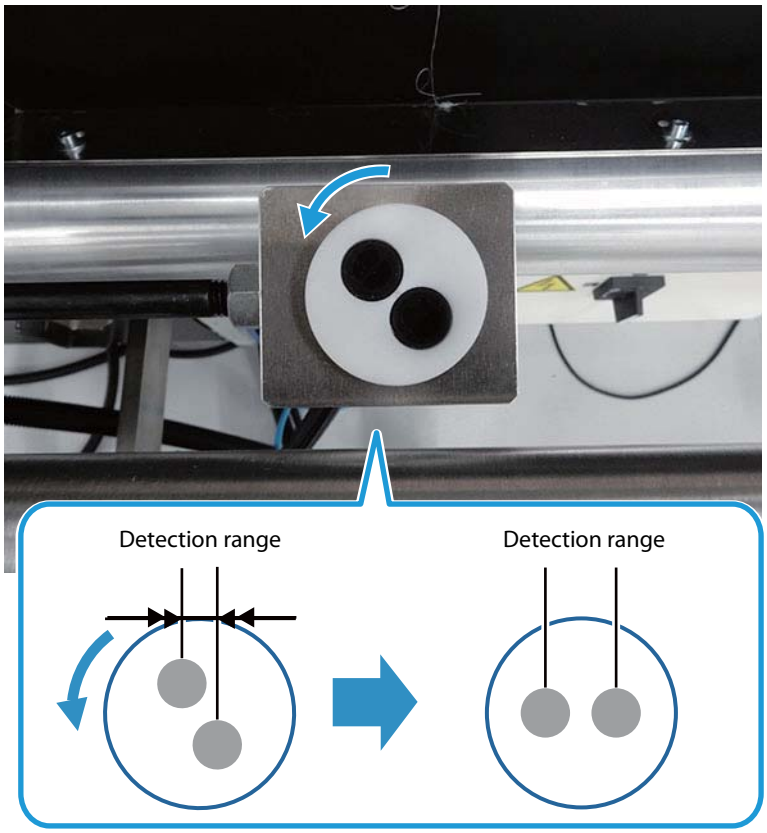
	Do not rotate the sensors more than 90° to the right. Otherwise, the sensors will be switched left to right, and it will not be possible to correct meandering.



3 Use a hex wrench (2.5 mm {0.1 in}) to tighten the sensor adjustment screw.

To return the sensors to the original detection range, rotate the fabric edge detection sensors to the left.

	Do not rotate the sensors to the right. Otherwise, the sensors will be switched left to right, and it will not be possible to correct meandering.



Set the Foreign Material Detection Sensor

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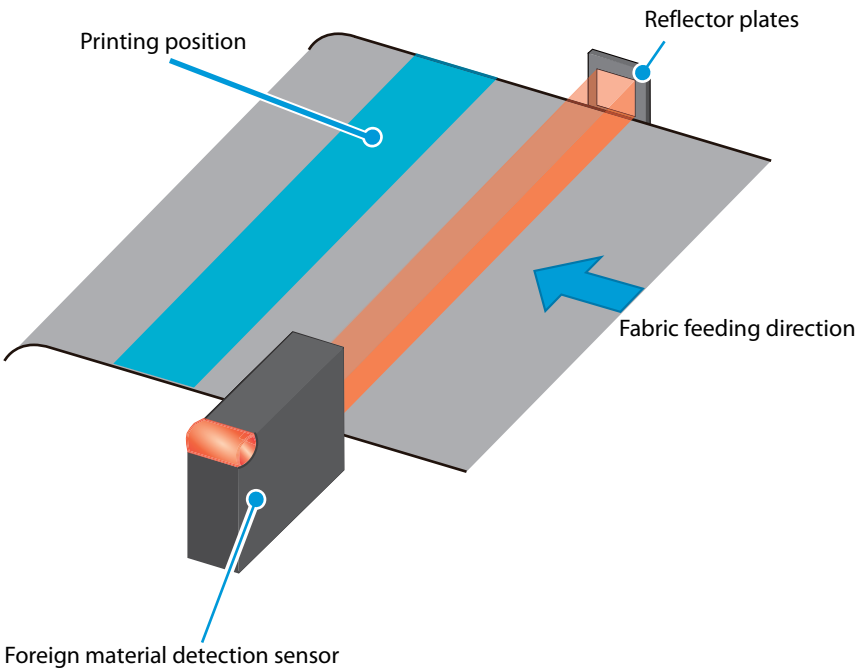
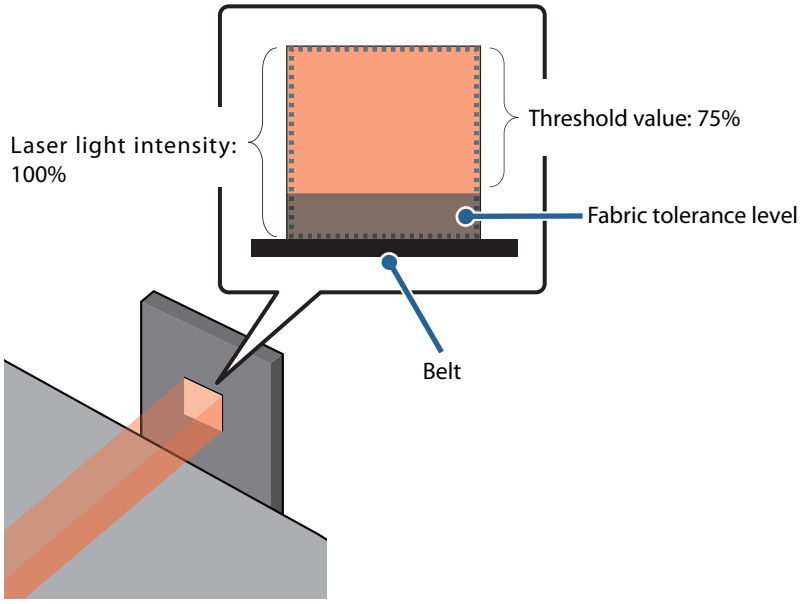
The foreign material detection sensors are located inside the rear cover and use a laser beam to detect gaps in the thickness of the fabric.If there is any foreign material on the fabric, or if the fabric does not stick to the belt and rises up or flips over, the print head stops to prevent it from colliding with the foreign material or the fabric.



This measures the amount of light emitted by the sensor when the laser light is reflected back from the reflectors. When the light is at 100% intensity, there is no foreign material or folded fabric blocking the laser light. The percentage of light intensity decreases if there is any foreign material or folded fabric blocking the light.

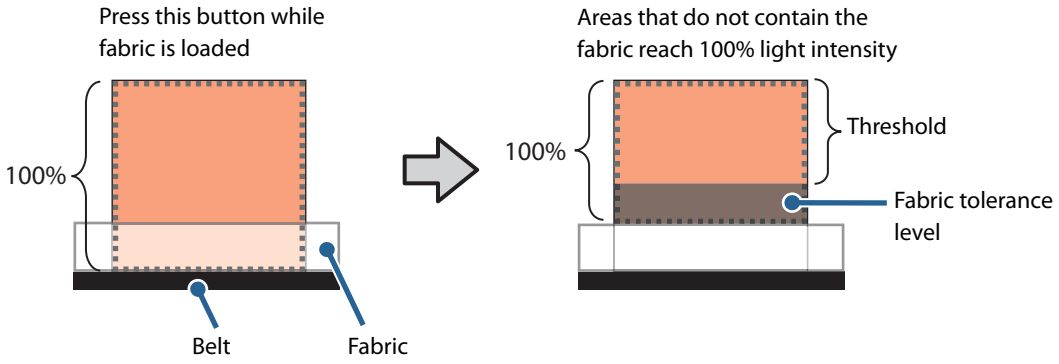
If the percentage of light intensity is lower than the specified value (the threshold), the sensor will react. The default threshold is 75%. When loading the fabric for the first time or changing the fabric thickness, you need to set the sensor.

If the fabric is thicker than 2 mm, the threshold value must also be adjusted.



The light intensity and threshold value of the foreign material detection sensor can be confirmed and configured on the front panel.

CAUTION	Normally, leave the foreign material detection sensor switch On. If this function is disabled, a collision with foreign material on the fabric may cause a head failure. Head failures due to collisions are not covered by the warranty, even during the product warranty period.

No.	Description
1	Indicates the threshold. The sensor reacts when the amount of light falls below the threshold (%) specified here. If the fabric is thicker than 2 mm, it is recommended to set the threshold value low (less sensitive). If the default threshold value (75%) is used, the sensor might react too sensitively.
2	Indicates the measured light intensity (%).
3	Press ◀ to decrease the threshold, and press ▶ to increase the threshold. The higher the threshold, the more sensitive the sensor becomes. The lower the threshold, the less sensitive it becomes.
4	When you press this button, the amount of light measured when you press it is set as 100%. When loading the fabric for the first time or changing the fabric thickness, press this button while fabric is loaded. 

	To return the threshold to the default value, press the (4) [PRESET] button while no fabric is loaded.

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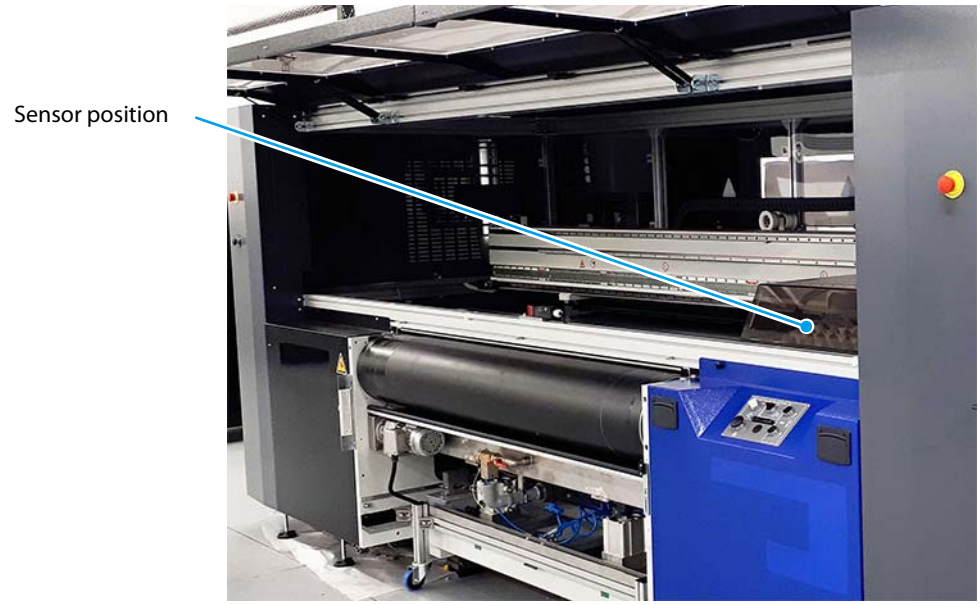
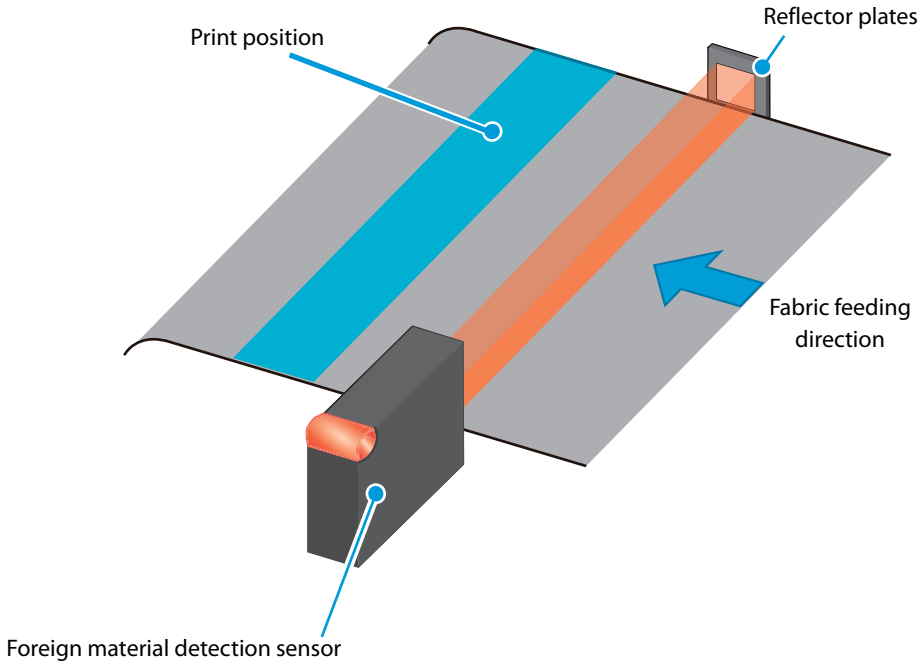
When loading the fabric for the first time or changing the fabric type or thickness, you need to set the sensor.

Located at the side of the belt, that detect gaps of the fabric thickness with a laser beam. If there is foreign material on the fabric or if the fabric lifts up or folds over without pressing against the belt, printing is stopped to prevent the print head from colliding with the foreign material or fabric. This threshold value is set by the user.





CAUTION	To prevent print head damage, set appropriately.
	Sensors are located on the left and right sides of the print head carriage. When foreign material is detected, the machine stops. When the carriage is moving at high speeds, such as when printing, it may not be able to stop even if it detects foreign material.

How to Set the Foreign Material Detection Sensor

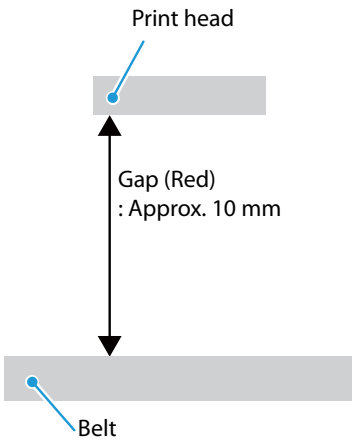
Set according to the following procedure.

1 Turn the foreign material detection sensor switch on the front panel to On.

CAUTION	Normally, leave the foreign material detection sensor On. If this function is disabled, a collision with foreign material on the fabric may cause a head failure. Head failures due to collisions are not covered by the warranty, even during the product warranty period.

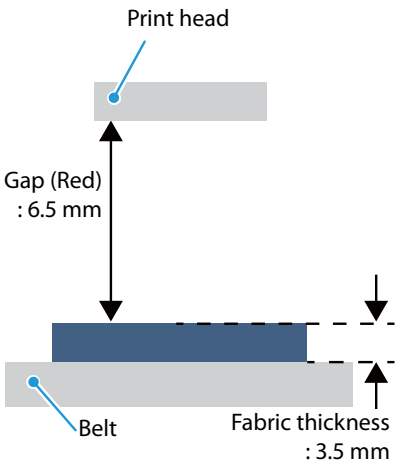
2 Open the cover on the foreign material detection sensor controller.

(3) Fabric is not set.



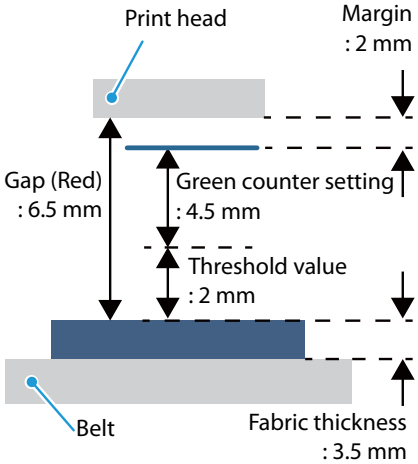
Counter values
- Red: 9999
- Green: -

(4) Fabric is set.



