



durst

Rho 312R

Operating Instructions

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Retain for future use!



Original instructions

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A About these operating instructions





1 Using these operating instructions

These operating instructions is part of the printer.

- ▶ Ensure that these operating instructions are accessible to personnel at all times.
- ▶ Any supplements received from Durst Phototechnik AG are to be included with these operating instructions.
- ▶ Give these operating instructions to any subsequent owners or users of this printer.

2 Symbols and signs

The following symbols are used in these operating instructions:


Symbol	Meaning
✓	Requirement for an action
▶	One-step action
First	Step within a multi-step action
↳	Result of an action or sequence of actions
i	Information on easier or safer work
(→ Page 25 / Description)	Cross reference
 DANGER	Imminently hazardous situation that, if not avoided, results in death or serious injury.
 WARNING	Potentially hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Potentially hazardous situation that may result in minor injury if the safety precautions are not complied with.
 NOTICE	Potentially hazardous situation that, if not avoided, may result in property damage.

The following typographical markings (e.g. **bold**) are used in these operating instructions for differentiating between types of information:

Example	Meaning
Start Queue	<ul style="list-style-type: none"> ■ Operating element on unit, e.g. buttons, levers etc. ■ Software element, e.g. menu name, menu entry, operating elements etc.
start	File name, path name
[ALT]	Keyboard key

2.1 Structure of warnings

Warnings are structured as follows (here: example for the warning level WARNING):


Type and source of danger! Consequence of the danger ▶ Measure for avoiding the danger

- ▶ Read and observe the warnings.

B Safety

i Read these operating instructions before using the printer and ensure that you have understood everything!

i If it is determined that damage has been caused by a person's non-compliance with these operating instructions, Durst Phototechnik AG is in no way liable. Safe operation of the printer is only ensured when the following safety precautions and warnings are observed exactly.

1 Intended use

The printer is suitable for printing roll media within the specified limits (→ Page 142 / Technical data). The following framework conditions apply in particular:

- The printer may only be operated in closed rooms.
- Only Durst-certified inks and media may be used. Other inks or media may only be used after agreement with Durst Phototechnik AG.
- Intended use includes only the activities described in these operating instructions. Transport, installation, commissioning, decommissioning, disassembly and disposal of the components may only be performed by service technicians authorized by Durst Phototechnik AG.

1.1 Impermissible use

The printer may not be used to print the following media:

- Plate media
- Foodstuffs
- Animals
- Media outside the specified limit values
- Media with an ignition point of less than 150 °C (302 °F)

2 Duties of the owner

To ensure the safety of personnel, the owner must take the following safety measures:

2.1 Safety measures

- ▶ Ensure that the personnel possesses the appropriate qualifications and is sufficiently trained. Brush up on knowledge by taking training courses on a regular basis.
- ▶ Provide the personnel with the stipulated protective equipment.
- ▶ Keep the warnings on the printer in a legible, visible and clean condition.

- ▶ Ensure sufficient lighting.
- ▶ Keep the concentration of ozone and spray mist of the ink below the maximum permissible value. For this purpose, ensure sufficient ventilation in the immediate vicinity the printer.
- ▶ Ensure sufficient fire protection around the printer and issue instructions for fire-extinguishing measures.
- ▶ Observe all regional and national regulations and safety requirements.

3 Safety and monitoring equipment

3.1 Housing covers

The housing covers should prevent the user from being exposed to electrical or mechanical danger and UV light when loading and unloading media and ink.

- ▶ Do not change the way these devices function.

3.2 Protective switches on printer

All moving housing covers must always be closed. They may only be opened for maintenance and checks, e.g. for checking the material advance.

Protective switches are located on the flip door and the light trap carrier. The printing process can only start if the flip door or light trap carrier is closed.

The light trap carrier may only be pulled out for print head maintenance.

- ▶ Do not change the method of functioning of the protective switches.
- ▶ Do not bypass protective switches.

3.3 Light barrier

A light barrier is located near the clamping roller on the unloading side. It is active as soon as the clamping roller is closed. If someone comes near the clamping roller, the light barrier is interrupted and the controller responds as follows:

- The print carriage stops moving.
 - The clamping roller opens.
 - The printer is switched off.
1. Do not change the method of functioning of the light barrier.
 2. Do not bypass light barrier.

3.4 Signs on printer

3.4.1 Rating plate



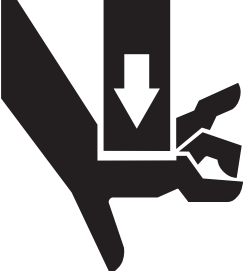



Fig. 1 Rating plate






3.4.2 Safety signs




All safety signs attached to the printer must be observed.

The safety signs have the following meaning:

Safety sign	Meaning
	Wear protective gloves
	Wear safety goggles
	Extremities can be crushed

Safety sign	Meaning
	<p>Extremities can be crushed</p>
	<p>Extremities can be crushed</p>
 <p> ACHTUNG Auch wenn Netzschalter in "Off-Position", steht Teil unter Netzspannung CAUTION Even if Mains switch in "Off-Position" part stay under hazardous live </p>	<p>The component is energized even when the main switch is switched off</p>
 <p> Disconnect main switch before opening Vor dem Öffnen Hauptschalter ausschalten </p>	<ul style="list-style-type: none"> ■ Warning on UV light ■ Switch off main switch before opening
	<p>Warning on UV light</p>
	<p>Warning on UV light</p>

Safety sign	Meaning
	Warning on hot surfaces
	Warning on chemical substances
	Dispose of the device via a separate collection for electric and electronic devices in accordance with the locally applicable regulations
	Warning on laser
 <p data-bbox="284 1240 657 1279">Hoher Ableitstrom Vor Inbetriebnahme Erdungsverbinding herstellen</p> <p data-bbox="284 1290 676 1328">High power discharge Before initial operation provide for earth-connection</p> <p data-bbox="284 1339 663 1377">Haute dérivation de courant Avant mise en service construire connexion de terre</p> <p data-bbox="284 1388 711 1426">Alto potenziale di scarica Prima della messa in servizio provvedere alla messa a terra</p> <p data-bbox="284 1438 708 1476">Alto poder de descarga Antes de ponerlo en marcha establecer conexión de tierra</p>	High leakage current Make ground connection before commissioning

Safety sign	Meaning
	Read the operating instructions
	Laser class 1
	Warning at compressed-air output

4 Ambient conditions

The printer may only be operated under the specified ambient conditions (→ Page 142 / Technical data).

5 Modifications, attachments and changes in location

The printer is installed and commissioned by authorized Durst service technicians.

- The installation location of the printer may not be changed. Structural stresses and strains are taken into account during installation. Any change to the installation location or structural modifications to the building must be approved by Durst Phototechnik AG.
- Opening housing covers and electronics cases, except for routine work, and opening the workstation or unplugging the cable may only be performed by authorized Durst service technicians.
- Print heads may only be replaced by authorized Durst service technicians.
- The UV lamp protection prevents reflected light from drying out the ink in the print head, thus damaging it. The UV lamp protection may therefore not be removed.

6 Connection of external devices

The printer features SELV connections in accordance with IEC60950. The computer features two Fast Ethernet connections (SELV) for connection to LAN/WAN networks. Only SELV-compatible peripheral devices approved by Durst may be connected to the printer.

7 Electromagnetic compatibility

For users in the US The printer has been tested and corresponds with the restrictions for a Class A digital unit in agreement with the regulations of the FCC, Paragraph 15. These restrictions serve to provide appropriate protection against harmful interference with equipment used commercially. This printer generates, uses and radiates energy in the radio frequency range and can, if not installed or used in accordance with the requirements of these operating instructions, cause harmful interference in radio communication. The use of the system in a residential area can lead to such interference. In this case, damage/loss caused by the interference are the fault of the user.

8 Specific types of danger

The printer was built using the best available technology and in compliance with the recognized safety regulations. Areas of danger which cannot be avoided through design are provided with appropriate protective equipment. If the printer is used improperly, however, the user or third parties risk death or injury. The printer itself or the medium could also be damaged.

8.1 UV light

UV light emitted by the UV lamps onto the print carriage can cause lethal burns and damage to the eyes. The viewing windows filter out UV rays.

The UV lamps are not switched off automatically when the flip door is opened. Scattered light can thus be discharged.

- ▶ Do not remove the flip door.
- ▶ Check to make sure the flip door is closed and locked during printing.
- ▶ Carry out the following measures during print head maintenance:
 - Ensure that the UV lamp is switched off.
 - Wear safety goggles
- ▶ When the flip door is open, do not look at the UV lamp.

8.2 High temperatures

The UV lamps on the print carriage are heated up to temperatures exceeding 65 °C (149 °F). Contact with the UV lamps can cause severe burns.

Flammable media can ignite as a result of the UV lamps heating up.

- ▶ Before carrying out work on the UV lamp head, wait at least half an hour after the unit has been switched off until the UV lamps have cooled down.
- ▶ During print head maintenance, do not touch UV lamps.

- ▶ Do not print media which have an ignition point of less than 150 °C (302 °F).
- ▶ Observe sufficient fire protection around the printer and issue instructions for fire-extinguishing measures.

8.3 Electrical energy

The printer has a leakage current greater than 3.5 mA. Safe operation of the printer is ensured via a fixed connection to the ground wire.

The entire unit is not de-energized even when the main switch is switched off. Solely the disconnect switch serves as the power isolator.

The capacitors remain charged for several minutes after switching the printer off. There is a risk of electric shock if you touch electrical components.

- ▶ Do not touch any cables or electrical components even when the main switch is switched off.

8.4 Moving parts

The following dangers are present near moving parts:

- Hair, jewelry and clothing being caught and drawn in
- Crushing, impacting, cutting and severing of extremities

Lethal injuries could result.

Dangerous areas include, in particular:

- Print carriage
- Roll mounts
- Rollers
- ▶ Do not remove the flip door.
- ▶ Do not remove the housing covers.
- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ When placing the roll medium into the roll mounts:
 - Wear protective gloves.
 - Do not grip the ends of the axes.

8.5 Contact with ink

Coming into contact with ink is harmful to your health. Sources of danger include:

- Ink supply unit
- Catch tank
- Carriage guide
- Light trap carrier
- Non-hardened inks on print-outs due to burnt out UV lamps
- Spray mist of ink droplets in case of large print head distance
- ▶ Observe the safety data sheets supplied with the ink.
- ▶ Operate the printer with Durst inks only.
- ▶ Use only the refill tank intended for the printer.
- ▶ Wear protective gloves and safety goggles when cleaning the print heads, adding ink or emptying the catch tank.
- ▶ Avoid allowing ink to contact your face or eyes, e.g. by rubbing your eyes with dirty hands.
- ▶ If contact with the skin occurs, wash affected areas with pH-neutral soap and water.
- ▶ Carry out all specified inspection and cleaning work.

8.6 Ozone buildup

To prevent ozone from building up in the room, Durst recommends setting up the external ventilator with a switch-off time delay. The switch-off time delay should switch off the ventilator at least 10 minutes after the printer is switched off.

The external exhaust equipment must be capable of extracting the required minimum exhaust quantity (→ Page 142 / Technical data).

- ▶ Do not switch off external ventilator for exhaust during printing.

8.7 Pneumatic system

The pneumatic circuits for generating a vacuum at the print head and ink transport are under pressure. Ink which is ejected suddenly from leaky lines and connections or compressed air released suddenly from leaky lines and connections can cause severe injury.

The printer features a compressed-air output on both the loading and unloading sides. The pressure at these compressed-air outputs is 6 to 8 bar without pressure limitation.

- ▶ Ensure that the required service work is carried out regularly by Durst customer service.
- ▶ Connect only the accompanying compressed-air gun to the compressed-air outputs.

8.8 Danger of falling

There is a danger of falling when climbing components of the printer. Components can also be damaged.

- ▶ Do not use components of the printer as climbing aids.

8.9 Weights

Falling media present the following dangers:

- Danger of impact and crushing due to heavy weight
- Danger of cuts from sharp edges
- ▶ Wear safety shoes.
- ▶ Perform the following measures before loading/unloading:
 - Ensure that there are no obstacles near the printer.
 - Ensure that the printer has a secure footing.

9 Protective equipment

9.1 Safety goggles and protective gloves

- ▶ When cleaning components which come into contact with ink, wear the protective gloves provided for this purpose and recommended safety goggles (→ Page 145 / Accessories and spare parts).

9.2 Safety shoes

- ▶ Wear safety shoes when loading and unloading media.

10 Maintenance and cleaning

i If the service work is not carried out sufficiently, all warranty and guarantee claims are null and void.

- Apart from the activities described in the "Service" section, the customer may not perform maintenance or cleaning work. Regular and additional special service may only be performed by authorized Durst service technicians.
- Only spare parts and consumable media which have been specially developed and optimized by Durst may be used.
- When cleaning the housing or workstation, the printer and workstation must be switched off and de-energized via the power isolator.

11 Disposal

- Tools and accessories that come into contact with ink must be disposed of in an environmentally-friendly manner according to local regulations. This includes, among other things:
 - Ink and ink waste
 - Cleaning cloths
 - Protective gloves
 - Air filter
 - Refill filter
 - Ink filter
- Information on proper disposal of Durst inks can be found on the data sheet for media safety contained in the ink refilling set or which can be obtained from Durst Phototechnik AG.

12 Emergencies

12.1 Emergency-Stop switch and Emergency-Stop ripcord

- 1 Emergency-Stop switch
- 2 Emergency-Stop ripcord

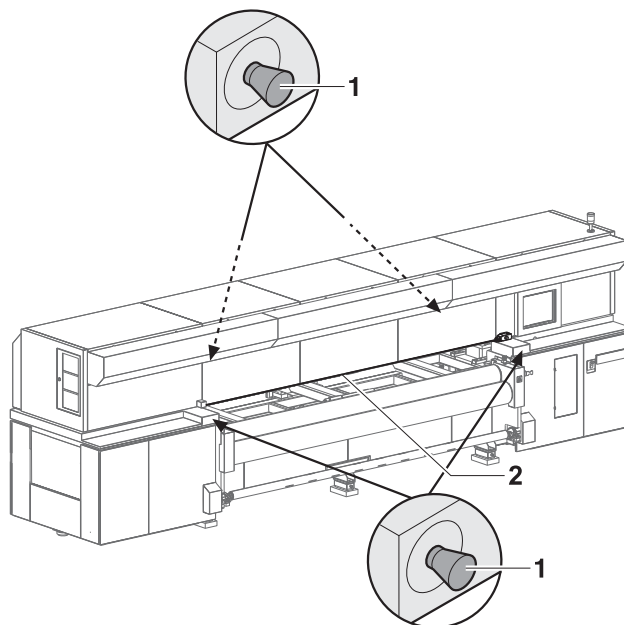


Fig. 2 Emergency-Stop switch

The printer can be switched off with the main switch, one of the Emergency-Stop switches or the Emergency-Stop ripcord.

12.2 What to do in case of an emergency

12.2.1 Printer shutdown

- ▶ Switch off printer with one of the Emergency-Stop switches, Emergency-Stop ripcord or the main switch if a fault occurs that could endanger personal safety.

12.2.2 First aid in case ink contacts skin, mucous membranes or eyes

- ▶ Wash affected areas with pH-neutral soap and water. Under no circumstances should solvents be used, as it remove oils from the skin and increase irritation.
- ▶ Change your clothes immediately if heavy contamination has occurred.
- ▶ If some spray has entered your eyes, wash your eyes immediately with lots water and contact a doctor.

12.3 Switching on the printer again after an emergency stop

12.3.1 Reactivating an Emergency-Stop switch

1. Turn Emergency-Stop switch to the right.
 - ↳ Emergency-Stop switch pops out
2. Switch on printer.

12.3.2 Reactivating an Emergency-Stop ripcord

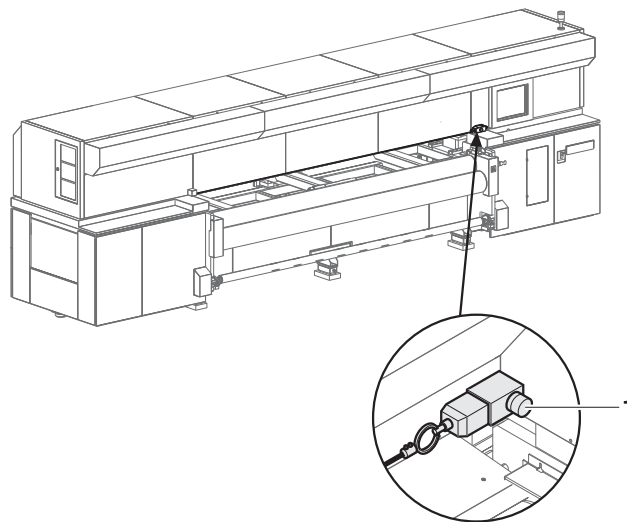


Fig. 3 Reactivating an Emergency-Stop ripcord

1. Press blue (1) switch.
 - ↳ Emergency-Stop is reactivated
2. Switch on printer.

13 Faults

13.1 Handling faults

- ▶ If the printer stops unexpectedly:
 - Switch off the printer with the Emergency-Stop switch and/or the main switch.
 - Notify the Durst customer service.

- ▶ If a paper jam occurs, never reach under the covers with your hand.

14 Avoiding damage to property

14.1 Print head maintenance

The print heads can be damaged if the ink dries out.

- ▶ Carry out all prescribed maintenance work on the print heads.

14.2 Careful handling of the encoder ruler

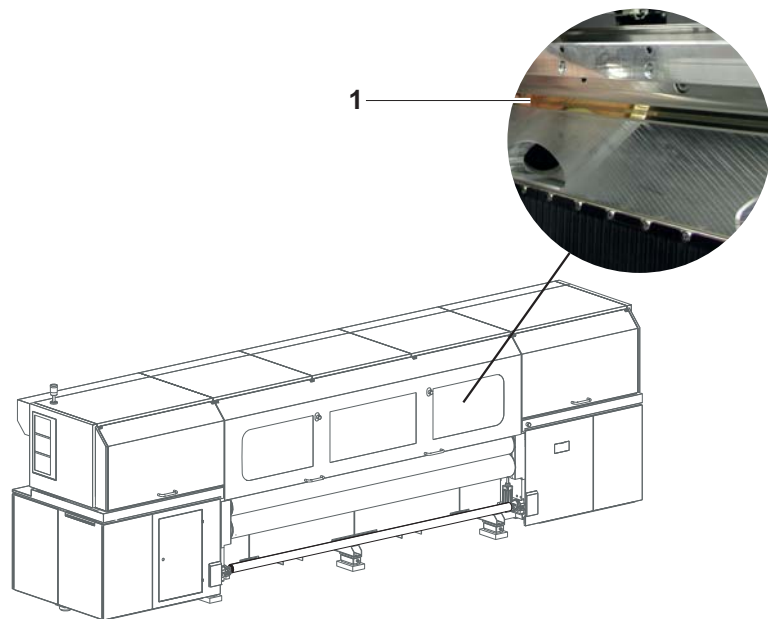


Fig. 4 Encoder ruler

Scratching of the encoder ruler (1) reduces the functionality of the printer.

- ▶ Do not touch the encoder ruler with hard objects.

14.3 Purge

Incorrect cleaning of the nozzle plate can cause print heads to dry out. This will lead to decreased printing quality or even the failure of individual nozzles.

Due to soiling on the nozzle plate, the ink can be smeared on the printed medium.

Soiled filters can lead to malfunctioning of the exhaust and ventilation. This can cause electronic components to fail.

Soiling on the transport rollers and on the encoder ruler reduce print quality.

Unsuitable cleaning tools, corrosive cleaning agents and the penetration of liquids into the printer or workstation can cause damage.

- ▶ Carry out all specified cleaning work.
- ▶ Use only the specified cleaning tools.

14.4 Lubrication

Improper lubrication of the carriage guide and the use of the lubricating plates past the specified usage duration shortens the service life of the bearings.

- ▶ Carry out all specified service work.

14.5 Changing the UV lamps

Insufficient UV exposure can cause the following damage:

- Moist, sticky printed media
- Unhardened ink on components of the printer
- ▶ Change UV lamps according to the specified intervals (→ Page 99 / Service).

C Description

1 Printer

Task The printer prints roll media, e.g. textiles, vinyl, tarpaulin, paper and film with a width up to 3.2 m.

Components The printer consists of the following components:

- 1 UV lamp head
- 2 Print carriage
- 3 Loading unit
- 4 Roll medium
- 5 Flip door
- 6 Take-up roll
- 7 Clamping roller
- 8 Transport roller
- 9 Workstation and GSM radio element
- 10 Take-up unit

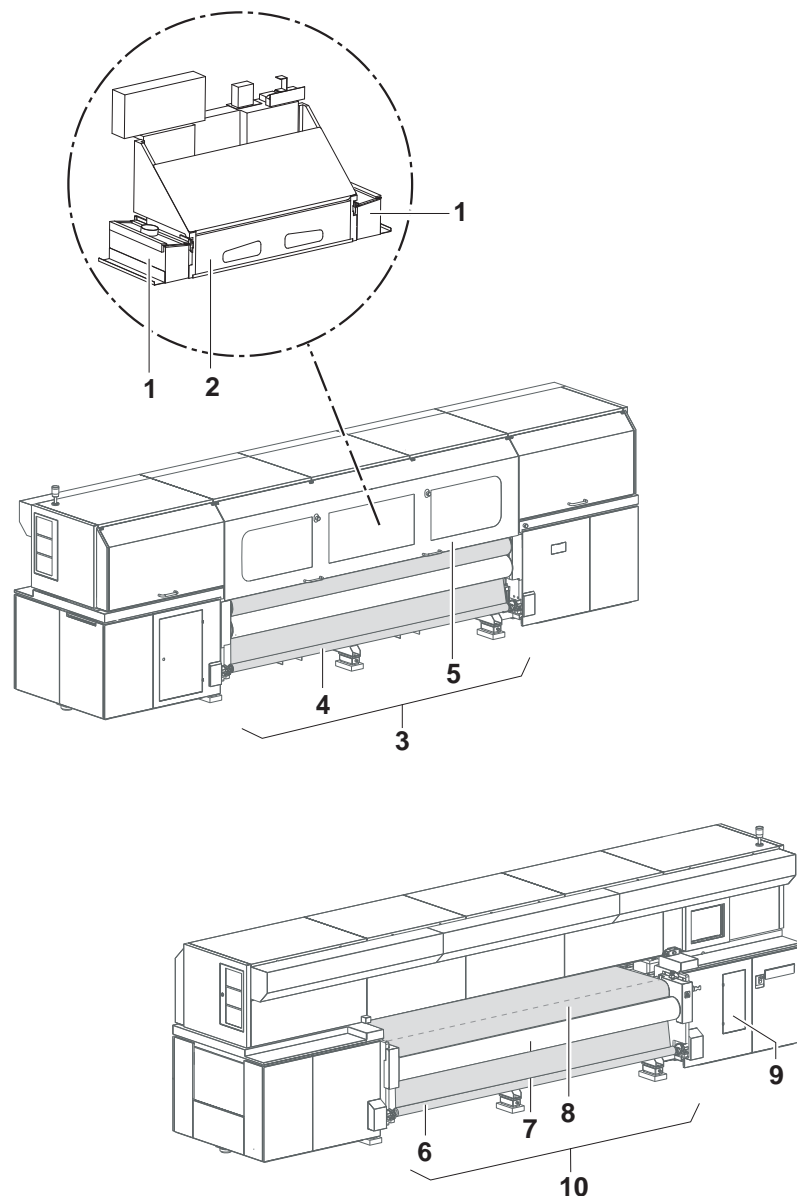


Fig. 5 Components of the printer (top: Loading side – straight-running control version here; below: unloading side)

Function The roll medium (4) is stored in the loading unit (3) and is fed to the printer from there.

A clamping roller (7) and transport roller (8) are found on both the loading and unloading sides. The transport rollers transport the medium through the printer during the printing process. The clamping rollers secure the medium.

A tensioning function tensions the medium by applying torque on the roll medium via the bearings of the loading unit opposite the direction of transport.

The printer is operated at the workstation (9).

During printing, the print carriage (2) passes over the medium. The print heads on the print carriage print the roll medium with ink. The UV lamps in the UV lamp head (1) dry the ink on the medium.

The flip door (5) is locked for the protection of the user during the printing process.

On the unloading side, the medium is taken up on the take-up roll (6) in the take-up unit (10).

The GSM radio element (9) (optional) transmits the following messages by radio to up to 4 preset mobile phones:

- Error messages
- Message when the end of the queue is reached
- Maintenance indication notification

1.1 Loading unit

Task The loading unit loads the medium.

Components

- 1 Roll mounts
- 2 Roll medium

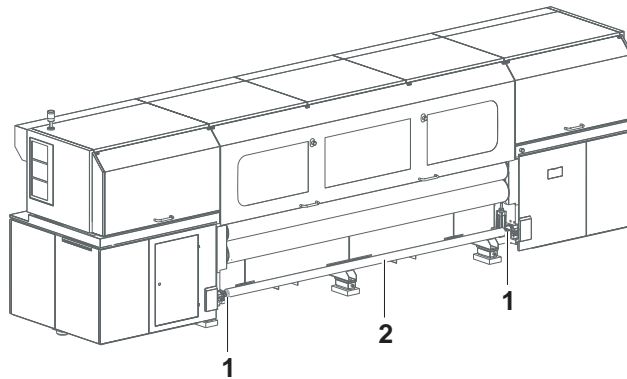


Fig. 6 Loading unit

Function The core of the medium (2) rests on an axis that is borne in the roll mounts (1) of the loading unit. Locking jaws on the axis are pressed against the core using compressed air. This secures the core on the axis.

1.2 Straight-running control

Task The straight-running control ensures that the medium runs straight through the printer. It can only be used at 1-roll printing.

Components

- 1 Sensor (light barrier)

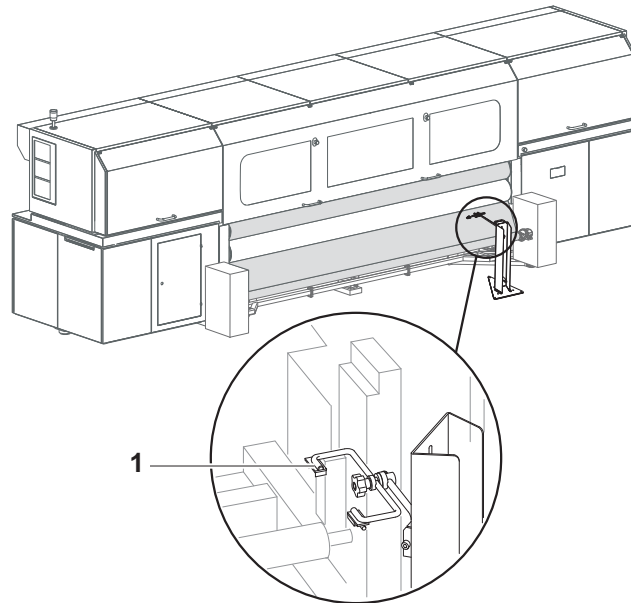


Fig. 7 Straight-running control

Function Imprecision during winding causes the medium to be shifted slightly toward the axes. Straight-running control compensates for this shift.

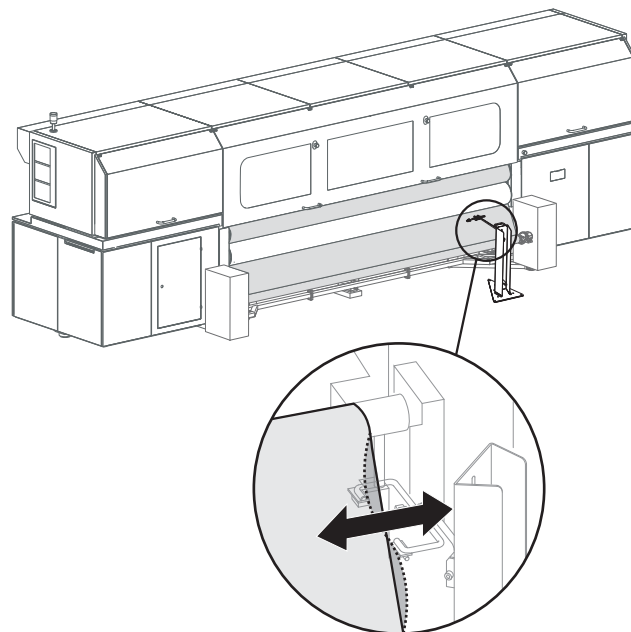


Fig. 8 Straight-running control

For this purpose, the sensor (light barrier) (1) measures the position of the right edge of the medium. If the edge shifts away from the reference position, the entire loading unit moves in the opposite direction to compensate for this.

1.3 Workstation

Task The printing process is controlled and monitored at the workstation.

Components

- 1 Monitor with touch screen
- 2 Keyboard
- 3 Computer

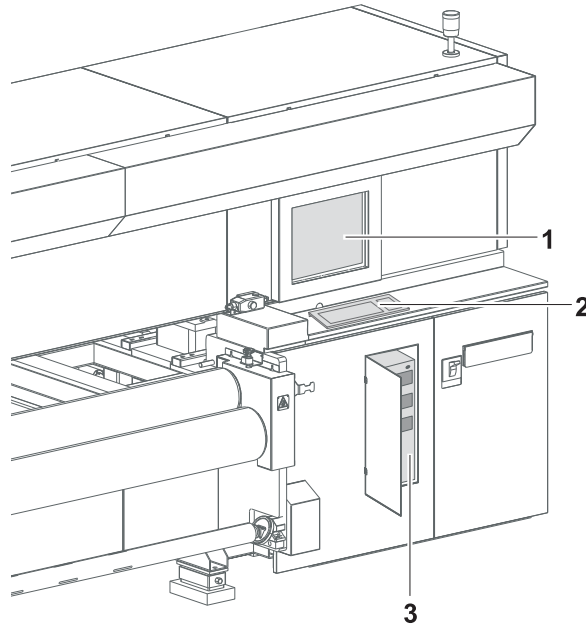


Fig. 9 Workstation

Function The software used to control the printer is found on the workstation.

The images to be printed can be loaded via a network cable to the workstation from the external CALDERA RIP station.

