



durst

# Rho 1000

## Operating Instructions

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Original instructions





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# A About these operating instructions





## 1 Using these operating instructions

These operating instructions are part of the unit.

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

## 2 Symbols and markings

The following symbols are used in these operating instructions:

Symbol	Meaning
✓	Requirement for an action
▶	One-step action
1.	Step within a multi-step action
↳	Result of an action or sequence of actions
<b>i</b>	Information on easier or safer work
(→ Page 23 / Description)	Cross reference
	Immediate danger, which can lead to death or serious injury if not heeded
	Possible danger, which can lead to death or serious injury if not heeded
	Possible danger, which can lead to minor injury if not heeded
	Possible danger, which can lead to damage of property if not heeded

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

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



## 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 plate and roll media in industry within the specified limits (→ Page 101 / Technical data). In particular, the following framework conditions apply for this:

- The printer may only be operated in closed rooms.
- Operation is carried out by 1 person.
- Only the inks and media certified by Durst may be used. Other inks or media may only be used by agreement with Durst Phototechnik AG.

#### 1.1 Impermissible use

The printer may not be used to print the following 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:

- The personnel must possess the appropriate qualifications and be sufficiently trained.
- The stipulated protective equipment must be made available to the personnel (→ Page 103 / Accessories and spare parts).
- The warnings on the printer must always be legible and be kept in a visible and clean condition.
- Sufficiently bright illumination for the personnel must be ensured.
- All regional and national regulations and safety requirements must be observed.

### 3 Areas of work

Operation is carried out mainly in the following areas of work:

- Workstation
- Feed system

## 4 Safety and monitoring equipment

### 4.1 Protective equipment

The purpose of the protective equipment for loading and unloading media and ink is to prevent the user from being exposed to electrical or mechanical danger.

- ▶ Do not change the method of functioning of this equipments.

### 4.2 Protective switch

- 1 Flip doors (here: shown on a flip door as an example)
- 2 Cleaning access point

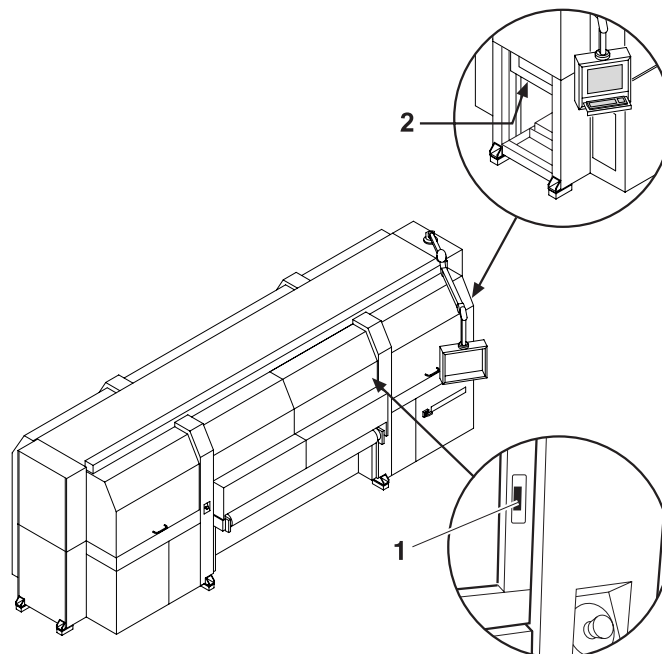


Fig. 1 Location of the protective switch

All flip doors must be closed at all times and the light trap carrier on the cleaning access point must be pushed in. The flip doors may only be opened for maintenance and checks, e.g. checking of the material advance. The light trap carrier may only be pulled out for the purpose of print head maintenance.

Protective switches are thus fitted on all flip doors and at the cleaning access point. Printing cannot start if the flip doors are not closed and the light trap carrier is not pushed in.