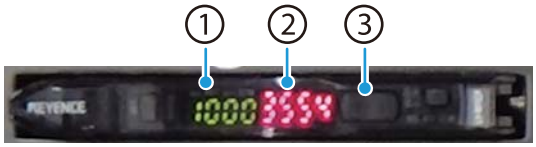
Counter values
- Red: 6500
- Green: -

(5) Threshold value setting



Counter values
- Red: 6500
- Green: 4500

3 **If the fabric is not set, the red counter will show 9999. This shows there is a gap of about 10 mm. Values may vary depending on the condition of the belt.**
If the fabric is set, the red counter displays the gap between the print head and fabric.



No.	Name	Description
1	Green counter	This is the setting for the threshold value. If detected value falls below this number, an error occurs and printing stops.
2	Red counter	Displays the height of the fabric, measured with a laser.
3	Selector	Use the selector to set the height. Press + to increase the value for the green counter, and press - to decrease the value.

4 **Press the + or - of the selector to set the threshold value. The value is displayed by the green counter. The difference between the red counter and green counter is the threshold value.**

	Recommended setting:	Set a value that is 2000 less than the red counter.
	Setting example:	If the red counter is set to 4500, set the green counter to 2500.

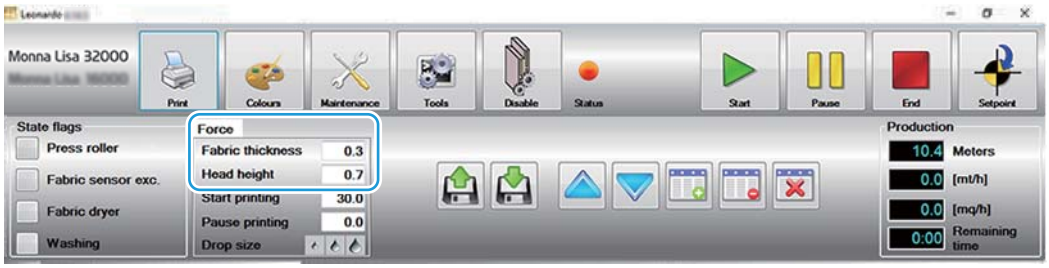
5 **Close the cover on the foreign material detection sensor controller.**

Set the Printer

Configure the settings in the Print menu.

Setting the Fabric Thickness and Print Head Height

Set the fabric thickness and print head height according to the fabric that is used.

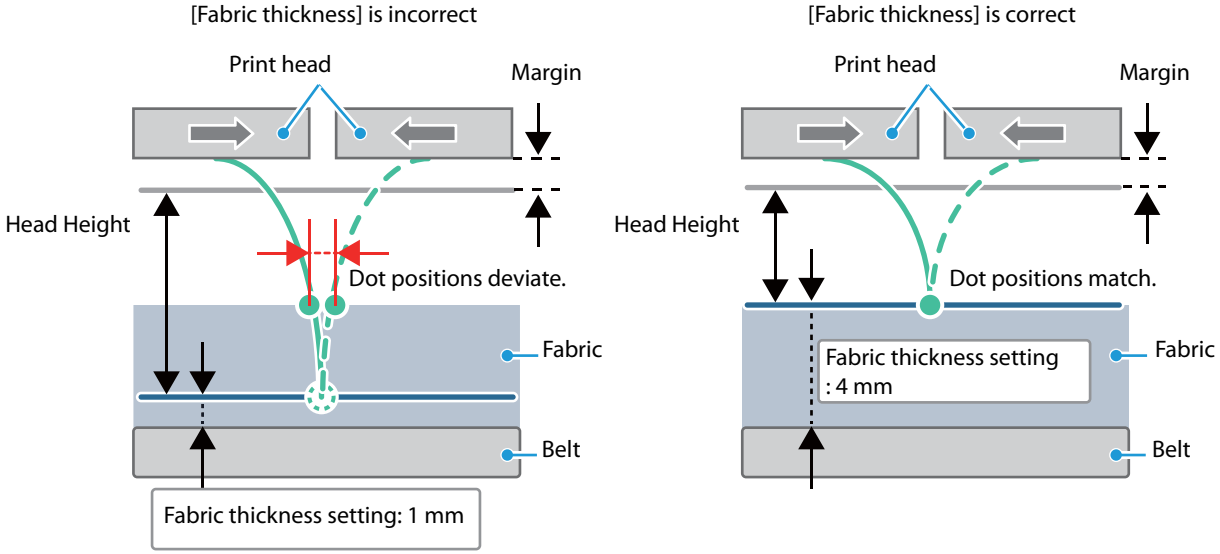


Fabric Thickness

Since ink is discharged while the print head moves at high speed, the ink dot position will change according to the distance from the print head to fabric surface.

With bidirectional printing, the ink lands at the height position set with [Fabric thickness]. If this height is not correct, the inkdot position will differ depending on whether printing is from the left or right, causing print quality to drop. Therefore, it is extremely important to ensure that the [Fabric thickness] setting matches the fabric thickness.

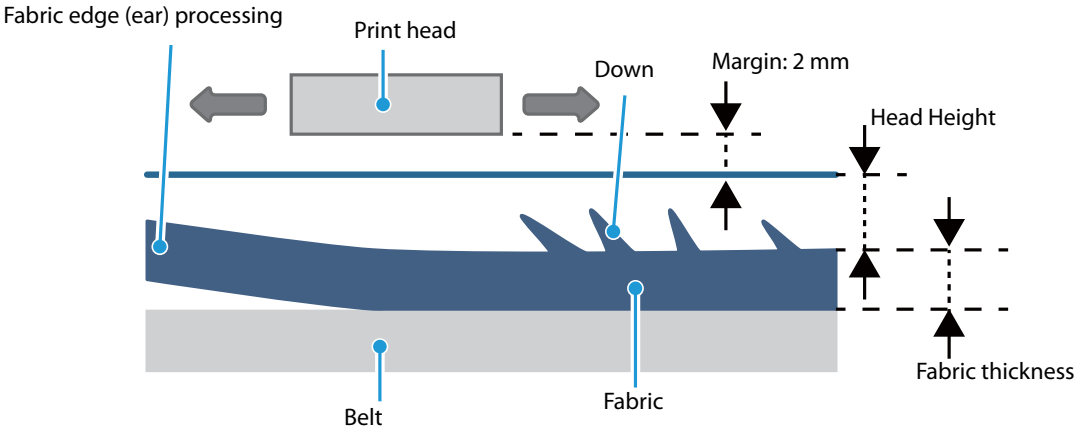
The figures below show the ink dot positions when the [Fabric thickness] is incorrect versus when it is correct. When the [Fabric thickness] is correct, the ink dot positions will be uniform, resulting in high-quality printing.



Head Height

This setting adds the distance from the print head to the belt. Use it to set a safe distance from the fabric surface so that the print head will be protected.

Set it to protect the print head from fluff generated from the fabric and from fabric edge (ear) processing.



Up to 10 mm can be set in total for [Fabric thickness] and [Head height].

Giving a 2 mm margin to this value, the print head height is a maximum of 12 mm.

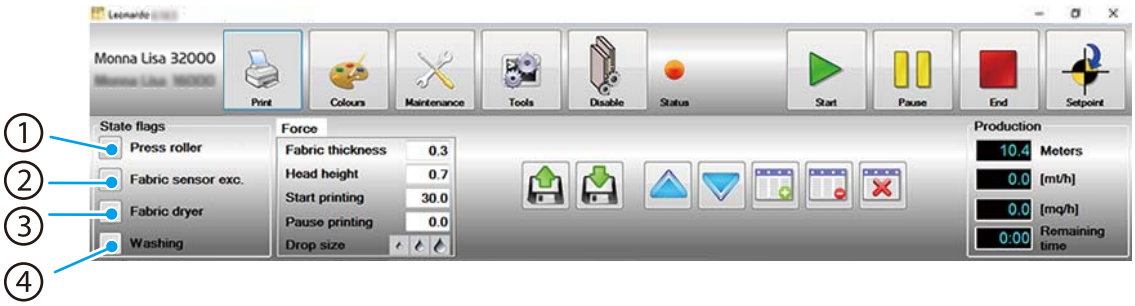
Recommended [Head height] setting:

- High quality: 0.7 mm
- Stable operation: 2.0 mm

	• Appropriate values for [Head height] will vary according to the type of fabric used. • If the [Head height] setting is large, the gap between the print head and fabric surface will be large, possibly generating ink mist. For optimal adjustment, we recommend that you take the fabric type and thickness into account. • If the [Head height] setting is small, the print head might collide with the fabric when the fabric floats upward, causing print head failure or clogged nozzles. Note that Epson shall bear no responsibility for any outcome that occurs as a result of the print head colliding with the fabric.

Set the Printer Equipment and Sensors

Set the printer.



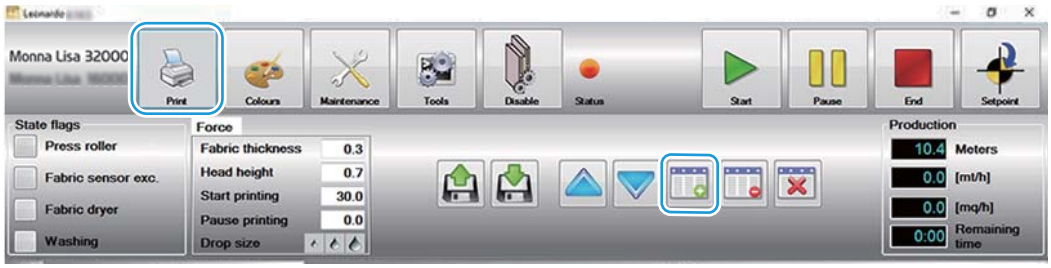
No.	Name	Description
1	Press roller	Select this flag to operate the pressure roller. This flag is selected automatically when printing is in progress.
2	Fabric sensor exc.	Select this flag to disable the foreign material detection sensor. This flag is unselected automatically when printing is in progress. This is enabled only when the foreign material detection sensor switch is On. (Page 23)
3	Fabric dryer	Select this flag to send a signal notifying an external device (external winder, dryer, etc.) of printing. This flag is selected automatically when printing is in progress.
4	Washing	Select this flag to operate the belt cleaning system.

CAUTION	If the machine is stopped for a long period of time, disable the belt cleaning unit. Otherwise, the belt will be damaged.

Loading Print Data

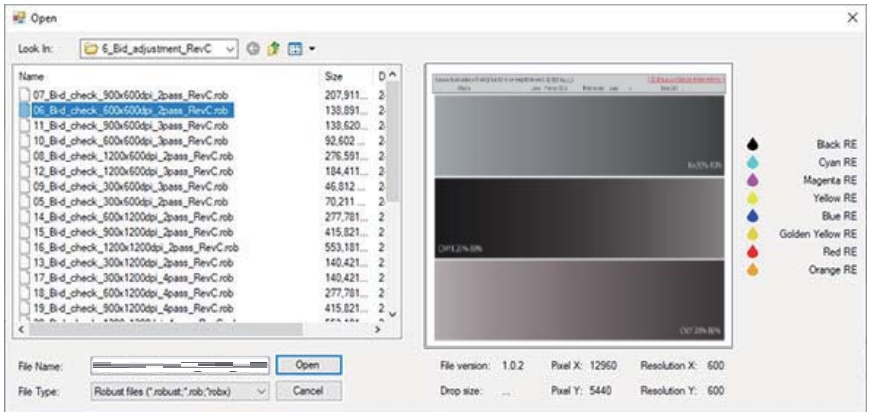
	To load print data into Leonardo, first copy the job files to a user-defined folder on the control PC. We recommend creating a folder named "Design" or something similar on the desktop of the control PC. To load job files from USB memory, connect the USB device to the USB port on the back of the display. To remove the USB memory from the control PC, perform the correct Windows operation to safely remove hardware.

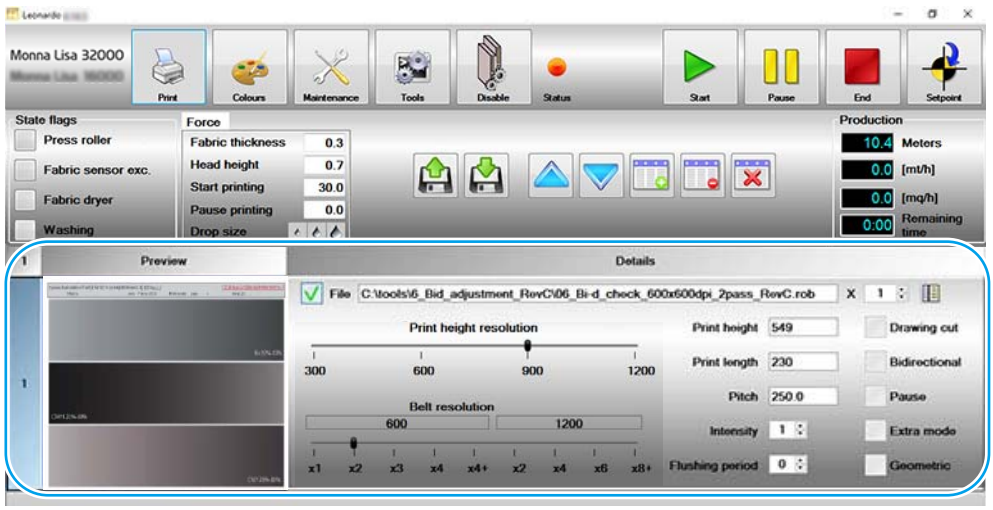
1 **Click [Load file] in the Print menu.**



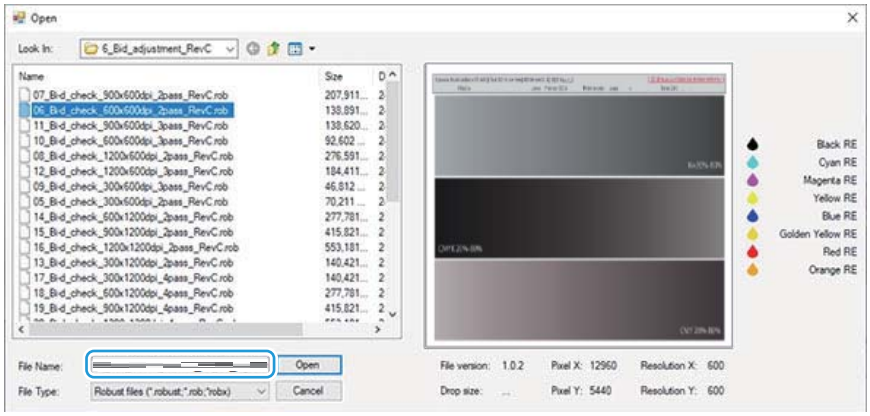
2 Follow the on-screen instructions to select a job file.

The information for the file that is loaded is displayed in the [Print] menu.





There is a character limit for file names.
When adding data, if the message is displayed but the file information is not displayed, reduce the number of characters in the file name, including the path, displayed for [File name] on the [Load file] screen. When using ASCII characters, limit the input to 251 characters.



	Some types of ROB file creation software may automatically generate a design file for color patches at the same time as the ROB file. If there is a design file for color patches in the same folder as the ROB file and the design file for color patches has the same file name as the ROB file (ROBfilename_chips.rob), the design file for color patches is loaded at the same time the ROB file is loaded.

3 To load multiple job files, repeat procedures 1 and 2.

Setting the Print Data

Check the job file, and configure the settings if necessary.