The operator performs the following activities at the touch screen:

- Preparation of the printer for loading the medium and for maintenance work
- Basic printing settings
- Modification of print parameters
- Sorting of images in the printing queue
- Initiation of the printing process

1.4 Ink supply unit

Task The ink supply unit provides the print heads with ink of different colors.

Components

1 Ink supply unit

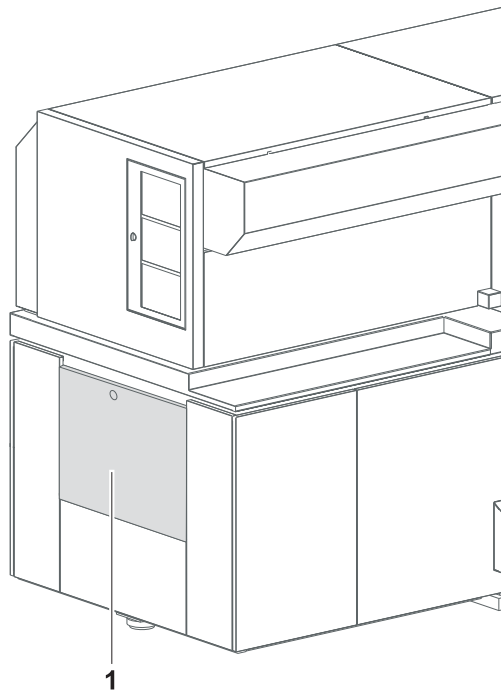


Fig. 10 Ink supply unit

Depending on the version, the ink supply unit (1) contains 4 to 8 ink tanks for ink of different colors and loading compartments for cubitainers.

Function The ink is stored in the ink tanks. New cubitainers are connected in the loading compartments to refill the ink tanks.

1.5 Cleaning system

Task The cleaning system is used for automatic and manual cleaning of the print heads.

Components The cleaning system consists of a catch tank and a cleaning access point.

- 1 Catch tank
- 2 Cleaning access point

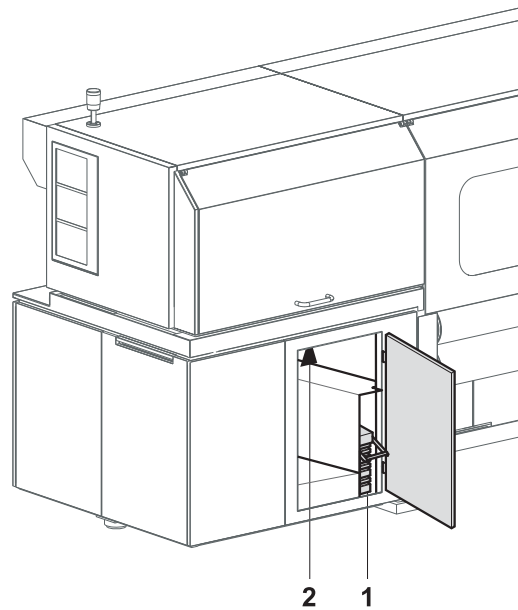


Fig. 11 Cleaning system

Function When the purge cycle is initiated, ink is forced through the print heads and collected in the catch tank (1).

The cleaning access point (2) allows manual cleaning of the print heads from below.

2 Workflow

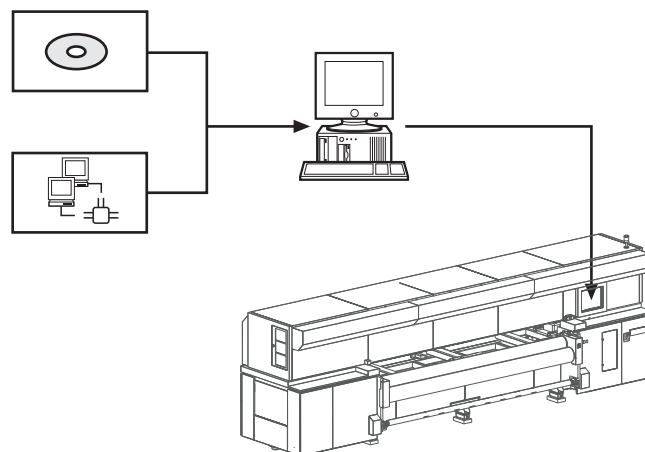


Fig. 12 Workflow

The image files to be printed are loaded onto an external RIP server via CD/DVD, USB stick, external USB hard disk or network. A DTP professional or an automated workflow then fully prepares the image files for printing. The prepared image files are then transferred to a prepared printer hotfolder via the network.

The operator selects or checks the desired print options at the operating panel of the printer. He/she then adds the image files to the queue. The image data is printed automatically in succession there.

D Transport, installation and commissioning

Transport, installation and commissioning are performed by service technicians authorized by Durst Phototechnik AG.

E Operation

1 Overview of daily work

1.1 Carrying out the daily work

Preparing printer

1. Switch the printer on if it is off.
2. Start up workstation if not already done.
3. Check fill level of ink and refill ink if necessary.
4. Carry out morning cleaning (→ Page 99 / Service)
5. Check printing table for soiling and clean if necessary.
6. Change medium if necessary.

Printing

7. If necessary, print the encoder test image and correct the encoder offset.
8. Prepare images on external RIP server and send them to printer.
9. Select or check print options at the workstation.
10. Move images to the queue.
11. Take up medium if necessary.

Finishing work



For economical work, we recommend not shutting down the workstation when switching off the printer.

This allows you to prepare files and transfer data from the RIP server to the workstation even if the printer is switched off.

12. If the timer is not used, switch off the printer and carry out evening cleaning.

2 Clamping roller

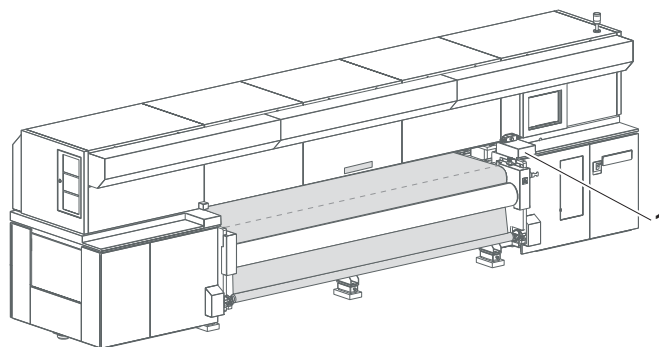


Fig. 13 Position of the buttons for operating the clamping roller

The clamping roller is opened or closed with the buttons (1)

Button	Function
0	Open clamping roller
I	Close clamping roller

3 Straight-running control (optional)

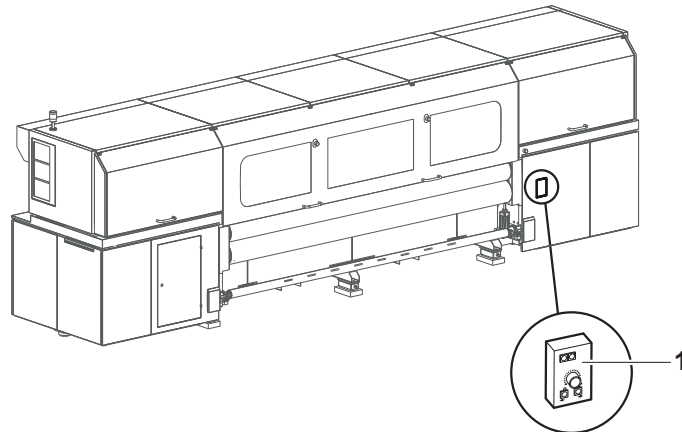


Fig. 14 Location of the operator panel for straight-running control

Straight-running control is operated via the operator panel (1).

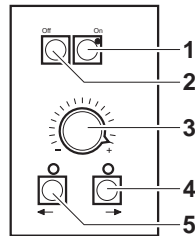


Fig. 15 Operator panel for straight-running control

The buttons have the following function:

Position	Button designation	Function
1	On	Activate automatic operation
2	Off	Deactivate automatic operation
3	Fine adjuster	Set zero point
4	Loading unit right	Move loading unit to the right
5	Loading unit left	Move loading unit to the left

If the **Loading unit right** and **Loading unit left** buttons are pressed simultaneously for 3 seconds, the loading unit moves to the reference position. The reference position is a central position from which straight-running control has enough leeway for automatic compensation movements to the left and right.

4 Blocking mechanism (optional)

Elastic media could oscillate due to the medium tension while advancing. To prevent this from occurring, the elasticity of the medium can be limited using the blocking mechanism.

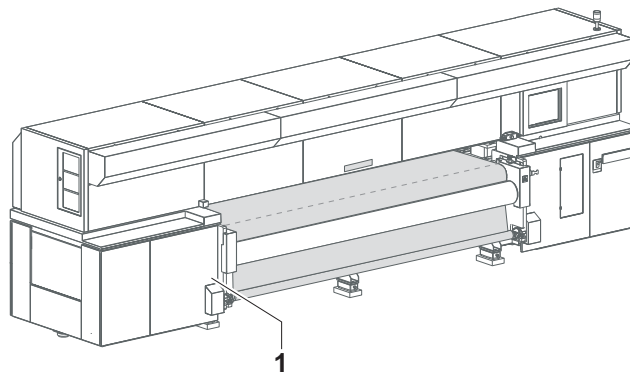


Fig. 16 Rotary knob

The rotary knob (1) has the following positions:

Position	Recommended for the following media
open	Rigid media
arrested	Media with a medium tension lower than level 15 (Software tab Medium)
blocked	Highly elastic media with a medium tension lower than level 6 (Software tab Medium)

5 Tension equalization

Some media exhibit different tensile stresses across their width. This can lead to folding while being drawn into the printer.

To prevent folds from forming, you can set the spacing on the loading and unloading sides, and thereby the contact pressure, between the clamping and transport rollers.

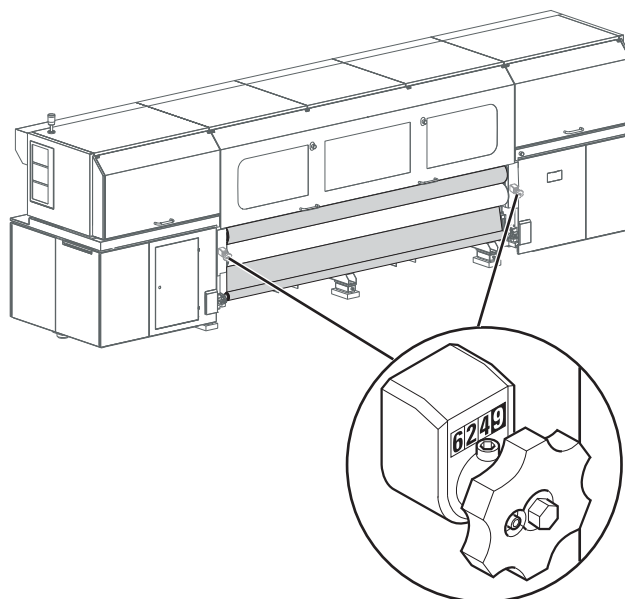


Fig. 17 Rotary knob for regulating the tension equalization

Spacing is regulated by a rotary knob on the right and left sides. The scale indicates the spacing.

Rotation direction

Rotation direction	Scale value	Change in tension
Clockwise	Increases	Increase in spacing and thus a reduction in tension
Counterclockwise	Decreases	Decrease in spacing and thus an increase in tension

Scale graduation The four-digit scale value is read as follows:

Digit	1.	2.	3.	4.
Scale value	x 1 mm	x 0.1 mm	x 0.01 mm	x 0.001 mm

Example: A scale value of **1538** corresponds to 1.538 mm

With a scale value of **0000**, the rollers touch when no medium is inserted. The contact pressure is at a maximum in this case, as the spacing is specified by the medium itself here.

Standard setting The recommended standard setting is **0970**.

5.1 Setting tension equalization in case of folds



The spacing should be set to the same value on the right and left sides.

The following procedure is recommended:

1. Set spacing to medium thickness.
2. If folds are still being created, find the optimum setting by changing the spacing.
3. Record the optimum setting for future use of the same medium.

6 Workstation

6.1 Connection of external devices

6.1.1 Connecting a USB stick/an external USB hard disk



Data transfer from an external USB hard disk, for example, only makes sense via the connected RIP server since the image data to be printed must be in the 1-bit format.

NOTICE

Connection of an incompatible device to the workstation!

Damage to the workstation

▶ Connect only SELV-compatible devices to the workstation.

▶ Connect a USB stick/USB hard disk to the USB port of the computer.

6.2 Booting up and shutting down the workstation

6.2.1 Booting up workstation

- ▶ Switch on main switch of computer.
 - ↳ The LED illuminates.
 - ↳ The computer boots up.
 - ↳ The Linux screen interface appears on the monitor after booting up.

6.2.2 Shutting down workstation

i We recommend only shutting down the workstation if the unit will not be used for more than two days.

Only the software should be exited daily, without shutting down the workstation. The monitor switches off automatically.

- ✓ The software has been exited
- ▶ Shut down Linux operating system.
 - ↳ Once the Linux operating system has shut down, the workstation switches off automatically.

7 Switching printer on and off

i The printer is only switched on and off in the following cases:

- The timer is not used
- The printer is being maintained
- The printer will not be used for a longer period of time

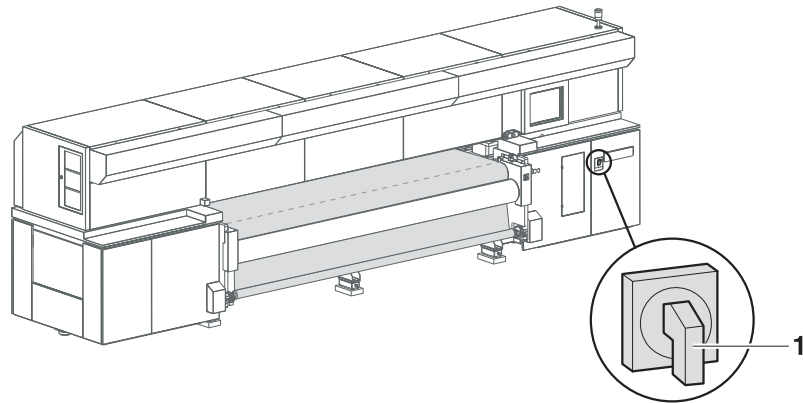


Fig. 18 Position of the main switch

7.1 Printer startup

- ✓ The workstation is booted up
- ✓ The software has been started
- 1. Switch on main switch (1) on the printer.
- 2. Close flip door.
- 3. Click **Printer** in the software.
- 4. Select **Printer** tab.

i You must always load the medium in the software after initialization. This also applies if the medium was used just before switching off the printer.

- 5. Click **Media > Load** in the software.

7.2 Printer shutdown

The workstation is not disconnected from the power mains when the printer is switched off.

⚠ WARNING

Energized components, even when the printer has been switched off!

Risk of death via electric shock

- ▶ Switch main switch off.
- ▶ Disconnect printer from the mains with the power isolator.

- 1. Pull out the light trap carrier (1) until it stops.
- 2. Select **Printer** on the Software tab.
- 3. Click the **Daily** button under **Printer Shutdown**.
 - ↳ The **Shutdown** dialog window appears.

4. Click **Yes**.
 - ↳ The transport rollers open.
5. Confirm with **OK**.
6. Switch off printer with main switch.

8 Operating the GSM radio element (optional)

8.1 Overview

The GSM radio element is configured for the printer so that the following messages are sent to up to 4 mobile phones:

- Printer status and error messages
- End of the queue has been reached
- Maintenance indication notifications

The SMS function in the software has to be activated with the corresponding telephone numbers so that the GSM radio element processes messages:

- Error messages: **Auto Timer** tab
- End of the queue: **Queue**
- Maintenance indication notifications: **Maintenance** tab

The blue LED indicates the modem status:

LED	Possible modem states
Flashes every 3 seconds	Modem switched on
Flashes every 0.5 seconds	<ul style="list-style-type: none"> ■ Network connection interrupted ■ Network connection not found ■ SIM card not found ■ No valid PIN number entered
Not flashing	Modem switched off

8.2 Handling the SIM card (not included in scope of delivery)

8.2.1 Inserting the SIM card

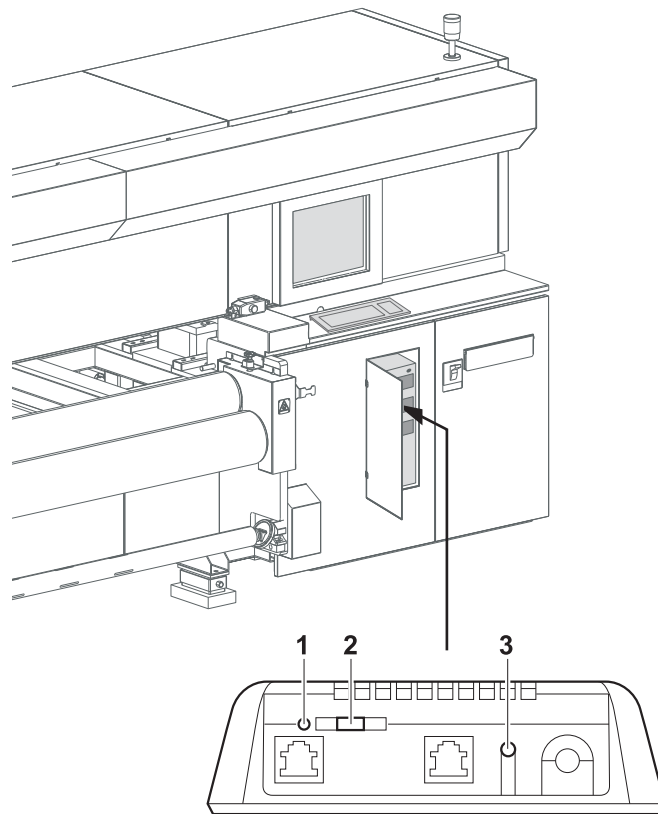


Fig. 19 GSM radio element

The SIM card must fulfill the following requirements:

- Voltage: 3 V or 1.8 V
 - GSM frequency: 850/900/1800/1900 MHz
1. Insert a suitable SIM card into a cell phone. Follow the operating manual of the cell phone here.
 2. Set PIN number of the SIM card "0000".
 3. Deactivate mailbox function and call number suppression of the SIM card.
 4. Remove SIM card from the cell phone.
 5. To open the SIM card compartment of the GSM module, carry out the following steps:
 - Switch off GSM module with the **ON/OFF** (3) switch.
 - Press the yellow button (1) with a pointed object, e.g. the tip of a pen.
 - ↳ The SIM card compartment (2) opens
 6. Insert SIM card into the SIM card compartment.

7. Close SIM card compartment.
 8. Switch on GSM module.
- ↳ The GSM module is ready for option and can be activated in the software.

9 Loading medium (1-roll printing)

The medium can be loaded by one person.

i When printing cloth, ink may drip through the cloth onto the printing table. To prevent soiling of the printing table, the printer must be specially prepared for cloth printing.

Procedure The medium is loaded in the following steps:

- Initiating loading procedure in the software
- Load new roll
- Prepare printer for cloth printing (only necessary for cloth printing)
- Inserting a medium
- Aligning a medium
- Entering position of the medium
- Activate straight-running control
- Taking up medium
- Completing loading procedure

9.1 Initiating loading procedure in the software

1. Click **Media**.
2. Select the desired media channel.

i To prevent the medium from unwinding on the loading side, the corresponding button **Print Outside/Print Inside** must be selected in the medium channel.

3. Click **Load**.

↳ The **Load** menu appears.

9.2 Load new roll

1. Slide the axis into the core of the new roll.

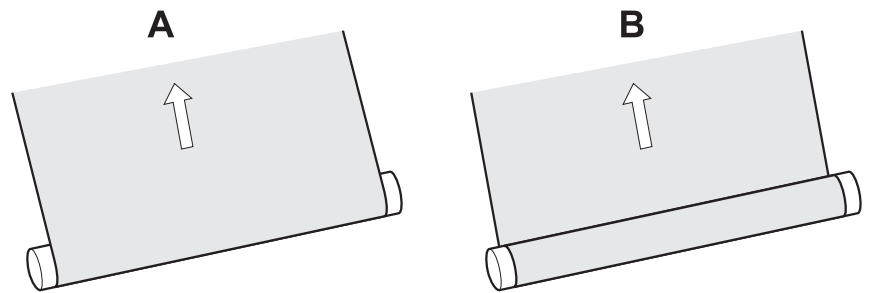


Fig. 20 Roll rotation direction (variant A: printing on the outside, variant B: printing on the inside)

2. Place roll on hand lift in the desired position depending on the desired roll rotation direction.
3. If the printer is equipped with straight-running control, carry out the following steps at the operator panel for straight-running control (→ Page 34 / Straight-running control (optional)):
 - Deactivate automatic operation with the **Off** button.
 - Press and hold the **Loading unit right** and **Loading unit left** buttons for at least 3 seconds.

↳ The loading unit moves to the reference position.
4. Position hand lift with roll on the loading side centrally between the two roll mounts.

⚠ WARNING

High weight of the medium!

Danger of crushing when inserting the ends of the axes into the roll mount

- ▶ Wear protective gloves.
- ▶ When loading the roll, do not grip the ends of the axes.

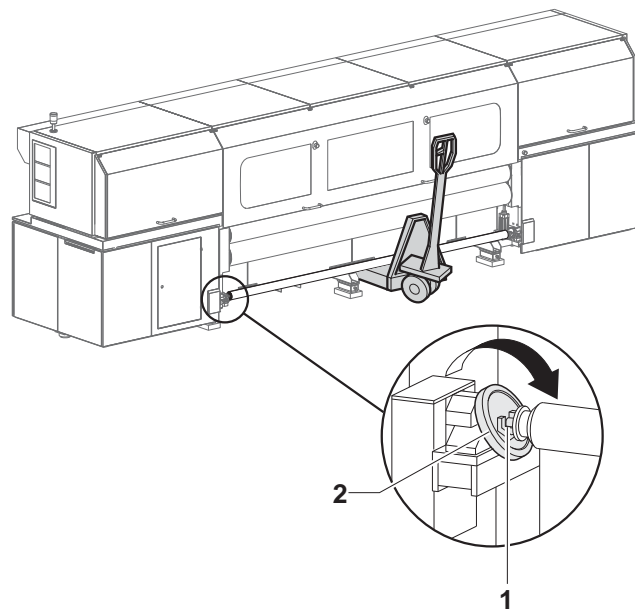


Fig. 21 Inserting roll (loading side)

5. If necessary, turn the roll mount (2) until the groove (1) points upwards.
6. Lift the roll with axis and place both ends of the axis into the right and left roll mount.
7. Close roll mounts (see illustration).

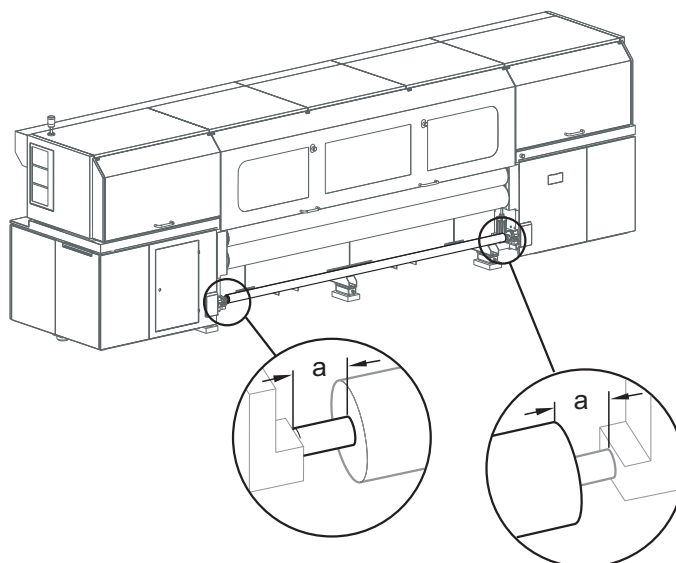


Fig. 22 Positioning the roll ventrally

8. With back printing, position the roll as centrally as possible on the axis, both for printing of the front and back.

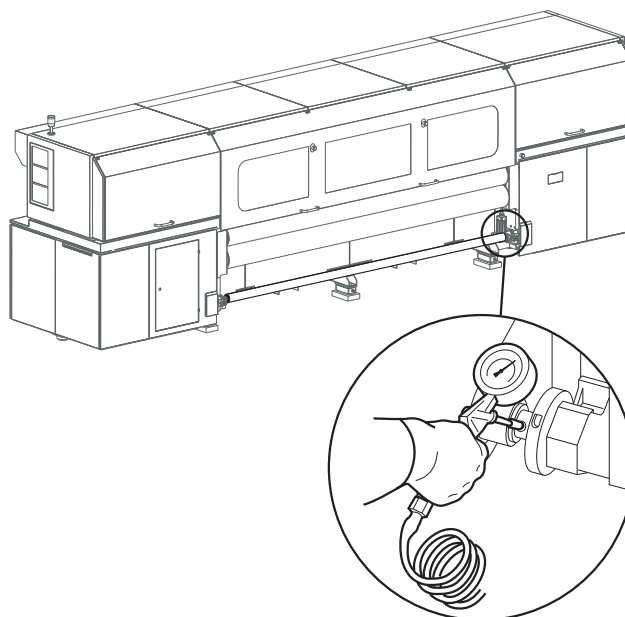


Fig. 23 Blowing compressed air into the valve

9. To secure the core on the axis, place air blow gun onto the valve and fill compressed air into the valve.
 - ↳ The core is secured to the axis via the locking jaws.

9.3 Preparing printer for cloth printing (optional)

- ✓ Perforated has been selected in the software

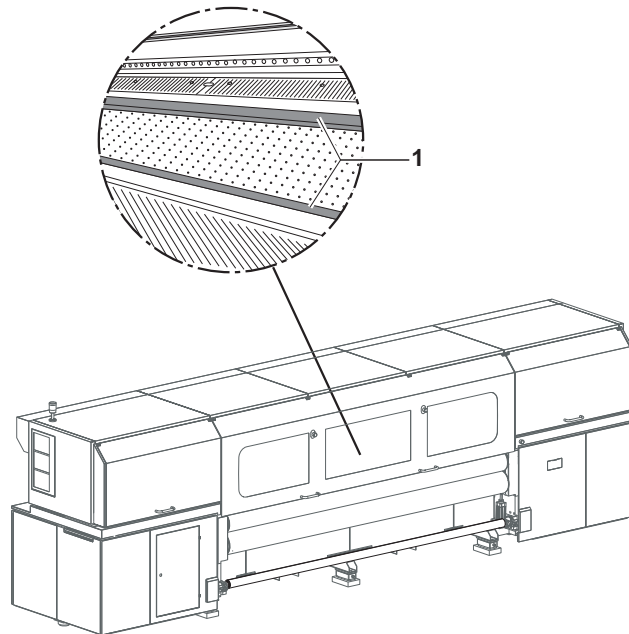


Fig. 24 Mounting the guide rails

1. Place guide rails (1) on printing table and screw down.

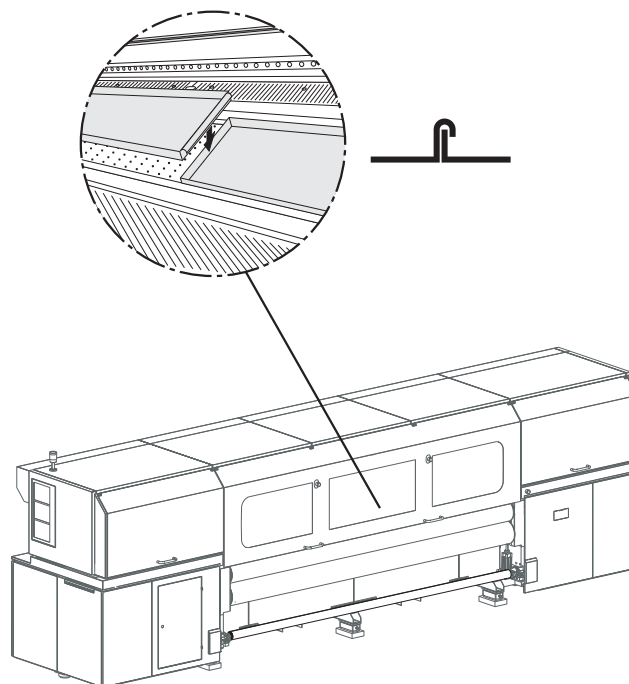


Fig. 25 Inserting troughs

2. Insert troughs. Note here, that the abutting edges of the troughs overlap.

NOTICE

Trough in traversal path of the print carriage!

Damage to property via collision of the print carriage and the trough

► Ensure that the troughs are inserted correctly.

3. Ensure that the troughs are inserted correctly.

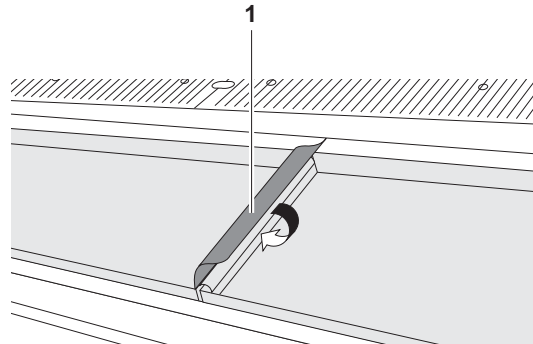


Fig. 26 Covering overlaps

4. Cover overlaps with strips of tape (1) to prevent soiling of the troughs.

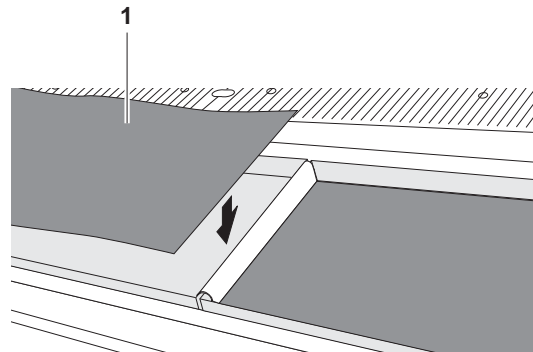


Fig. 27 Inserting material press filters

5. Insert included material press filters into the troughs to prevent the troughs from becoming soiled.

9.4 Inserting a medium

- ✓ The new roll is loaded
- ✓ The printer is prepared for cloth printing if necessary

⚠ WARNING

Rotating or closing clamping rollers!