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

### 4.3 Signs on printer

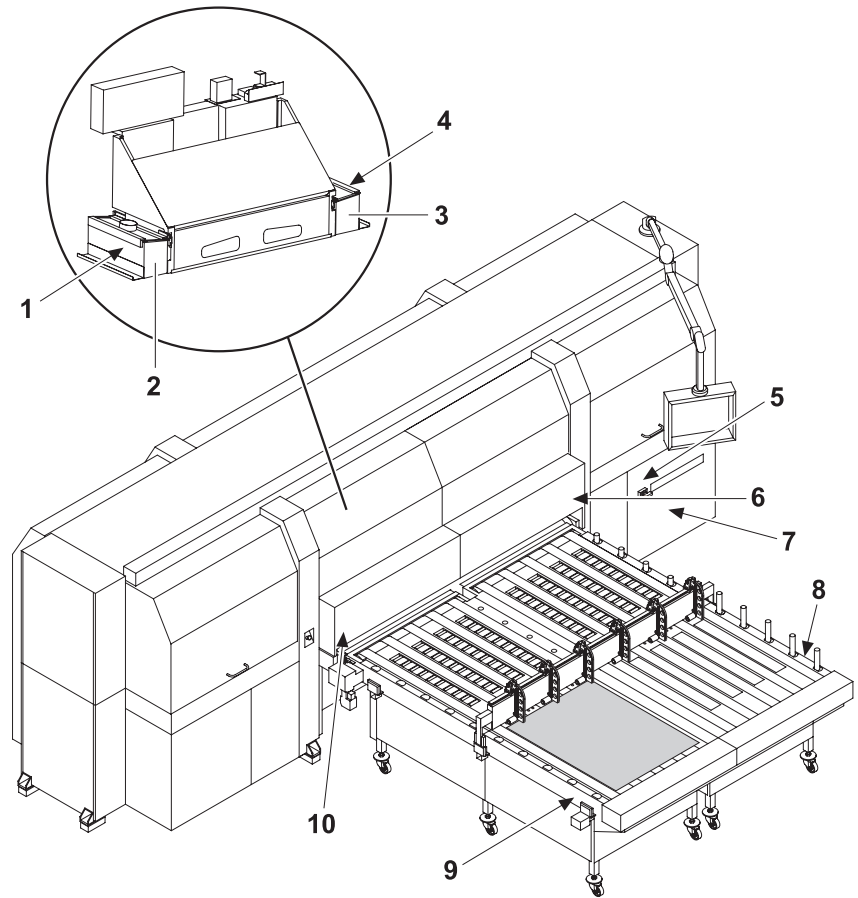


Fig. 2 Location of the signs (loading side)

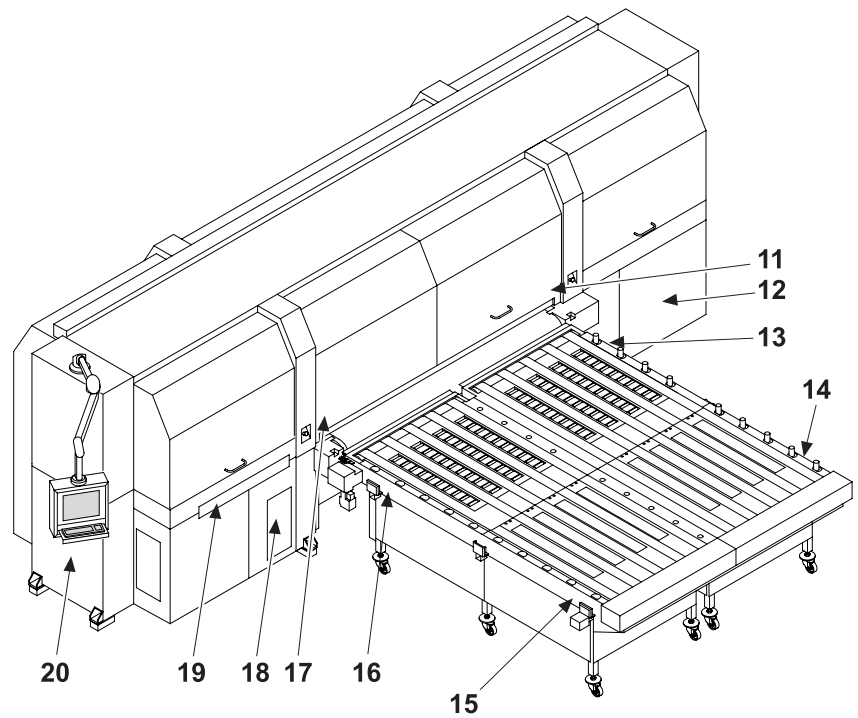


Fig. 3 Location of the signs (unloading side)