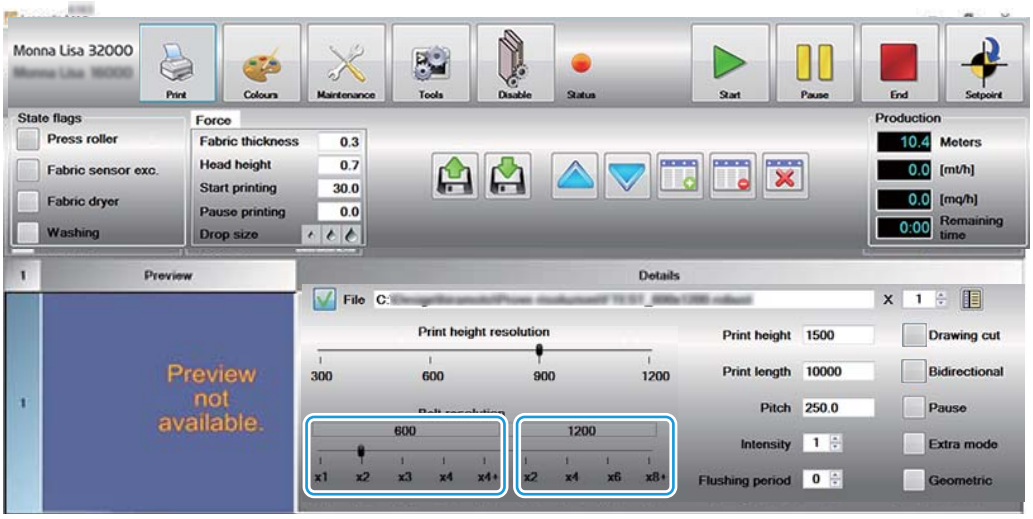
This section describes the settings to be configured for printing. For more information about job files, refer to the "Leonardo Reference Guide".

	The resolution is set with ROB file creation software (EpsonEdgePrint Textile) when the job file is created, and therefore cannot be set here. To change the resolution, create the job file again.

1 **Set the number of passes. Use the slider on one of the bars to select a value.**

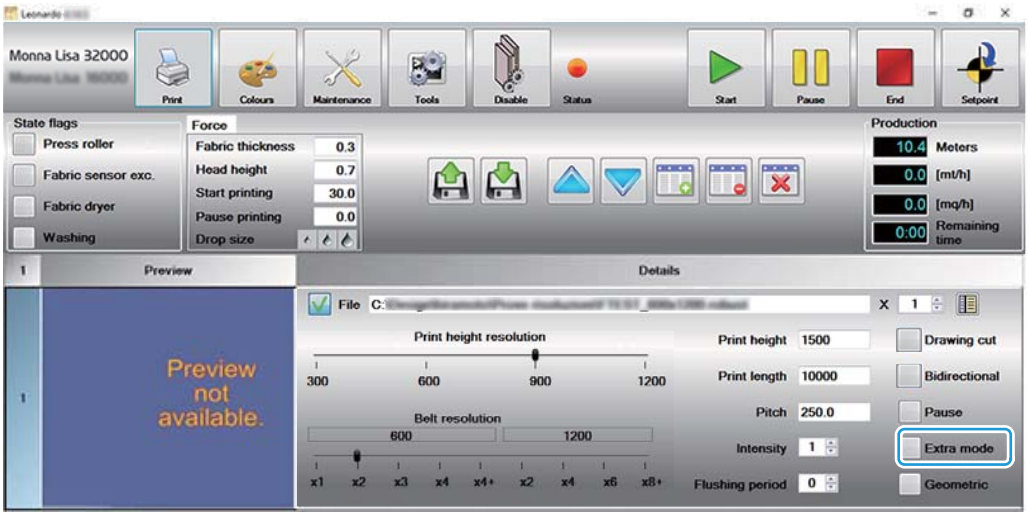
Vertical resolution of 600 dpi: Left bar

Vertical resolution of 1,200 dpi: Right bar



2 **Specify the printing direction for the print heads. Select [Bidirectional] for bidirectional printing.**

3 **Extra mode uses twice the amount of ink as usual. Select [Extra mode] to print in this mode.**



	Selecting Extra mode causes the print speed to drop.

Printing

Checking the Status of the Fabric

Check the status of the fabric.

- The fabric must be pulled into the print surface and spread out flatly.
- There must not be any folds or protrusions and the fabric must not be lifted up.
- If there is a seam between pieces of fabric, take measures to make it flat so that it does not scrape against the print head.

Checking the Towel Roller

If the towel roller is installed, check that the towel roller is down.

Checking the Print Path

Check the print path.

- No foreign material in the print head operating area.
- There must not be any abnormalities in the fabric path or winding path.

Checking the Amount of Ink

Before printing, lift the ink cartridges in the ink rack by hand to check if they contain sufficient ink.

Configuring the Print Settings

Set the print length and the margin (right side) for when printing starts.

Item	Description
Start printing	Set the margin from the right edge. (mm)
Pause printing	Set the length from when printing starts until it stops. (m)

Check the length of the fabric to be printed on, and then enter a value at least 3 m shorter than the actual fabric length.

WARNING	For the following reasons, perform settings so that printing ends with 3 m or more of fabric left. • If the ending edge of the fabric is not affixed to the winding core, the fabric can slip off the winding core, meaning it is not held by the brake or tension device and cannot properly adhere to the belt. If printing continues in that state, the fabric can become caught on the print head and damage the print head. • If the ending edge of the fabric is affixed to the winding core, the belt is pulled by the fabric at the end of the fabric, putting excessive strain on the belt motor. This could cause belt motor malfunctions.
CAUTION	We recommend always using the [Pause printing] option. Using this option lets you set the length (meters) to be printed. When printing stops, the machine pauses and waits for the next command.
	A test print should be at least 1 m, to check for banding due to misalignment of the print heads.

Printing

1 **Click the [Start] icon.**

2 **If the "Enable belt cleaning?" message is displayed, click [YES].**

3 **Starts printing. The printed fabric is fed to the front of the machine.**

	If there are any print quality problems, refer to "Print Result Trouble" on Page 113. If an emergency stop button is pressed while printing, the data that is being printed will be lost.

Checking the Cleaning Unit

Confirm that water is provided to the cleaning unit and check the water level in the tank.

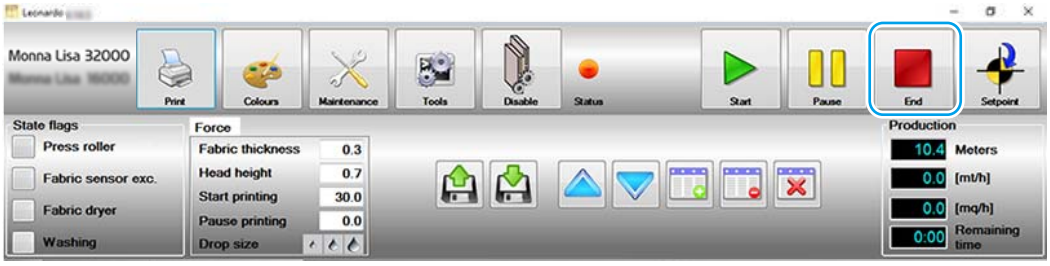
Printing Ends

After it finishes printing the set length, the printer stops in the pause status.

After the printer stops, the operator can remove the fabric from the winding core that finished printing, then handle any issues such as folds in the fabric edge by hand.

Stopping Printing

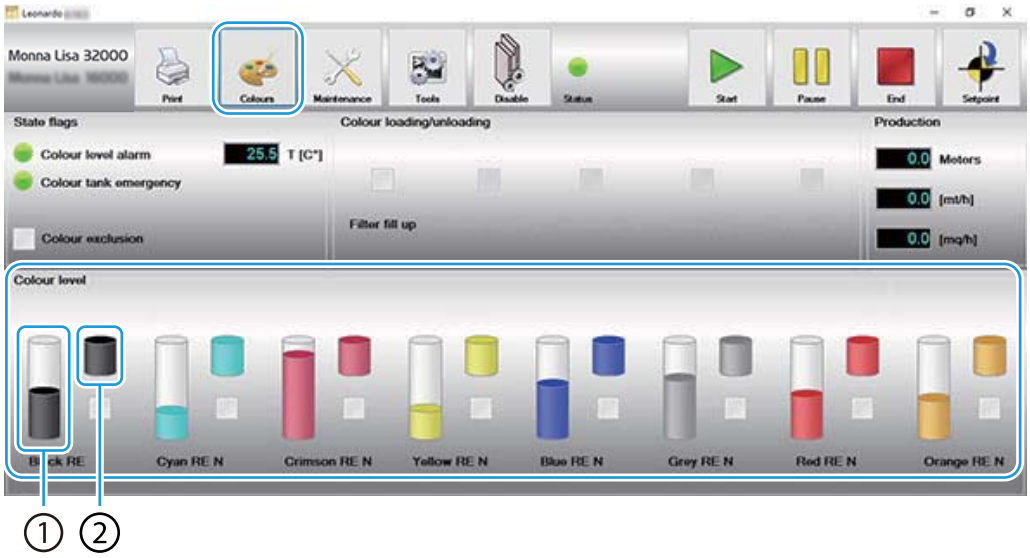
When printing of the job files that were set when printing started is complete, the machine stops automatically. To stop printing before printing is complete, click [End] in Leonardo.



Replace the Ink

Checking the Amount of Ink

Use the [Colours] menu in Leonardo to check the amount of ink in the ink system.



No.	Name	Description
1	Main tank	Allows you to check the approximate amount of ink remaining in the ink cartridge.
2	Sub tank	Allows you to check the approximate amount of ink remaining in the sub-tank.

Replace the Ink

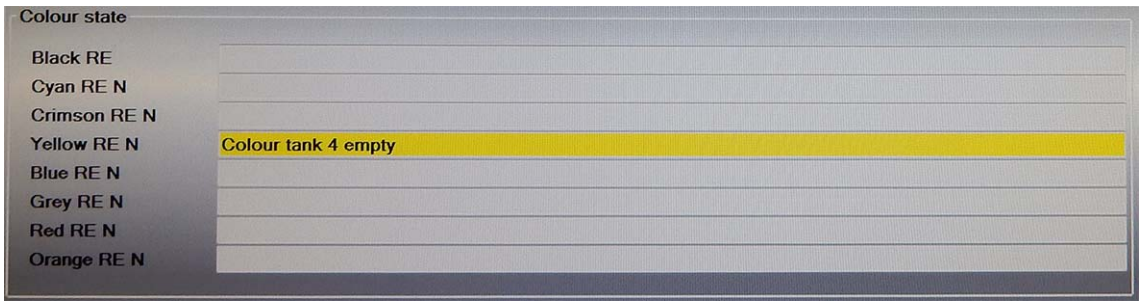
The buzzer sounds when low ink is detected in this machine.

Use the following procedure to replace ink.

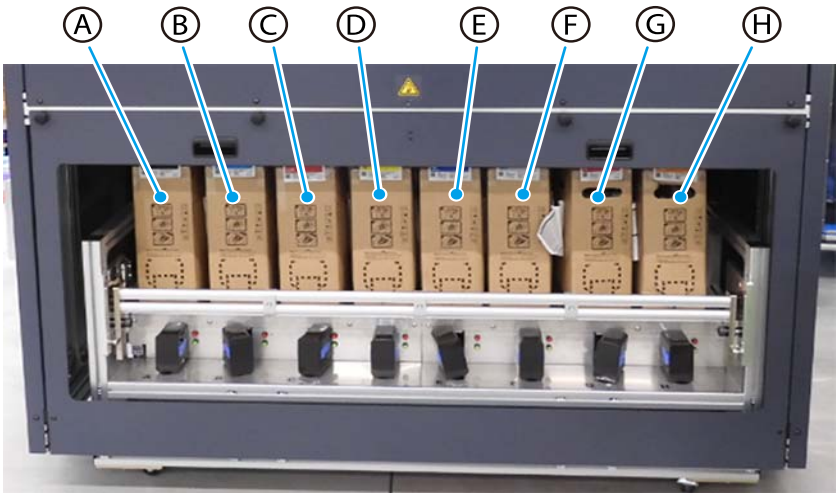
	Replace the ink within five minutes after low ink is detected. Continuing to print after ink low is detected without replacing ink will cause printing to stop when the sub-tank rack is empty.

1 **In the [Colours] menu in Leonardo, check the number of the ink cartridge in which the ink is low.**

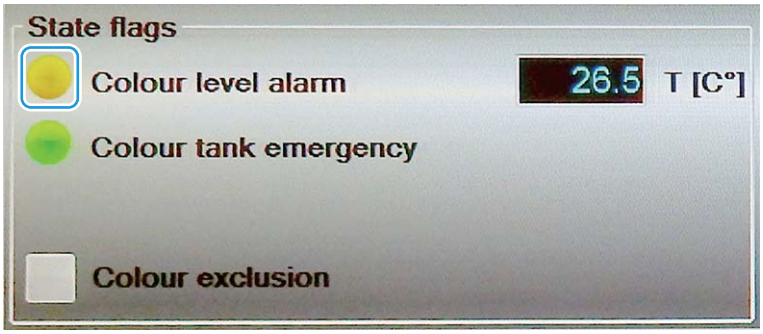
Example: "Colour tank 4 empty" (The number in quotes is the ink cartridge number)



Ink cartridge numbers

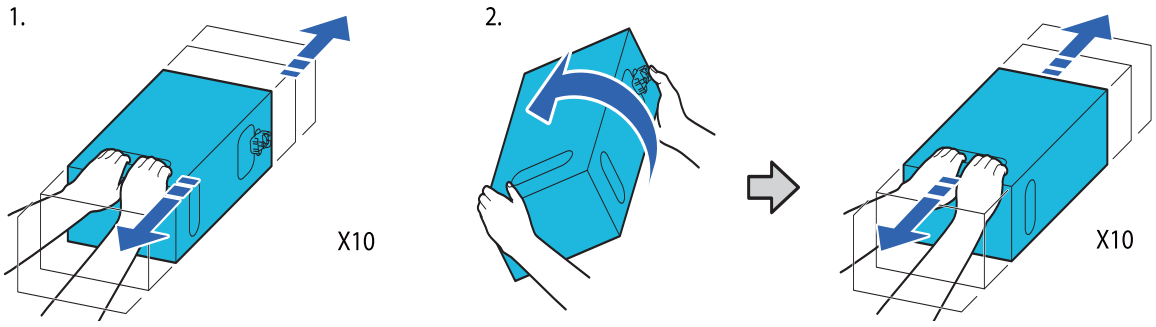


2 **Double-click the ● icon for "Colour level alarm". The buzzer stops, and the ● icon changes from yellow to green.**

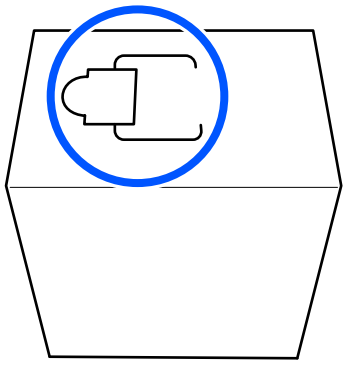


3 Check on the ink rack if the cartridge check lamp of the corresponding ink cartridge lights up in red.

4 Prepare a new ink cartridge, and stir the ink.
1. Place the ink cartridge with the ink supply port facing the side, and slide the ink cartridge back and forth longitudinally within the range of approximately 10 cm, 10 times. Move the ink cartridge at a rate of one back-and-forth cycle per second.
2. Turn over cartridge and slide it back and forth 10 times in the same way.