Risk of death via crushing, catching and drawing in

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ If an acoustic signal is heard or the warning light illuminates, take your hands away from the clamping roller immediately.

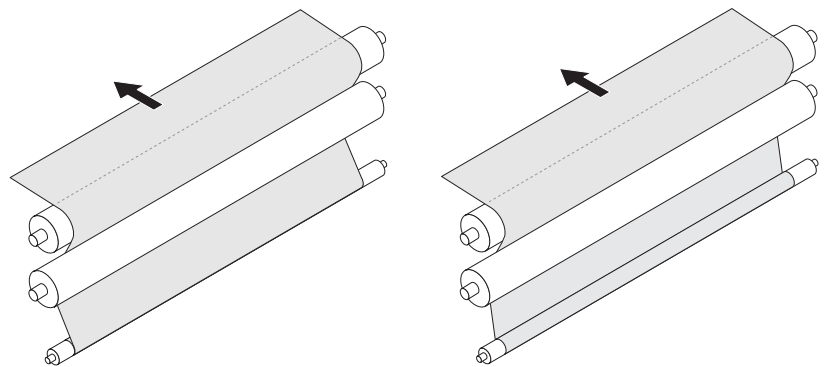


Fig. 28 Inserting medium (2 possibilities, depending on the side to be printed)

1. Pull medium upward and guide it around clamping and transport rollers.
2. Guide medium onto printing table.
3. Guide medium manually or with the buttons of the operator panel through the printer to the unloading side.
4. Guide medium out on the unloading side and guide it around the transport and clamping rollers on the loading side in the same way.

9.5 Aligning medium

- ✓ The medium is inserted

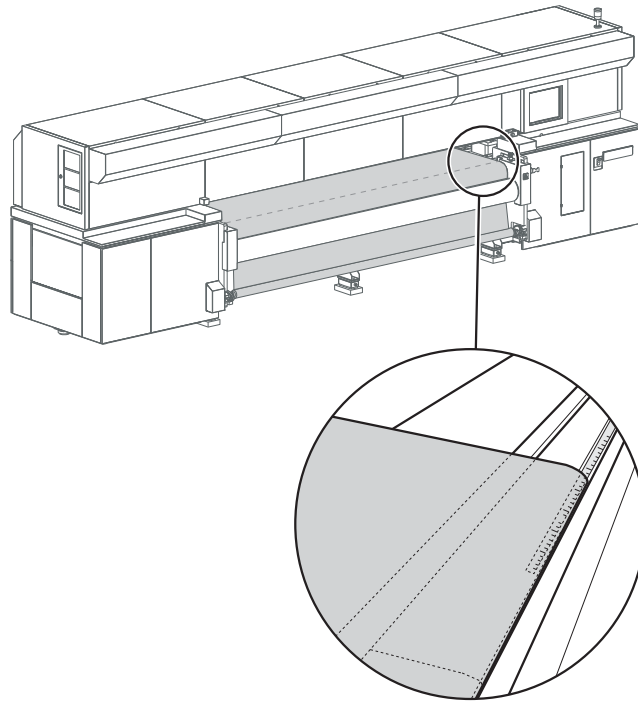


Fig. 29 Aligning a medium

1. Manually align medium on the loading and unloading sides using the scale as follows:
 - For printing on one side, the medium edges on the loading and unloading side must always be positioned at the same scale value.
 - With back printing, the medium must be positioned exactly in the center of the printer.
2. Close clamping rollers on the loading and unloading sides with the **Loading side roller** and **Unloading side roller** buttons.
 - ↳ An acoustic signal is heard and the warning light illuminates.
 - ↳ The clamping rollers close after 3 seconds.
 - ↳ The indicator lights on the operator panel illuminate.

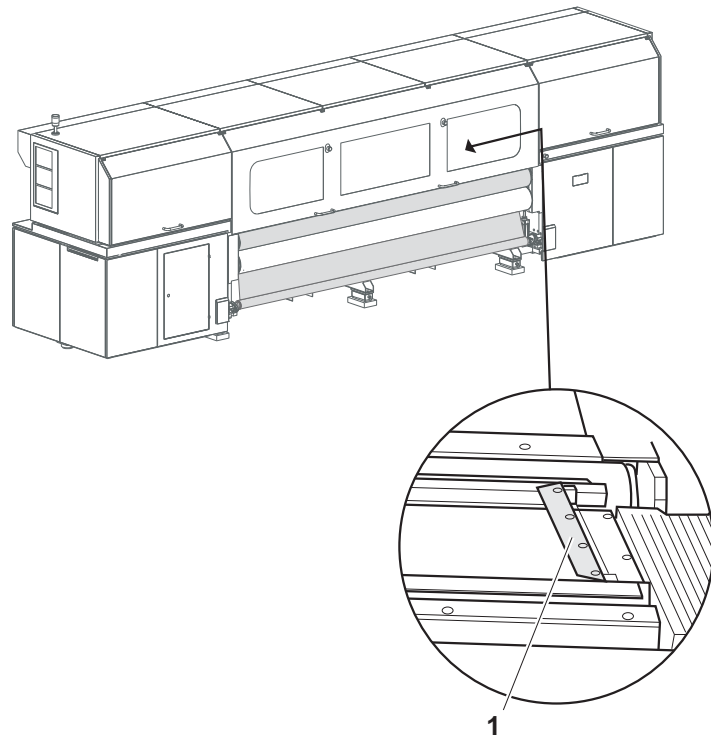


Fig. 30 Inserting side guides for cloth printing

3. If you are printing on cloth that turns upright at the sides, is cut poorly or shows signs of fringing, proceed as follows:
Insert the side guides (1) into the guide rails in such a way that the medium is transported properly below the guides. Ensure that the guides engage properly here.

9.6 Entering medium position



It can only be ensured that the printer will not print past the medium edge if the position of the right-hand medium edge is read exactly and entered in the software.

- ✓ The **Load** dialog window is open in the software
- 1. Click **OK** in the software.
 - ↳ The **Media Load Position** dialog window appears.

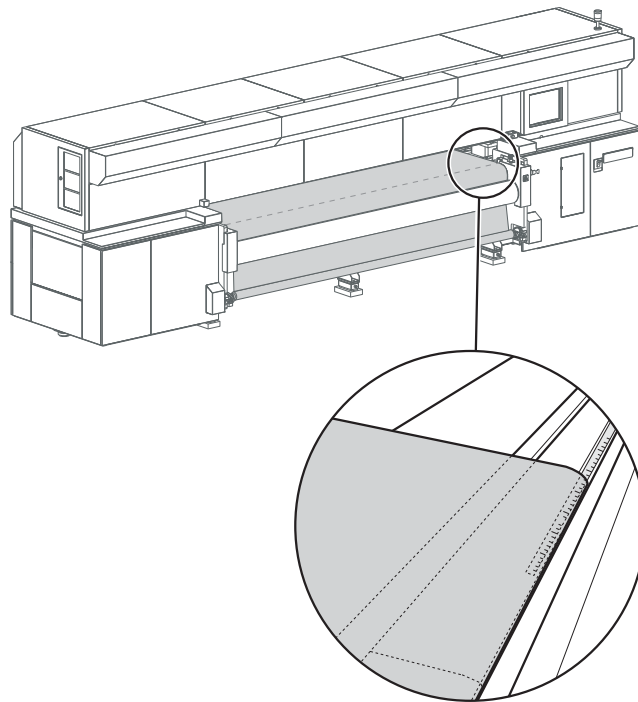


Fig. 31 Reading the position of the right medium edge

2. Read the position of the right-hand medium edge on the unloading side with the scale and enter it in the software.
3. Enter position of the right-hand medium edge in the **Right edge position** input field precisely.
4. Confirm with **OK**.

9.7 Activating straight-running control (optional)

- ✓ The position of the medium is entered

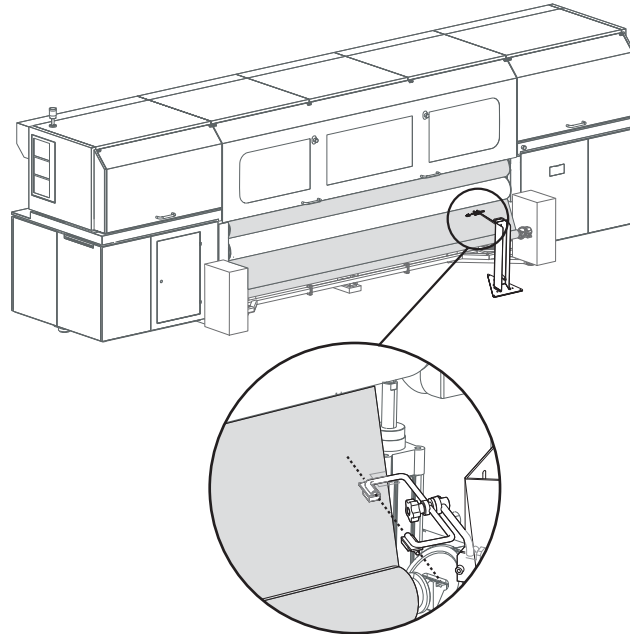


Fig. 32 Adjusting the sensor mount manually

1. Manually adjust sensor mount (3) of straight-running control using the following steps:
 - Loosen set screws (1, 2).
 - Shift sensor mount in such a way that the right edge of the medium lies on an imaginary line between the sensors.
 - Swivel sensor mount in such a way that the sensor mount is positioned approx. vertically to the paper edge.
 - Tighten set screws.
2. Rotate **fine adjuster** at the operator panel for the straight-running control (→ Page 34 / Straight-running control (optional)) until the two LEDs on the **Loading unit right** and **Loading unit left** buttons go out.
3. Switch straight-running control to automatic operation with the **On** button.

9.8 Taking up medium



You can either have the medium freely transported out on the unloading side or, as is described in the following steps, take it up using the take-up unit.

⚠ WARNING

Rotating parts of the take-up unit!

Risk of death via drawing in and catching

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ Switch off take-up unit in the software.

1. Switch off take-up unit in the software as follows, if necessary:
 - Click **Queue**.
 - Deactivate the  and  buttons.
2. Load empty core for the take-up roll in the take-up unit in the same manner as when loading a new roll (→ Page 41 / Load new roll).

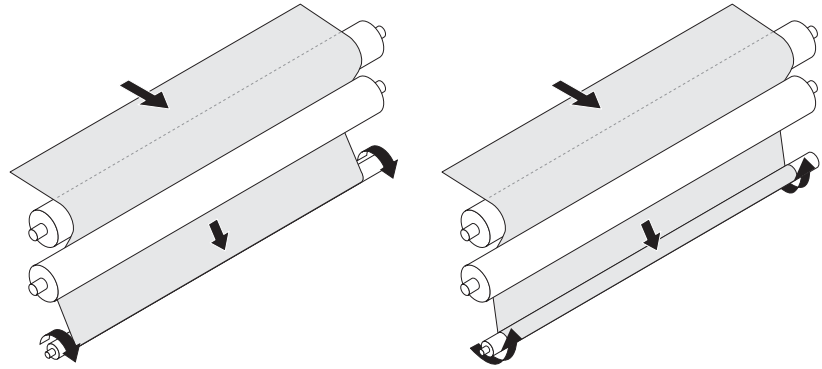


Fig. 33 Taking up medium (2 possibilities)

3. Secure the medium to the core with tape depending on the position of the printed side (inside or outside).

9.9 Completing loading procedure

- ✓ The medium is secured to the take-up roll on the unloading side, if necessary

1. Close flip door.
2. Set the blocking mechanism depending on the medium (→ Page 34 / Blocking mechanism (optional)).
3. Set the tension equalization if necessary (→ Page 35 / Tension equalization).

- **i** The direction of rotation of the take-up roll must be set correctly in the queue software.

4. Set rotation direction of the take-up roll in the queue.

10 Loading medium (2-roll printing)

The medium can be loaded by one person.

- **i** When printing cloth, ink may drip through the cloth onto the printing table. To prevent soiling of the printing table, the printer must be specially prepared for cloth printing.

Procedure The medium is loaded in the following steps:

- Inserting central bearing
- Initiating loading procedure in the software
- Load new roll
- Prepare printer for cloth printing (only necessary for cloth printing)
- Inserting a medium
- Aligning a medium
- Entering position of the medium
- Taking up medium
- Completing loading procedure

10.1 Inserting central bearing

A central bearing must be used on the loading side for the retention of two rollers.

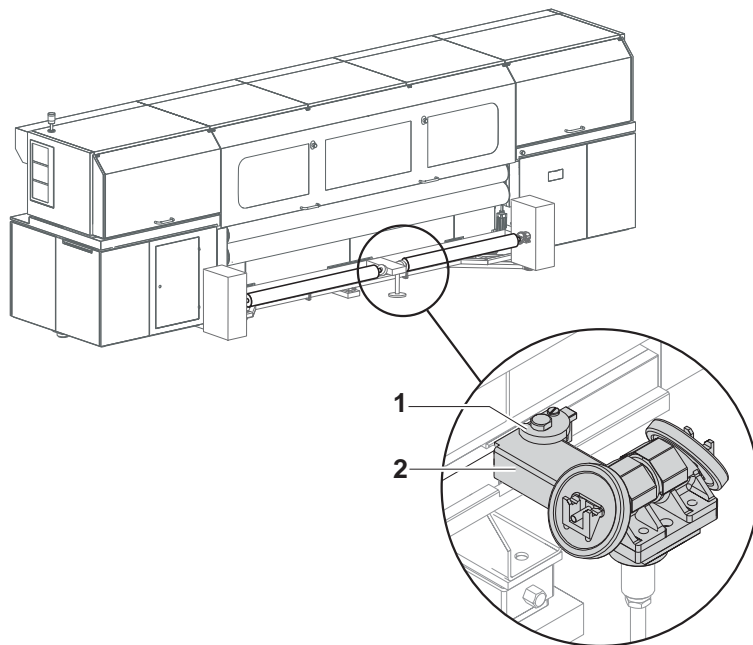


Fig. 34 Inserting central bearing

i The straight-running control is not used at 2-roll printing.

1. If present, switch off automatic mode of the straight-running control (→ Page 34 / Straight-running control (optional)).
2. Open closure (1).

3. Insert central bearing (2).
 - ↳ If the printer is equipped with straight-running control, a contact is closed and the loading unit moves to the reference position automatically.
4. Close the closure.

10.2 Initiating loading procedure in the software

1. Click **Media**.
2. Select the desired media channel. When doing so, ensure that **Two-roll printing** is activated.
 - To prevent the medium from unwinding on the loading side, the corresponding button **Print Outside** / **Print Inside** must be selected in the medium channel.
3. Click **Load**.
 - ↳ The **Load** menu appears.

10.3 Load new roll

1. Slide axes into the cores of the new rolls respectively.

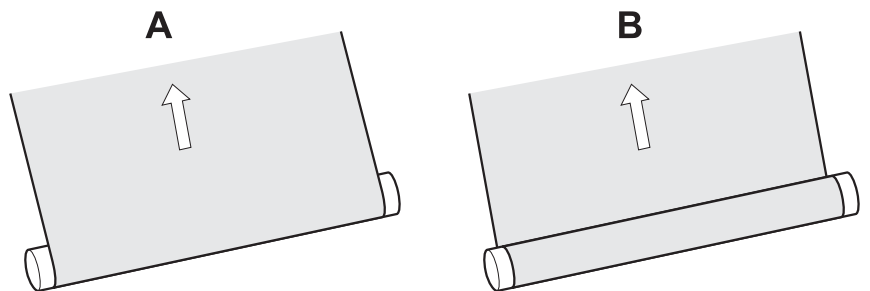


Fig. 35 Roll rotation direction (variant A: printing on the outside, variant B: printing on the inside)

2. Place the rolls on the hand lift in the desired position depending on the desired roll rotation direction.

⚠ WARNING

High weight of the medium!

Danger of crushing when inserting the ends of the axes into the roll mount

- ▶ Wear protective gloves.
- ▶ When loading the roll, do not grip the ends of the axes.

3. Insert the rolls as follows:

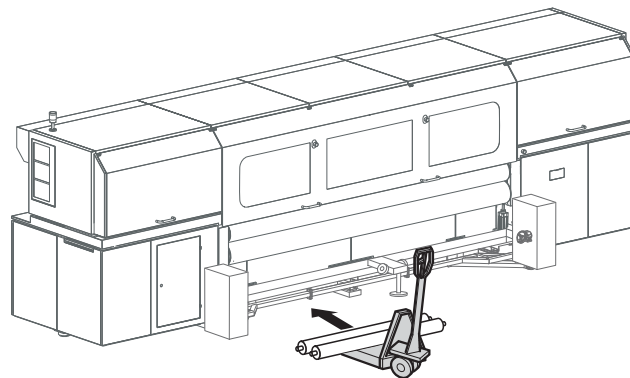


Fig. 36 Positioning the hand lift

- Position hand lift with rolls on the loading side centrally between both roll mounts.

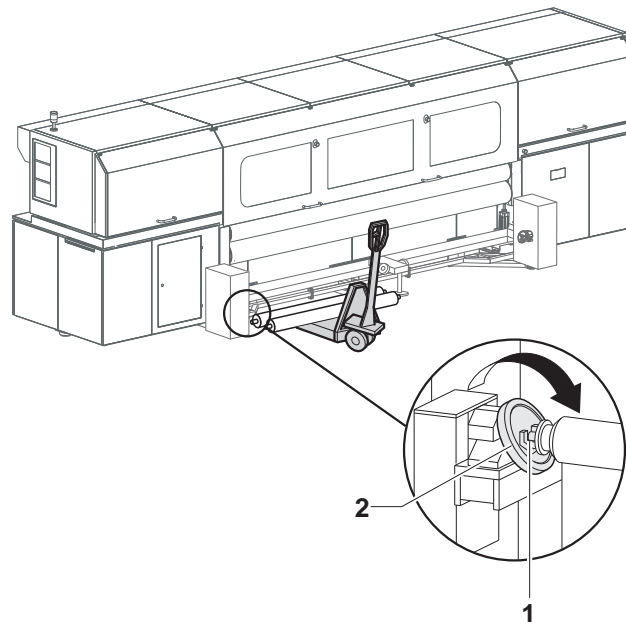
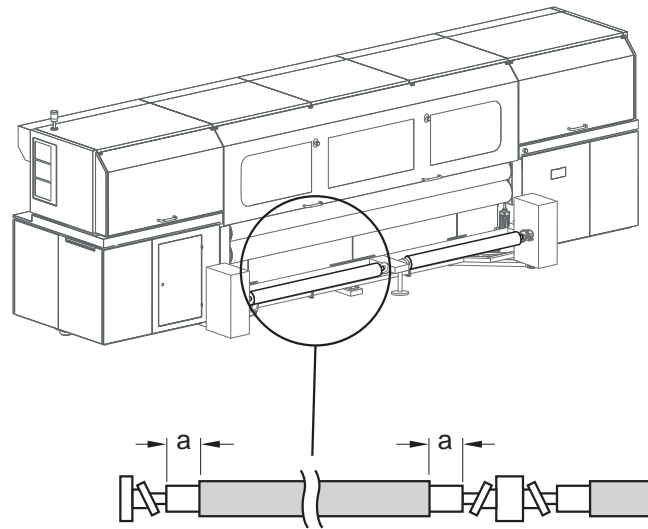


Fig. 37 Inserting the roll

- If necessary, turn the roll mount (2) until the groove (1) points upwards
- Lift the roll with axis and place both ends of the axis into the roll mounts.
- Close roll mounts.
- Insert the second roll in the same manner.



4. Slide rolls onto the axes so that they are positioned centrally on the axes.
5. Close roll mounts (see illustration).

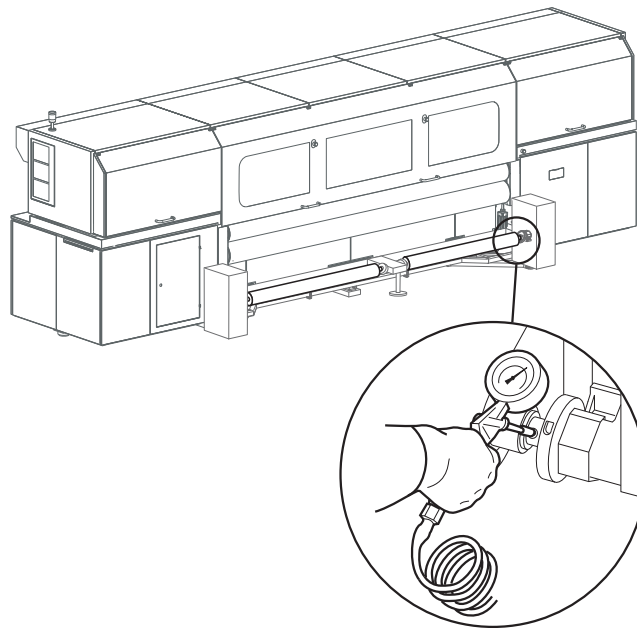


Fig. 38 Blowing compressed air into the valve

6. To secure the cores on the axes, place air blow guns onto the valves and fill compressed air into the valves.
 - ↳ The cores are secured to the axes via the locking jaws.

10.4 Preparing printer for cloth printing (optional)

- ✓ Perforated has been selected in the software

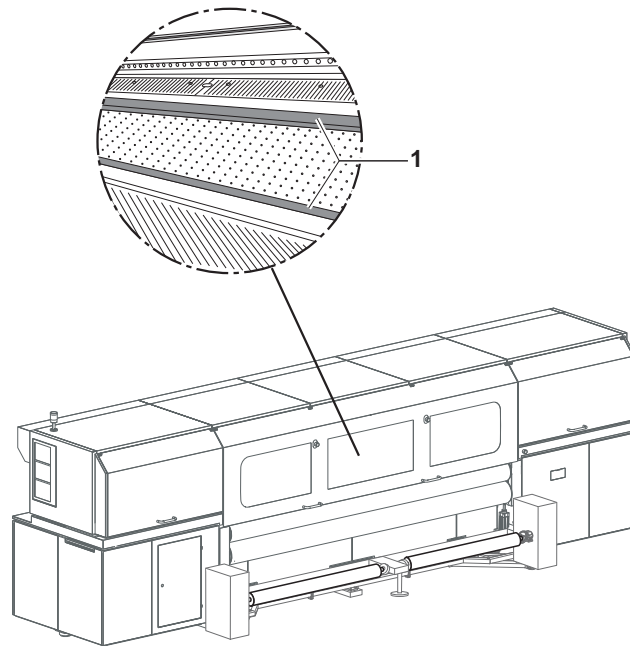


Fig. 39 Mounting the guide rails

1. Place guide rails (1) on printing table and screw down.

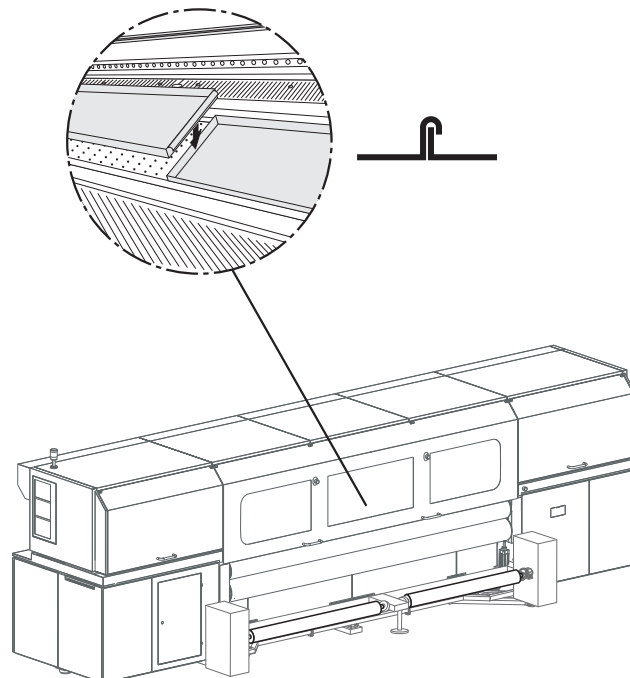


Fig. 40 Inserting troughs

2. Insert troughs. Note here, that the abutting edges of the troughs overlap.

NOTICE

Trough in traversal path of the print carriage!

Damage to property via collision of the print carriage and the trough

► Ensure that the troughs are inserted correctly.

3. Ensure that the troughs are inserted correctly.

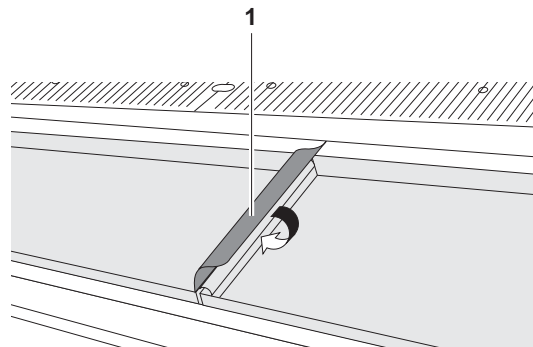


Fig. 41 Covering overlaps

4. Cover overlaps with strips of tape (1) to prevent soiling of the troughs.

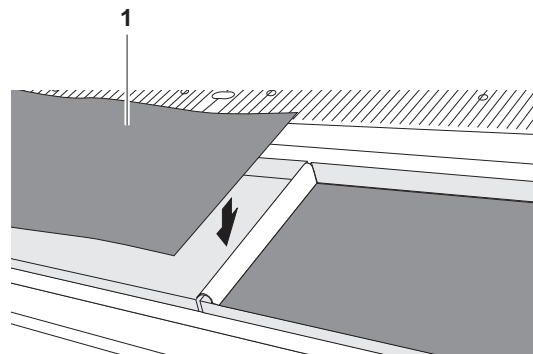


Fig. 42 Inserting material press filters

5. Insert included material press filters into the troughs to prevent the troughs from becoming soiled.

10.5 Inserting a medium

The following steps have to be carried out with both rolls.

- ✓ The new rolls are loaded
- ✓ The printer is prepared for cloth printing if necessary

⚠ WARNING

Rotating or closing clamping rollers!

Risk of death via crushing, catching and drawing in

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ If an acoustic signal is heard or the warning light illuminates, take your hands away from the clamping roller immediately.

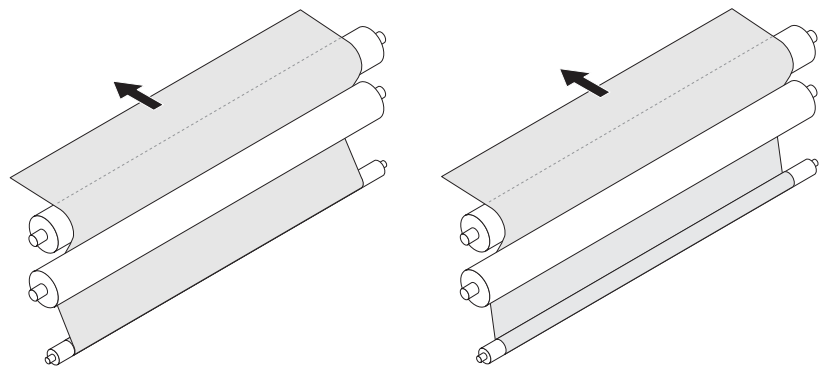


Fig. 43 Inserting medium (2 possibilities, depending on the side to be printed)

1. Pull medium upward and guide it around clamping and transport rollers.
2. Guide medium onto printing table.
3. Guide medium manually or with the buttons of the operator panel through the printer to the unloading side.
4. Guide medium out on the unloading side and guide it around the transport and clamping rollers on the loading side in the same way.

10.6 Aligning media

- ✓ The media are inserted

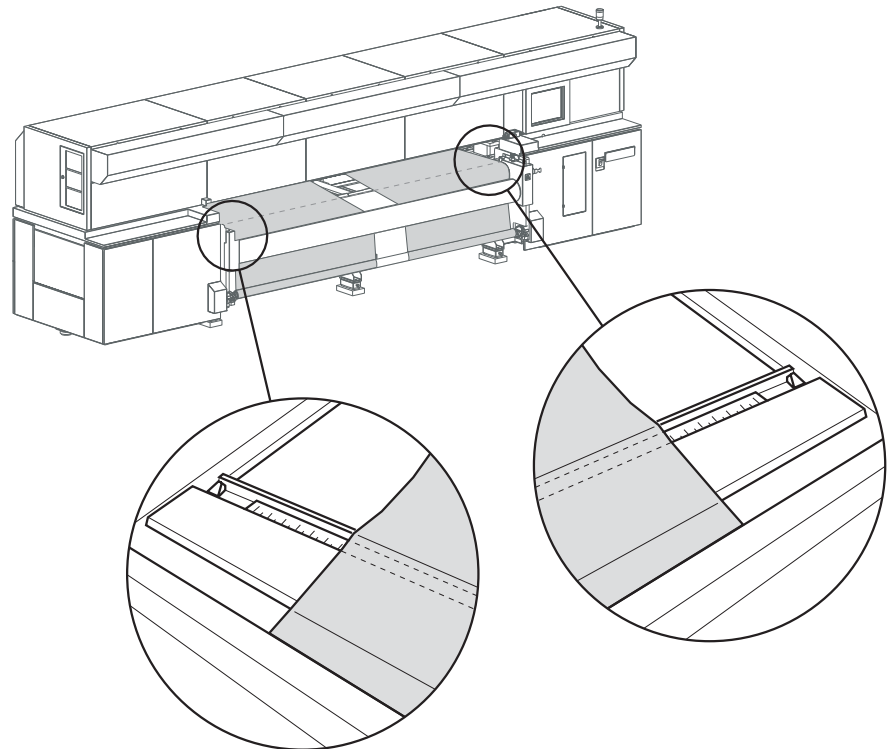


Fig. 44 Aligning a medium

1. Align media with the scale on the loading and unloading sides in such a way that the medium edges are positioned at the same scale value on the loading and unloading sides.
2. Close clamping rollers on the loading and unloading sides with the **Loading side roller** and **Unloading side roller** buttons.
 - ↳ An acoustic signal is heard and the warning light illuminates.
 - ↳ The clamping rollers close after 3 seconds.
 - ↳ The indicator lights on the operator panel illuminate.