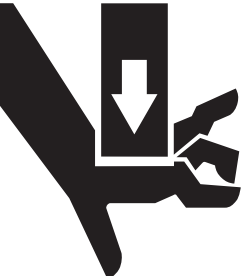
### 4.3.1 Rating plate










Fig. 4 Rating plate (location 7: door at main switch)

### 4.3.2 Safety signs

All safety signs attached to the printer must be observed (→ Page 11 / Location of the signs (loading side)) (→ Page 11 / Location of the signs (unloading side)).

Safety sign	Position	Meaning
	<ul style="list-style-type: none"> <li>■ 18: Catch tank/door</li> <li>■ 12: Ink supply unit/loading compartment</li> <li>■ 20: Cleaning access point/machine frame behind the cover</li> </ul>	Wear protective gloves
	<ul style="list-style-type: none"> <li>■ 6, 10, 11, 17:                             <ul style="list-style-type: none"> <li>– Edge of the conveyor belt</li> <li>– Machine frame on the lower edges of the flip doors</li> </ul> </li> <li>■ 18: Catch tank/door</li> <li>■ 20: Cleaning access point/machine frame behind the cover</li> <li>■ 12: Ink supply unit/loading compartment</li> <li>■ 8, 9, 13, 14, 15, 16: Feed system</li> </ul>	Wear safety goggles
	<ul style="list-style-type: none"> <li>■ 6, 10, 11, 17:                             <ul style="list-style-type: none"> <li>– Edge of the conveyor belt</li> <li>– Machine frame on the lower edges of the flip doors</li> </ul> </li> <li>■ 8, 9, 13, 14, 15, 16: Feed system</li> </ul>	Limbs could be crushed

Safety sign	Position	Meaning
	<ul style="list-style-type: none"> <li>■ 6, 10, 11, 17:                             <ul style="list-style-type: none"> <li>– Edge of the conveyor belt</li> <li>– Machine frame on the lower edges of the flip doors</li> </ul> </li> <li>■ 18: Catch tank/door</li> <li>■ 20: Cleaning access point/machine frame behind the cover</li> <li>■ 8, 9, 13, 14, 15, 16: Feed system</li> </ul>	<p>Limbs could be crushed</p>
 <p>ACHTUNG Auch wenn Netzschalter in "Off-Position", steht Teil unter Netzspannung</p> <p>CAUTION Even if Mains switch in "Off-Position" part stay under hazardous live</p>	<p>5: Main switch</p>	<p>The component is energized even when the main switched is switched off</p>
 <p>Disconnect main switch before opening Vor dem Öffnen Hauptschalter ausschalten</p>	<p>2, 3: UV lamp heads</p>	<ul style="list-style-type: none"> <li>■ UV light warning</li> <li>■ Switch off main switch before opening</li> </ul>
	<ul style="list-style-type: none"> <li>■ 6, 10, 11, 17:                             <ul style="list-style-type: none"> <li>– Edge of the conveyor belt</li> <li>– Machine frame on the lower edges of the flip doors</li> </ul> </li> <li>■ 18: Catch tank/door</li> <li>■ 20: Cleaning access point/machine frame behind the cover</li> <li>■ 8, 9, 13, 14, 15, 16: Feed system</li> <li>■ 19: Light trap carrier</li> </ul>	<p>UV light warning</p>

Safety sign	Position	Meaning
	2, 3: UV lamp heads	Hot-surface warning
	20: Cleaning access point/machine frame behind the cover	Chemical substance warning
	7: Door at main switch	Dispose of the unit via a separate collection for electric and electronic devices in accordance with the locally applicable regulations.
High-voltage text sign	1, 4: UV lamp heads	Caution: High voltage; The power cable must be disconnected before the unit is opened or tubes are changed
Ultraviolet radiation text sign	1, 4: UV lamp heads	Caution: Ultraviolet radiation; UV-C, UV-B, UV-A; Protect eyes and skin

## 5 Ambient conditions

The printer may only be operated under the specified ambient conditions (→ Page 101 / Technical data).