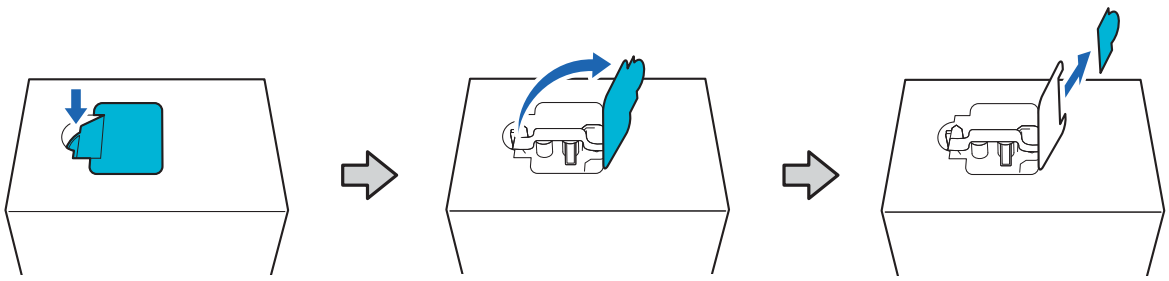


5 Place the ink cartridge as shown in the following image.

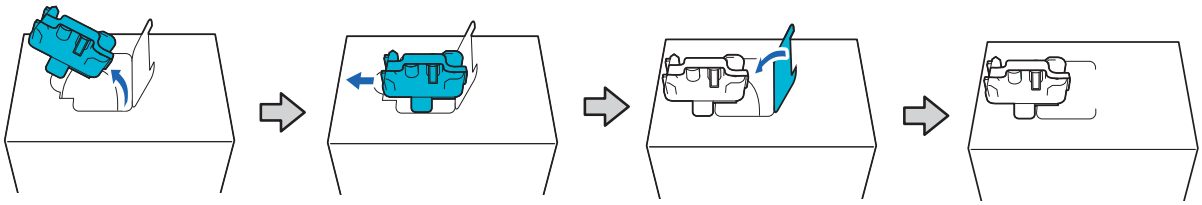


6 Use your hands to cut along the dashed lines of the slot to remove the top portion.

CAUTION	Do not use a cutter to cut along the dashed lines. Failure to observe this precaution could damage the internal parts and cause ink to leak.

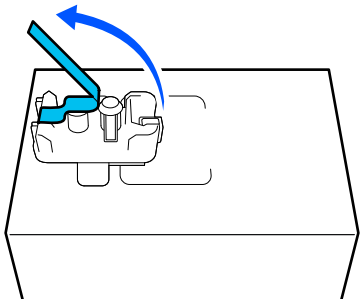


7 Take out the ink supply port and fix it as shown in the illustration.



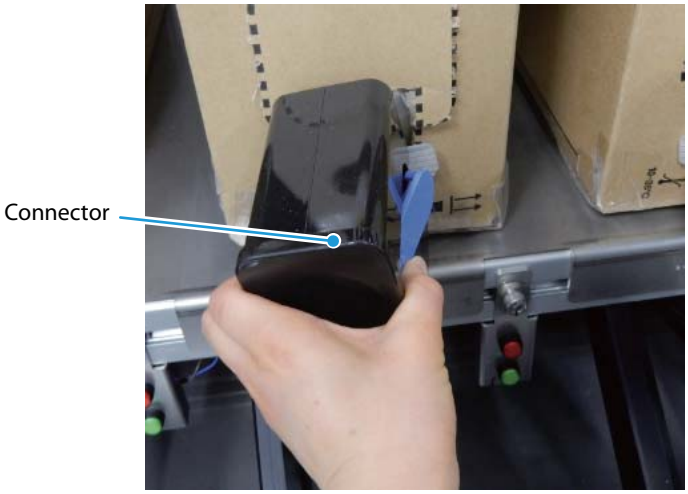
8 Peel the tape (yellow) from the surface of ink supply port.

CAUTION	Do not touch the IC chip on the ink cartridge.



9 Pull the ink rack front bar towards you and down.

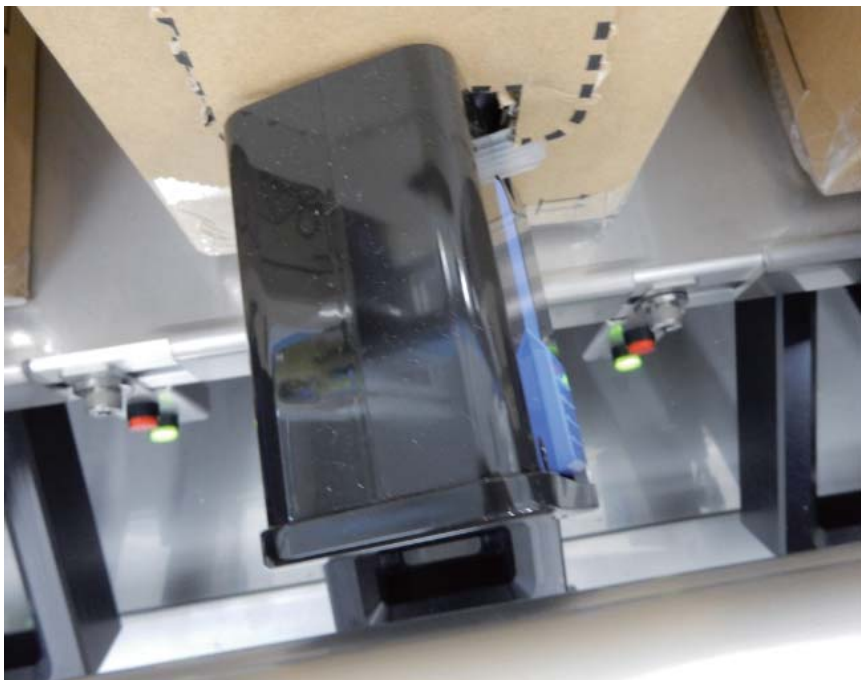
10 Remove the ink cartridge to be replaced from the ink rack. Grab the blue levers on both sides of the connector, and then pull it out toward you.



11 Lower the ink cartridge to be replaced from the ink rack.

12 Set the new ink cartridge in the ink rack.

13 **Insert the connector of the ink rack into the ink supply port of the ink cartridge. Push the needle of the connector into the ink supply port of the ink cartridge. Insert it carefully and securely as shown in the following image.**



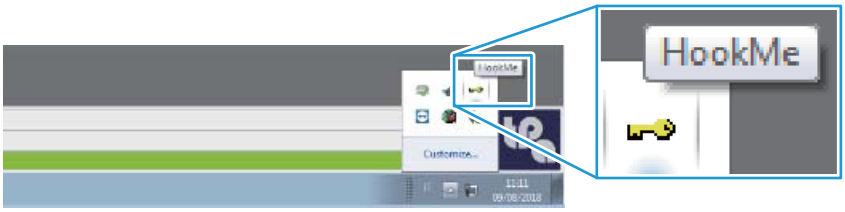
14 **Raise the ink rack front bar up.**

This completes ink replacement. When the sub-tank is filled with ink, the green LED on the ink rack Illuminates.

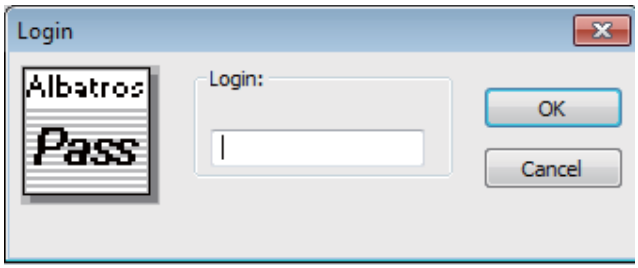
Changing User Permissions

There are two types of user permissions: "L user permissions" and "H user permissions".
For more information about user permissions, refer to "User Permissions" on Page 4.
The procedure for changing permissions is described below.

1 **Click "Show Hidden Icons" in the Windows taskbar. Click [HookMe].**



2 **The Login screen is displayed. Enter the user-level password, and click [OK].**



✎	Contact qualified service personnel for the passwords for each user.

Check the Belt Cleaning Unit Operation

Colour exclusion mode is used for performing printing operations such print head operation and belt feeding without the use of ink.

You can check operation during Colour exclusion mode if you want to check operation of the belt cleaning unit without printing on fabric.

	If fabric is already set, belt feeding is performed without printing.

Follow these procedures to use this mode.

1 **In the [Colours] menu, select [Colours exclusion].**

2 **Click "Start".**

Workflow When Turning Off the Power

This section describes the procedure for turning off the power.

1. Inserting the Stopper Pin of the Pressure Roller (Page 98)
2. Lifting Up the Towel Roller (Page 99)
3. Cleaning (Page 101)
4. Pushing an Emergency Stop Button for an Emergency Stop (Page 101)
5. Exiting Leonardo (Page 101)
6. Turning Off the Control PC (Page 101)
7. Turning Off the Main Power Switch (Page 102)
8. Closing the Water Supply Valve (Page 102)
9. Exhausting Compressed Air (Page 103)

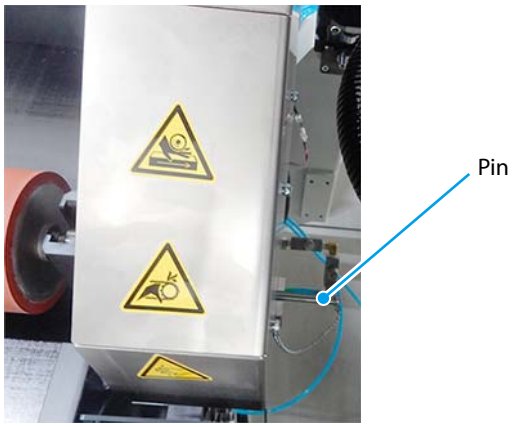
Inserting the Stopper Pin of the Pressure Roller

CAUTION	Be sure to always insert the pins on the left and right when work is completed. Leaving the hanging low may deform the belt.

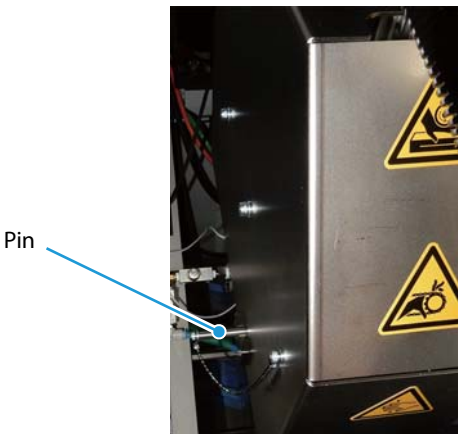
1 **Open the rear cover.**

2 **Turn the pressure roller switch to the left to lift up the pressure roller.**

3 **Insert the right-side stopper pin into the pressure roller.**



4 **Insert the left-side pin into the pressure roller.**



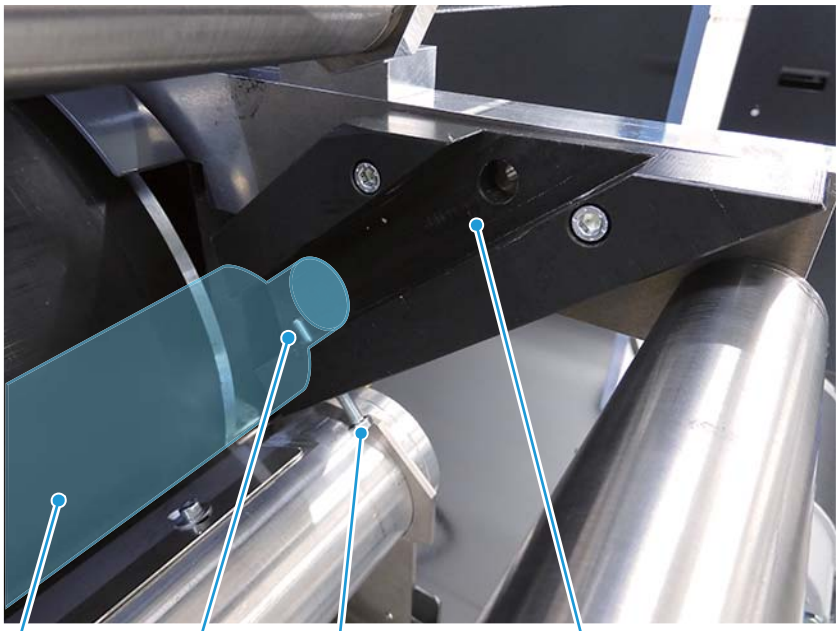
5 **Close the rear cover.**

Lifting Up the Towel Roller

Lift up the towel roller away from the belt.

To lift up the towel roller, lift the towel roller first and tighten the supporting screw with the screw sticking out into the groove. Then, lower the towel roller spindle onto the screw.

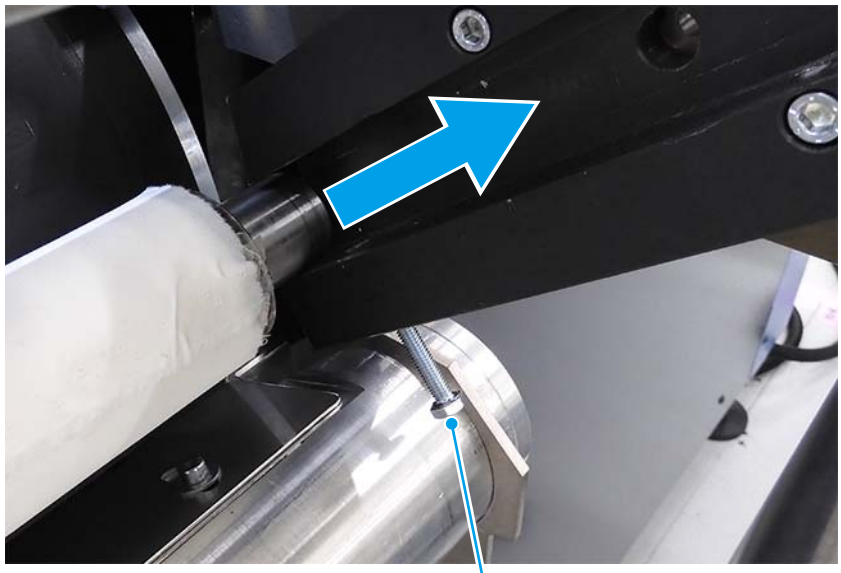
Towel roller in upper position



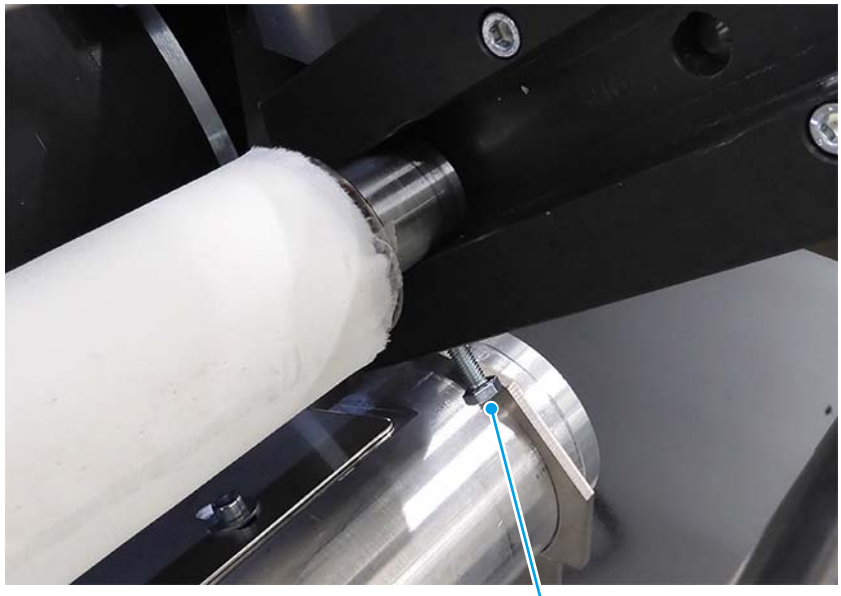
If the towel roller is kept in contact with the belt for a long time, glue on the belt may adhere to the towel roller. Keep the towel roller in the lifted position while the machine is not in printing operation.

1 **While lifting up the right side of the towel roller toward you, tighten the supporting screw (right) by hand keeping the screw sticking out into the groove.**

CAUTION	When the supporting screw is loosened, the towel roller automatically lowers under its own weight. Be careful not to get your fingers caught between the towel roller and the belt.



2 **Lower the towel roller gradually onto the supporting screw.**



3 **Repeat procedures 1 and 2 on the left side of the towel roller.**

Cleaning

Wipers and Caps

Refer to the "Maintenance Guide".

Flushing Plate

Refer to the "Maintenance Guide".

Belt (When Using Pigment Ink)

When pigment ink adheres to the belt, an ink film is formed. To prevent ink films, clean the belt referring to the Maintenance Guide.