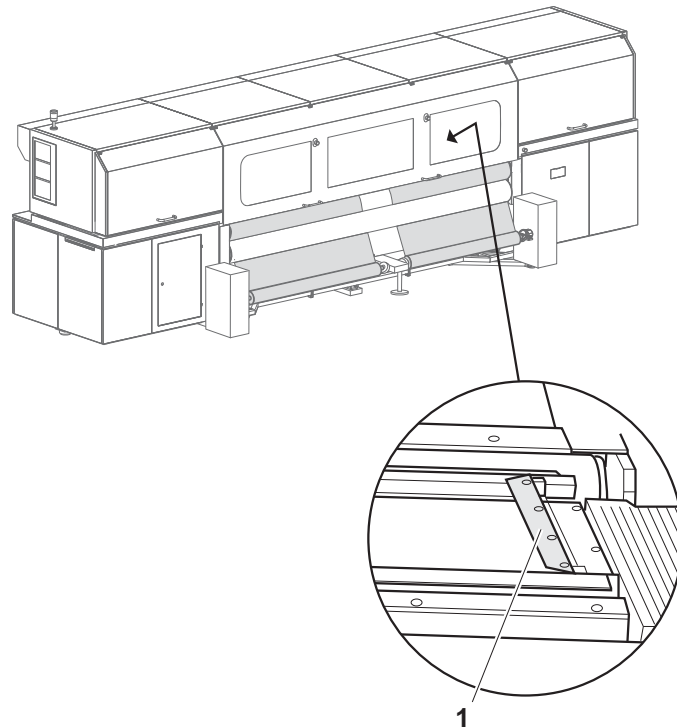


Fig. 45 Inserting side guides for cloth printing

3. If you are printing on cloth that turns upright at the sides, is cut poorly or shows signs of fringing, proceed as follows:
Insert the side guides (1) into the guide rails in such a way that the medium is transported properly below the guides. Ensure that the guides engage properly here.

10.7 Entering position of the media

i It can only be ensured that the printer will not print past the medium edge if the position of the right-hand medium edge or left-hand one is read exactly and entered in the software.

- ✓ The **Load** dialog window is open in the software
- 1. Click **OK** in the software.
 - ↳ The **Media Load Position** dialog window appears.

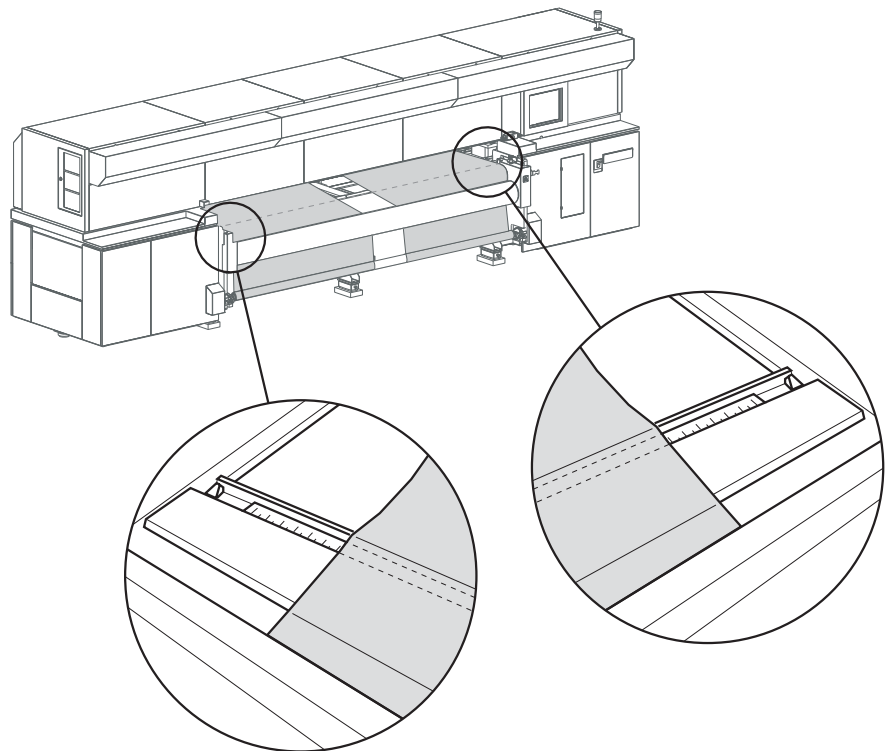


Fig. 46 Reading position of the medium edges

2. Read the position of the left-hand edge of the left-hand medium and of the right-hand edge of the right-hand medium on the unloading side with the scale (1) and enter in the software.
3. Enter the positions in the **Left edge position** and **Right edge position** input fields exactly.
4. Confirm with **OK**.

10.8 Taking up media

You can either have the media freely transported out on the unloading side or, as is described in the following steps, take them up using the take-up unit.



Both take-up rolls are loaded on a single axis on the unloading side.

⚠ WARNING

Rotating parts of the take-up unit!

Risk of death via drawing in and catching

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ Switch off take-up unit in the software.

1. Switch off take-up unit in the software as follows, if necessary:

- Click **Queue**.

- Deactivate the  and  buttons.

2. Load empty cores for the take-up rolls in the take-up unit in the same manner as when loading a new roll (→ Page 41 / Load new roll).

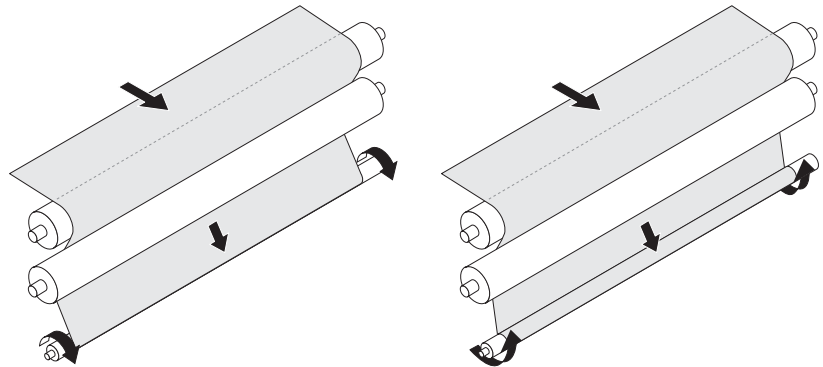


Fig. 47 Taking up medium

3. Secure the medium to the core with tape depending on the position of the printed side (inside or outside).

10.9 Completing loading procedure

- ✓ The medium is secured to the take-up roll on the unloading side, if necessary
1. Close flip door.
 2. Set media tension correctly with the blocking mechanism (→ Page 34 / Blocking mechanism (optional)).
 3. Set the tension equalization if necessary (→ Page 35 / Tension equalization).

11 Cutting medium on the unloading side

11.1 Cutting medium

▲ WARNING

Rotating or closing clamping rollers!

Risk of death via crushing, catching and drawing in



- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ If an acoustic signal is heard or the warning light illuminates, take your hands away from the clamping roller immediately.

▲ WARNING

Rotating parts of the take-up unit!

Risk of death via drawing in and catching

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ Keep a safe distance from the take-up unit.

1. Click **Printer > For Cut** in the software.
 - ↳ The medium is transported forward until it can be cut on the unloading side.
2. Cut medium.
 - ↳ If the medium is secured to the take-up roll, the take-up unit continues rotating and takes up the medium.
3. Once the medium is fully taken up, switch off take-up unit in the software as follows:
 - Click **Queue**.
 - Deactivate the  and  buttons.
4. To prevent the printed roll from unwinding, secure the cut end with a strip of tape on the roll.
5. Position hand lift centrally under roll.
6. Remove roll from the roll mounts in the same manner as when removing rolls on the loading side and set down on the hand lift (→ Page 64 / Removing old roll).

12 Unloading medium

12.1 Removing old roll

1. Click **Media > Unload** in the software.

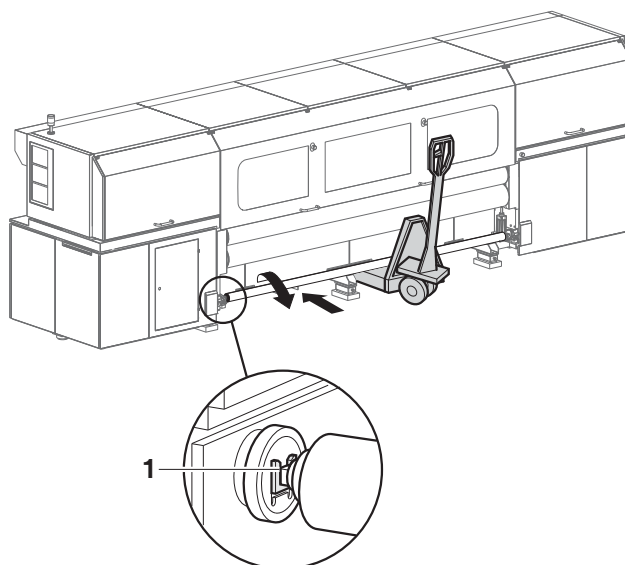


Fig. 48 Position hand lift under the roll (here: loading side)

2. Position hand lift centrally under the roll.

3. Manually roll back the roll until the remaining medium has been taken up and the groove (1) of the roll mount faces upward.

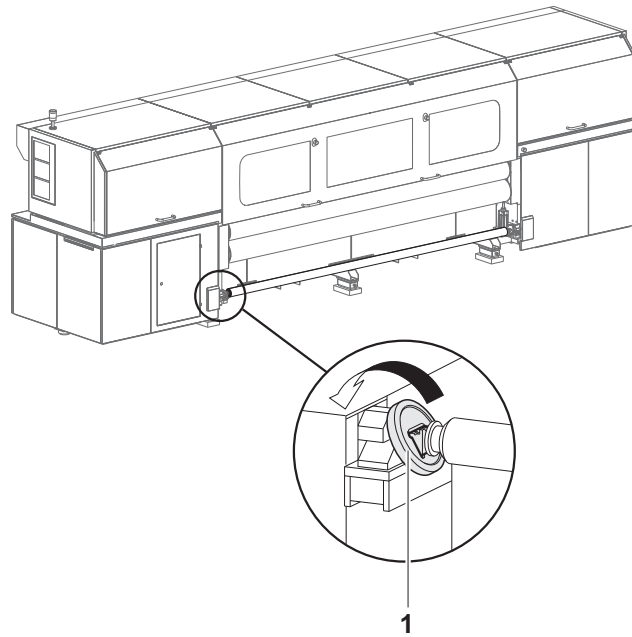


Fig. 49 Opening roll mounts

4. Open the right and left roll mounts (1).

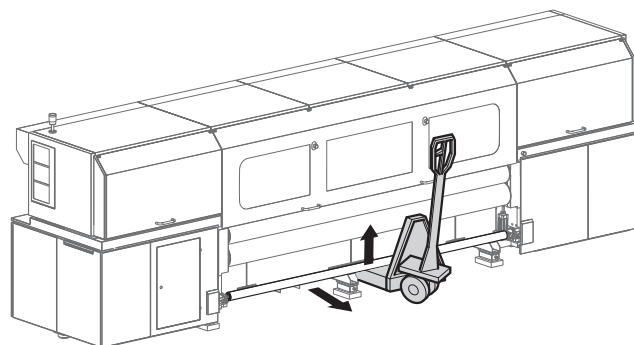


Fig. 50 Lifting roll

5. Lift roll with axis upward and set down on hand lift.

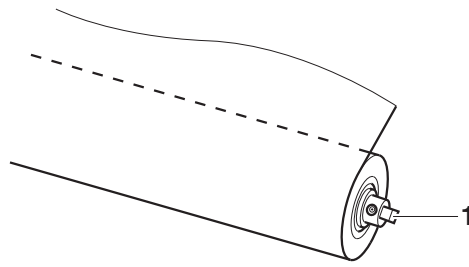


Fig. 51 Allowing compressed air to escape

6. To release the locking jaws from the axis, press the compressed-air valve (1) with your finger and allow the compressed air to escape.
 7. Remove axis from the core.
- ↳ The medium is unloaded.

F Software

1 Basic functions

1.1 Installation

You can install the software either via the Durst FTP server or from a CD/DVD.

You must enter the license number after the software is started to be able to use all the functions.

1.1.1 Installing software via the Durst FTP server

You can download software updates as an ISO file from the Durst FTP server.

- ▶ Contact Durst customer service for information on download and installation.

1.1.2 Installing software from CD / DVD

- ▶ Insert Rho software CD/DVD and follow the instructions on the screen.

1.1.3 Entering software license

- ✓ The software has been started

1. Press **Setup > Validation**.
2. Press **Edit**.
3. Enter license number in the **License code** input field.
4. Press **Save**.





1.2 The menu bar

The menu bar is the starting point for all activities of the software. You can see the current program function at all times.



Fig. 52 Menu bar

The menu bar contains the following dialog elements, among other things:

Item	Function
	Open operating instructions
	<ul style="list-style-type: none"> ■ Selecting operator ■ Selection of the operator is not absolutely necessary. It makes internal tracking of print orders easier, however. The operator is printed with the header data.
	Maximize/minimize program window
	Exiting the software

1.3 The status bar

The status bar informs you of the important current data of the printer, e.g. loaded medium, medium width, remaining length and ink fill level.




Fig. 53 Status bar

1.4 Basic operation

1.4.1 Starting the software

- ✓ Monitor and computer are switched on
- ✓ The Linux operating system has been started

1. Press  twice.

2. After boot-up, the operator can be selected with the  button.

1.4.2 Exiting the software

1. Press .
 - ↳ The **Durst Rho** dialog window appears.
2. Confirm with **Yes**.

1.4.3 Modifying parameters

Parameters can be changed on many tabs. The basic procedure is as follows:

1. Press **Edit**.

2. Modify desired parameters.
3. Press **Save**.

2 Setting up printer

2.1 Switch-on and switch-off times

Define the following settings on the **Auto Timer** tab:

- Time interval for switching off ink heating and UV lamps
- Time interval and telephone numbers for sending error messages via SMS



Fig. 54 Auto Timer tab

2.2 Hotfolder

Hotfolders offer the option of printing any number of image files automatically with a fixed set of presets, e.g. for print quality, medium or color mode.

When creating a hotfolder, define the settings of the various parameters. You can create as many hotfolders as desired.

Each image file copied from the external computer to a hotfolder is given the specified settings of that particular hotfolder. This only applies if the RIP station does not send a job ticket, however. If the RIP station sends a job ticket, the settings of the job ticket take precedence. The settings of the hotfolder are ignored.

Hotfolders are set up on the **Hotfolder Setup** tab.

You can edit the following sub-tabs on the **Hotfolder Setup** tab:

- **Basics**
- **Print options**
- **Border/Size**
- **Spot Gloss**

The navigation window and the **New**, **Edit** and **Delete** buttons are available on all sub-tabs.

Navigation window The navigation window (1) displays all hotfolders with previews, order names and job names.

1 Navigation window

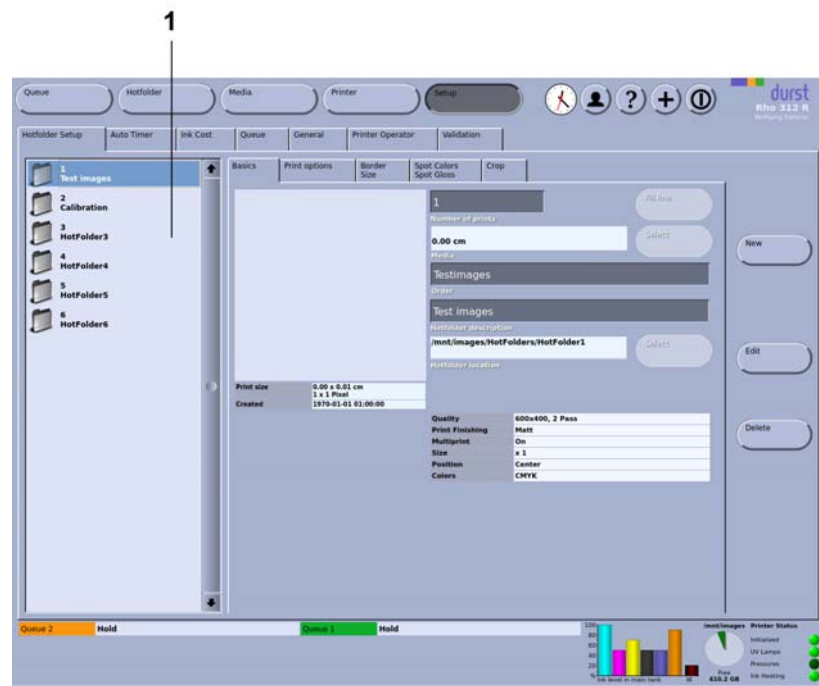


Fig. 55 **Hotfolder Setup** tab with navigation window

New New hotfolders are created with the **New** button.

Edit Parameters of the selected hotfolder are modified with the **Edit** button.

Delete The selected hotfolder is deleted with the **Delete** button.

2.2.1 Basic setup options

On the **Basics** sub-tab, you can create new hotfolders and edit and delete existing hotfolders.

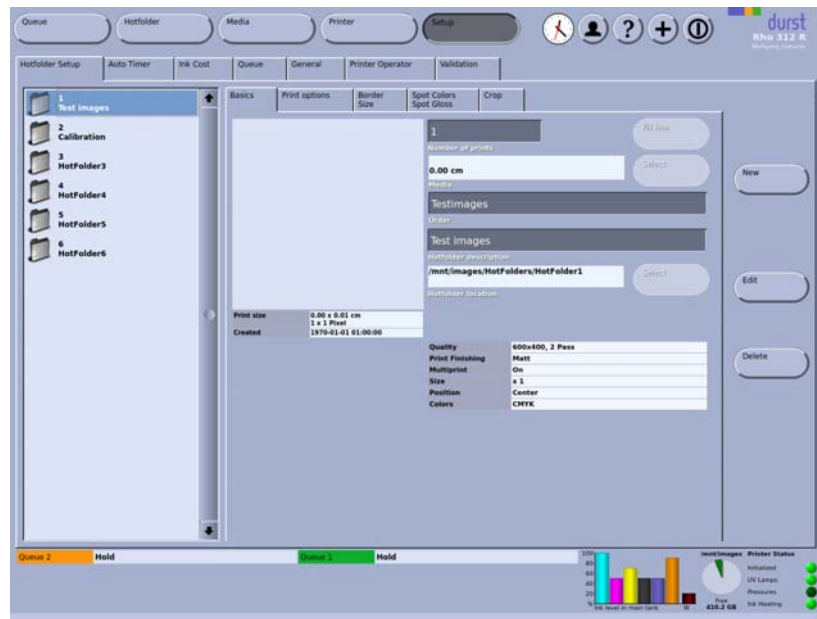


Fig. 56 **Basics** sub-tab

Basic parameters, such as the number of copies, the media channel, the order name and the job description, are specified here.

2.2.2 Print options

You can define the following print parameters on the **Print options** sub-tab:

- Quality level
- Print Direction
- Special effects
- Image position
- Back printing and back marking (optional)
- Curing delay



Fig. 57 **Print options** sub-tab

Print Quality The higher the value, the more frequently the print carriage passes over the image and the higher the image quality.



An overview of the recommended levels of quality for different media is found on the Durst Rho Community Website (www.rho-online.com).

Print Direction **Bidirectional:** The ink is applied in both directions when the print carriage moves. This increases print speed.
Unidirectional: The ink is only applied in one direction or the other when the print carriage moves.
Lamps ON when returning print carriage: This option is recommended if you have selected the **Unidirectional** option and are printing a poorly-drying medium.

Curing delay The print carriage waits after traversing in each direction to enable better penetration of the ink into the medium.

If the **Glossy** option under **Print Finishing** is activated, the curing delay increases the gloss effect.

If the **Matt** option is selected under **Print Finishing**, deformation of the medium can be prevented, especially with heat-sensitive media.

Special **Backlit:** The ink is applied twice. This option is recommended for transparent media for lit sign advertisement or for textiles.

Same image side by side: If a smaller image is to be printed in large numbers, the individual copies of the image are not only printed in the direction of transport, but also next to one another.

Position You can select whether the image is to be printed left-aligned, right-aligned or centered. For left- or right-aligned printing, the margin distance preset on the **Border/Size** sub-tab is taken into account.

If the image in the hotfolder is smaller than the loaded medium, several images are printed side by side. These images need not be prepared as nesting files at the RIP station.

Back printing **Print Back Marks:** The front and back sides can be aligned perfectly over one another with duplex printing. For this purpose, back markings are made automatically during front printing and are read automatically by sensors during back printing.

Print Backside: The sensors for detecting the back marking are activated.

Improvement With the **Pass overlapping** function, you can increase the image quality, especially in single-color areas. Productivity is reduced by approx. 7 to 15% in Backlit mode.



When determining the encoder offset, **Pass overlapping** should be deactivated so as to not interfere with the result.

2.2.3 Border/Size

Specify the border width around the image and the desired image enlargement (in fixed stages) on the **Border/Size** sub-tab.

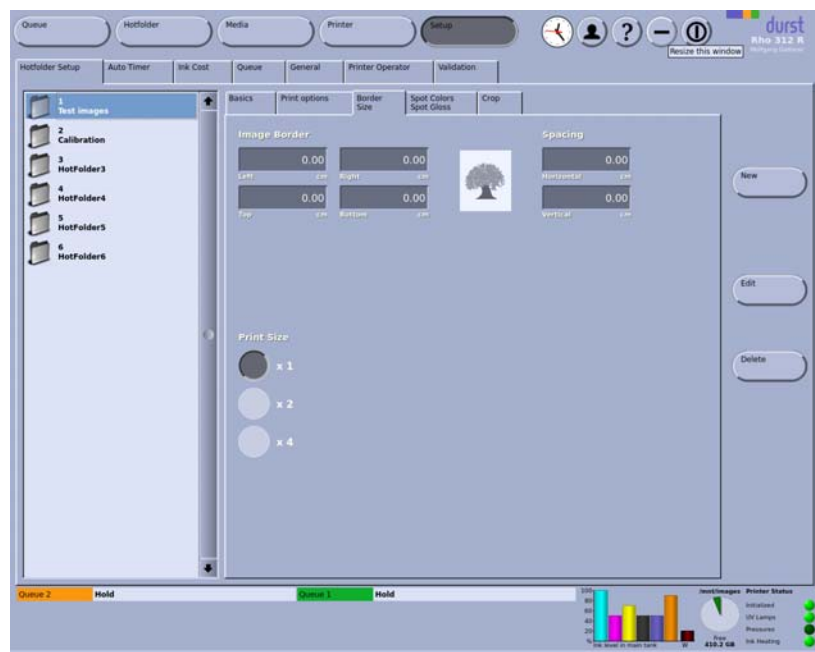


Fig. 58 **Border/Size** sub-tab

Border width In the input fields **Left**, **Right**, **Top** and **Bottom**, you enter the respective image borders to the left, right, top and bottom borders of the printable area.

Spacing When printing several smaller images next to one another or in succession, you can specify the spacing between the individual images using the **Horizontal** and **Vertical** input fields.

2.2.4 Spot colors

The following functions are available on the **Spot Gloss** sub-tab:

- Print a section with gloss in a matte image
- Print 3-layer images for backlighting



Fig. 59 **Spot Colors/Spot Gloss** sub-tab

Spot Gloss To print an image with a gloss section, two images are superimposed. The background image with matt printing is selected first. Then a second image is selected, which is placed over the background image and printed with gloss. The images must be prepared accordingly at the RIP station.

Day & Night With the **Day & Night** function, the images are printed so that they have the same brightness both during the day with the backlighting switched off and at night.

The following 3 layers were printed on top of one another: Image (CMYK) – white intermediate layer – Image (CMYK). The layers must be prepared accordingly at the RIP station.

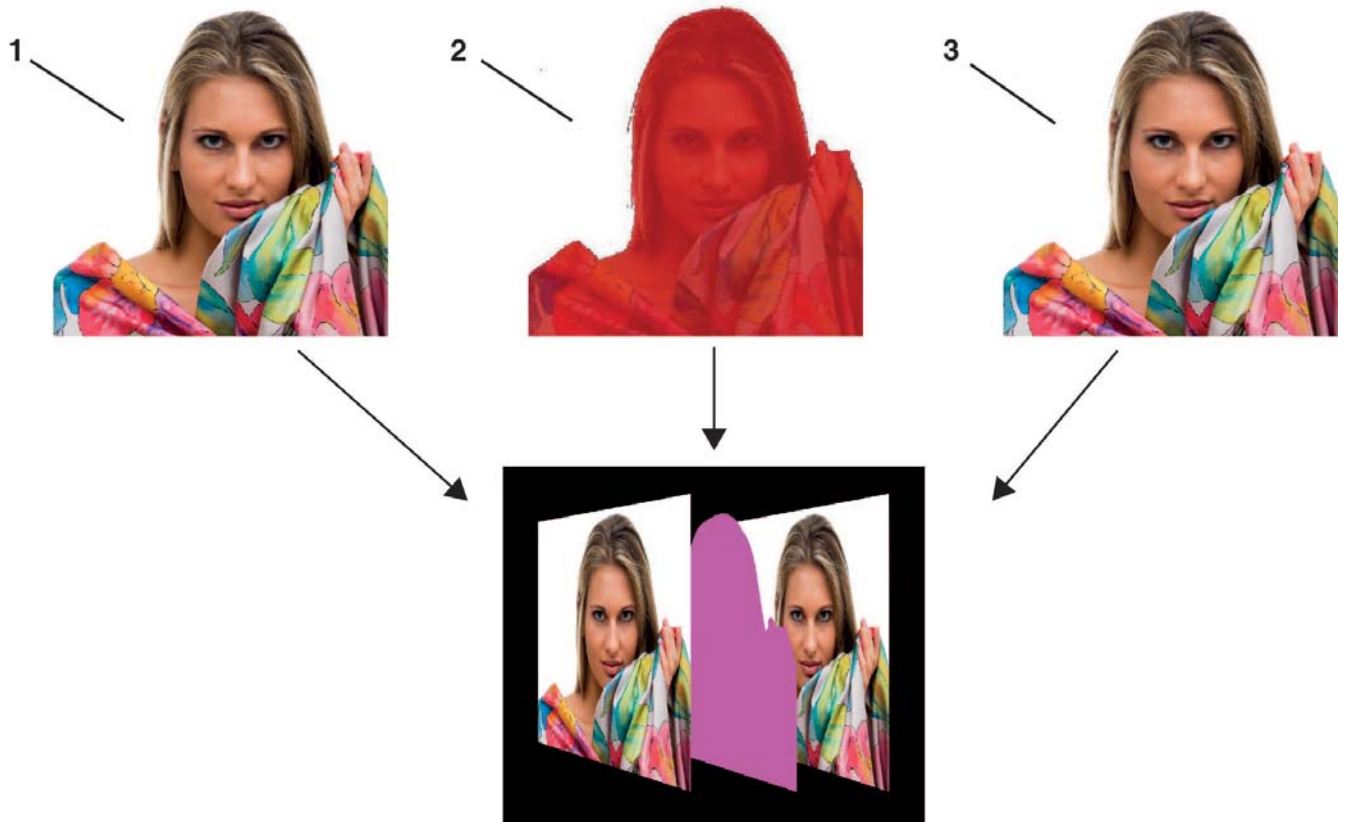


Fig. 60 Overlapping of the 3 layers

- 1 Image (CMYK) for top layer
- 2 White intermediate layer

- 3 Image (CMYK) for bottom layer

Printing an image section with gloss

1. Select the background image in the corresponding hotfolder in the navigation window.
2. Click **Edit**.
3. Open the **Spot Gloss** tab.
4. Click **Edit**.
5. Click **Spot Gloss**.

6. Click **Select Job**.
 - ↳ The **Select Job** dialog window appears.

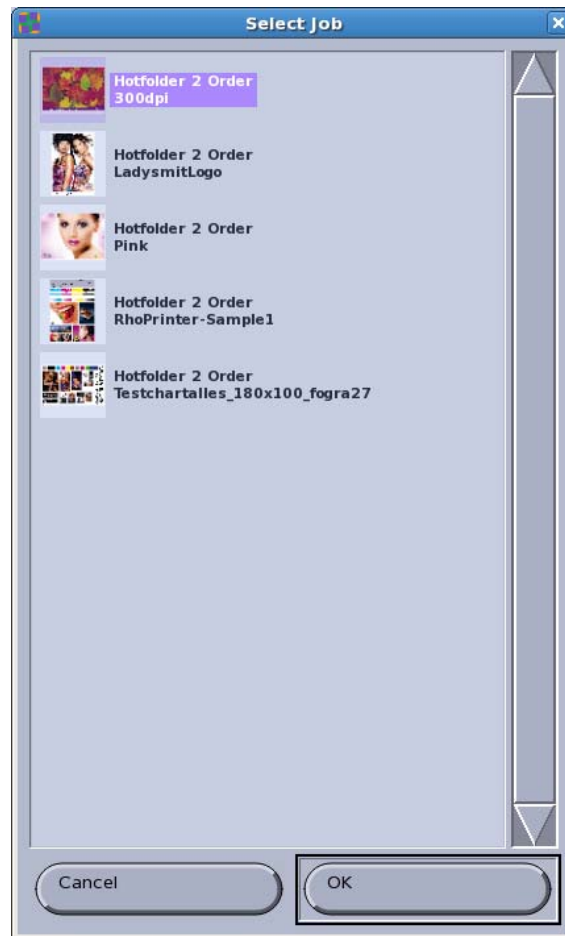


7. In the **Select Job** dialog window, select the image to be printed with glossy printing on the background image.
8. Click **OK**.
9. Click **Save**.
10. Click **Print**.
 - ↳ The superimposed images are transferred to the queue.
The printed image is displayed in the queue in the information window.

Printing an image section with the Day & Night function

- ✓ The foreground image has been prepared with a spot channel (white) at the RIP station
1. Select the foreground image in the navigation window in the corresponding hotfolder.
 2. Open the **Spot Gloss** tab.
 3. For **Spot color 1**, click the **Use channel** button.
 4. Click **Edit**.
 5. Click **Day & Night**.

6. Click **Select Job**.
 - ↳ The **Select Job** dialog window appears.



7. Select the foreground image in the **Select Job** dialog window.
8. Click **OK**.
9. Click **Save**.
10. Click **Print**.
 - ↳ The superimposed images are transferred to the queue.
The printed image is displayed in the queue in the information window.