## 6 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 the printer housing, electronics case and covers, except for routine work, and opening the workstation or unplugging the cable may only be performed by authorized Durst service technicians.
- No modifications, attachments or alterations may be performed on the printer without the approval of Durst Phototechnik AG.
- 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.

## 7 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 which have been approved by Durst may be connected to the printer and the computer.

## 8 Electromagnetic compatibility

**For 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 the 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.

## 9 Specific types of danger

The printer has been constructed using state-of-the-art technology and following the recognized technical 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 another medium could also be damaged.

### 9.1 UV light

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

The UV lamps are not automatically switched off when the flip doors are opened. This allows scattered light to escape.

- ▶ Do not remove the flip doors.
- ▶ Check to make sure the flip doors are closed and locked during printing.
- ▶ Carry out the following measures to the print head maintenance:
  - Ensure that the UV lamps are switched off.
  - Wear safety goggles
- ▶ Do not look at the UV lamps when the flip doors are open.

## 9.2 Hot surfaces

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

- ▶ Before working on the UV lamp head, you must wait at least half an hour after the lamps have been switched off and allowed to cool down.
- ▶ Wear protective gloves when working on the UV lamp head.
- ▶ Do not touch the UV lamps during the print head maintenance.

## 9.3 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. Only the separator element set up and defined during installation can be used as the power isolator.

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

## 9.4 Rotating parts and printhead carriage

Hair, jewelry and clothing can be caught by following components and pulled in:

- Rolls and rollers
- Belt drive of the feed system
- Conveyor belt

Lethal crushing of the limbs can result.

When reaching into the inlet and outlet openings, there is a danger of impacts and crushing due to the movement of the printhead carriage.

- ▶ Do not remove the flip doors.
- ▶ Do not remove the covers.
- ▶ Do not wear long hair, jewelry or loose clothing.
- ▶ Do not reach into the inlet and outlet openings during printing.

## 9.5 Contact with ink

Coming into contact with ink is harmful to your health. Dangerous areas are:



- Ink supply unit with Durst Cubitainer
- Waste tank
- Carriage guide
- Light trap carrier
- Unhardened inks on print-outs due to insufficient UV level
- Spray mist from ink drops due to large print head spacing
- ▶ Observe the safety data sheets supplied with the ink.
- ▶ Operate the printer with Durst inks only.
- ▶ Wear protective gloves and safety goggles when cleaning the print heads, adding ink or emptying the waste 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.

## 9.6 Ozone buildup

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

The external exhaust equipment must be dimensioned in such a way that the required minimum exhaust quantity can be extracted (→ Page 101 / Technical data).

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

## 9.7 Risk of fire

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

- ▶ Do not print media which have an ignition point of less than 150 °C (302 °F).

## 9.8 Pneumatics

The pneumatic circuits for vacuum generation on the print head, conveyor belt and ink transport are under pressure. Powerfully spraying ink or escaping compressed air due to leaky lines and connections can cause serious injury.

- ▶ Ensure that the necessary maintenance work is carried out regularly by Durst Customer Service.

## 9.9 Danger of falling

Climbing onto components of the printer can damage them. There is also a risk of falling.

- ▶ Do not use printer components as a climbing aid.

## 10 Protective clothing

### 10.1 Safety goggles and protective gloves

- ▶ When cleaning the ink supply unit or the print heads, wear the protective gloves provided for this purpose and recommended safety goggles (→ Page 103 / Accessories and spare parts).

### 10.2 Safety footwear

- ▶ Wear safety footwear when loading or unloading media.

## 11 Handling inks and media

The operating personnel should familiarize themselves with the printer before loading and unloading the media and inks.

### 11.1 Loading/unloading media

- ▶ Since media weigh a significant amount, take the following measures:
  - Wear safety footwear
  - Make sure that your footing is secure before loading/unloading.
- ▶ Before loading/unloading, ensure that there are no obstacles near the printer.