Pushing an Emergency Stop Button for an Emergency Stop

Push the emergency stop button to put the machine in emergency stop status, so that the print heads and motor do not operate suddenly when the power is turned on.

For the locations of the emergency stop buttons, refer to "Safety Precautions".

Exiting Leonardo

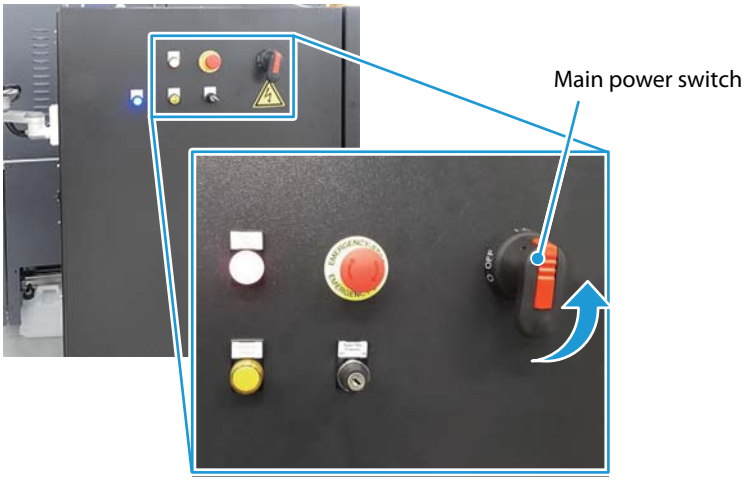
Exit Leonardo.

Turning Off the Control PC

Shut down the control PC.

Turn off the Main Power

Turn off the power. Turn the main power switch on the main electric panel to 0 (OFF).

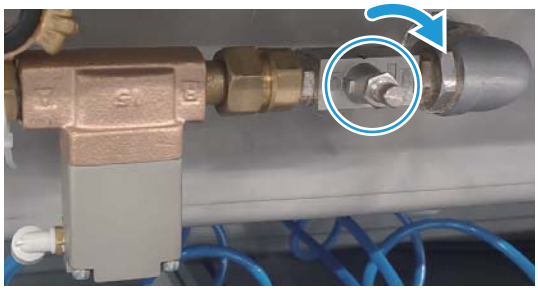


Closing the Water Supply Valve

Close the water supply valve at the bottom of the front of the machine.

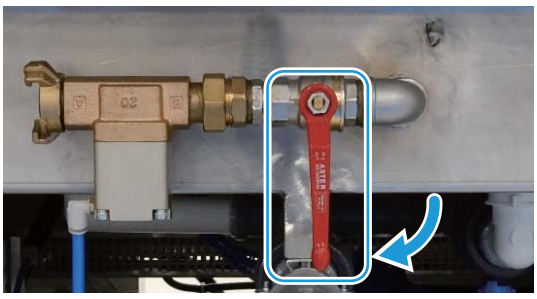
ML-32000-340 / ML-16000-180

Using a flat-head screwdriver, tighten the water supply valve.



ML-32000-180

Operate the lever to close the water supply valve.



Exhausting Compressed Air

Exhaust the compressed air that has been supplied to this machine.

Turn the red valve of the air pressure supply regulator clockwise to change the indicator for the valve from "SUP" to "EXH".

Make sure the air is exhausted and the meter goes to zero.

When Not Using the Printer

This chapter applies to ML-32000-340.

To keep the printer functioning properly, perform the following maintenance when the printer is not in use.

Maintenance methods vary depending on the period of time the printer is not in use.

- If the printer will not be used for two days to a week: Keep the sponge roller in antimicrobial storage.
- If the printer will not be used for more than one week: Keep the sponge roller in dry storage.

CAUTION	If the sponge roller is not stored properly when the printer is not in use, the sponge could become moldy or deformed.

When the Printer will Not Be Used for Two Days to a Week

If the printer will not be used for two days to a week, remove the sponge roller from the machine and store it in the sponge roller tank for antimicrobial storage.

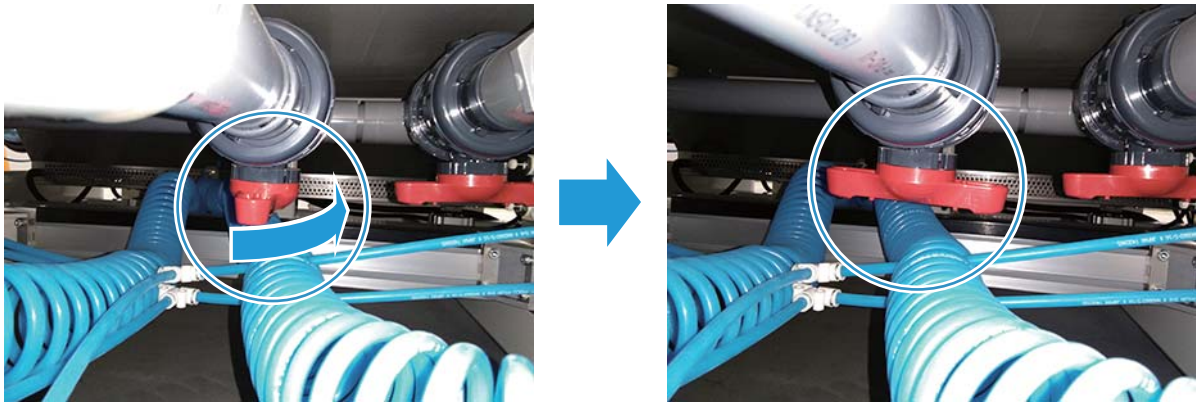
Before starting work, be sure to prepare the following items.

Item	Quantity	Details
Eye protection	1	Commercially available.
Protective gloves	1	Commercially available.
Protective clothing	1	Commercially available.
Sponge roller tank	1 set	
Belt cleaning unit wheels	2	
Hex key (width: 6 mm)	1 set	Commercially available.
Bucket	1	Commercially available.This is separate from the one for glue application.
Antimicrobial agents: Items that includes benzothiazolin (CAS RN: 2634-33-5)		Commercially available. Confirm the concentration of benzothiazolin.

CAUTION	• Do not use antimicrobial agents that contain quaternary ammonium salts. Foreign matter produced by the reaction between the antimicrobial agent and ink might adhere to the belt, making it impossible to clean the belt. • As the belt cleaning unit is heavy, work in a team of three people when pulling it out or restoring it to its original position. • Make sure that installation and removal of the sponge roller is performed by two workers due to the weight of the roller.

Before starting work, turn off the machine.

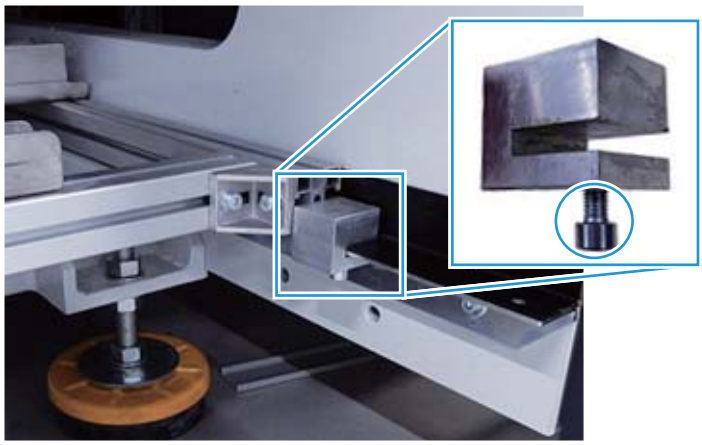
1 Turn the left drain valve in the direction of the arrow to close it.



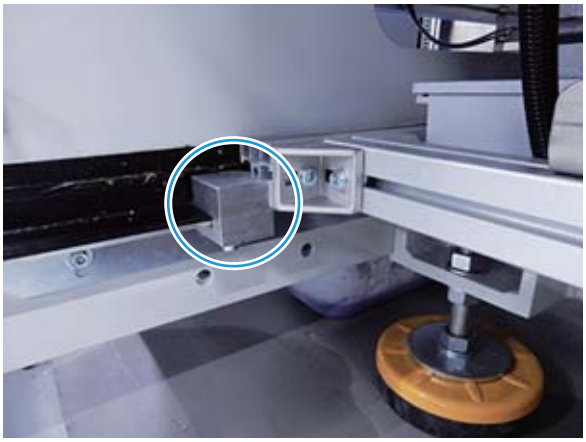
2 Remove the one screw of each fixing block [2] on the left and right using the hex key (width: 6 mm).

Store the removed screws to ensure they are not dropped or placed somewhere they can cause damage.

Right side

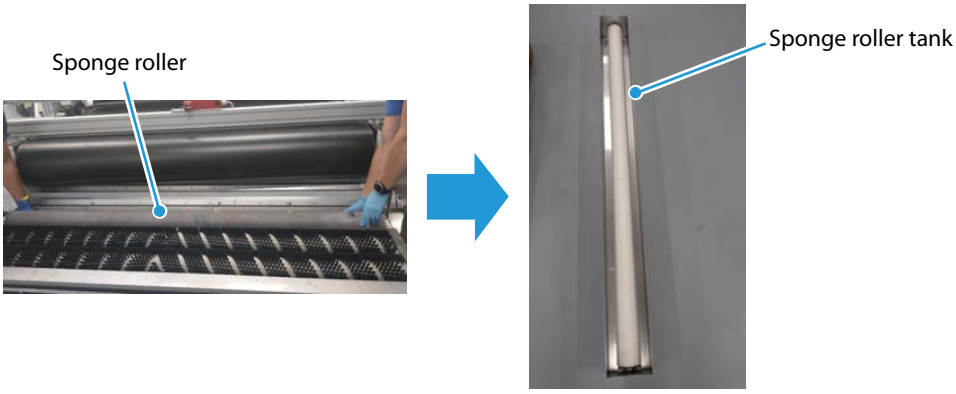


Left side



3 **Pull the belt cleaning unit toward you until the carriage rail hits the stopper nearest from you.**

4 **Remove the sponge roller and then place it in the sponge roller tank.**



5 **Prepare a solution using the antibacterial agent and tap water, with a concentration of 0.01 to 0.02% of benzothiazolin (CAS RN: 2634-33-5), in the bucket to match the capacity of the sponge roller tank (45 - 55 L).**

6 **Pour the antibacterial agent solution into the sponge roller tank, and completely submerge the sponge roller for storage. If the sponge roller absorbs the antimicrobial solution and the water level drops, add tap water.**

CAUTION	Be sure not to tip over the sponge roller tank. If the floor becomes wet due to the antibacterial agent, it could lead to injury due to slipping.

This completes the work.

When the Printer will Not Be Used for More than One Week

If the printer will not be used for more than one week, remove the sponge roller from the machine and store it in the sponge roller tank for dry storage.

Before starting work, be sure to prepare the following items.

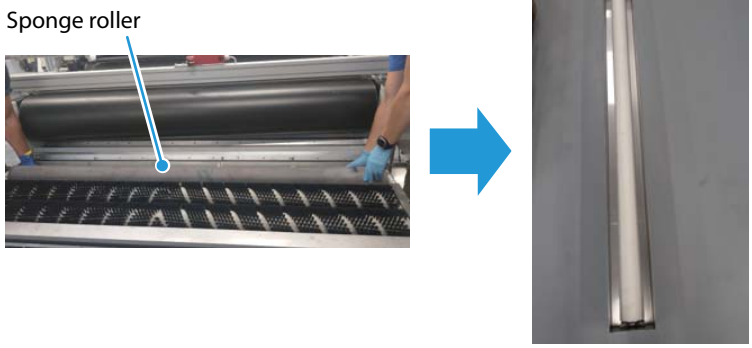
Item	Quantity	Details
Protective gloves	1	Commercially available.
Protective clothing	1	Commercially available.
Sponge roller tank	1 set	
Belt cleaning unit wheels	2	
Hex key (width: 6 mm)	1 set	Commercially available.

CAUTION	• As the belt cleaning unit is heavy, work in a team of three people when pulling it out or restoring it to its original position. • Make sure that installation and removal of the sponge roller is performed by two workers due to the weight of the roller.

Before starting work, turn off the machine.

1 **Pull out the belt cleaning unit.**
Perform steps 1 through 5 of "When the Printer will Not Be Used for Two Days to a Week". (Page 104)

2 **Remove the sponge roller and then place it in the sponge roller tank for dry storage.**



This completes the work.

When Resuming Printing

1 **If the sponge roller was placed in dry storage, fill the sponge roller tank with tap water so that the sponge roller is completely submerged, and keep it submerged for four hours.**

2 **Remove the sponge roller from the sponge roller tank and install it on the belt cleaning unit.**

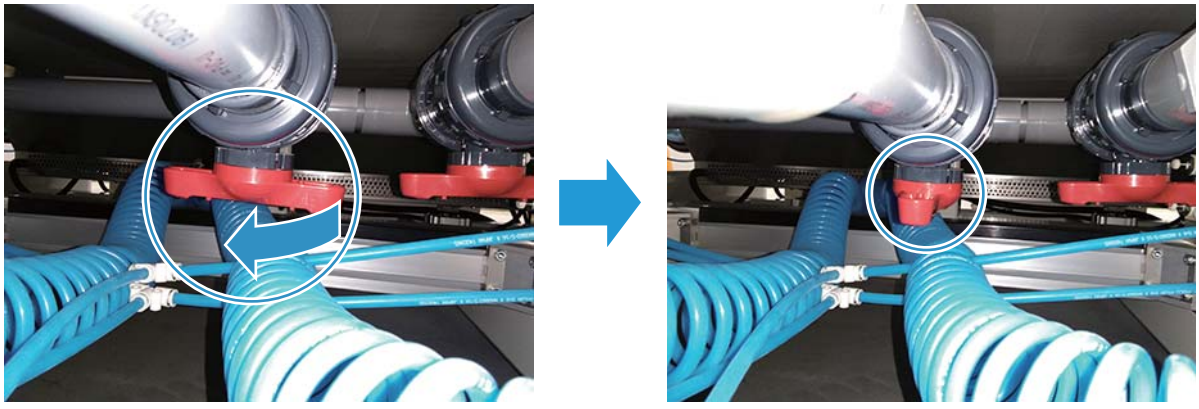
3 **Return the belt cleaning unit to the carriage rail.**

4 **Push the belt cleaning unit to the original position. Then tighten the screw on the fastener at two locations with the hex key (width: 6 mm).**

Insert the belt cleaning unit straight in its original position.
If it is inserted at an angle, the belt cleaning unit position sensor in the left rear will be unable to detect it, and therefore the emergency stop status may not be released.

Belt cleaning unit position sensor

5 **Turn the left drain valve in the direction of the arrow to open it.**



This completes the work.

Troubleshooting

This section describes actions to take when trouble occurs.

Error Messages

This section describes the causes for error messages and the actions that should be taken.

If the trouble is not resolved even after taking these actions, contact the distributor where the machine was purchased for assistance.

Error Messages	Cause	Action
Bag not recognized Do you want to continue?	The ink cartridge is not recognized.	Disconnect the ink cartridge and then connect it again.
Colour doesn't match previous. Do you want to continue?	The color of the ink cartridge has changed.	Check if the ink cartridge is the wrong color.
Bag not inserted	The ink cartridge is not connected correctly.	Check if the connector is connected to the ink supply port of the ink cartridge correctly. Disconnect the ink cartridge and then connect it again.
Colour tank empty (Audible and light alarm)	Low ink was detected.	Replace the ink cartridge. If the ink cartridge is not replaced, printing will continue until the ink in the reserve tank in the ink system runs out, and then the machine will stop in "Pause" status. After the ink cartridge is replaced, press "Start" to restart printing.
Machine emergency (Light alarm)	An emergency stop button has been pressed. A fault has been detected.	Check the reason why the emergency stop button was pressed. Inspect the machine to see if a fault has occurred. Remove the cause of the fault. Turn off the power to the machine, turn off the system, reset all errors that have occurred, and then restart the system.
Guard emergency	A front cover or rear cover is open.	Close the front cover or rear cover.
No air	The air pressure is not sufficient. Air is not being supplied.	Check the air pressure. Check the air supply system in the factory.
Run machine set-point	Setpoint has not been executed. Setpoint has been reset due to a fault.	Execute Setpoint. If Setpoint was reset due to a fault, check the cause of the fault and reset it before executing Setpoint.