2.2.5 Setting up and editing hotfolders

Opening Hotfolder Setup tab

1. Press **Setup**.
2. Select **Hotfolder Setup** tab.

Creating a new hotfolder

✓ The **Hotfolder Setup** tab is open

1. Press **New**.
 - ↳ The **New Hotfolder** dialog window appears.

2. Confirm with **Yes**.
 - ↳ The new hotfolder appears in the navigation window.
3. Press **Save**.

2.3 Cost of ink

You enter the current cost per ink color and read the current ink consumption on the **Ink Cost** tab.



Fig. 61 Ink Cost tab

- Ink cost statistics** Ink cost statistics displays the current amount of consumed ink as a quantity and a cost.
- Ink cost per liter** You enter the current price per color under **Ink cost per liter**.

2.4 Queue

You can specify options for the queue on the **Queue** tab.

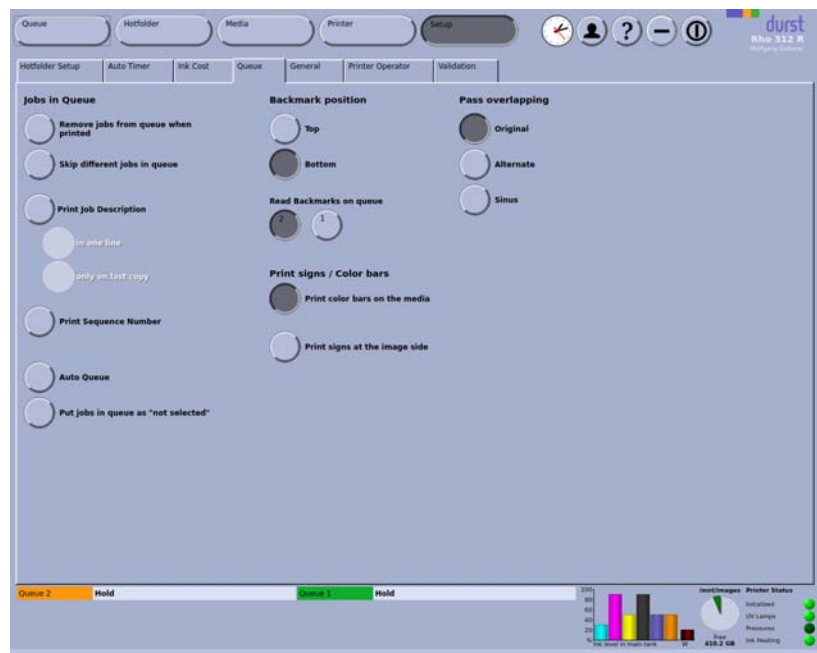


Fig. 62 Queue tab

Jobs in Queue **Skip different jobs in queue:** Jobs which force the printing process to stop due to differing parameters are skipped (example: jobs with different quality levels).

Print Job Description: The header data is printed at the edge of the image.

Print Sequence Number: As soon as a parameter is changed in a media channel, the software generates a unique sequence number. If the **Print Sequence Number** function is activated, the sequence number is printed with the header data.

Auto Queue (optional): The **Auto Queue** function is available if the **SPOOLING** option is part of the scope of delivery. If **Auto Queue** is activated, images transferred from the RIP station to the queue are printed automatically.

Registration marks **Print color bars on the media:** Color bars are printed at the edge of the medium.

Print color bars outside the media: Color bars are printed outside of the medium. This function is intended for fabric printing. In this case, the color is printed in the tray on the printing table.

Print signs at the image side: Registration marks as a positioning aid for back printing are printed at the edge of the medium.

Pass overlapping With this function, you can eliminate striping and increase the image quality, especially in single-color areas.

2.5 General basic setup options

Define the following settings on the **General** sub-tab:

- Language
- Units

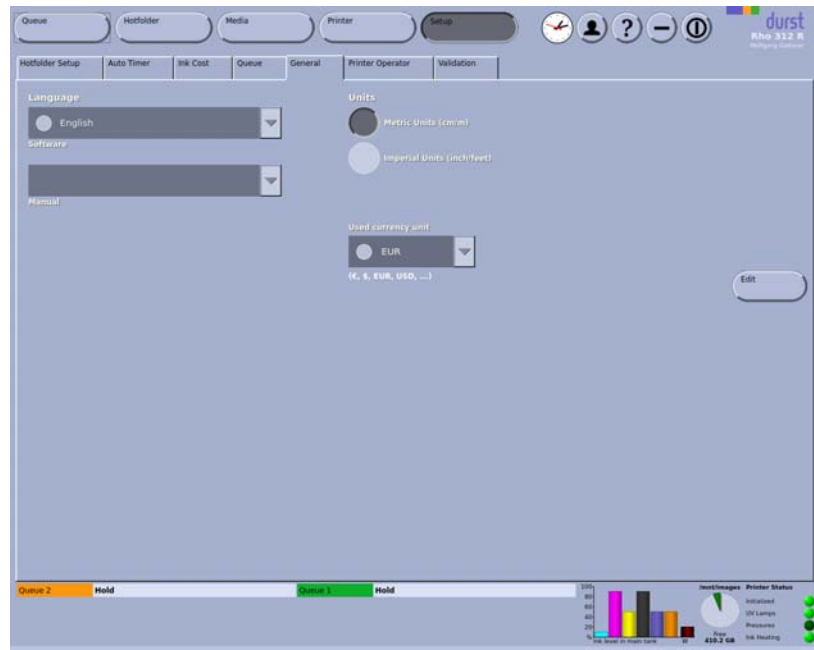


Fig. 63 General tab

2.6 Operator

On the **Printer Operator** tab, you can create the operators who operate the printer.

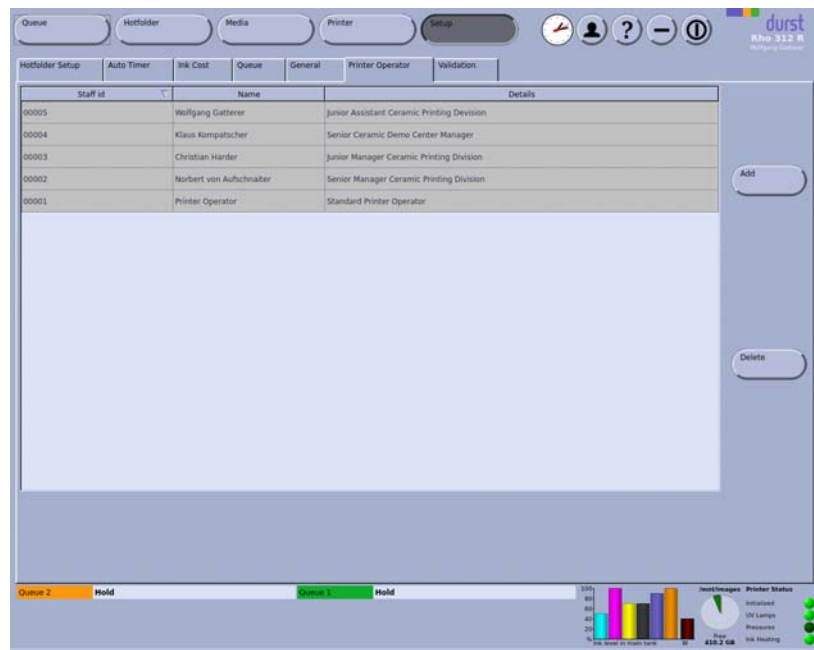


Fig. 64 Printer Operator tab

After being created, the created operators appear in the list of operators

when the  button is pressed.

2.7 Software validation

You enter the license number and the software options on the **Validation** tab:



Fig. 65 Validation tab

3 Operating printer functions

You can operate the individual printer functions under the **Printer** button and call up information as well. The following tabs are available:

- Printer
- Purge
- Ink heating
- Maintenance
- Ink Batch Tracking
- UV Lamp Tracking

3.1 Basic functions

You operate the following basic functions on the **Printer** tab:

- Initialization
- Test print
- Switching off
- Print carriage position
- Open, close and test the flip door
- UV lamps
- Displays the software version
- Medium advance
- Ink heating



Fig. 66 **Printer tab**

Printer Startup During initialization, the reference positions are approached automatically. This option is recommended if the printer was switched on manually.

Printer Shutdown Daily: The printer moves to the reference position. The transport rollers open.

Longer time

i If the unit is not used for over 2 weeks, there is a risk that the ink in the print heads will dry out. For this reason, we recommend contacting Durst customer service before this period.

Medium advance You control the manual advance of the medium with this option.

Continuously: The medium is transported further until you press **Stop Media**.

Reverse: The medium is transported backward until you press **Stop Media**.

One Line: This option is used to transport the medium further by any desired number of lines. The number of lines is entered in the input/list field and **Advance in µm**. You select the number of lines in the input/list field **Repeats**.

For Cut: The medium is transported further until you can cut it.

To Backmark; the medium is transported further until the back marking is detected by the sensors.

Stop Media: Advance (**Continuously** or **Reverse**) is stopped.

Door Lock/Unlock: Light trap carrier and flip door are locked/unlocked.

3.2 Cleaning function

You set the purge parameters and initiate the purge cycle on the **Purge** tab.

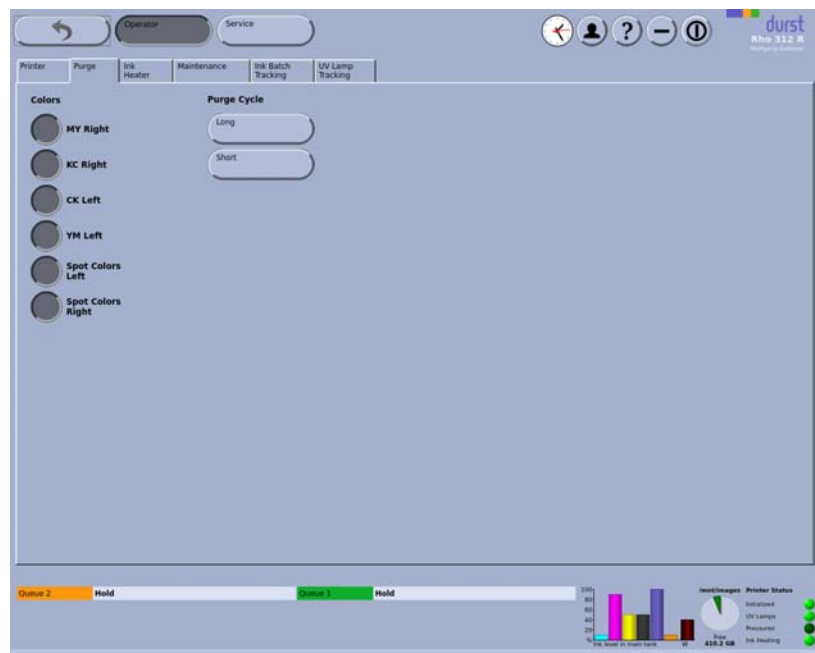


Fig. 67 **Purge** tab

Colors Under **Colors**, you select the colors for which the print heads are to be rinsed.

Purge Cycle Long: Purge cycle with a duration of approx. 6 minutes.

Short: Purge cycle with a duration of approx. 3 minutes.

3.3 Ink heating

You can call up the print head temperature and print head heating on the **Ink Heater** tab.

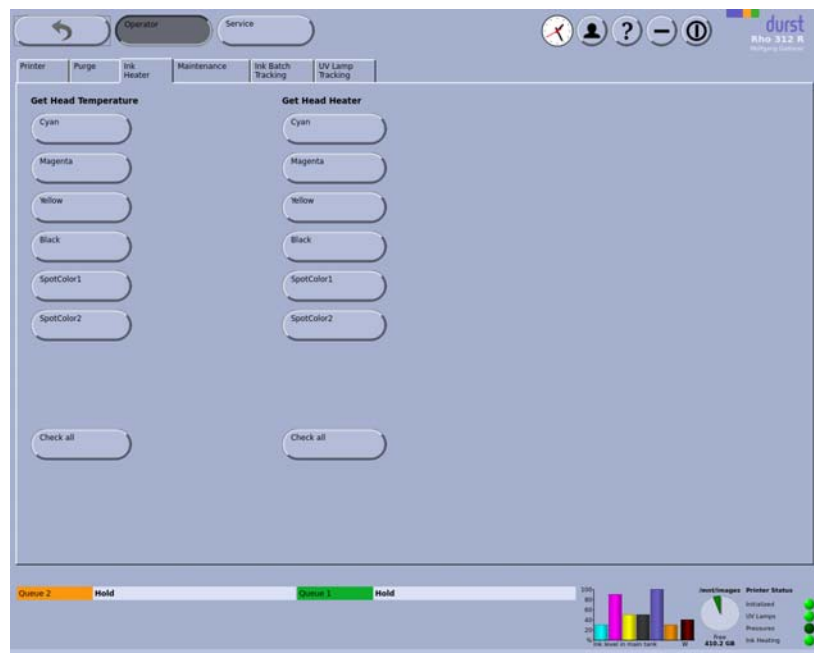


Fig. 68 Ink Heater tab

Calling up print head temperature

When the respective button is pressed, the current temperature for each color and print head is displayed. The individual values **XXXX** correspond to the individual print heads in the order 1, 2, 3 and 4. The value is not updated automatically, rather it must be updated when necessary by pressing the button.

Calling up print head heating

When the respective button is pressed, the current status of the print head heating for each color and print head is displayed. The individual positions **XXXX** correspond to the individual print heads in the order 1, 2, 3 and 4. The values have the following meaning:

- **0**: Temperature OK
- **C**: Temperature too low
- **H**: Temperature too high (sets itself to 0 after a few minutes)
- All other values: Durst customer service must be notified.

3.4 Maintenance

The **Maintenance** tab provides an overview of all service activities described in the "Service" chapter (→ Page 99 / Service).

Some activities described in the "Service" chapter can be called up directly in this tab as a PDF or film.



Fig. 69 Maintenance tab

3.5 Ink batch tracking

You can document the refill date, color and batch number of the ink on the Ink Batch Tracking tab.

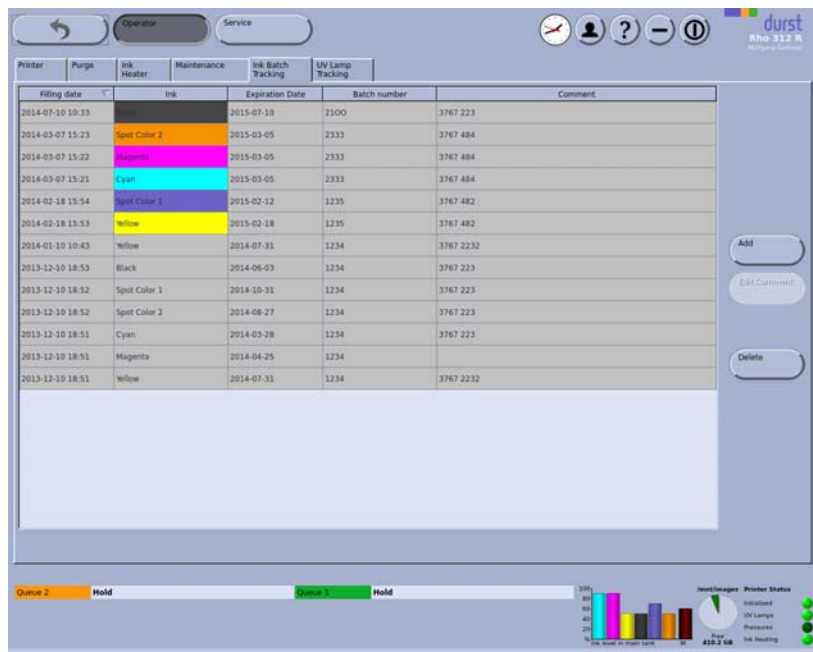


Fig. 70 Ink Batch Tracking tab

When using a bar code scanner, the entries are created automatically when refilling the ink.

3.6 Changing UV lamps

You can document the changing of the UV lamp on the **UV Bulb Exchanges** tab.

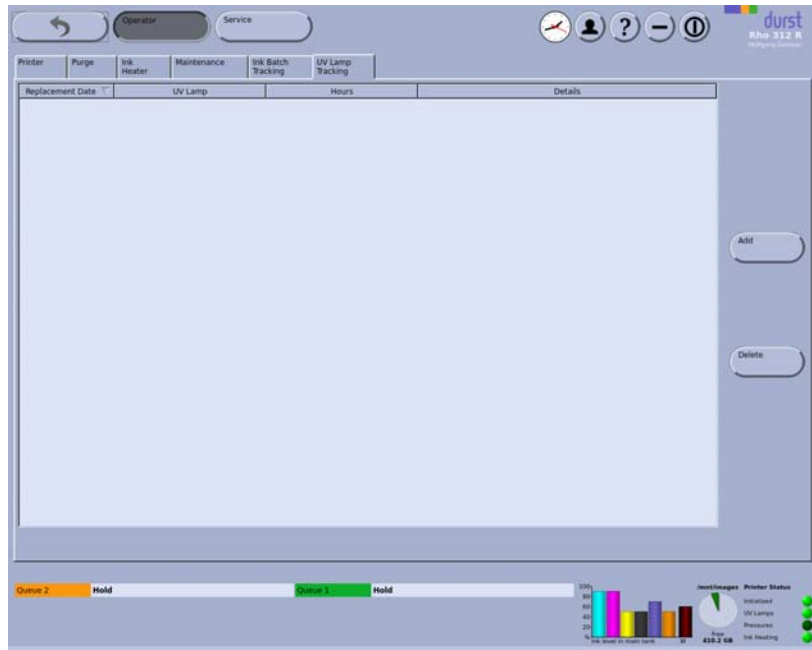


Fig. 71 UV Lamp Tracking tab

4 Managing media data

In the **Media** dialog window, you create new media channels and edit and delete existing media channels.

1 Navigation window

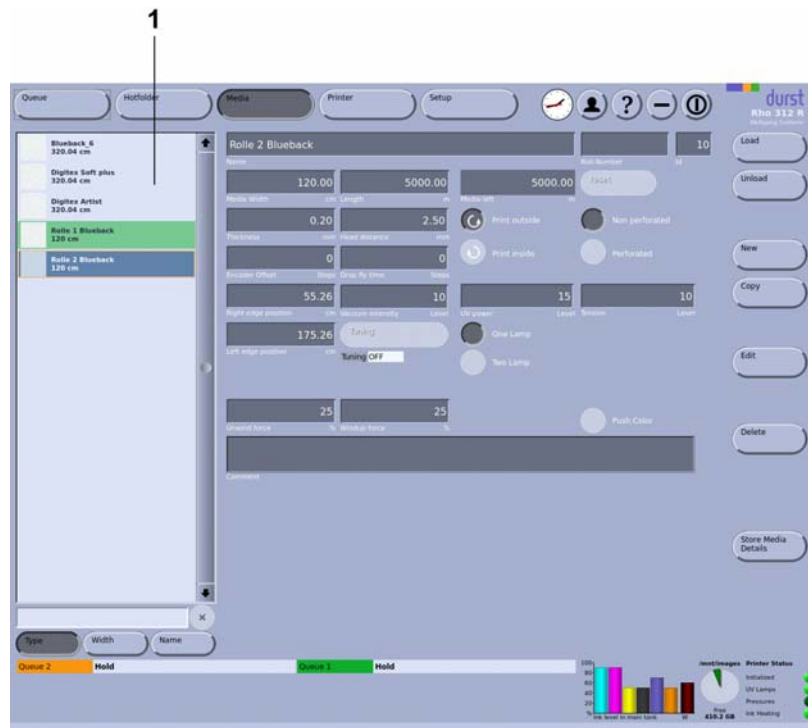


Fig. 72 Navigation window and tabs under **Media**

Navigation window All created media channels are listed in the navigation window (1). You specify the sorting order with the **Type**, **Width** and **Name** buttons.

Encoder Offset You must determine the encoder offset for each media channel using the Durst test image.

Print outside/Print inside



To prevent the medium from being unwound on the loading side, the correct direction of rotation of the tensioning function must be set.

The integrated tensioning function ensures that the medium is drawn in straight. During printing, the roll mounts on the loading side create resistance against the direction of roll rotation. The buttons are used to set the action direction, either clockwise or counterclockwise.

Unwinding tension/Take-up tension For the media tension during printing, you can select a value between 50 and 100%.

Unwinding axis / Take-up axis With the option for heavy rolls, the drives of the roll mounts on the loading side (unwinding axis) and unloading side (take-up axis) can be switched on.

All other parameters An overview of the recommended values for the different parameters is found on the Durst Rho Community Website (www.rho-online.com).

4.1 Buttons on the right edge of the dialog window

- Load/Unload** The loading and unloading procedures for changing the media channel are triggered with the **Load** and **Unload** buttons.
- New** A new media channel is created with the **New** button.
- Copy** You copy the selected media channel and save it with a new name with the the **Copy** button.
- Edit** Parameters of the selected media channel are modified with the **Edit** button.
- Delete** The selected media channel is deleted with the **Delete** button.

4.2 Other buttons

- Reset** You set the remaining length of medium back to the initial value with the **Reset** button.

4.3 Creating and editing media channels

4.3.1 Opening Media dialog window

- ▶ Press **Media**.

4.3.2 Creating new media channel

- ✓ The **Media** dialog window is open
1. To create a media channel with completely new data, carry out the following steps:
 - Press **New**.
 - Enter all desired values.
 2. To create a new media channel based on an existing media channel, carry out the following steps:
 - Select desired existing media channel in the navigation window.
 - Press **Copy**.
 - Modify desired parameters.
 - Rename media channel if necessary.
 3. Press **Save**.

4.3.3 Deleting media channel

- ✓ The **Media** dialog window is open
1. Select desired media channel in the navigation window.
 2. Press **Delete**.

4.3.4 Determining encoder offset

The encoder test image for the three different resolutions of 900 dpi, 600 dpi and 500 dpi should be sharp, and the lines under "Encoder Test" should be as thin as possible.

- ✓ The **Pass overlapping** function on the **Hotfolder > Print options** tab is deactivated
- 1. Print corresponding Durst test image `EncoderTestImage_900dpi_1bit`, `EncoderTestImage_600dpi_2bit` or `EncoderTestImage_500dpi_1bit` in hotfolder **1**.
- 2. If stripes are visible in the blue area of the test image, proceed as follows:
 - White stripes: Reduce encoder offset (negative values are also possible)
 - Black stripes: Increase encoder offset

5 Printing

Image files in the hotfolder All image files to be printed are first stored in the desired hotfolder via the file system. You can modify the preset parameters of the hotfolder for each image file separately here. Each new image file stored in the hotfolder is given the original settings of the hotfolder, however.

Jobs A job is created by linking the image file to the parameters of the hotfolder or the job ticket sent from the RIP station.

Queue After adapting the parameters in the hotfolder, you transfer the desired jobs to the queue. You start the printing process in the queue.

5.1 An overview of activities

5.1.1 Printing image files

1. Store image file in the desired hotfolder via the folder system.
2. Prepare job in the hotfolder (→ Page 90 / Preparing jobs in the hotfolder).
3. Transfer job to the queue (→ Page 90 / Preparing jobs in the hotfolder).
4. Initiate printing process in the queue (→ Page 92 / Queue).
5. If the medium folds while being drawn in, set the tension equalization (→ Page 35 / Tension equalization).

5.2 Preparing jobs in the hotfolder

The jobs are prepared in the corresponding hotfolders. The hotfolders are displayed on tabs with the numbers 1, 2 and 3.

1 Navigation window

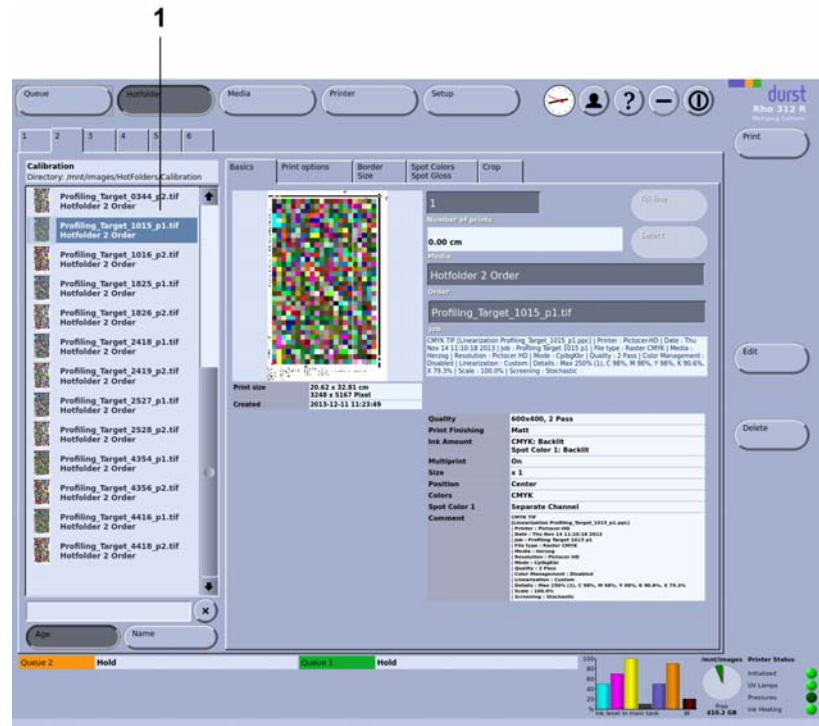


Fig. 73 Example: 1 tab

Navigation window The tab of a hotfolder contains the navigation window (1), in which the current stored jobs are displayed.

Sub-tabs The sub-tabs **Basics**, **Print options**, **Border/Size** and **Spot Colors/Spot Gloss** correspond with the sub-tabs on the **Hotfolder Setup** tab (→ Page 69 / Hotfolder). You can modify the preset parameters for each job separately on this sub-tab. The basic setup options on the **Hotfolder Setup** tab remain unchanged.

5.2.1 Section

You can change the image crop on the **Crop** sub-tab.

1 Slider

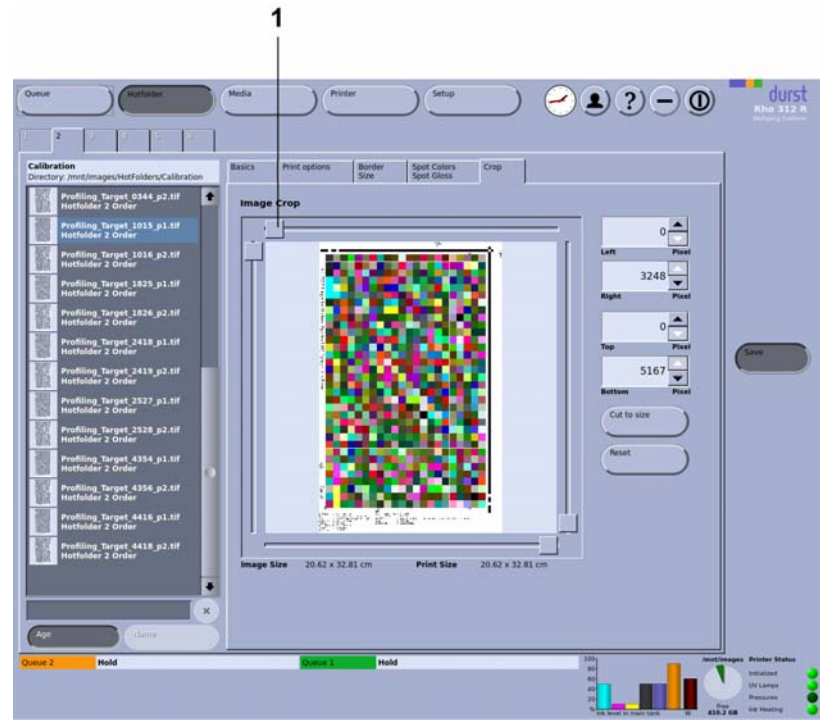


Fig. 74 **Crop** sub-tab

To select an image crop, you can define how much is to be cut away from the respective image border. You have the following options here:

- Enter the desired number of pixels with the **Left**, **Right**, **Top** and **Bottom** entry boxes or the arrow keys.
- Select image section with the sliders (1).

Cut to size With the **Cut to size** button, you can cut an image to fit the media size. For this, the **Print Job Description** option must be deactivated on the **Queue** tab.

5.2.2 Preparing job and transferring it to the queue

Opening a hotfolder

1. Press **Hotfolder**.
 2. Select corresponding tab **1**, **2**, **3** etc. for the desired hotfolder.
- ↳ All jobs currently stored in the hotfolder are displayed in the navigation window.

Modifying parameters

- ✓ The desired hotfolder is open
1. Select desired job in the navigation window.
 2. Select desired sub-tab **Basics**, **Print options**, **Border/Size** or **Crop**.
 3. Press **Edit**.

4. Modify desired parameters.
5. Press **Save**.

Transferring jobs to the queue

- ✓ The desired hotfolder is open
1. Select desired job in the navigation window.
 2. Press **Print**.

5.3 Queue

The **Queue** dialog window shows all the jobs which have been transferred from a hotfolder for printing. You can change the order of jobs in the queue, delete jobs from the queue and initiate the printing process here.

Depending on the number of rolls loaded, either 1, 2 or 3 queues are displayed. The position of the queues corresponds to the position of the loaded rolls.

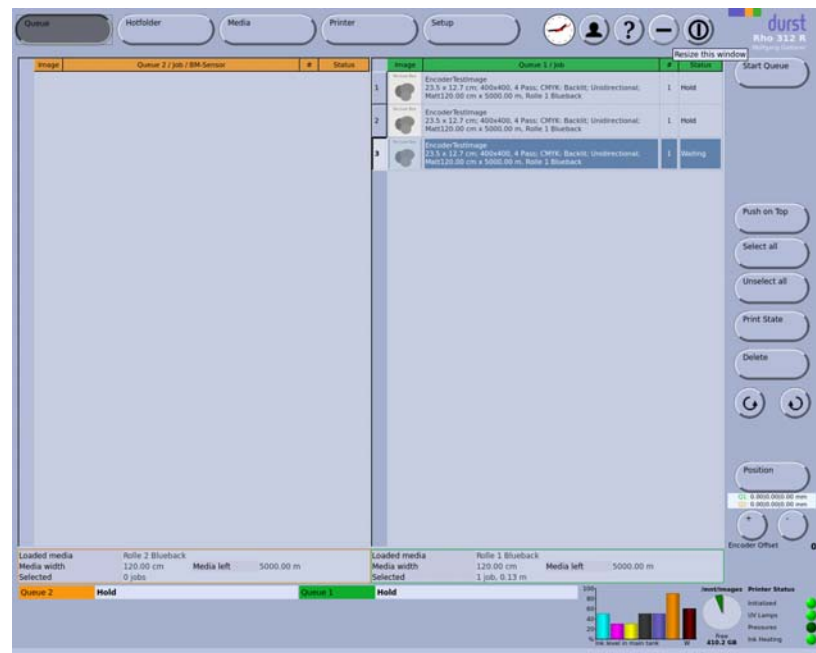


Fig. 75 Queue

Start Queue The printing process is started for the selected job with the **Start Queue** button.