### 11.2 Refilling ink

- ▶ Use only the Cubitainers intended for the printer (→ Page 103 / Accessories and spare parts).

## 12 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 chapter entitled "Service", 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.

## 13 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 filters
  - Cubitainers
  - Ink filters
- 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.

## 14 Emergencies

### 14.1 Emergency-Stop switch

1 Emergency-Stop switch

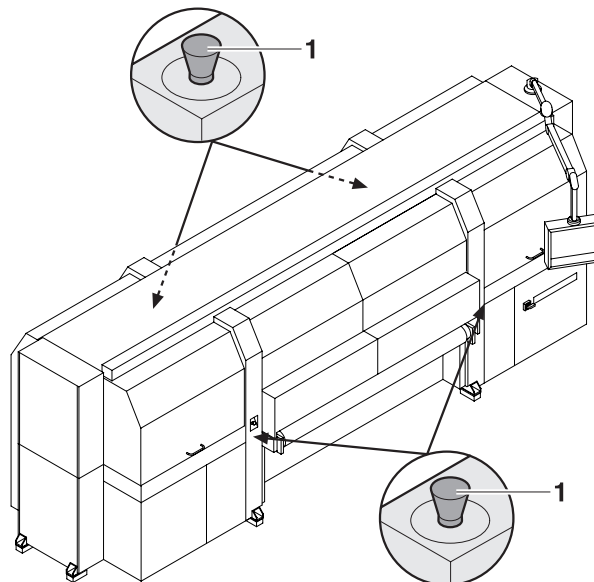


Fig. 5 Emergency-Stop switch

In an emergency, the printer is switched off with the Emergency-Stop switch (1).



The yellow and black Emergency-Stop switches on the docked tables and feed systems switch only these off. The printer is not switched off.

### 14.2 What to do in case of an emergency

#### 14.2.1 Switching off printer

- ▶ Switch off the printer immediately with one of the Emergency-Stop switches if any fault occurs that could endanger personal safety.

### 14.2.2 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 they 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.

## 14.3 Switching the printer back on after an emergency stop

### 14.3.1 Reactivating Emergency-Stop switch

1. Turn Emergency-Stop switch to the right.
  - ↳ Emergency-Stop switch pops out
2. Turn the main switch counterclockwise until it stops.
3. Turn the main switch clockwise to switch on the printer.

## 15 Faults

### 15.1 Handling faults

- ▶ If the printer stops unexpectedly:
  - Switch off the printer with the Emergency-Stop switch and/or the main switch.
  - If the printer is switched off with the main switch: Secure the main switch with a lock to prevent it from being switched back on.
  - Notify the Durst customer service.
- ▶ If a paper jam occurs, never reach under the covers with your hand.

## 16 Avoiding damage to property

### 16.1 UV lamps

The UV lamps will be damaged if they are changed incorrectly. The UV lamps may only be changed by Durst service technicians.

### 16.2 Print head maintenance

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

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

### 16.3 Careful handling of the encoder ruler

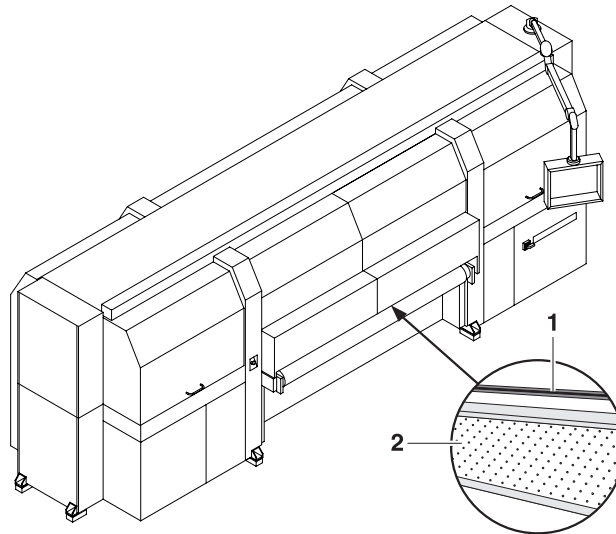


Fig. 6 Encoder ruler

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

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

### 16.4 Media

Unsuitable media can cause a collision with the printhead carriage.