Error Messages	Cause	Action
Piece fault.	The fabric to be printed on is not affixed to the belt. There is an abnormality or fault on the surface of the fabric.	Check the fabric, and remove any folds or bulges. Remove the fabric and install it again.
Check piece fault excluded	The foreign material detection sensor is disabled.	Enable the foreign material detection sensor. It is dangerous to print with the foreign material detection sensor disabled. If an abnormality occurs in the fabric, or if the fabric is not affixed to the belt, the print heads could be damaged.
Printing suspended	Printing was paused by request.	Remove the cause for pausing the printer, and then click "Start" to restart printing.
Head height incorrect	The print head height is incorrect.	Check the setting value.
Piece too tall	The fabric height is incorrect.	Check the setting value.
Initial design position too small	The print data setting is incorrect.	Increase the value for "Start print".
Head not in safe position.	The print heads are not in the correct position.	Contact qualified service personnel for assistance.
CARRIAGE. carriage linear motor: Servoerror	The position of the print heads is not recognized due to a mechanical impediment.	Press an Emergency stop button. Turn off the power to the machine. Remove the cause of the fault. Turn on the power to the machine.
CARRIAGE. carriage linear motor: encoder connection incorrect	The print heads were moved by hand.	
CARRIAGE. carriage linear motor: movement not completed	The print heads cannot move to the specified position due to a mechanical impediment.	
BELT. belt drive motor: Servoerror	The position of the belt is not recognized due to a mechanical impediment.	
BELT. belt drive motor: encoder connection incorrect	The belt was moved by hand.	
BELT. belt drive motor: movement not completed	The belt cannot move to the specified position due to a mechanical impediment.	
"xx-x" albre receiver disconnected	One or more devices have been disconnected from the internal system network.	Press an Emergency stop button. Turn off the power to the machine. Check the connection of the network cable. Turn on the power to the machine.
"xx" albrem receiver disconnected		
"x" albstep receiver disconnected		

Error Messages	Cause	Action
"xx-x" albre receiver: +24cc power supply error	An error has occurred in a +24 V power supply device on the machine.	Press an Emergency stop button. Turn off the power to the machine. Check the status of the device. Turn on the power to the machine.
"x" albstep receiver: +24cc power supply error		
File opening error	There is an error in the "ROBUST" file in the CAD system.	Delete the file. Create the file again in the CAD system.
File reading error		
Incongruent data in source file		
Quantity of data incorrect in file header		
Too many colour row values specified		
Design file version old		
Design file version not supported		
The height pixels exceed the print capacity		
Height resolution differs from that in the file		
Length resolution differs from that in the file		
Drop type in file incorrect		
Height increments don't match those in the file		
Length increments don't match those in the file		
Out of memory	A problem has occurred in the system memory.	Check if the OS settings on the system PC have been changed. Restart the machine.
There isn't enough memory to run the next band.		
File not found	The file to be printed was not found in the specified directory.	Specify the correct file name and directory.
Dongle error	The system does not recognize the dongle.	Contact qualified service personnel for assistance.
Invalid dongle		
Colours different from those in the machine	The printed color does not match either the file to be printed or the specified color.	If there is no problem with the color to be printed, continue printing. Check the file to be printed.
Colours in design file swapped		

Error Messages	Cause	Action
Print start error	An error or fault has occurred in the control system during system initialization or printing.	Restart the machine.
First pixel error		
Pixel count error		
TIMEMAC error		
REQ error		
Interruption due to TIMEMAC error		
Generic error	An unidentified error has occurred.	Restart the machine.
"Foreign material sensor" detected some foreign materials or a fabric error	The foreign material detection sensor detected foreign material on the belt or wrinkles or folds in the fabric.	Check if there is any foreign material on the belt and if the fabric is wrinkled or folded.
"Head stroke sensor" detected some foreign materials or a fabric error	The head stroke sensor detected foreign material on the belt or wrinkles or folds in the fabric.	Check if there is any foreign material on the belt and if the fabric is wrinkled or folded.
HEAD4 $"x" DRV $"x" temperature > $"x"°	The temperature of the print head drive substrate cannot be lowered.	Clean or replace the cooling fan filters. For more information about cleaning and replacement, refer to the Maintenance Guide.
Rear Chuck System sensor maintenance required	The belt control unit does not operate properly.	Check if there is any ink, glue, tape, or the like adhering to the right edge or left edge of the belt (within 25 mm from the belt edge). If ink, glue, tape, or the like is adhering to the belt, wipe it clean with a wipe cloth soaked in ethanol (proper amount). If the same error is displayed again after cleaning, contact qualified service personnel for assistance.
Rear Chuck System sensor fault		
Front Chuck System sensor maintenance required		
Front Chuck System sensor fault		

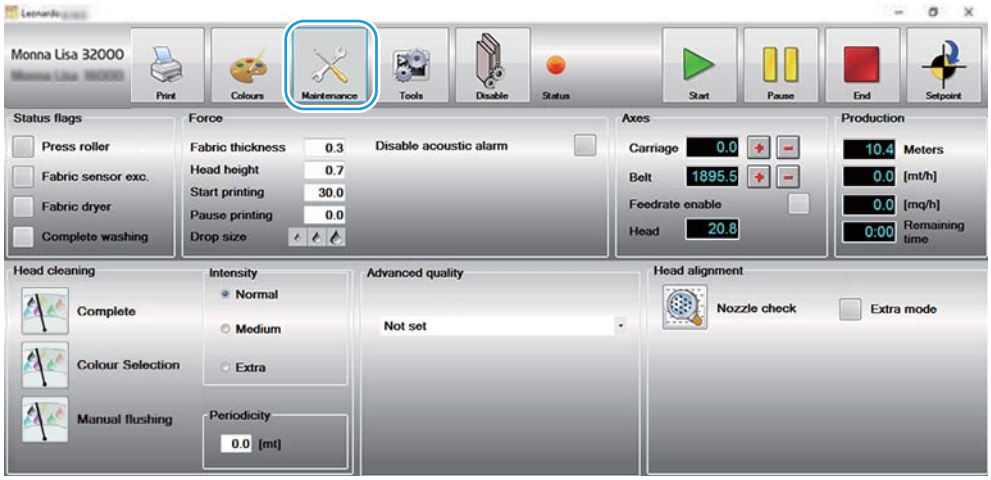
Print Result Trouble

Condition	Cause	Action
Poor print quality	Faulty discharge of print head	Increase the number of printing passes. (Refer to "Loading Print Data" on Page 82.) Perform a nozzle check when changing jobs. Check that discharge is normal (normal print quality) before printing.
Mixed ink colors	Ink mixing is occurring in the print head.	Perform manual flushing for the print head. (Refer to "Manual flushing" on Page 113)

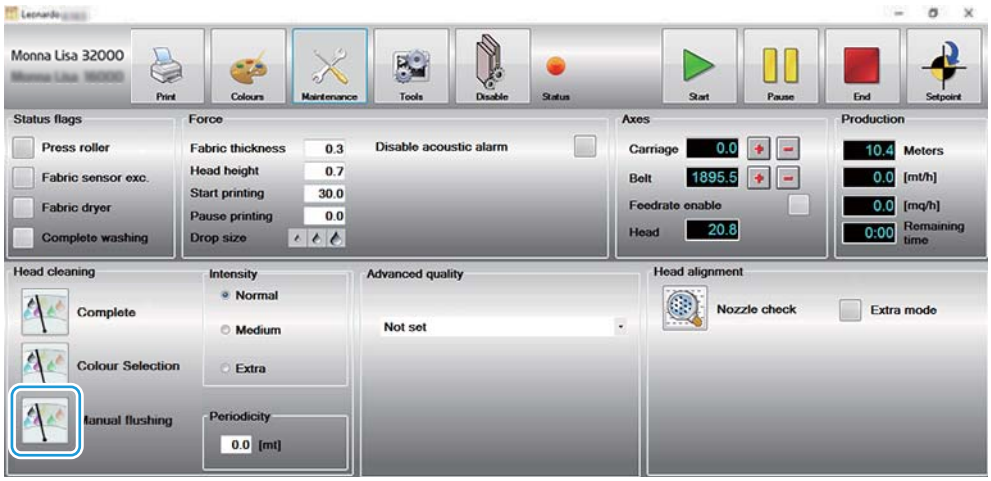
Manual flushing

Perform manual flushing on the print head to resolve ink color mixing.

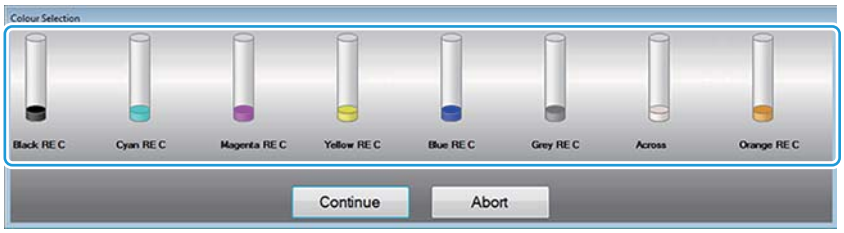
1 Click [Maintenance].



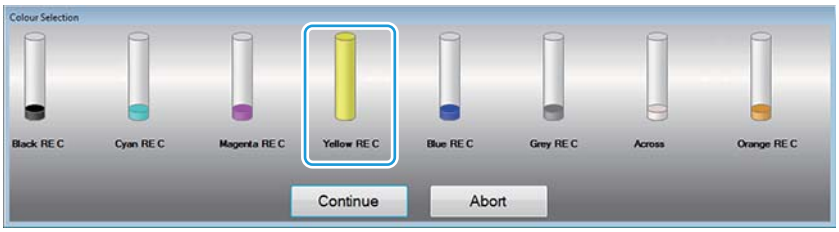
2 Click [Manual flushing].



3 **On the [Color Selection] screen, select the print head for manual flushing. Multiple print heads can be selected.**



The selected print head changes its display as shown below.



4 **Click [Continue].**

The print head moves over the flushing plate and starts manual flushing. When manual flushing is completed, the print head returns to its original position.

5 **Perform a nozzle check to see if there is any ink color mixing.**

For more information, refer to "Nozzle Check" on Page 46.

If the nozzle check pattern has mixed colors, perform manual flushing again.

Fabric Trouble

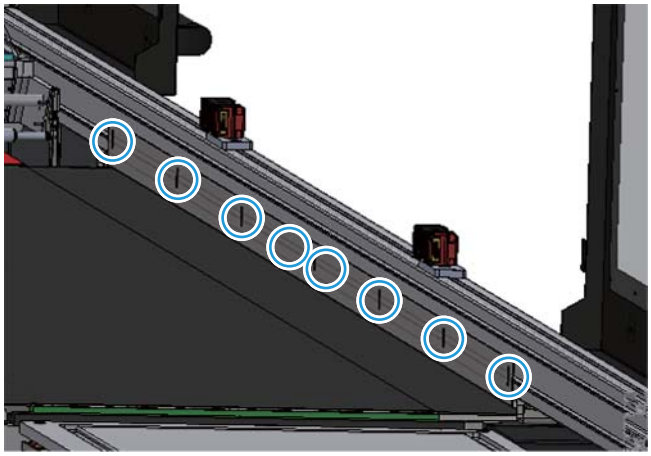
Condition	Cause	Action
Fabric cannot be fed below the fabric peeling prevention bar.	The fabric in use is thick or hard.	Raise the fabric peeling prevention bar. (Refer to "Adjusting the Fabric Peeling Prevention Bar" on Page 114.)
Fabric cannot be fed below the fabric slack prevention unit.	The fabric in use is thick or hard.	Remove the fabric slack prevention unit. (Refer to "Removing the fabric slack prevention unit" on Page 117.)

Adjusting the Fabric Peeling Prevention Bar

If you cannot feed thick or hard fabric below the fabric slack prevention unit due to the height at which the fabric peeling prevention bar is installed, raise the fabric peeling prevention bar. Adjust the height of the fabric peeling prevention bar whenever changing the type or thickness of the fabric.

1 Open the front cover.

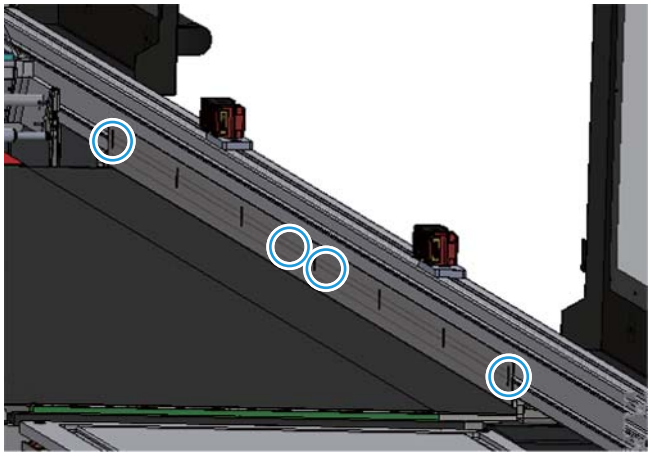
2 Use a hex key (width: 4 mm) to loosen the screws on the fabric peeling prevention bar (8 screws) about half one rotation.



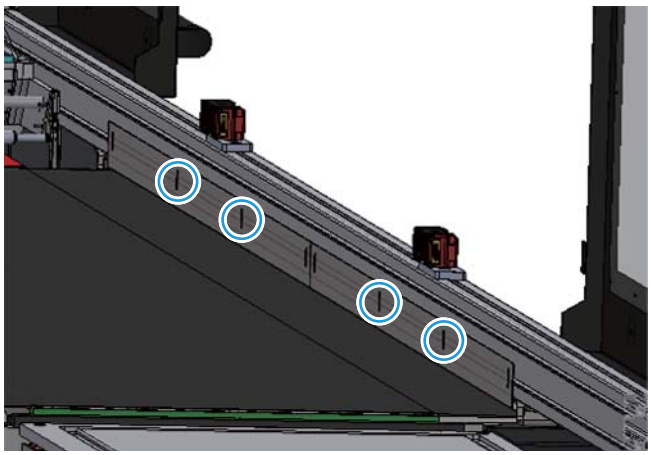
3 Lift the bar up from the belt to about 3 to 5 mm above the fabric thickness.

If using a ruler for measuring, be careful not to let the ruler get caught on the belt.
Doing so could scratch or damage the belt.