Repeat A printed job can be printed again by pressing the **Repeat** button.

Push on Top The selected job is moved to the front of the queue with the **Push on Top** button.

Printing status You can print out the current status of the queue either directly with the printer or from another external printer.

Direction of take-up rotation

You select the direction of the take-up roll rotation with the



and

SMS message You can activate the SMS function by using the **SMS Alerting** button. When the queue end has been reached, the GSM radio element (optional) sends a message to up to 4 preset mobile phones.

Position Pressing the **Position** button causes a dialog window to appear with which you can carry out fine adjustment of the image and enter a correction factor for the vertical elasticity of the medium.



We recommend carrying out no more than 2 correction steps per print carriage traversal.

Encoder Offset If you change the encoder offset, the value is automatically changed in the medium channel.

You can also change the encoder offset during printing if necessary.

5.3.1 Displaying information on a job

- ▶ Move mouse pointer over the text of the desired job.
- ↳ An information window appears, in which important data such as the image dimensions, medium, ink cost and spot gloss, are displayed.

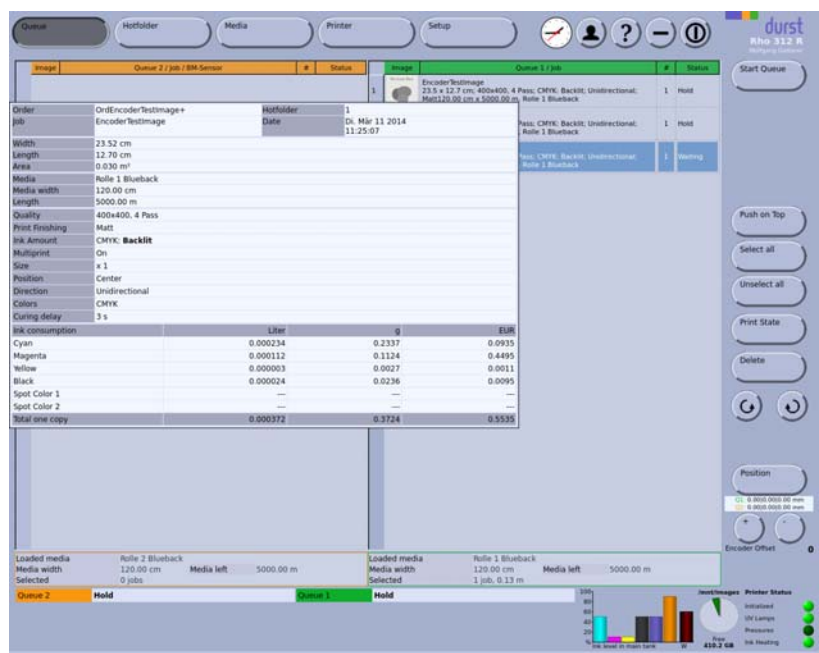


Fig. 76 Displaying information on a job

5.3.2 Initiating printing process in the queue

1. Press **Queue**.
 - ↳ The queue appears.
 - ↳ All jobs in line for printing are displayed in the queue.
2. If necessary, activate the SMS function by using the **SMS Alerting** button.

3. For standard-model printers: Select the direction of take-up roll rotation

with the  or  button.

4. To print a job, carry out the following steps:
 - Select desired job.
 - Press **Start Queue**.
 - ↳ The current print status is displayed on the status line.
 - ↳ When the end of the queue is reached, a message is displayed. If a GSM module is installed, the message is passed on to the preset mobile phone.

6 Calling up statistics

The printer writes a daily text file that informs you about the statistical data such as the width and length of jobs, number of copies, ink consumption or start/stop time. A new line is written for every print. The name of the text file always begins with `DPJobState`. This is followed by the respective date.

6.1 Opening statistics

1. Open the `/images/HotFolders/Statistics` folder on the workstation.
2. Open the respective text file (e.g. with MS Excel).

7 Calling up printer status via network

You can call up the printer state from each computer in the network. The printer state is displayed in the **Printer State** window.

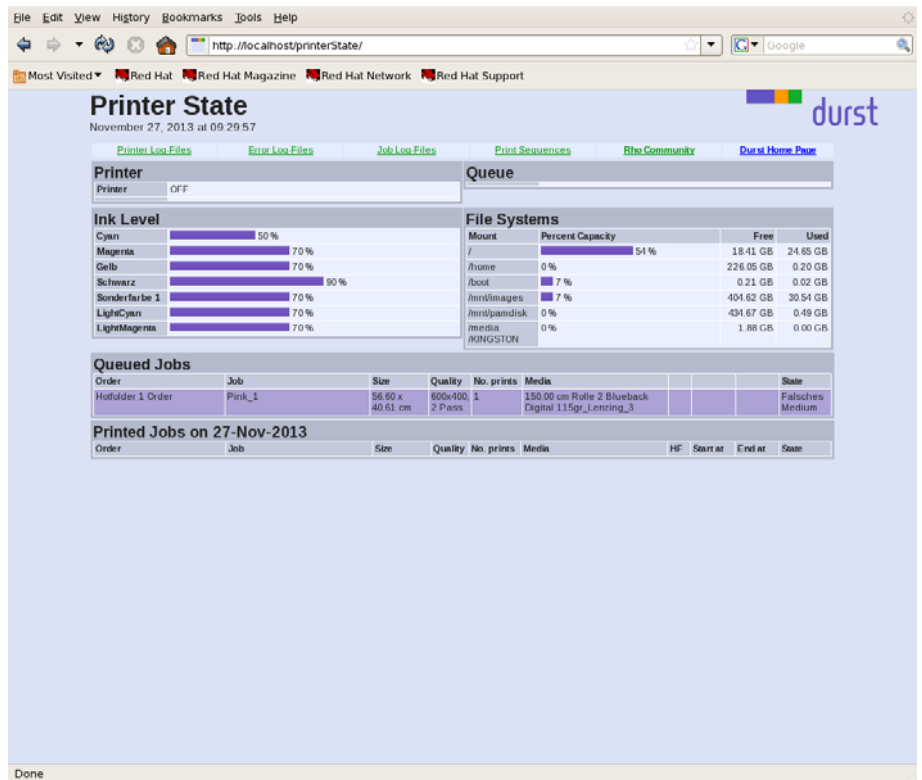
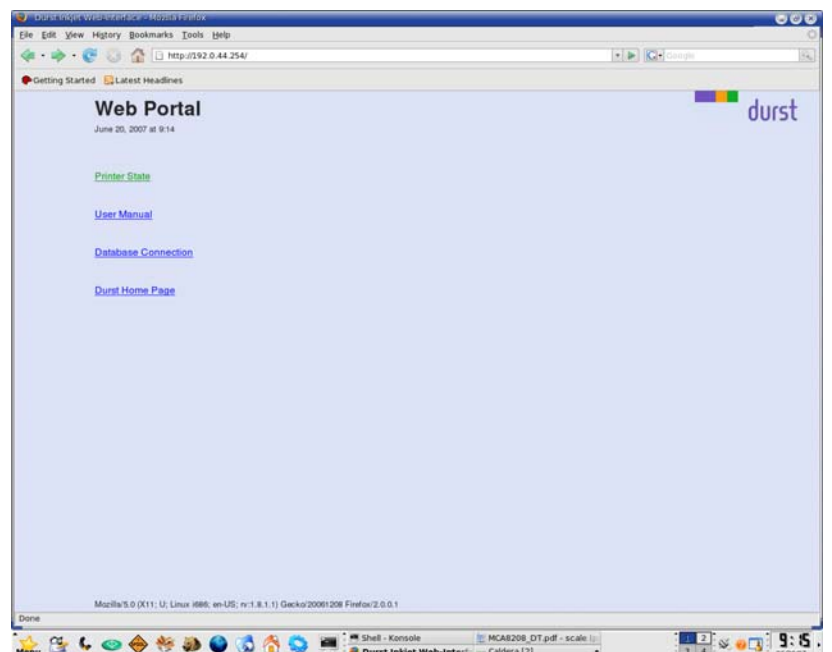


Fig. 77 Printer State dialog window

Using the **Printer Log-Files**, **Error Log-Files**, **Jog Log-Files** and **Print Sequences** buttons, you can view the corresponding log files.

7.1 Opening the Printer State dialog window

1. Enter the IP address of the printer in the browser.
↳ The **Web Portal** dialog window appears.



2. Press **Printer State**.
- ↳ The **Printer State** window is displayed.

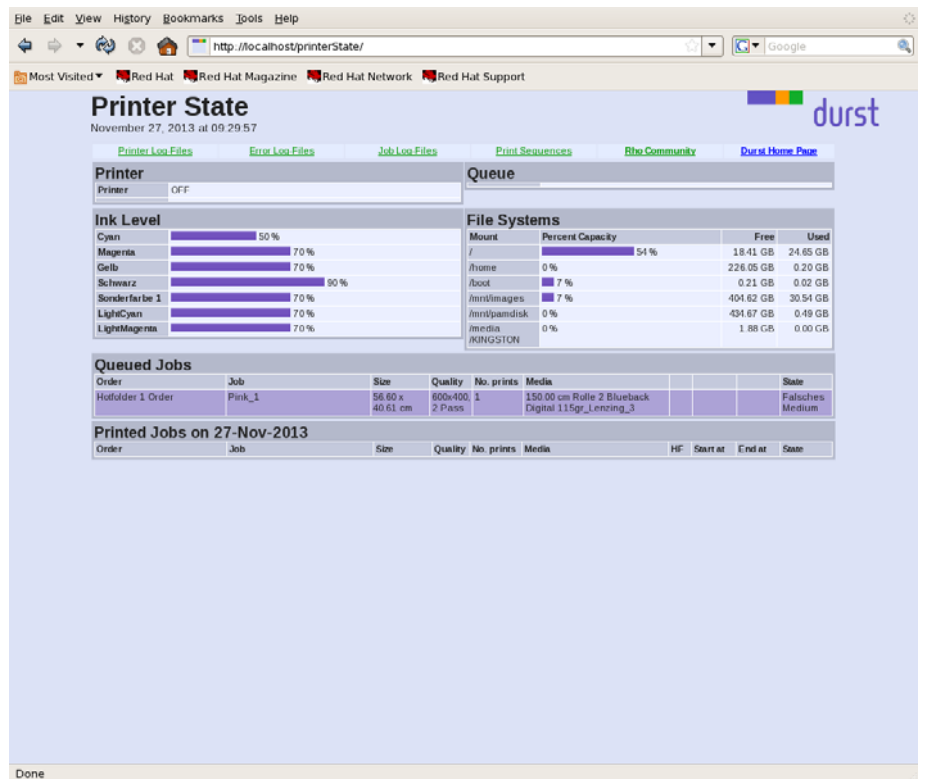


Fig. 78 Printer State dialog window

7.2 Calling up information on jobs

1. Press the **Job Log-Files** button in the **Printer State** dialog window.

↳ The **Job Log-Files** dialog window appears.

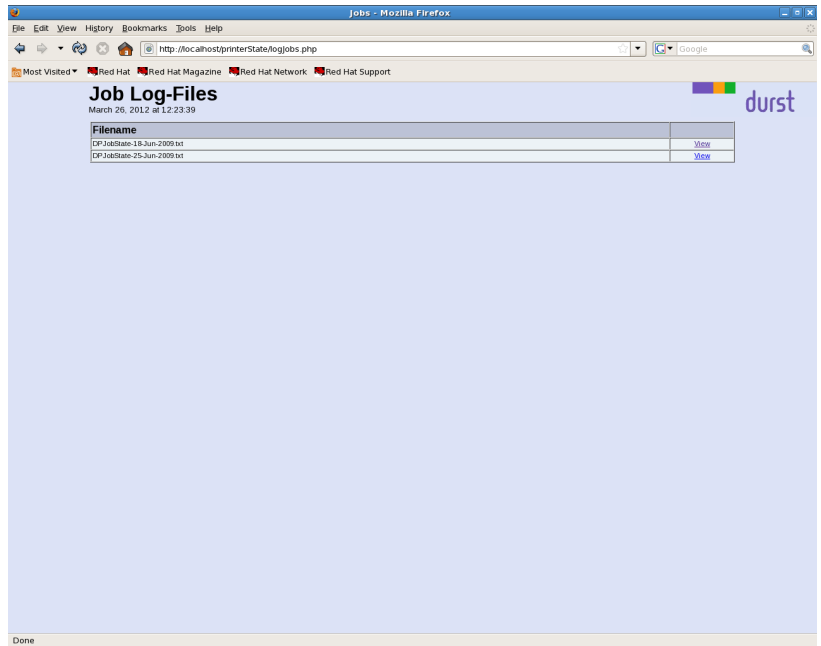


Fig. 79 The **Job Log-Files** dialog window

2. In the **Job Log-Files** dialog window, press the **View** button for the corresponding date.

↳ The **Job Log** window appears.

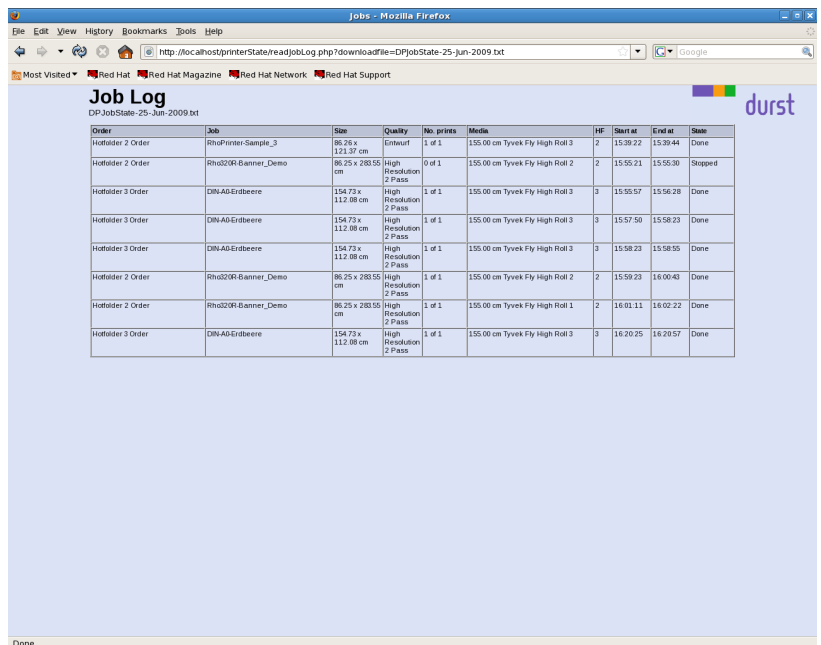


Fig. 80 The **Job Log** dialog window

Information on all jobs which have been printed on this date are displayed.

G Faults

Faults are indicated by a message in the software. If a GSM radio element is installed, the faults are passed on by radio to a preset mobile phone.

H Service

1 Service intervals of the owner

The following service activities must be carried out by the owner.

i Warranty and guarantee claims can only be made if the test images have been retained.

When?	What?
Daily	<ul style="list-style-type: none"> ▶ Carry out the work of daily print head maintenance (→ Page 130 / Print head maintenance). ▶ Check all warning signs for cleanliness and readability and replace if necessary. ▶ Check housing covers visually. ▶ Check printing table for soiling and clean if necessary (→ Page 106 / Cleaning printing table). ▶ Ensure that all protective equipment is attached and in proper working order. This includes the following protective equipment (in particular): <ul style="list-style-type: none"> – Protective switches – Housing covers – UV lamp protection
Every 2 days	<ul style="list-style-type: none"> ▶ Clean air filter of the aerosol extractor (→ Page 118 / Cleaning aerosol extractor).
Weekly	<ul style="list-style-type: none"> ▶ Wipe printing plate (→ Page 130 / Print head maintenance). ▶ Check carriage guide visually for damage and lubricate (→ Page 111 / Lubricating carriage guide). ▶ Clean outlet hole of the purge unit (→ Page 128 / Cleaning outlet hole of purge unit). ▶ Check condition of the encoder ruler and clean if necessary (→ Page 128 / Cleaning encoder ruler). ▶ Check print carriage bearings for noise and visually for damage. ▶ Check filter for fusion board cooling and change if necessary (→ Page 120 / Change filter for fusion board cooling). ▶ Check main tank supply air filter and change if necessary (→ Page 120 / Changing main tank supply air filters).

When?	What?
Weekly (at beginning of week)	<ul style="list-style-type: none"> ▶ Document condition of the print heads (→ Page 140 / Documentation of the print head state).
Monthly	<ul style="list-style-type: none"> ▶ Check rollers and clean if necessary (→ Page 108 / Cleaning transport rollers). ▶ Check air filter of the UV lamp shaft and change if necessary (→ Page 114 / Cleaning air filter of UV lamp air shaft). ▶ Check lung catch glass for ink (→ Page 110 / Checking lung catch glass for ink). ▶ Create a backup (→ Page 102 / Creating a backup).
Every 6 months	<ul style="list-style-type: none"> ▶ Change lubricating plates (→ Page 112 / Changing lubrication plates). ▶ Treat cabling of the energy chain with Vaseline (→ Page 130 / Treating energy chain cables with Vaseline).
Annually	<ul style="list-style-type: none"> ▶ Check right- and left-hand light trap carriers for damage. ▶ Change main ink filters (→ Page 121 / Changing main ink filter) ▶ Change dust filter on top of housing.

When?	What?
Every 1000 operating hours	<ul style="list-style-type: none"> ▶ Replace UV lamp (→ Page 124 / Changing UV lamp).
When necessary	<ul style="list-style-type: none"> ▶ Clean housing of the printer (→ Page 129 / Cleaning housing). ▶ Refilling ink (→ Page 103 / Refilling ink) ▶ Remove leaked ink. ▶ Emptying catch tank (→ Page 109 / Emptying catch tank) ▶ Clean encoder ruler (→ Page 128 / Cleaning encoder ruler). ▶ Change air filter of the UV lamp air shaft (→ Page 114 / Cleaning air filter of UV lamp air shaft). ▶ Change filter for fusion board cooling (→ Page 120 / Change filter for fusion board cooling). ▶ Change air filter of the aerosol extractor (→ Page 118 / Cleaning aerosol extractor).
In case of fault or defect	<ul style="list-style-type: none"> ▶ Check fuses and, if necessary, have replaced by Durst customer service (→ Page 123 / Checking fuses).

2 Service intervals of Durst customer service

i The following service activities must be carried out by Durst customer service.

When?	What?
Annually	<ul style="list-style-type: none"> ▶ Have height adjustment of the print carriage lubricated. ▶ Have print heads checked and, if necessary, adjusted. ▶ Have pneumatic circuits checked. ▶ Have encoder values checked. ▶ Have crash sensor checked and set. ▶ Have print head distance checked and set. ▶ Have cooling ventilator of the fusion board cleaned and checked. The cooling ventilators must run smoothly. ▶ Check energy chain and have it lubricated with Vaseline if necessary. ▶ Have linear guide of the press-on carrier cleaned. ▶ Have print carriage bearings lubricated. ▶ Have lubricating plates changed. ▶ Have distance of the press-on carrier set. ▶ Have the harmonic driver transport and clamping motor transmission lubricated.
Every 3 years	<ul style="list-style-type: none"> ▶ Have lung filter changed. ▶ Have ink tank emptied and rinsed.
When necessary	<ul style="list-style-type: none"> ▶ Have print heads adjusted. ▶ Have UV quartz filter changed. ▶ Have UV reflector changed. ▶ Have UV lamp head changed.

3 Creating a backup

Durst recommends backing up the following files on a regular basis:

- `DBData-YYYY-MM-DD.dat`: Contains all printer-specific parameters (e.g.: media channels, media transport settings, software validation).
- `DBStructure-YYYY-MM-DD.dat`: Contains all structural data.

- ✓ Operating system and software are installed

NOTICE

Accidental modification of system files!

Reduced functionality

- ▶ Do not change entries in the file `DurstPrinter.setup`.

- ▶ Back up the following files in the file system at the workstation:
 - `/mnt/images/HotFolders/SYSTEM_BACKUP/DBData-YYYY-MM-DD.dat`
 - `/mnt/images/HotFolders/SYSTEM_BACKUP/DBStructure-YYYY-MM-DD.dat`

4 Refilling ink

Tools/Accessories:

- Protective gloves
- Safety goggles
- Cubitainer for the desired color

The refilling is carried out through the following steps:

- Placing cubitainer into the loading compartment
- Starting refilling procedure

⚠ WARNING

Contact with ink!

Contact with skin or breathing in fumes poses health risk

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.
- ▶ Do not use inks containing solvents.

NOTICE

Unsuitable ink!

Damage to the print heads

- ▶ Use only Durst ink.

Placing cubitainer into the loading compartment

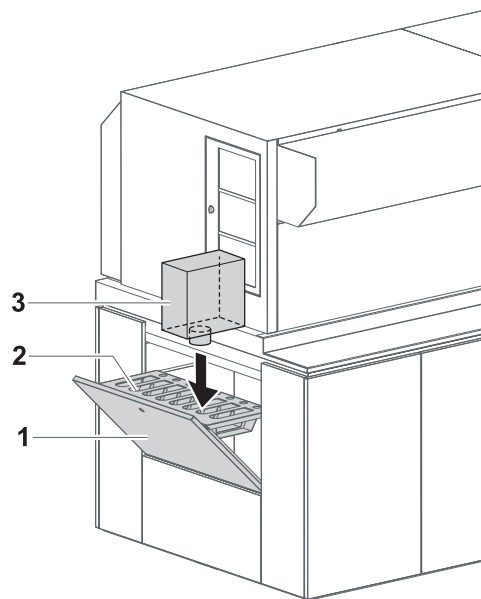


Fig. 81 Placing cubitainer into the loading compartment

1. Pull out cover (1) of the loading compartment (2).
2. Prepare Cubitainer (3) for the desired color (Y, M, C, K, light colors such as Lc and Lm or white and spot colors).
3. Shake cubitainer.
4. Place cubitainer with the connection piece downwards in the loading compartment.

Starting refilling procedure ✓ The cubitainers are located in the loading compartment

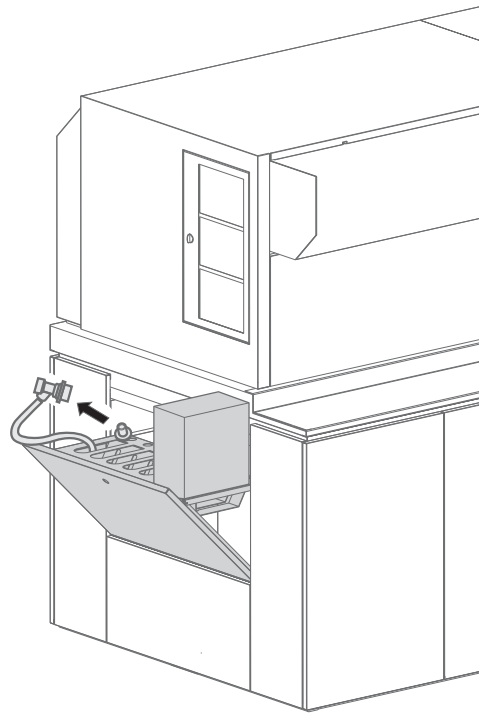


Fig. 82 Removing the fill hose from the park position

5. Once the ink has been identified correctly, remove the respective fill hose from the park position.

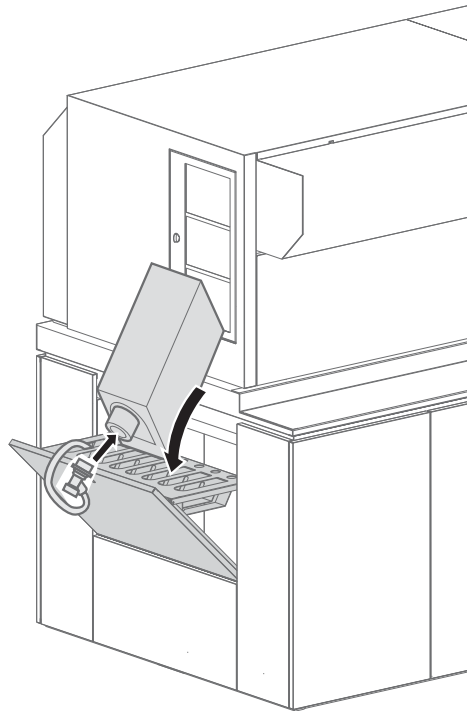


Fig. 83 Connecting the filling hose

6. Attach the quick connector of the fill hose to the connection piece of the cubitainer by pulling back the coupling.
7. Release coupling.
8. Remove coupling by pulling it back.
9. Return refill hose to the park position.
10. Remove empty cubitainer.
11. Carry out the following procedure in the software:
 - Click **Printer > Ink Batch Tracking**.
 - Create new entry for color and batch number.

5 Cleaning printing table

i If printing has inadvertently occurred on the printing table, you should clean it immediately. The longer you wait, the more laborious cleaning will be, as the ink cures even harder due to the additional exposure to UV light.

Tools/Accessories:

- Protective gloves
- Safety goggles
- Isopropyl alcohol
- Razor
- Cleaning paper

WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

NOTICE

Ink on the printing table!

Collision with the print head, missing vacuum or overheating of the printing table

- ▶ Remove ink on the printing table before printing.

1. Apply isopropyl alcohol to a clean piece of cleaning paper.

- **i** Ink is easier to remove if the cleaning paper saturated with alcohol is placed on the printing table surface 15 to 20 minutes before wiping.



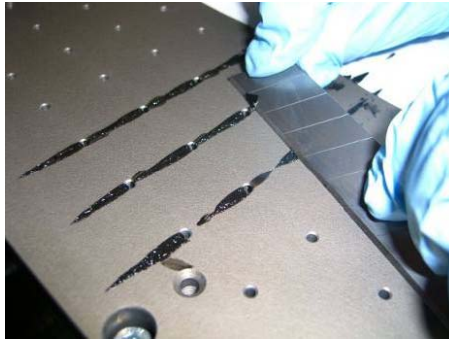
2. Firmly wipe printing table surface with a fresh piece of the specified cleaning paper.

NOTICE

Improper scratching of the printing table!

Damage to the printing table surface

- ▶ Allow razor blade to lie as flat as possible on the surface.
- ▶ Scratch carefully.



3. Scratch off ink with a razor blade if necessary.

6 Cleaning transport rollers

The following steps must be carried out for the transport rollers on the loading and unloading sides:

Tools/Accessories:

- Protective gloves
- Safety goggles
- Specified cleaning cloth
- Air filter for the printing table exhaust
- One of the following cleaning agents:
 - Water
 - Soapy water
 - Methyl Ethyl Ketone (MEK/2-butanone)

▲ WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

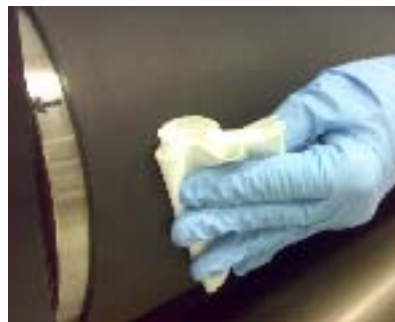
⚠ WARNING

Rotating or closing clamping rollers!

Risk of death via crushing, catching and drawing in

- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ If an acoustic signal is heard or the warning light illuminates, take your hands away from the clamping roller immediately.

1. Start the transport roller as follows in the software:
 - Open **Printer** tab.
 - Press the **Continuously** button under **Media Advance**.



2. Remove soiling with a fresh cleaning cloth and cleaning agent of the types specified. When doing so, start with water and then continue cleaning with soapy water or methyl ethyl ketone depending on the degree of soiling.
3. Carefully remove all dirty deposits on the transport roller.
4. To stop the transport roller, press **Stop Media** in the software.

7 Emptying catch tank

Tools/Accessories:

- Protective gloves
- Safety goggles

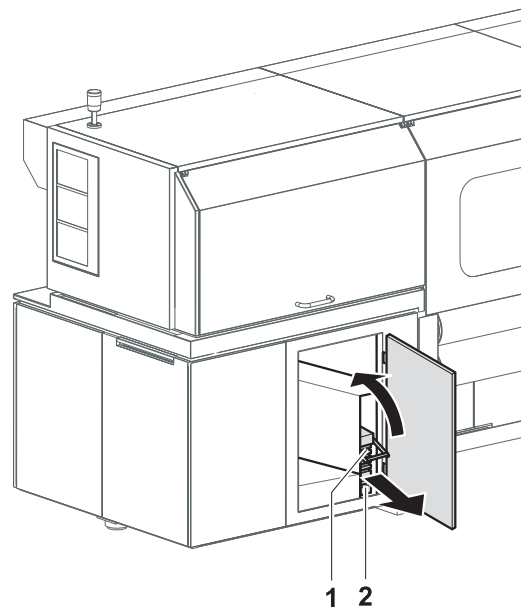


Fig. 84 Emptying catch tank

WARNING

Contact with ink!

Contact with skin or breathing in fumes poses health risk

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.
- ▶ Do not use inks containing solvents.

1. Open door.
2. Slide connection piece upwards using the grip (1).
3. Pull out catch tank (2).
4. Remove and empty catch tank.
5. Replace empty catch tank in its original position.
6. Slide connection piece downwards using the grip.
7. Close door.