Examples:

- Bent sheet-metal plates
- Media with uneven surfaces
- Media with poor temperature stability
- Media with ribs or burrs

- ▶ Do not load media which could cause a collision.

### 16.5 Cleaning

Incorrect cleaning of the slots on 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 and soiling on the conveyor belt can lead to malfunctioning of the exhaust and ventilation. This can cause the following damage:

- Failure of electronic components
- Overheating of the UV lamps
- Damage to the conveyor belt via overheating

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

Unsuitable cleaning tools, caustic 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.

## **16.6 Careful handling of the conveyor belt**

- ▶ Do not damage the conveyor belt.
- ▶ Do not soil the conveyor belt.
- ▶ Do not clean the conveyor belt with aggressive cleaning solutions.
- ▶ Remove soiling from the conveyor belt only by means of adhesive tape.

## C Description

### 1 Printer

**Task** The printer prints coated and uncoated plate or roll media, such as rigid- and flexible-foam panels, aluminum, acrylic glass, polycarbonate, etc. with a width of up to 2.5 m.

**Components** The printer consists of the following components:

- 1 UV lamp head
- 2 Printhead carriage
- 3 Workstation
- 4 Plate medium
- 5 Feed system

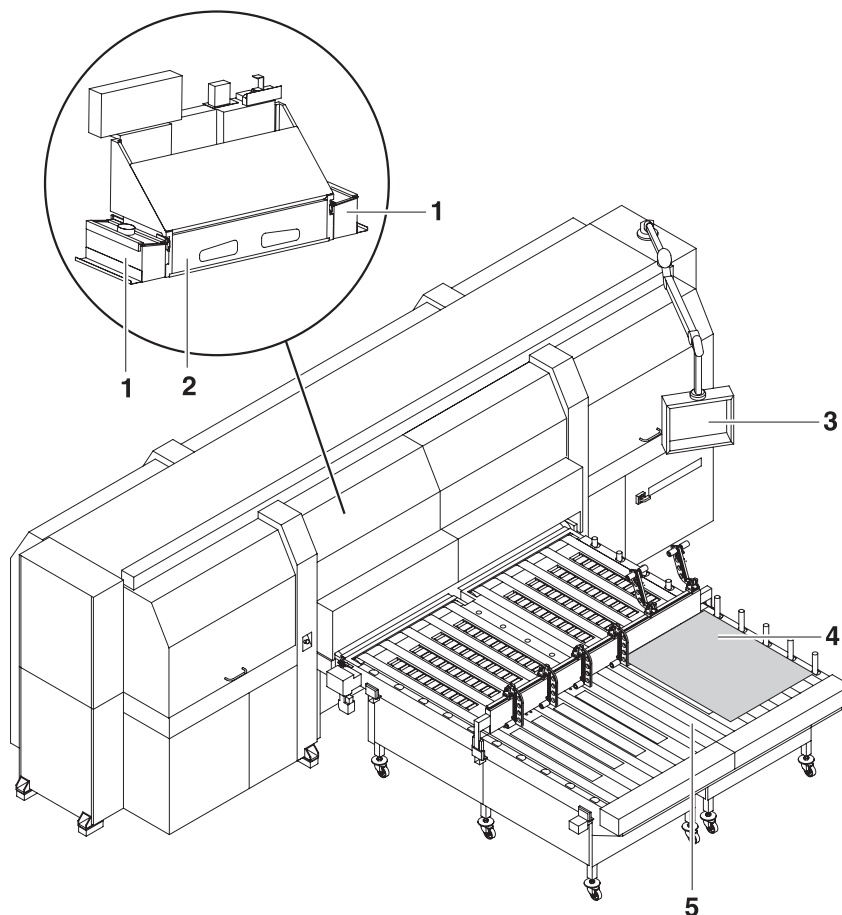


Fig. 7 Components of the printer (here: loading side)

**Function** The medium (4) is fed from the loading side. The automatic feed system (5) allows plate media to be fed in continuously on a larger scale.