4 **While holding the fabric peeling prevention bar, use a hex key (width: 4 mm) to tighten the screws shown on the bar figure (4 screws).**



5 **Use a hex key (width: 4 mm) to tighten the remaining screws on the fabric peeling prevention bar (4 screws).**



6 **Close the front cover.**

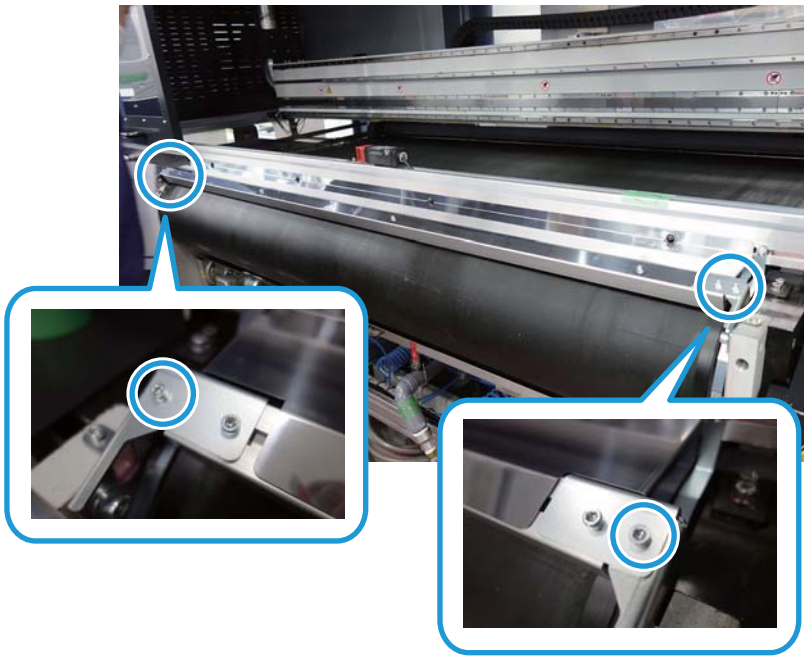
Removing and Installing the Fabric Slack Prevention Unit

If you cannot feed thick or hard fabric below the fabric slack prevention unit due to the height at which the fabric slack prevention unit is installed, remove the fabric slack prevention unit. When changing to a fabric that can be fed below the fabric slack prevention unit, such as a fabric that is soft and has a thickness of 6 mm or less, install the fabric slack prevention unit before beginning printing.

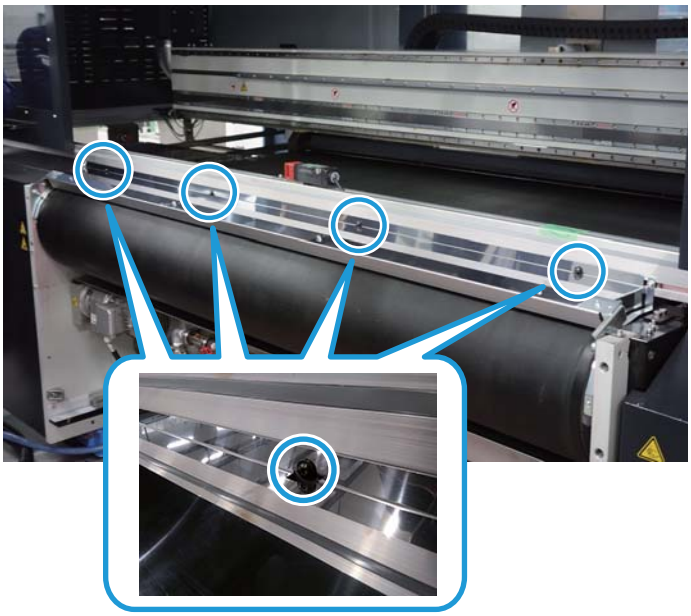
Removing the fabric slack prevention unit

1 **Open the front cover.**

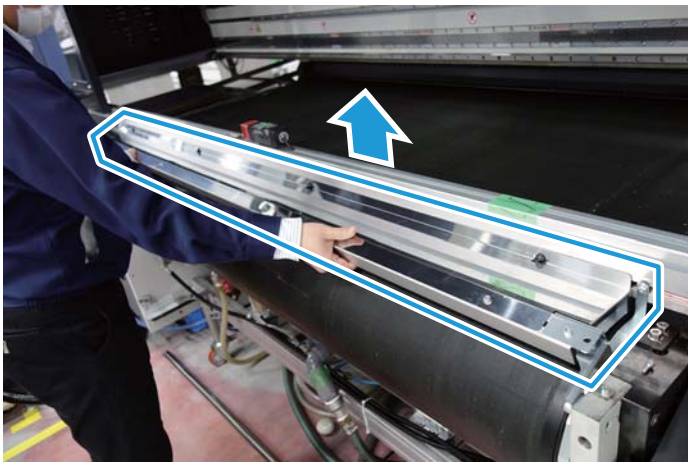
2 **Use a hex key (width: 4 mm) to remove the screws on the outer left and right sides of the fabric slack prevention unit (2 screws).**



3 Use a hex key (width: 4 mm) to loosen the screws securing the fabric slack prevention unit to the front cover frame (4 screws) about half one rotation.



4 Remove the fabric slack prevention unit.

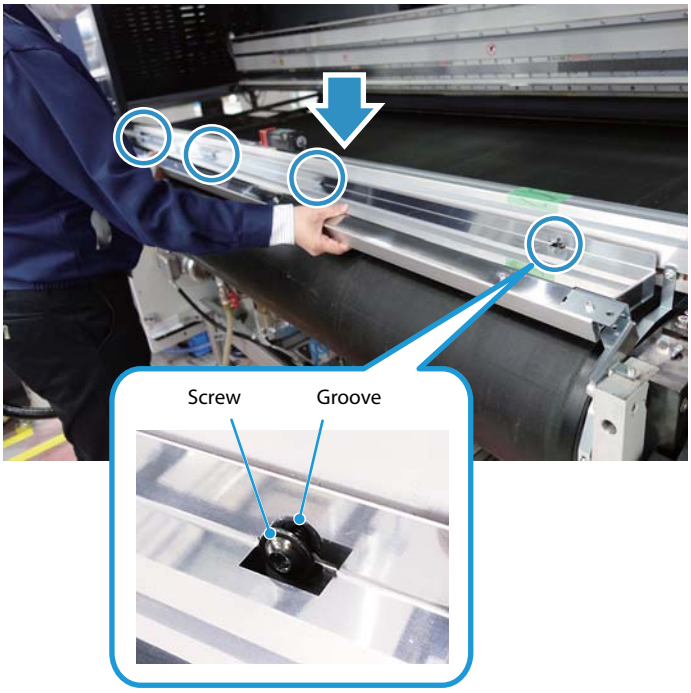


5 Close the front cover.

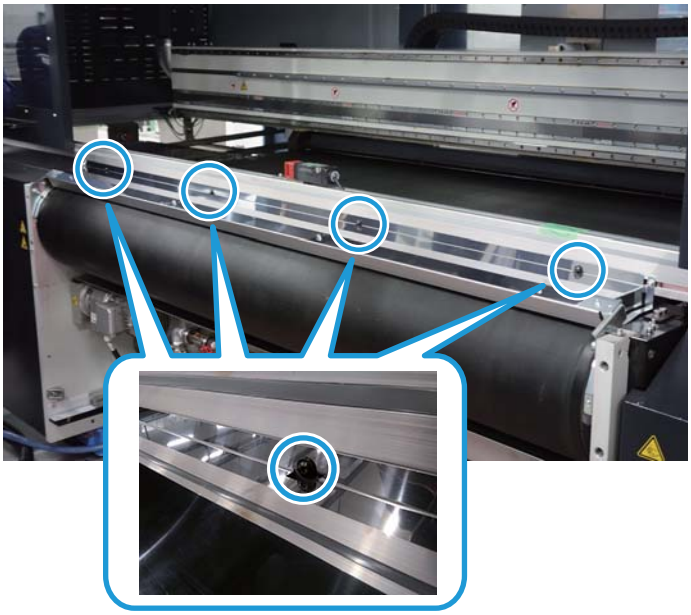
Installing the fabric slack prevention unit

1 **Open the front cover.**

2 **Fit the groove on the fabric slack prevention unit into the gap between the front cover frame and the screws.**



3 **Use a hex key (width: 4 mm) to tighten the screws on the front cover frame (4 screws).**



4 **Use a hex key (width: 4 mm) to tighten the screws on the left and right sides of the fabric slack prevention unit (2 screws).**

5 **Close the front cover.**

Print Head Failure

If a print head failure occurs, promptly make a request for repairs to be performed.

If a print head failure occurs on this machine, you can configure the settings so that only that specific head column is not printed. The other print heads will cover for the head that does not print. This will cause the print speed to drop, but production can continue until the print head is repaired.

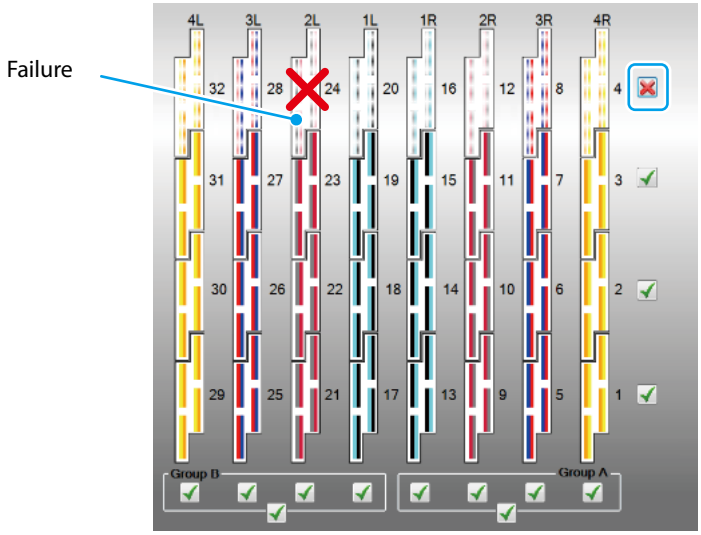
	For more information about how to use this function, contact qualified service personnel

1 **Use nozzle check and other functions to identify the print head that has failed.**

2 **Click "Disable" in Leonardo.**

3 **Select the check box for the column or row of the print head that has failed, and an "X" will appear at that position.**

In this example, head 2L-24 has failed.



In this case, column 4 will not be used when printing.

	An X cannot be set for only column 2 or only column 3. Use this setting for the columns on the outer edges. We do not recommend unselecting the check boxes for [Group A/Group B] along the bottom of this screen; doing so might adversely affect image quality.

Specifications

This section describes the specifications for this machine.

Basic Specifications

ML-32000-180

Item	Specifications	Notes
Print head	Inkjet	8-color
Compatible inks	Reactive ink, dispersion ink, acid ink, pigment	
Printing resolution	X: Scanning direction Min. 300 dpi to Max. 1200 dpi Y: Fabric feeding direction 600 dpi, 1,200 dpi	
Print speed	Refer to "ML-32000-180" on Page 125.	
Max. printing width	1,800 mm	
Color number	8-color	
Ink cartridge	1 color/1 pack	
Ink cartridge capacity	10 L	
Sound pressure level	80 dB(A) or less	
Printer operating environment	Temperature: 20 to 30 °C Humidity: 35 to 80 % RH (no condensation)	
Recommended printing environment	Temperature: 22 to 28 °C Humidity: 35 to 80 % RH (no condensation)	
Printer storage environment	Store the printer filled with ink. Temperature: 0 to 40 °C 1 month Must not be any condensation.	
Device dimensions	Printer: 4,610(W) x 2,500(D) x 2,070(H) mm Main electric box: 1,500 (W) x 660 (D) x 2,285 (H) mm	Not including the feeding unit, winding area, and drying area. Height includes the adjusters and tower lamp.
Equipment weight	Printer: Approx. 3,700 kg Main electric box: Approx. 400 kg	

ML-32000-340

Item	Specifications	Notes
Print head	Inkjet	8-color
Compatible inks	Reactive ink, dispersion ink, acid ink, pigment	
Printing resolution	X: Scanning direction Min. 300 dpi to Max. 1200 dpi Y: Fabric feeding direction 600 dpi, 1,200 dpi	
Print speed	Refer to "ML-32000-340" on Page 127.	
Max. printing width	3,400 mm	
Color number	8-color	
Ink cartridge	1 color/1 pack	
Ink cartridge capacity	10 L	
Sound pressure level	80 dB(A) or less	
Printer operating environment	Temperature: 20 to 30 °C Humidity: 40 to 60 % RH (no condensation)	
Recommended printing environment	Temperature: 22 to 28 °C Humidity: 40 to 60 % RH (no condensation)	
Printer storage environment	Store the printer filled with ink. Temperature: 0 to 40 °C 1 month Must not be any condensation.	
Device dimensions	Printer: 6,560 (W) x 2,500 (D) x 1,940 (H) mm Main electric box: 1,500 (W) x 660 (D) x 2,270 (H) mm	Not including the feeding unit, winding area, and drying area. Height includes the adjusters and tower lamp.
Equipment weight	Printer: Approx. 6,000 kg Main electric box: Approx. 400 kg	

ML-16000-180

Item	Specifications	Notes
Print head	Inkjet	8-color
Compatible inks	Reactive ink, dispersion ink, acid ink, pigment	
Printing resolution	X: Scanning direction Min. 300 dpi to Max. 1200 dpi Y: Fabric feeding direction 600 dpi, 1,200 dpi	
Print speed	Refer to "ML-16000-180" on Page 129.	
Max. printing width	1,800 mm	
Color number	8-color	
Ink cartridge	1 color/1 pack	
Ink cartridge capacity	10 L	
Sound pressure level	80 dB(A) or less	
Printer operating environment	Temperature: 20 to 30 °C Humidity: 35 to 80 % RH (no condensation)	
Recommended printing environment	Temperature: 22 to 28 °C Humidity: 35 to 80 % RH (no condensation)	
Printer storage environment	Store the printer filled with ink. Temperature: 0 to 40 °C 1 month Must not be any condensation.	
Device dimensions	Printer: 4,610(W) x 2,500(D) x 2,070(H) mm Main electric box: 1,500 (W) x 660 (D) x 2,000 (H) mm	Not including the feeding unit, winding area, and drying area. Height includes the adjusters and tower lamp.
Equipment weight	Printer: Approx. 3,900 kg Main electric box: Approx. 400 kg	

Resolution/Number of Passes and Print Speed

ML-32000-180

*Prerequisites: Bidirectional printing, Print width of 1,500 mm

Print speed differs depending on the images, firmware, PC operating status and print settings.

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
300	600	1 pass	697
	600	2 passes	434
	600	3 passes	313
	600	4 passes	235
	600	4+ passes	215
	1,200	2 passes	423
	1,200	4 passes	238
	1,200	6 passes	158
	1,200	8+ passes	108
600	600	1 pass	485
	600	2 passes	423
	600	3 passes	317
	600	4 passes	239
	600	4+ passes	208
	1,200	2 passes	286
	1,200	4 passes	232
	1,200	6 passes	161
	1,200	8+ passes	105

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
900	600	1 pass	374
	600	2 passes	345
	600	3 passes	305
	600	4 passes	244
	600	4+ passes	168
	1,200	2 passes	211
	1,200	4 passes	186
	1,200	6 passes	155
	1,200	8+ passes	84
1,200	600	1 pass	302
	600	2 passes	286
	600	3 passes	262
	600	4 passes	232
	600	4+ passes	137
	1,200	2 passes	164
	1,200	4 passes	151
	1,200	6 passes	135
	1,200	8+ passes	68

ML-32000-340

*Prerequisites: Bidirectional printing, Print width of 3,100 mm

Print speed differs depending on the images, firmware, PC operating status and print settings.

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
300	600	1 pass	947
	600	2 passes	584
	600	3 passes	412
	600	4 passes	316
	600	4+ passes	286
	1,200	2 passes	544
	1,200	4 passes	317
	1,200	6 passes	216
	1,200	8+ passes	150
600	600	1 pass	626
	600	2 passes	554
	600	3 passes	412
	600	4 passes	316
	600	4+ passes	273
	1,200	2 passes	347
	1,200	4 passes	302
	1,200	6 passes	218
	1,200	8+ passes	142
900	600	1 pass	464
	600	2 passes	428
	600	3 passes	391
	600	4 passes	318
	600	4+ passes	207
	1,200	2 passes	247
	1,200	4 passes	229
	1,200	6 passes	206
	1,200	8+ passes	107

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
1,200	600	1 pass	351
	600	2 passes	346
	600	3 passes	324
	600	4 passes	302
	600	4+ passes	165
	1,200	2 passes	182
	1,200	4 passes	182
	1,200	6 passes	169
	1,200	8+ passes	84

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* Prerequisites: Bidirectional printing, Print width of 1,500 mm
  Print speed differs depending on the images, firmware, PC operating status and print settings.