8 Checking lung catch glass for ink

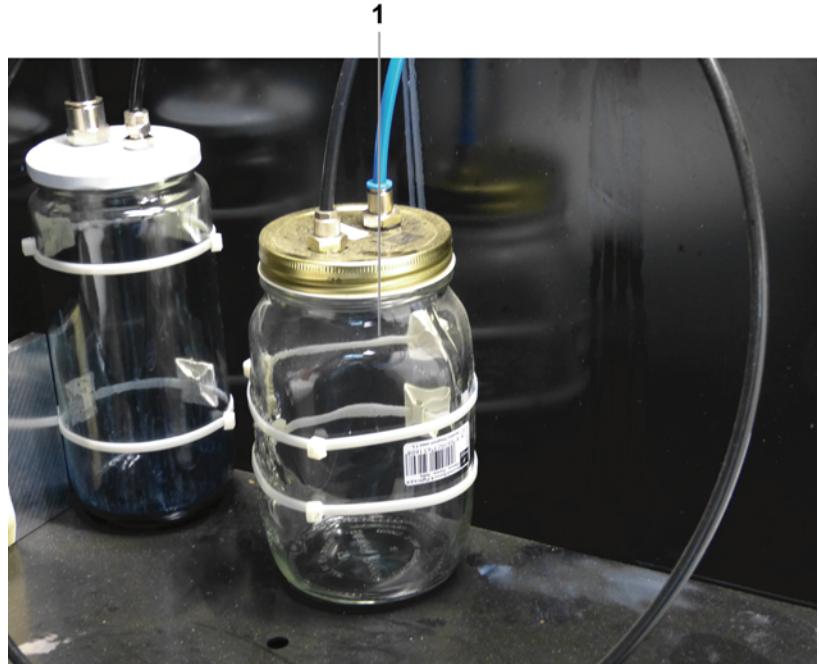
If the lung catch glass contains ink, the lung is damaged.

⚠ WARNING

Contact with ink!

Contact with skin or breathing in fumes poses health risk

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.



- ▶ Check lung catch glass (1) at the cleaning access point: If it contains ink: Notify Durst customer service.

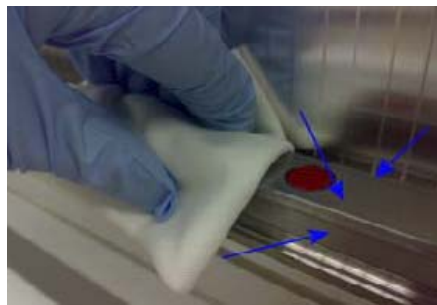
9 Lubricating carriage guide

Tools/Accessories:

- Lubricating oil Klüber LAMORA D220
 - Specified cleaning cloth
1. Move the print carriage to the left.
 2. Switch off printer.



3. Clean all accessible rail surfaces of soiling and oil accumulations using a fresh cleaning cloth of the type specified.
4. Saturate cleaning cloth with the lubricating oil.

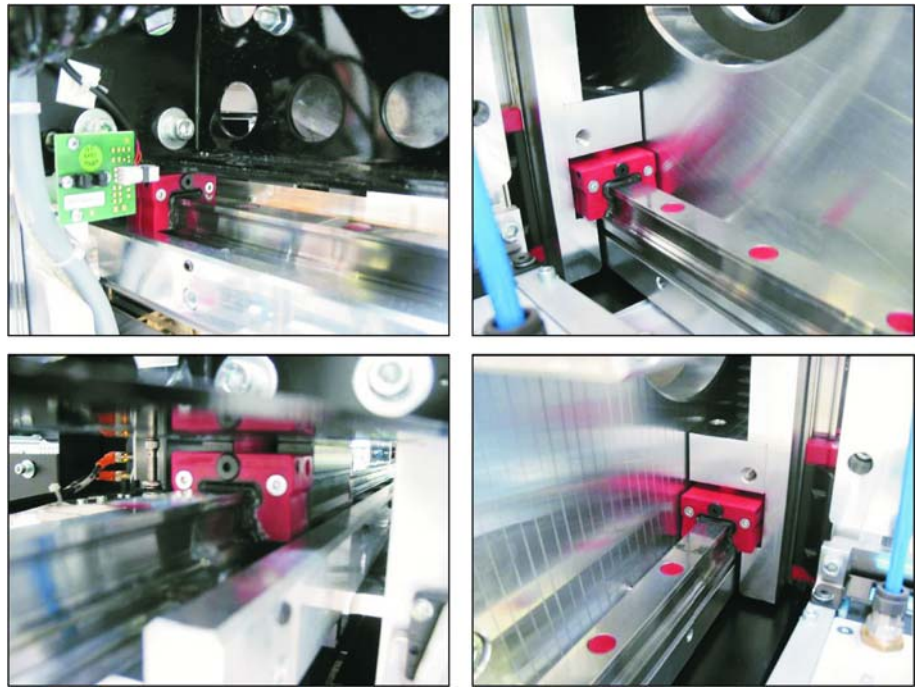


5. Wipe top (1) and bottom (2) rails in such a way that all rail surfaces are fully coated with a thin film of oil.
6. Manually move print carriage to the right.
7. Clean and lubricate the remaining areas of the rails in the same manner.

10 Changing lubrication plates

Tools/Accessories:

- Specified cleaning cloth
- Specified oil
- 4 lubricating plates



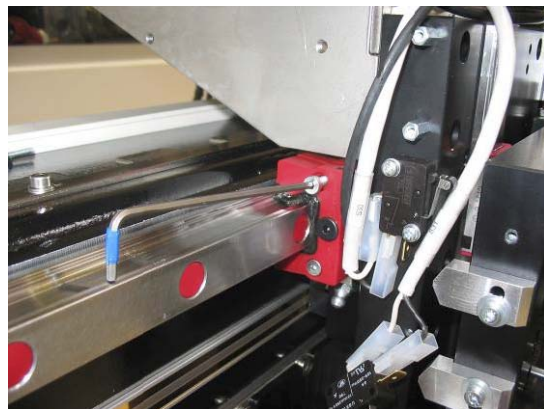
NOTICE

Encoder ruler could be scratched!

Reduced functionality of the printer

- ▶ Do not touch the encoder ruler with hard objects.

1. Switch off printer.



2. Loosen screws at the 4 lubricating plates (2 lubricating plates on each side of the print carriage).
3. Slide lubricating plates to the ends of the guide rails and remove them.
4. Clean guide rails with specified cleaning cloth.
5. Place new lubricating plates on the ends of the guide rails and move them to the print carriage.
6. Tighten screws on the lubricating plates.

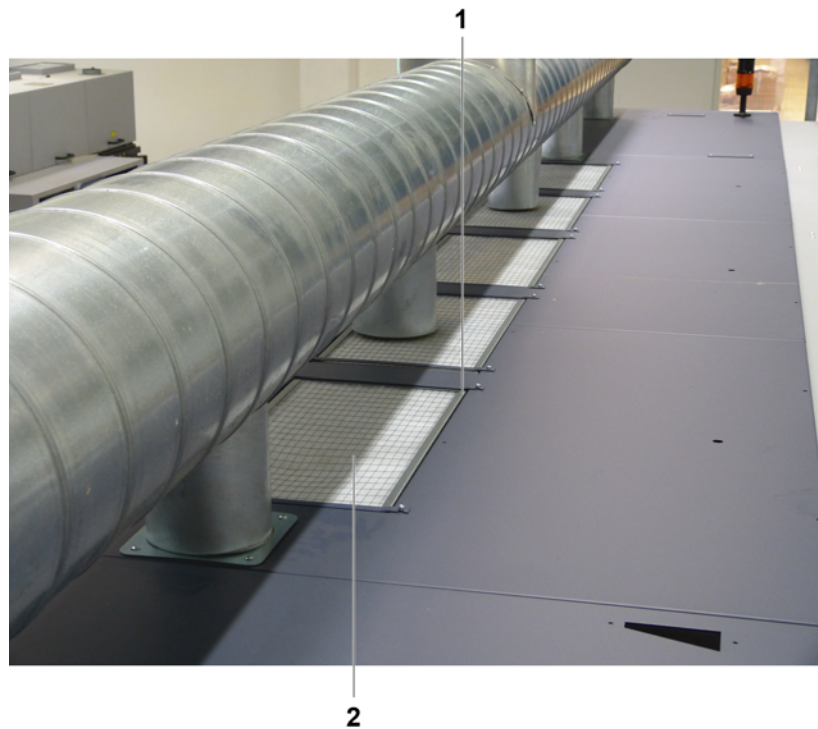
7. Lubricate guide rails with the specified oil.

11 Cleaning dust filter

Tools/Accessories:

- Protective gloves
- Safety goggles
- Vacuum cleaner

1. Switch off printer.



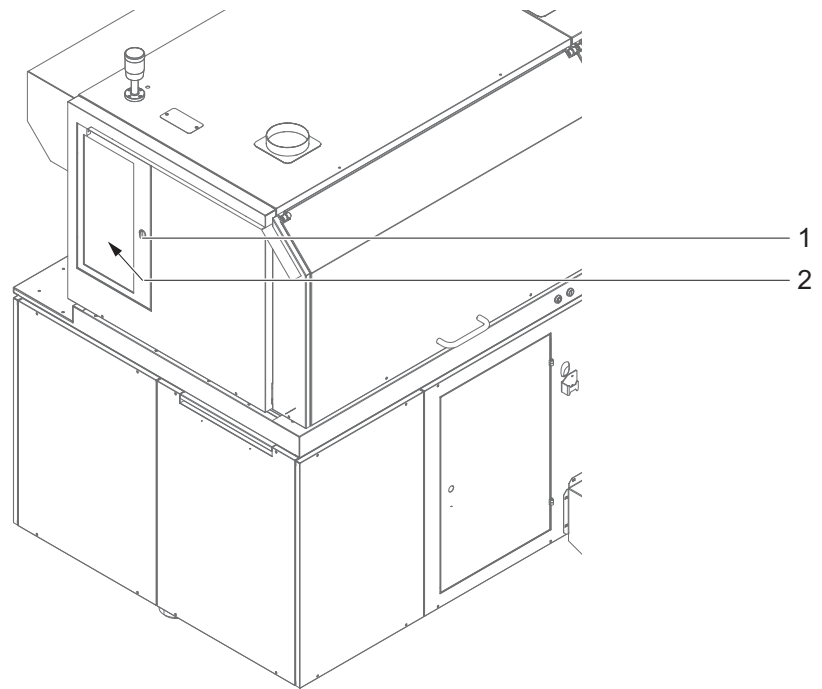
2. Unscrew filter retainers (1) on top of the housing.
3. Remove dust filter (2).
4. Vacuum off grate with a vacuum cleaner.
5. Blow out dust filter with compressed air.
6. Insert dust filter.
7. Mount filter retainer.

12 Cleaning air filter of UV lamp air shaft

Tools/Accessories:

- Protective gloves
- Safety goggles
- Vacuum cleaner

The air filters on the right and left sides of the printer are cleaned in the same way:



1. Switch off printer.
2. Open lock (1).
3. Remove air filter (2).
4. Vacuum off air filter.
5. Insert air filter.
6. Close lock.

13 Checking and changing air filter of UV lamp

Both air filters are checked and changed in the same way:

⚠ WARNING

Energized components, even when the printer has been switched off!

Risk of death via electric shock

- ▶ Switch off printer with the main switch.

WARNING

Hot surfaces!

Risk of burns

- ▶ Wait at least half an hour after switching off until the UV lamp has cooled down before attempting replacement.

WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

1. Switch off printer with the main switch.
2. Allow UV lamp to cool down for half an hour.

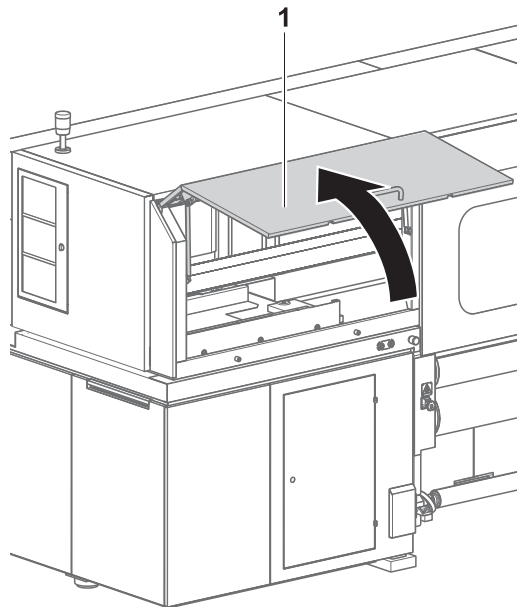
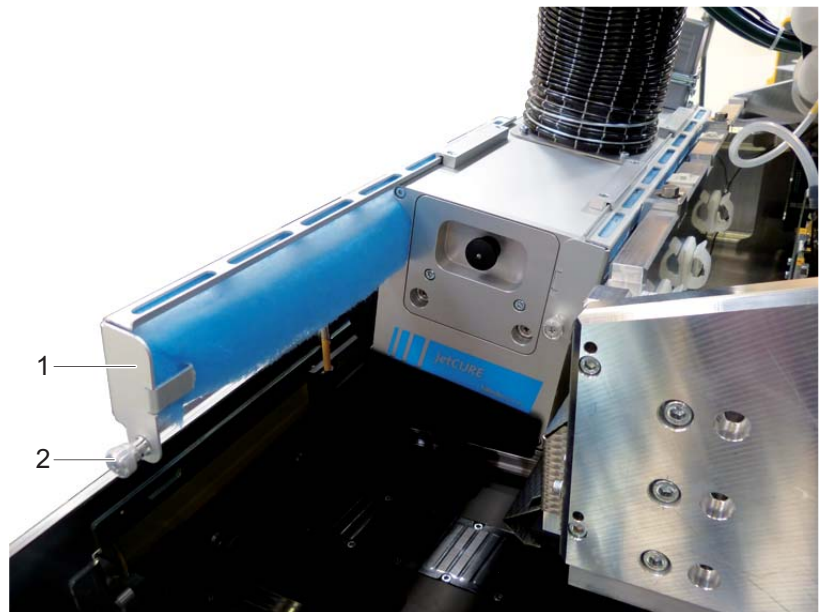
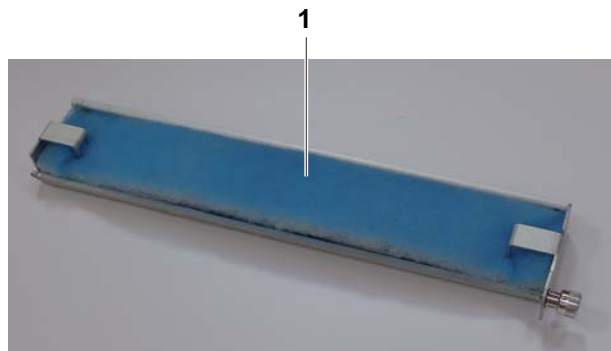


Fig. 85 Opening front panel

3. Lift left front panel (1) up.
4. Push print head carriage to a suitable position.



5. Loosen fastening screw (1) at the air filter holder (2).
6. Pull out air filter holder.
7. Check air filter for soiling.



8. If the air filter (1) is black, replace it.
9. Push air filter holder in.
10. Tighten fastening screw.
11. Close flip door.
12. Switch on printer with the main switch.

14 Cleaning aerosol extractor

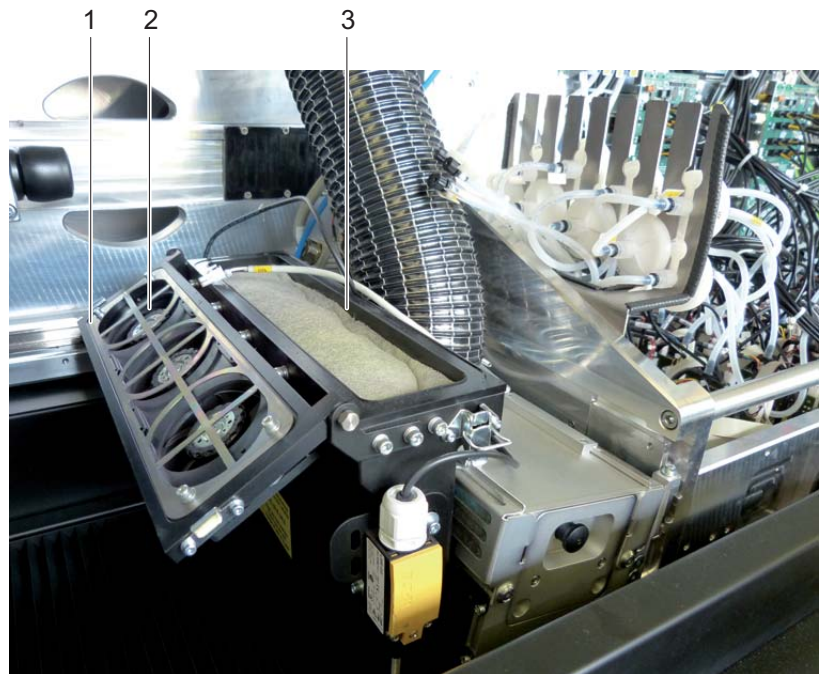
⚠ WARNING

Contact with ink!

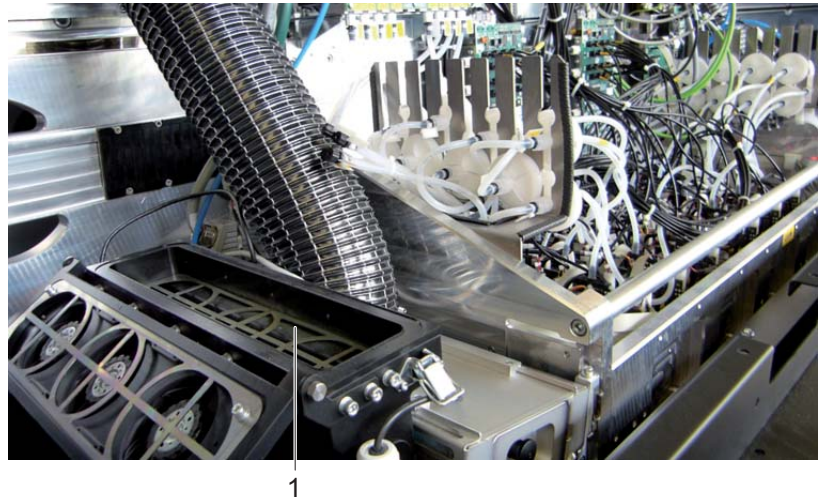
Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

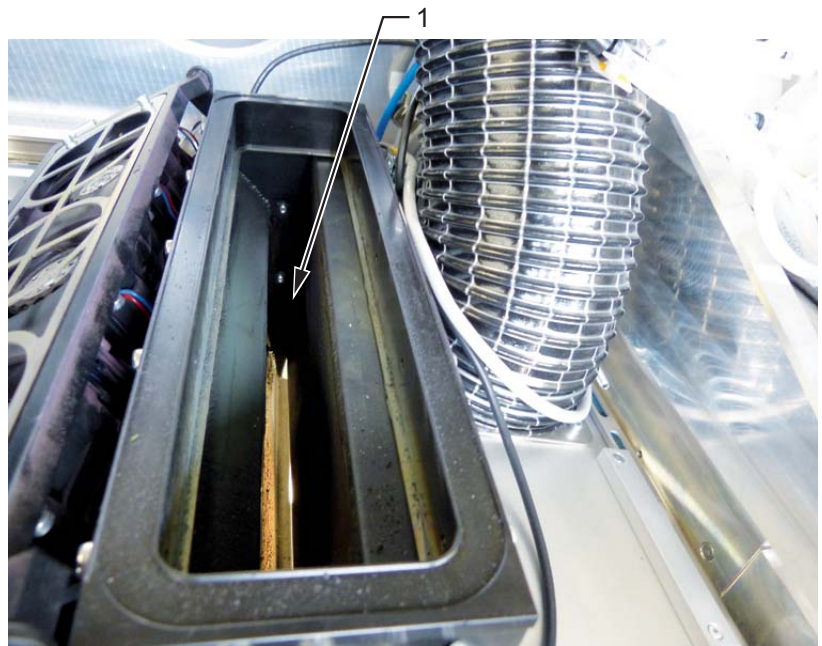
1. Initialize printer.
 - ↳ Print carriage moves upward.
2. Switch off printer.



3. Open cover (1) on aerosol extractor.
4. Check ventilator (2) and clean if necessary.
5. Remove air filter (3).
6. Clean air filter with water or change if heavily soiled.



7. Remove retaining plate (1).
8. Clean retaining plate.



9. Clean extraction shaft (1) as follows:
 - Brush off ink dust with a brush from above.
 - Vacuum off extraction shaft with a vacuum cleaner from below (accessed below the extraction shaft via the cleaning access point).
10. Insert retaining plate.
11. Insert air filter.
12. Close cover.

15 Change filter for fusion board cooling

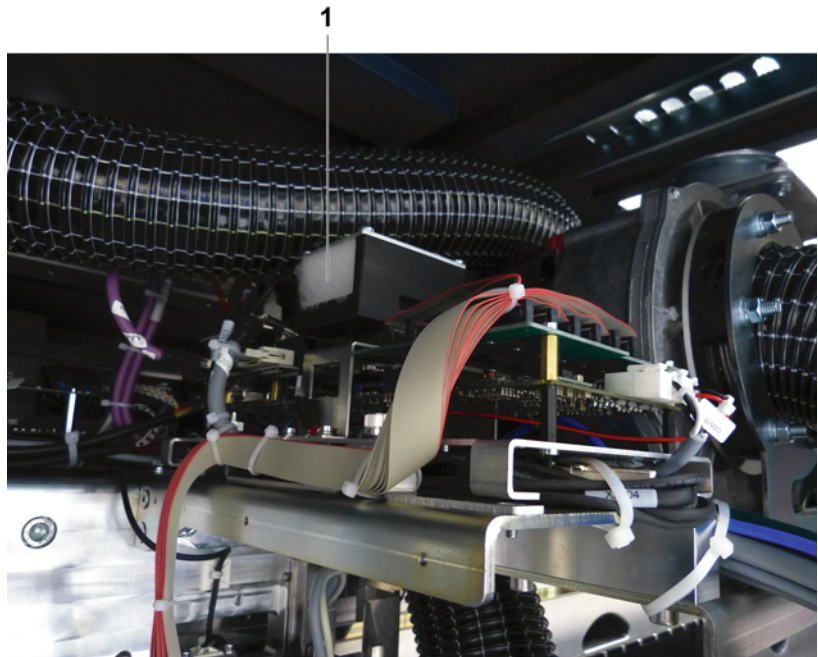
⚠ WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

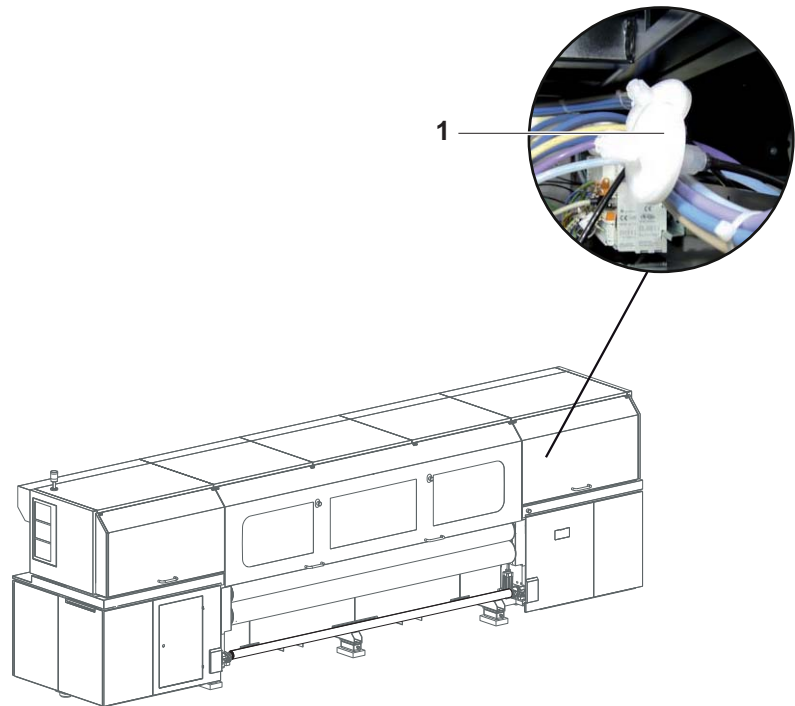
1. Switch off printer.



2. Check filter (1) and change if necessary. When inserting the new filter, ensure that the finely woven side faces the ventilator.

16 Changing main tank supply air filters

The supply air filters must be white.



- ▶ Check supply air filters: If the supply air filters are no longer white, change the supply air filters.

17 Changing main ink filter

The main ink filters prevent the print heads from being damaged by soiled inks. A possible indication of filter stoppage is error message 9145: **Timeout error caused by ink level sensor of one color head.**

Tools/Accessories:

- Protective gloves
- Safety goggles
- Specified cleaning cloth
- Specified ink filters

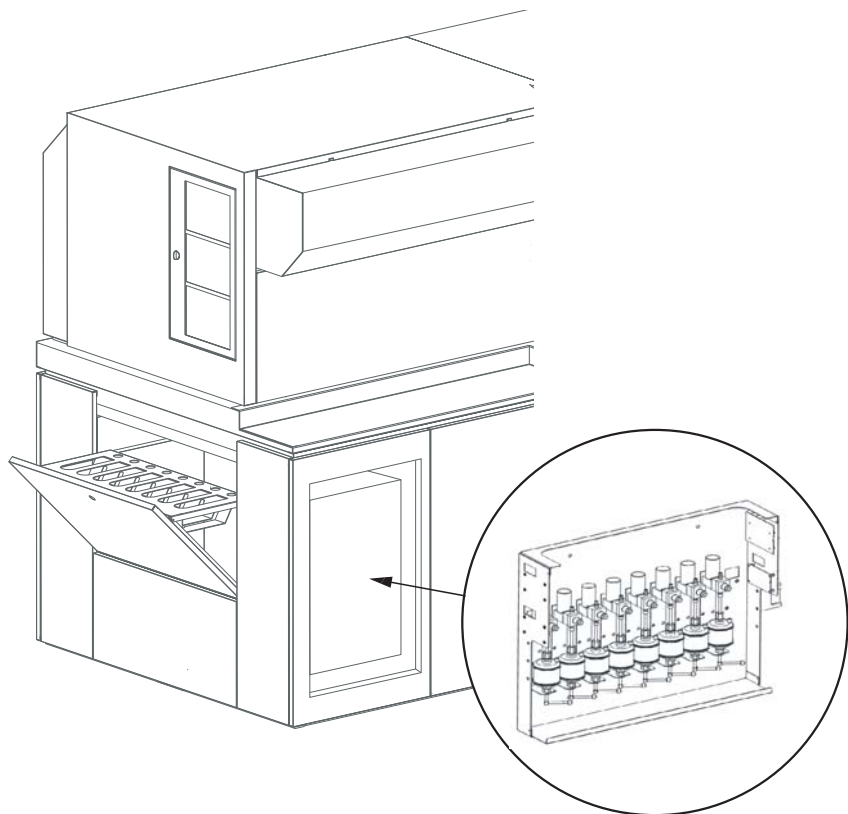


Fig. 86 Location of the main ink filters

⚠ WARNING

Squirting ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.
- ▶ Before opening, wrap cleaning cloth around connection.

1. Switch off printer.
2. Screw off cover plate.



3. Screw off fitting of top connection and detach hose of the ink filter.



4. Close ink filter with fitting.
5. To prevent ink from flowing from the ink filter when removing ink, swivel ink filter with the top down.

i When screwing off the bottom fitting, ink may flow from the bottom connection line.

6. Screw off fitting on the bottom connection and carefully remove ink filter.



7. Connect new ink filter at bottom and top connections.
8. Screw on cover plate.
9. Dispose of used ink filters according to local regulations.

18 Checking fuses

NOTICE

Wrong fuses!

Damage to the printer

- ▶ Allow only Durst service technicians to change fuses.

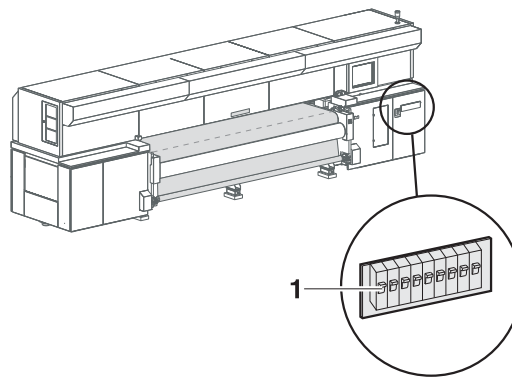


Fig. 87 Checking fuses

1. Check whether fuses (1) are switched off.
2. Switch on fuse if necessary.
3. If fuses switch off again, notify Durst customer service.

19 Changing UV lamp

Removing UV lamp holder

WARNING

Energized components, even when the printer has been switched off!

Risk of death via electric shock

- ▶ Switch off printer with the main switch.

WARNING

Hot surfaces!

Risk of burns

- ▶ Wait at least half an hour after switching off until the UV lamps have cooled down before attempting replacement.

WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

1. Switch off printer with the main switch.
2. Allow UV lamp to cool down for half an hour.

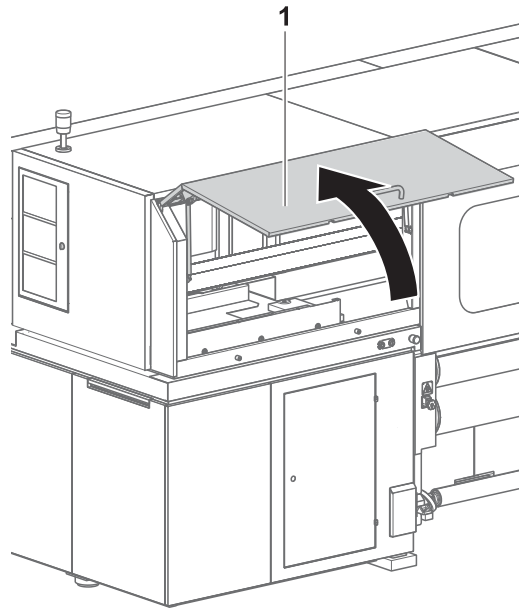
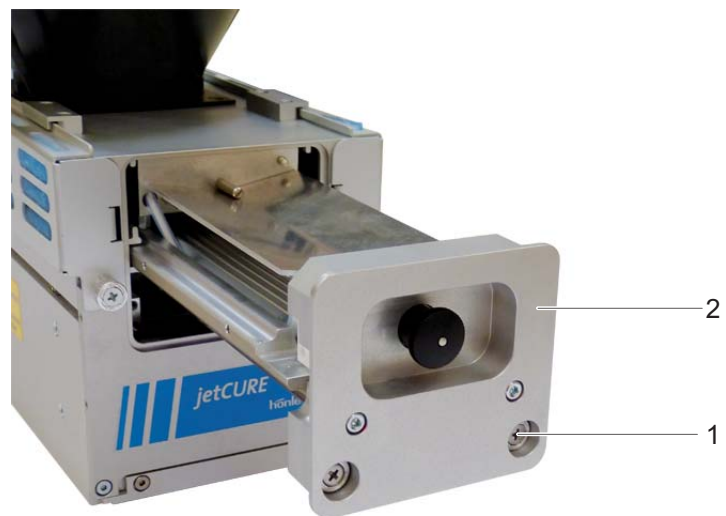
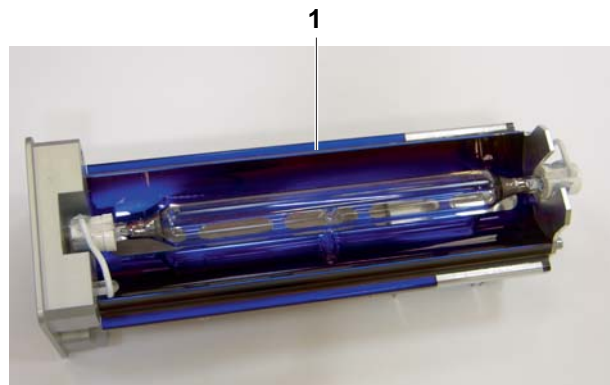


Fig. 88 Opening front panel

3. Open left-hand flip door (1) on the loading side.
4. Push print head carriage to a suitable position.

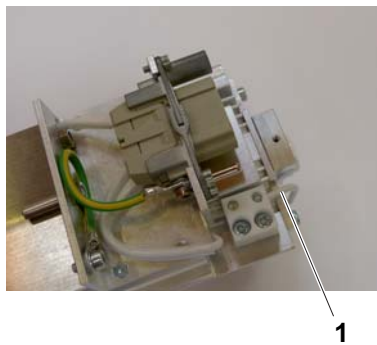


5. Unscrew fastening screws (1) on the cover of the UV lamp holder (2).
6. Pull out UV lamp holder.



7. Set UV lamp holder (1) down on a surface.

Replacing UV lamps



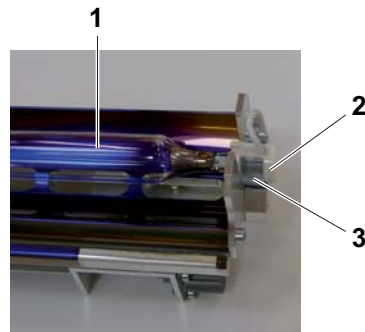
8. Detach the connection cables (1) from the luster terminals on the bottom of the UV lamp holder on both ends of the UV lamp.

NOTICE

Improper removal of the UV lamp!

Breakage of the UV lamp

- ▶ Do not grip UV lamp by the glass body, but rather at the bases on the ends.



9. Remove UV lamp together with the bases as follows:
 - Spread retaining brackets (3) apart slightly at one end.
 - Carefully lever out base (2).
 - Pull UV lamp (1) out of the retaining brackets on the opposite end.

NOTICE

Soiling can burn into the glass tube!

Reduced output of the UV lamp

- ▶ Do not touch glass body of new lamp with bare hands.

10. Place new UV lamp with sockets into the retaining brackets.
11. Connect cables to the luster terminals.

Installing UV lamp holder

12. Push UV lamp holder into the UV lamp head.
13. Insert fastening screws and tighten.
14. Close flip door.
15. Switch on printer with the main switch.

20 Cleaning outlet hole of purge unit

⚠ WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.



- ▶ Clean outlet hole (1) on the purge tray and ensure that the ink can drain.

21 Cleaning encoder ruler

Tools/Accessories:

- Protective gloves
- Safety goggles
- Specified cleaning cloth
- Isopropyl alcohol

⚠ WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

NOTICE

Encoder ruler could be scratched!

Reduced functionality of the printer

- ▶ Do not touch the encoder ruler with hard objects.
- ▶ Clean encoder ruler with the specified cleaning cloths only.

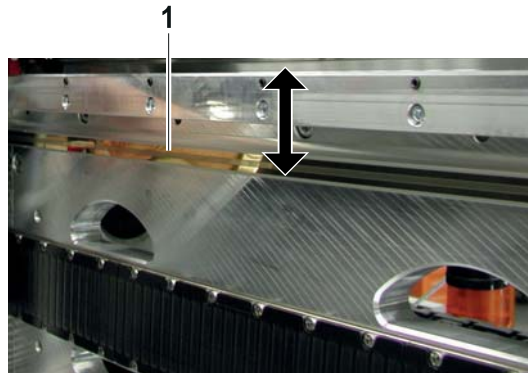
1. Move the print carriage to the left.
2. Switch off printer.
3. Saturate a fresh cleaning cloth of the type specified with isopropyl alcohol.

NOTICE

Wipe off dirt particles horizontally!

Scratching of large areas of the encoder ruler

- ▶ Wipe encoder ruler vertically only.



4. Carefully wipe encoder ruler (1) with the cleaning cloth in the vertical direction.
5. Move print carriage to the right manually.
6. Clean the rest of the encoder ruler in the same way.

22 Cleaning housing

Tools/Accessories:

- Damp cloth or dust brush

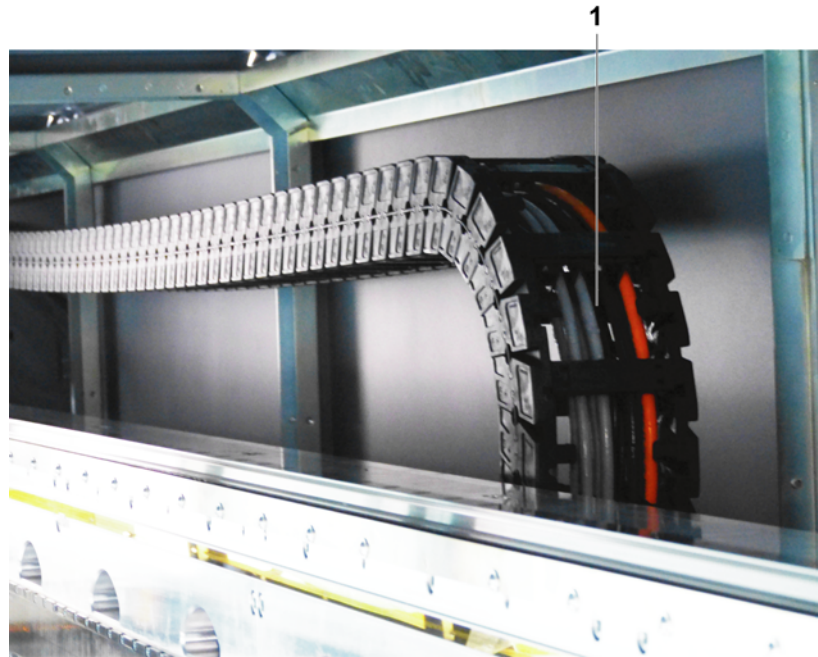
⚠ WARNING

Penetration of moisture into the printer!

Electric shock and damage to the printer

- ▶ Do not clean printer with high-pressure cleaner.
 - ▶ Use only a slightly moist cloth or dust brush to clean the housing.
- ▶ Use a slightly moist cloth or dust brush to clean the housing.

23 Treating energy chain cables with Vaseline



- ▶ Treat cables (1) of the energy chain with Vaseline.

24 Print head maintenance

24.1 Required tools/accessories


- Protective gloves
- Safety goggles
- Cleaning cloths (WW-3009)
- Cleaning solution (Rho Faceplate Solution 1)
- New silicone tube from closed package

24.2 Daily print head maintenance

24.2.1 Beginning of shift

Nozzles can fail due to soiled media or longer downtimes. The following work has to be carried out daily before starting work (once every 24 hours in case of 24-hour operation) and, if necessary, during the shift:

1. Carry out the following cleaning/purging:
 - Long purge cycle
 - Wiping print heads dry (→ Page 132 / Wiping print heads with dry cloth)
2. Print a test image.
3. If several nozzles have failed and angled jets are evident:
 - Carry out long purge cycle.
 - Wipe print heads dry. (→ Page 132 / Wiping print heads with dry cloth)

4. If the quality issues have not been remedied: Notify Durst customer service.
-  Warranty and guarantee claims can only be made if the test images have been retained.
5. Archive test image (→ Page 140 / Documentation of the print head state).

24.3 Preparation and completion of cleaning

24.3.1 Preparing for cleaning

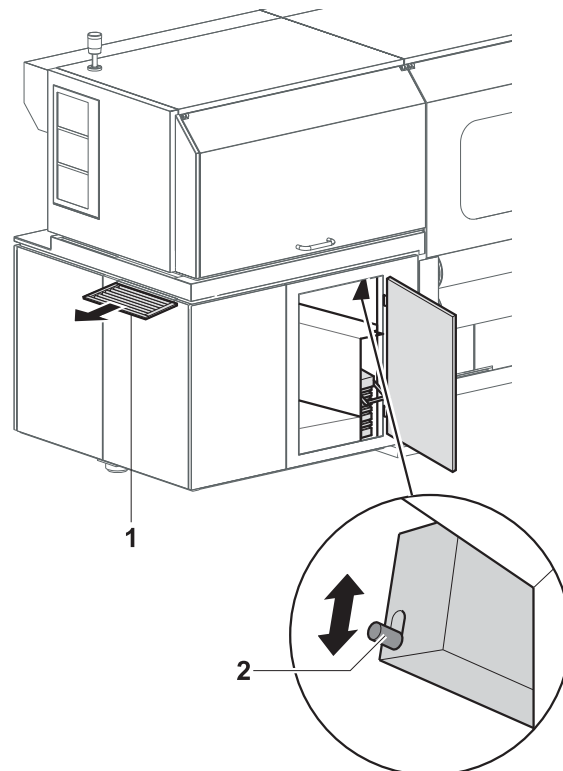


Fig. 89 Preparing for cleaning

1. Put out light trap carrier (1) up to the first stop.
2. Press **Printer > Purge** in the software.
3. Select all colors under **Colors**.
4. Depending on what is required, press **Short** or **Long** under **Purge Cycle**.
 - ↳ The **Purge** dialog window appears.
5. Press **Yes**.
 - ↳ The print carriage moves over the catch tank.
 - ↳ The purge cycle is started.
 - ↳ The ink is collected in the catch tank.
6. As soon as the **Purge Cycle finished** message appears in the software, press **OK**.

WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

7. Press unlocking device (2) downward.
8. Pull out light trap carrier to the second stop.

NOTICE

Cleaning with unsuitable cleaning tools!

Damage to the print heads

- ▶ Clean print heads with the specified cleaning cloths and cleaning solution only.

9. Dry or vacuum off print heads or wipe them with a wet cloth as required (→ Page 132 / Wiping the print heads), (→ Page 135 / Suction-cleaning soiled nozzles).

24.3.2 Completing cleaning procedure

- ✓ Wiping or suction cleaning has been carried out.
1. Push in light trap carrier.
 2. Move the print carriage to the left on the loading side.

24.4 Wiping the print heads**24.4.1 Wiping print heads with dry cloth**

- ✓ Cleaning has been prepared for (longer or shorter purge cycle)

WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.



1. Depending on the requirements, wipe the YM and MY print heads or all the print heads wet along the slot once from back to front until all remaining color residues or coatings have been removed. The print head surface must be bare.
2. Print to stabilize the nozzles.

24.4.2 Wiping print heads with wet cloth

- ✓ Cleaning has been prepared for (longer or shorter purge cycle)

⚠ WARNING
Contact with ink! Health hazard <ul style="list-style-type: none">▶ Wear protective gloves.▶ Wear safety goggles.▶ Avoid allowing ink to come into contact with skin and eyes.

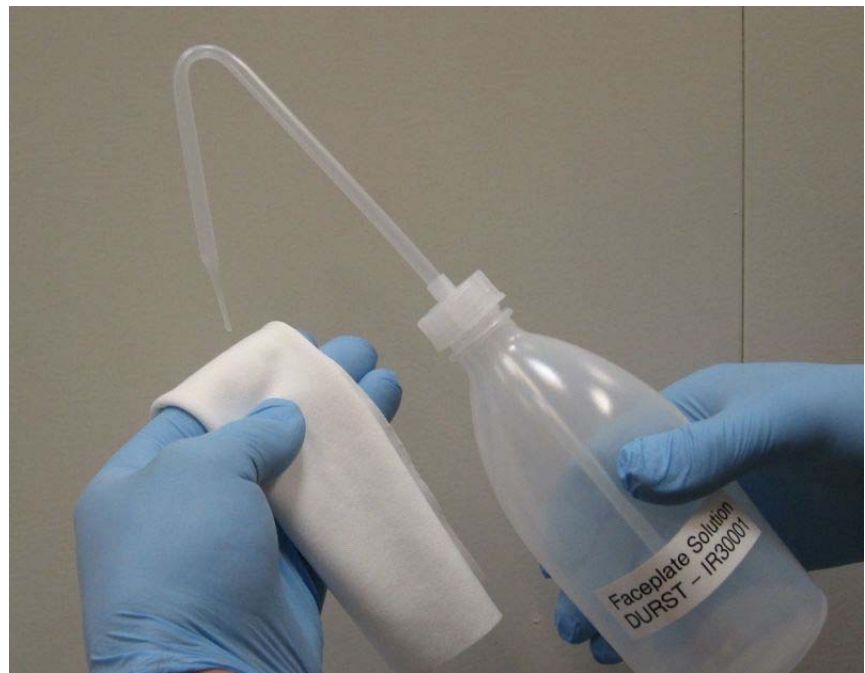
NOTICE

Cleaning with unsuitable cleaning tools!

Damage to the print heads

- ▶ Clean print heads with the specified cleaning cloths and cleaning solution only.

1. Pour cleaning solution into dispenser bottle.



2. Saturate cleaning cloth with cleaning solution.



3. Wipe print heads with a wet cloth once along the slot from back to front until all remaining color residue or coatings have been removed. The print head surface must be bare.
4. Print to stabilize the nozzles.

24.5 Suction-cleaning soiled nozzles

Soiled nozzles can be vacuumed out either with the integrated vacuum system or a syringe.

24.5.1 Identifying position

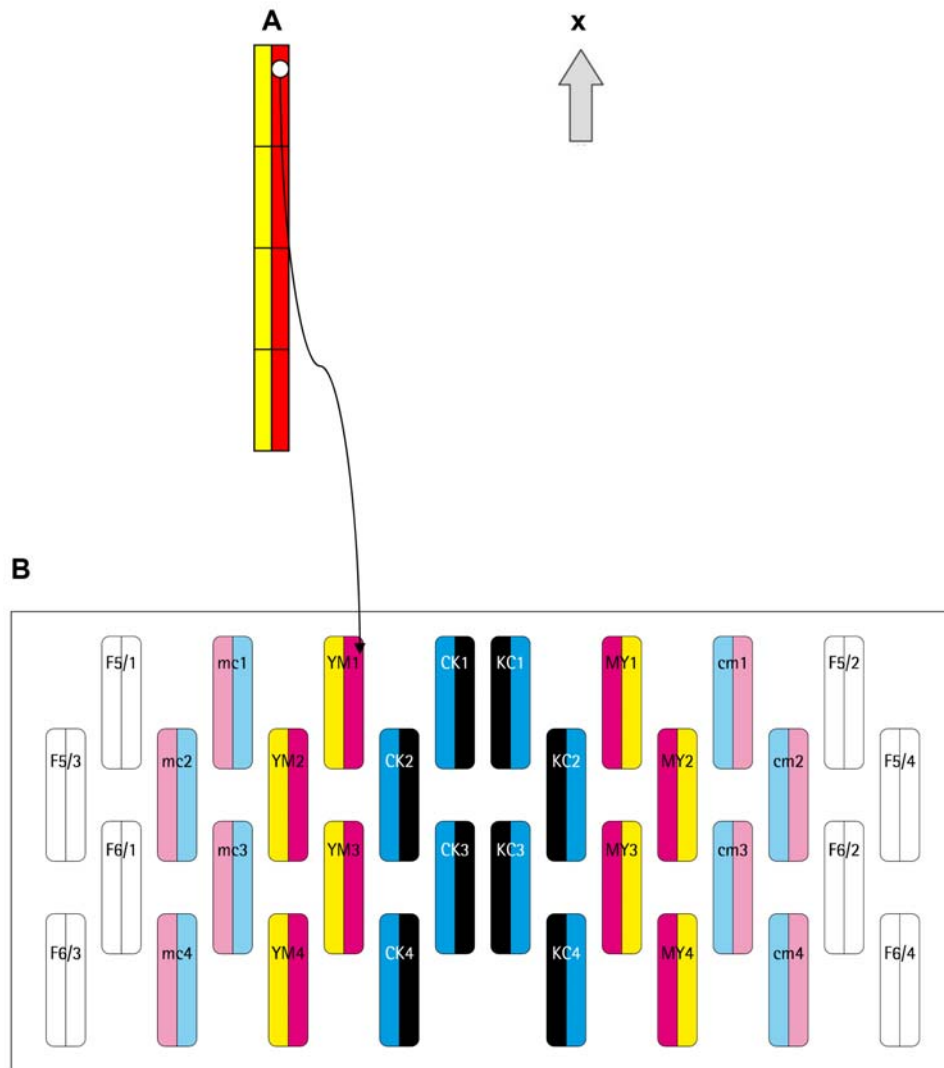


Fig. 90 Test image

A Test image from above

x Media advance

B Print carriage from above

- Identify position of the soiled nozzles with the test image.

24.5.2 Vacuuming out print heads with vacuum system

- ✓ The cleaning is prepared

⚠ WARNING

Contact with ink!

Health hazard

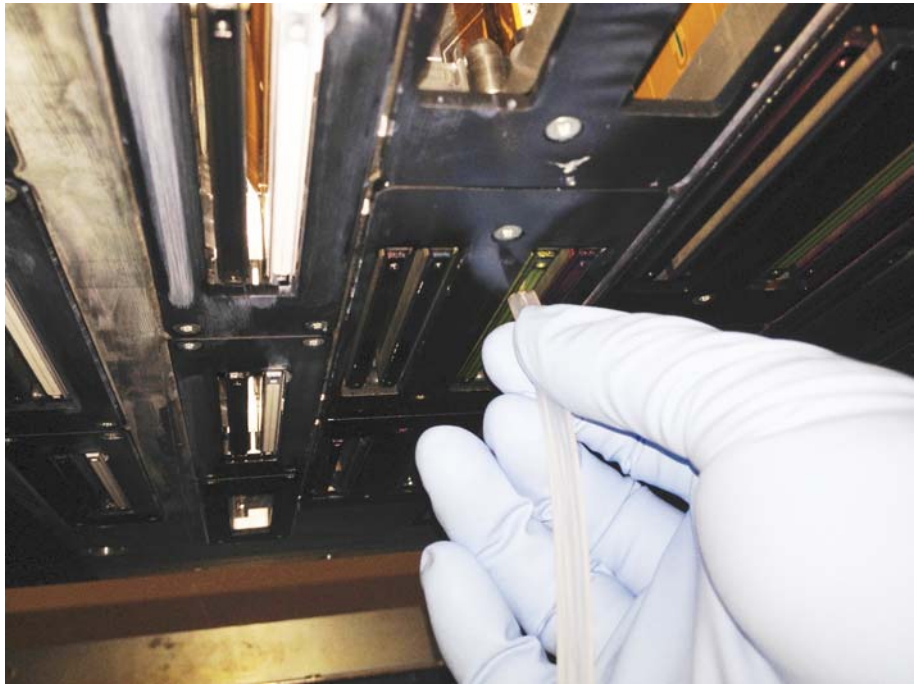
- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.



1. Place a new silicone tube on the vacuum hose.



2. Open valve (1).

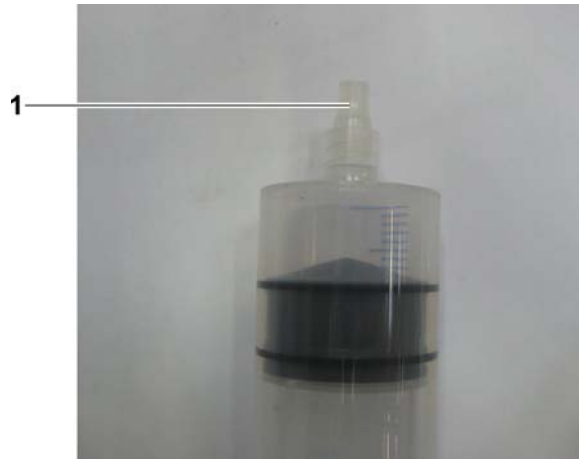


3. Vacuum off print head at the location of the dirty nozzles with the vacuum hose. When doing so, move vacuum hose back and forth approx. 2 cm several times.
4. Empty the catch glass when it is half full.
 - If the valve is not closed after vacuuming, the vacuum for degassing the ink drops off. This could cause nozzles to fail during printing.
5. Close valve.

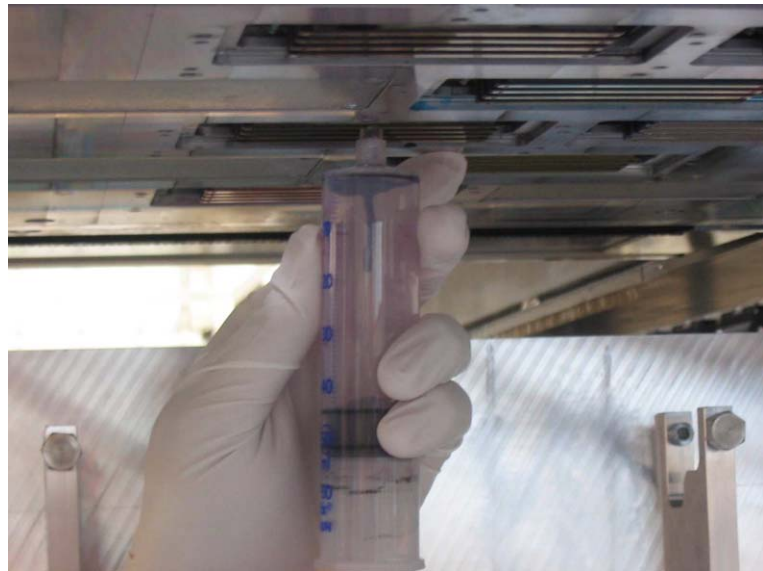
24.5.3 Vacuuming out print heads with syringe

- ✓ The cleaning is prepared

⚠ WARNING
<p>Contact with ink!</p> <p>Health hazard</p> <ul style="list-style-type: none"> ▶ Wear protective gloves. ▶ Wear safety goggles. ▶ Avoid allowing ink to come into contact with skin and eyes.



1. Place a new, clean silicone tube (1) on the tip of the syringe.



2. Vacuum off print head at the location of the dirty nozzles by drawing out the syringe piston. When doing so, move syringe back and forth approx. 2 cm several times.

24.6 Cleaning the printing plate

24.6.1 Wiping printing plate

- ✓ The cleaning is prepared

⚠ WARNING

Contact with ink!

Health hazard

- ▶ Wear protective gloves.
- ▶ Wear safety goggles.
- ▶ Avoid allowing ink to come into contact with skin and eyes.

NOTICE

Improper wiping!

Penetration of dirt into the print heads

- ▶ Wipe printing plate dry only.
- ▶ Do not touch print heads with cleaning cloth.



- ▶ Carefully wipe printing plate around the print heads.

24.7 Documentation of the print head state

24.7.1 Documenting the state of the print heads

1. Create a test image with the date and serial number of the printer.

i Warranty and guarantee claims can only be made if the test images have been retained.

2. Archive test image.

I Decommissioning and disassembly

Decommissioning and disassembly are performed by service technicians authorized by Durst Phototechnik AG.

J Appendix

1 Technical data

1.1 General specifications

Parameter		Value
Power supply	Europe	26 KVA/50 Hz, max. 34 A per phase
	US	26 KVA/60 Hz, max. 65 A per phase
Maximum current consumption	Europe	34 A
	US	65 A
Compressed-air input		Max. 6 to 8 bar at 5 L/min (70 psi at 1.3 gal/min) (dry air only)
Compressed-air connection on printer		Coupling standard MIGNON Interior diameter of line: min. 8 mm (315 mill)
Power isolator		Via external isolator (set up during commissioning by authorized Durst service technicians)
Fuses		Fuse type F374-63/0.5 (500 mA)
Dimensions	Width	approx. 680 cm (22.3 ft)
	Depth	approx. 163 cm (5.35 ft)
	Height	approx. 210 cm (6.89 ft)
Space requirement	Area	9 x 9 m (30 x 30 ft)
	Required room height	250 cm (8.3 ft)
Weight		Approx. 4500 kg (10000 lb)
Safety standards		As per the applicable directives (Machinery Directive 2000/42/EC)

1.2 Print specifications

Parameter		Value
Printing mode	Variodrop 20	<ul style="list-style-type: none"> ■ Resolution: 500 x 400 dpi ■ Pass 1 to Pass 6
	Variodrop grayscale	<ul style="list-style-type: none"> ■ Resolution: 600 x 400 dpi ■ Pass 1 to Pass 6
	Binary 12	<ul style="list-style-type: none"> ■ Resolution: 900 x 600 dpi ■ Pass 1 to Pass 6
Colors	Standard	CMYK
	Optional	<ul style="list-style-type: none"> ■ Light Cyan and Light Magenta ■ White ■ Spot colors (on request)

Parameter		Value
Ink supply unit		<ul style="list-style-type: none"> ■ Continuous ink feed with 10 L (2.19 gal) ink tanks per color ■ Color can be refilled during operation ■ Refill ink comes in 5 L (1.09 gal) cubitainers; can be disposed of while assembled
RIP	Software	Caldera Grand RIP+ Durst Rho Edition with the Durst Rho 312R printer driver for Linux and Macintosh operating systems
	RIP input file formats	All formats supported by Caldera®

1.2.1 Productivity

	1 passes	2 passes	3 passes	4 passes
	Productivity [m ² /h (sq ft/h)]			
Variodrop 20 res. 500 x 400 dpi	240 (2600)	140 (1500)	95 (1023)	80 (860)
Variodrop grayscale res. 600 x 400 dpi	224 (2400)	122 (1300)	86 (925)	70 (750)
Binary 12 res. 900 x 600 dpi	150 (1600)	109 (1170)	70 (750)	56 (600)

- When using light colors and double ink application (e.g. backlit advertising space), no reduction in print speed
- Double ink application can be selected starting with pass 4
- For a layer with spot color (e.g. underprinting with white): Reduction of print speed by 33%
- With pass overlapping activated, reduction in print speed by approx. 20%

1.3 Media specifications

Parameter	Value
Media	Uncoated and coated flexible roll media, such as: <ul style="list-style-type: none"> ■ Polyester film ■ Vinyl ■ Tarpaulin ■ Paper ■ Self-adhesive film
Maximum printing width	320 cm (10.5 ft)

Parameter	Value
Maximum printing length	Limited only by medium length
Maximum medium thickness	2 mm
Maximum roll diameter	450 mm (17.7 in) external diameter

1.4 Workstation

Parameter	Value
Type	HP workstation
Operating system	Red Hat Enterprise Linux WS EM64T
Monitor	Integrated 19" touch-screen monitor
Keyboard	Keyboard and mouse
Connections	<ul style="list-style-type: none"> ■ USB ■ Ethernet: 100/1000 Mbps

1.5 Requirements of location

Parameter	Value
Maximum altitude	2400 m (8000 ft) above sea level
Temperature range	+15 °C to +30 °C (59 °F to 86 °F)
Relative humidity	25 to 80%, non-condensing
Hot air output/feed	min. 4000 m ³ /h (1400 cu.ft./h)
Compressed-air connection	6 to 8 bar at 5 L/min (70 psi at 1.3 gal/min) (dry air only)

2 Scope of delivery

The basic equipment scope of delivery includes:

- Rho 312R printer, incl.
 - 4 ink tanks (10 L (2.19 gal) per color)
 - 16 Quadro-Array-12-print heads
 - Cleaning solution
- HP workstation with touch-screen monitor
- Caldera GrandRIP+ Durst Rho Edition
- Durst Rho 312R touch-screen printer software
- 2 pneumatic cores, one each for the loading and take-up units (Rho 312R Axle Pneu 76, 320 (76 mm/3 in))
- Rho 312R Operator Kit
- Operating Instructions
- Standard packaging

3 Accessories and spare parts

Accessory/Spare part	Description	Order code
Rho Roll Ink Cyan	Cyan UV ink	1605123
Rho Roll Ink Magenta	Magenta UV ink	1605119
Rho Roll Ink Yellow	Yellow UV ink	1605121
Rho Roll Ink Black	Black UV ink	1605147
Rho White Premium Ink	White UV ink	1605192
Rho Roll Ink Light Magenta	Light Magenta UV ink	1605124
Rho Roll Ink Light Cyan	Light Cyan UV ink	1605122
Rho Spot Color	Spot color (on request)	
Rho Pneu 76, 320 Media Axle 76 mm (3 inches)	Pneumatic take-up and loading cores	AB24115
Rho 312R Operator Kit	<ul style="list-style-type: none"> ■ 100 protective gloves ■ 1 pair safety goggles ■ 1 package cleaning cloths ■ 1 liter cleaning solution ■ 4 syringes 	Rho 312R Operator Kit
UV lamp, 7.2 kW	Average service life: 1000 h	1873130
Reflectors for the UV lamps	Complete set	1872865
Cover glass for the UV lamps	–	1872879
Lubricating plate	1 pc.	1345433
Cleaning cloths WW3009	150 pc.	1473245
Lubricating oil	Klüber LAMORA D220	4201010
Lubricant	Klüber ISOFLEX LDS18	4201011
Ink filter	PALL	LE2010160
Protective gloves	Nitrile protective gloves N-DEX	4235060
Safety goggles	Safety goggles UVEX 9195	1351015
Cleaning solution	Jet 0519, 1 L	IR20006
Hardware service contract	–	Rho Hardware Contract

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