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
300	600	1 pass	417
	600	2 passes	245
	600	3 passes	162
	600	4 passes	120
	600	4+ passes	112
	1,200	2 passes	236
	1,200	4 passes	123
	1,200	6 passes	81
	1,200	8+ passes	56
600	600	1 pass	284
	600	2 passes	236
	600	3 passes	165
	600	4 passes	123
	600	4+ passes	108
	1,200	2 passes	154
	1,200	4 passes	119
	1,200	6 passes	82
	1,200	8+ passes	54
900	600	1 pass	209
	600	2 passes	189
	600	3 passes	158
	600	4 passes	125
	600	4+ passes	87
	1,200	2 passes	112
	1,200	4 passes	95
	1,200	6 passes	79
	1,200	8+ passes	43

Resolution		Number of passes	Print speed * (m^2/h)
Scan direction [dpi]	Belt direction [dpi]		
1,200	600	1 pass	163
	600	2 passes	154
	600	3 passes	138
	600	4 passes	119
	600	4+ passes	70
	1,200	2 passes	85
	1,200	4 passes	77
	1,200	6 passes	69
	1,200	8+ passes	35

Printing Width

Item		Specifications
Possible printing area Scan direction (x)	ML-32000-180 ML-16000-180	340 to 1,800 mm
	ML-32000-340	340 to 3,400 mm
Margin specifications		No margin
Printing width settings input units		0.1 mm

Power

ML-32000-180

Item	Specifications	Notes
Voltage	400 V ± 10%, 3-phase + Neutral + Earth	
Frequency	50/ 60 Hz ±3%	
Rated apparent power	20.7 kVA	
Power consumption	While operating: Approx. 5.5 kW	
Rated current	30 A	
Leakage current	300 mA or less	
Factory facilities Connected/Wired	Type: Terminal block connection Connecting part model: 285-135, 285-137 (Manufacturer: WAGO) Compatible crimped terminals (Reference): Ferrule type AI 4-10 GY Wiring specifications (recommended): Withstand voltage of 600 V (UL1063 equivalent) Wire size of AWG12 or larger	

Factory facilities

Item	Specifications	Notes
Pressurized air	Pressure: Min. 0.6 MPa (6 bar) Prescribed flow rate: 280 Liter/min Average consumption: 3.4 m^3/h (3,400 Liter/h) Applicable outer hose diameter: Φ12 mm	Required for raising/lowering the belt cleaning unit, supplying ink, and other purposes.
Water	Connector: 3/4 gas Pressure: Min. 0.4 to 0.6 MPa (4 to 6 bar) Flow rate: Max. 100 Liter/hr	Cleans the belt with water.
Wastewater	Flow rate: Max. 100 Liter/hr Applicable inner pipe diameter: Φ48 mm (outer diameter) (Applicable pipe diameter: 40 A)	Discharges the water used to clean the belt. Users are requested to dispose of wastewater according to local laws and regulations.

Item	Specifications	Notes
Waste liquid	Flushing plate side Outer diameter of ink discharge outlet: Φ14 mm Applicable inner tube diameter: Φ12 mm	Waste ink is discharged from the flushing plate side and the cleaning station, and therefore it is necessary to provide a route for waste liquid in the factory's drainage system. Users are requested to dispose of waste ink according to local laws and regulations.
	Cleaning Station Side Outer diameter of ink discharge outlet: Φ29 mm Applicable inner tube diameter: Φ27 mm to 28 mm	
Exhaust	Connector: Φ125 mm Applicable outer pipe diameter: Φ123 mm Flow rate: 1,200 m^3/hr	Required for mist exhaust in the machine. If connection with factory exhaust is not possible, please provide a mist exhaust fan.
Network	A communication speed of 100BASE-TX or more is recommended	Please provide a network environment to which a PC can be connected.

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Item	Specifications	Notes
Voltage	400 V ± 10 %, 3-phase + Neutral + Earth	
Frequency	50 / 60 Hz ± 3 %	
Rated apparent power	34.6 kVA	
Power consumption	Printing Approx. 8.0 kW	
Rated current	50 A	
Leakage current	300 mA or less	
Factory facilities Connected/Wired	Type: Terminal block connection Connecting part model: Power: CB510 (Manufacturer. by Cabur) Ground: TO210 (Manufacturer. by Cabur) Compatible crimped terminals (reference): Ferrule type WP160/22 Wiring specifications (recommended): 600 V withstand voltage (UL1063 equivalent) Wire size of AWG6 (16 sq) or larger.	

Factory facilities

Item	Specifications	Notes
Compressed air	Pressure: Min. 0.6 MPa (6 bar) Prescribed flow rate: 180 Liter/min Average consumption: 3.3 m^3/h (3,300 Liter/h) Applicable outer hose diameter: Φ12 mm	Required for raising/lowering the cleaning tank, ink pressure, etc. Air consumption is the amount of air in an hour. This is used to select compressors. The required air flow capacity is the flow rate which needs to be supplied from factory to the machine within a short period of time. This is used to select the main piping to the machine.
Water	Connector: 3/4 gas Pressure: Min. 0.4 to 0.6 MPa (4 to 6 bar) Flow rate: Max. 100 Liter/hr	Required for belt cleaning.
Wastewater	Flow rate: Max. 100 Liter/hr Applicable inner pipe diameter: Φ48 mm (outer diameter) (Applicable pipe diameter: 40 A)	Required for wastewater for belt cleaning. Users are requested to dispose of wastewater according to local laws and regulations.
Waste liquid	Flushing plate side Outer diameter of ink discharge outlet: Φ14 mm Applicable inner tube diameter: Φ12 mm Cleaning Station Side Outer diameter of ink discharge outlet: Φ29 mm Applicable inner tube diameter: Φ27 mm to 28 mm	Waste ink is discharged from the flushing plate and cleaning station, and therefore it is necessary to provide a route for waste liquid in the factory's drainage system. Users are requested to dispose of waste ink according to local laws and regulations.
Exhaust	Connector: Φ125 mm Applicable outer pipe diameter: Φ125 mm Flow rate: 2,300 m^3/hr	Required for mist exhaust in the machine. If a 2,300 m^3/h exhaust system is not available, please provide a mist exhaust fan.
Network	A communication speed of 100BASE-TX or more is recommended. Use a shielded twisted-pair cable (Category 5 or higher).	Please provide a network environment to which a PC can be connected.

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Item	Specifications	Notes
Voltage	400 V ± 10%, 3-phase + Neutral + Earth	
Frequency	50/ 60 Hz ±3%	
Rated apparent power	20.7 kVA	

Item	Specifications	Notes
Power consumption	While operating: Approx. 5.5 kW	
Rated current	30 A	
Leakage current	300 mA or less	
Factory facilities Connected/Wired	Type: Terminal block connection Connecting part model: CB510, TO210 (Manufacturer. by Cabur) Compatible crimped terminals (reference): WP160/22 (Manufacturer. by Cabur) Wiring specifications (recommended): 600 V withstand voltage (UL1063 equivalent) Wire size of AWG8 (10 sq) or larger.	

Factory facilities

Item	Specifications	Notes
Pressurized air	Pressure: Min. 0.6 MPa (6 bar) Prescribed flow rate: 280 Liter/min Average consumption: 3.4 m^3/h (3,400 Liter/h) Applicable outer hose diameter: Φ12 mm	Required for raising/lowering the belt cleaning unit, supplying ink, and other purposes.
Water	Connector: 3/4 gas Pressure: Min. 0.4 to 0.6 MPa (4 to 6 bar) Flow rate: Max. 100 Liter/hr	Cleans the belt with water.
Wastewater	Flow rate: Max. 100 Liter/hr Applicable inner pipe diameter: Φ48 mm (outer diameter) (Applicable pipe diameter: 40 A)	Discharges the water used to clean the belt. Users are requested to dispose of wastewater according to local laws and regulations.
Waste liquid	Flushing plate side Outer diameter of ink discharge outlet: Φ14 mm Applicable inner tube diameter: Φ12 mm	Waste ink is discharged from the flushing plate side and the cleaning station, and therefore it is necessary to provide a route for waste liquid in the factory's drainage system. Users are requested to dispose of waste ink according to local laws and regulations.
	Cleaning Station Side Outer diameter of ink discharge outlet: Φ29 mm Applicable inner tube diameter: Φ27 mm to 28 mm	
Exhaust	Connector: Φ125 mm Applicable outer pipe diameter: Φ125 mm Flow rate: 1,200 m^3/hr	Required for mist exhaust in the machine. If connection with factory exhaust is not possible, please provide a mist exhaust fan.
Network	A communication speed of 100BASE-TX or more is recommended	Please provide a network environment to which a PC can be connected.

Supported Ink

The supported inks are subject to change without notice. Check with the distributor where the machine was purchased for the latest information.

Ink Type	Colour Name	Color Code	Product No.
Acid	Black	BK	C13T49Q110 C13T49Q11A
	Cyan	C	C13T49Q210
	Magenta	M	C13T49Q310
	Yellow	Y	C13T49Q410
	Grey	GY	C13T49Q510 C13T49Q51A
	Red	R	C13T49Q610 C13T49Q61A
	Blue	BL	C13T49Q710
	Cobalt	CO	C13T49Q810 C13T49Q81A
	Orange-F	OR-F	C13T49QA10 C13T49QA1A
	Rubine	RB	C13T49QB10 C13T49QB1A
	Fluorescent Pink	FP	C13T49QE10
	Fluorescent Flavine	FL	C13T49QF10
Reactive (RE-N)	Black	BK	C13T49R110
	Cyan	C	C13T49R210
	Magenta	M	C13T49R310
	Yellow	Y	C13T49R410
	Grey	GY	C13T49R510
	Red	R	C13T49R610
	Blue	BL	C13T49R710
	Orange	OR	C13T49R810
	Crimson	CR	C13T49RB10
	Grey (GOTS)	GY-G	C13T49RC10

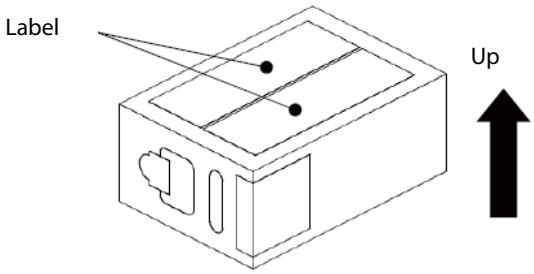
Ink Type	Colour Name	Color Code	Product No.
Reactive (RE-C)	Black	BK	C13T52J110
	Cyan	C	C13T52J210
	Magenta	M	C13T52J310
	Yellow	Y	C13T52J410
	Grey	GY	C13T52J510
	Red	R	C13T52J610
	Blue	BL	C13T52J710
	Orange	OR	C13T52J810
	Crimson	CR	C13T52JB10
Reactive (RE-E)	Black	BK	C13T52W110
	Cyan	C	C13T52W210
	Magenta	M	C13T52W310
	Yellow	Y	C13T52W410
	Grey	GY	C13T52W510
	Red	R	C13T52W610
	Blue	BL	C13T52W710
	Orange	OR	C13T52W810
Disperse	Black	BK	C13T49S110
	Cyan	C	C13T49S210
	Magenta	M	C13T49S310
	Yellow	Y	C13T49S410
	Grey	GY	C13T49S510
	Red	R	C13T49S610
	Blue	BL	C13T49S710
	Orange	OR	C13T49S810

Ink Type	Colour Name	Color Code	Product No.
Pigment	Black	BK	C13T49U110 C13T49U11A C13T49U10A
	Cyan	C	C13T49U210 C13T49U21A C13T49U20A
	Magenta	M	C13T49U310 C13T49U31A C13T49U30A
	Yellow	Y	C13T49U410 C13T49U41A C13T49U40A
	Yellow-C	Y	C13T49U41B C13T49U40B
	Grey	GY	C13T49U510 C13T49U51A C13T49U50A
	Red	R	C13T49U610 C13T49U61A C13T49U60A
	Green	GR	C13T49U710 C13T49U71A C13T49U70A
	Orange	OR	C13T49U810 C13T49U81A C13T49U80A
Others	Penetration Liquid (Acid ink, Reactive ink)*2	AC	C13T49QG10
	Penetration Liquid (Disperse ink)*2	AC	C13T49SA10

*1 GOTS: Global Organic Textile Standard

*2 Do not use the color (column) next to Across in the same head. The discharge of Across may become unstable. For details, refer to "Color" in the Leonardo Reference Guide, or inquire with qualified service personnel.

Ink Cartridges

<table>
<tr><th>Item</th><th colspan="4">Specifications</th></tr>
<tr><td rowspan="2">Ink Type</td><td>Ink cartridge for reactive ink</td><td>Ink cartridge for acidic ink</td><td>Ink cartridge for disperse ink</td><td>Ink cartridge for pigment ink</td></tr>
<tr><td colspan="4">Refer to "Supported Ink" on Page 136.</td></tr>
<tr><td>External dimensions</td><td colspan="4">150 (W) x 235 (D) x 412 (H) mm</td></tr>
<tr><td>Weight</td><td colspan="4">Approx. 11 kg</td></tr>
<tr><td>Ink color</td><td colspan="4">Refer to "Supported Ink" on Page 136.</td></tr>
<tr><td>Operating environment conditions with ink cartridges installed</td><td colspan="4">(1) Temperature: 20 to 30°C
(2) Relative humidity: 35 to 85% (no condensation)
(3) The ink in a cartridge that has been left in a low temperature environment will freeze at a temperature of -10°C or less. If ink is frozen, thaw it at room temperature and then use the ink after it is within the operating temperature range.
Reference: In a 25 °C environment it takes approximately 34 hours for frozen ink to warm from -10 to 20 °C.</td></tr>
<tr><td>Warranty period with ink cartridges installed</td><td colspan="4">(1) Temperature/warranty period without I/C installed: -20 to 60°C/Max. 5 days
-20 to 40°C/Max. 1 month
With I/C installed: -20 to 40°C/Max. 1 month
(2) Relative humidity: 35 to 85% (no condensation)</td></tr>
<tr><td>Transport and storage environment</td><td colspan="4">(1) Temperature: 10 to 35°C (recommended warranty temperature)
(2) Relative humidity: 35 to 85% (no condensation)</td></tr>
<tr><td>Recommended lifetime</td><td colspan="4">Indicated on ink cartridge labels</td></tr>
<tr><td>Orientation during transport and storage</td><td colspan="4">During transport and storage, ink cartridges should be oriented as shown below with the largest surface facing up.
 
</td></tr>
<tr><td>Stack height during transport and storage</td><td colspan="4">6 cartridges high</td></tr>
</table>

* The expiration date is indicated on the ink cartridge box.

Other

Item	Specifications	Use
Wiper	C13S210156	Wiper unit replacement part
Cap	C13S210157	Cap unit replacement part
Cooling fan filters	C13S210158	Cooling fan filter replacement part
Washing silicone scraper (Soft type)	C13S210159	Washing silicone scraper replacement part ML-32000-180, ML-16000-180
Washing T-shaped scraper	C13S210132	Washing T-shaped scraper replacement part ML-32000-180, ML-16000-180
Insulating Tape	C13S400213	For application of glue
Mist filter	C13S210133	Mist filter replacement part
Blowing fan filter	C13S210134	Blower filter replacement part
2 inch Feeding Spindle	C12C939721	Feeding spindle for 2-inch (inner) paper tube
3 inch Feeding Spindle	C12C939731	Feeding spindle for 3-inch (inner) paper tube
Pressure roller	C12C939741	Pressure roller (metal type)
Glue application blocks	C12C938661	For application of glue
Glue collection bucket	C12C938681	For removal of glue
Clean Stick	C13S090011	For cleaning the cap, wiper, etc., soak this in cleaning liquid and use it.
Cleaning cloth	C13S210050	For wiping off ink and grease
Maintenance liquid	C13T42X000	For cleaning the cap, suction cap, carriage surfaces other than the nozzle surface, and the head cover
Cleaning liquid	C13T49Q010 C13T49Q000	For cleaning ink before initial charging