Transport rollers on the inside of the printer transport the medium through the printer during the printing process.

The printer is operated at the workstation (3).

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

#### 1.1 Heavy roll tool (optional)

**Task** Roll media are loaded with the heavy roll tool.

**Components** The heavy roll tool is comprised of an unwinding unit on the loading side and a winding unit on the unloading side. The winding and unwinding units have essentially the same design

- 1 Roll mount
- 2 Roll medium
- 3 Roll-end sensor
- 4 Optical sensor

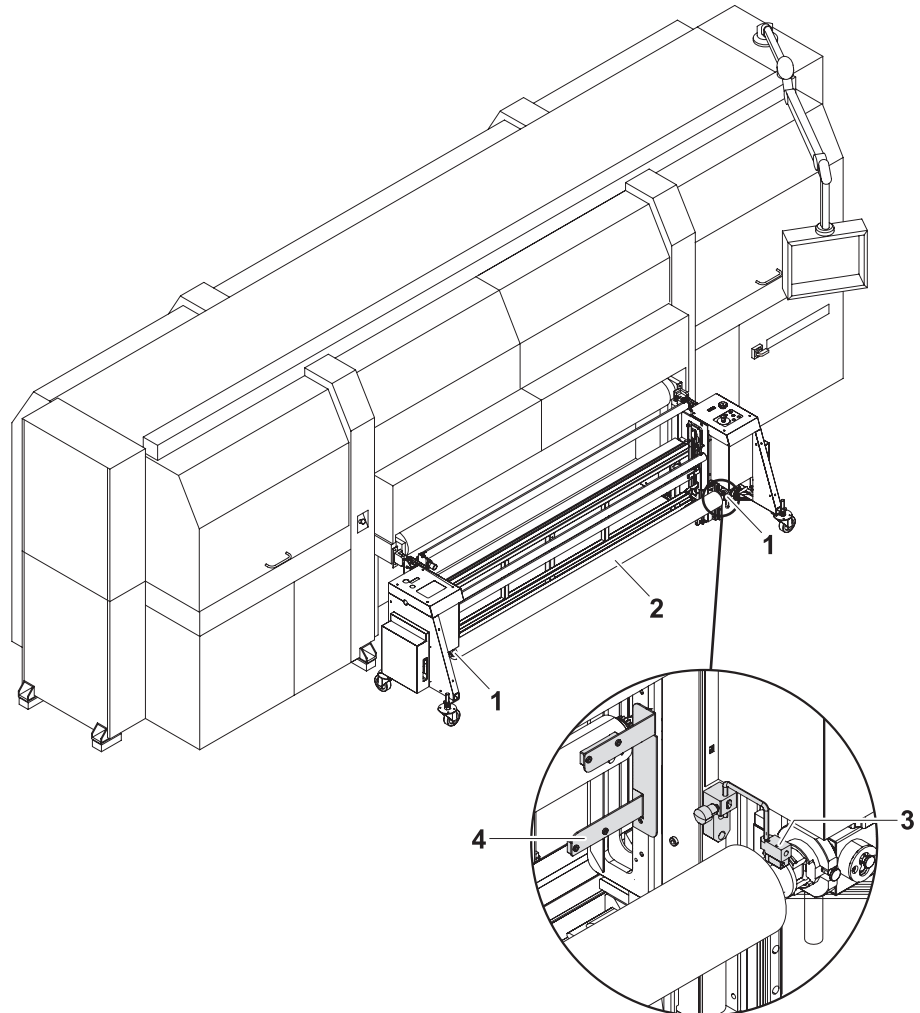


Fig. 8 Components of the heavy roll tool (here: unwinding unit on the loading side)

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

The roll medium is lead through the printer over the redirection and tensioning rollers and wound on the winding unit on the unloading side.

Drives controlled via optical sensors (4) wind and unwind the medium.

The roll-end sensor (3) on the unwinding unit detects when the roll medium is fully unwound. The printing process is then automatically interrupted, and a message appears in the software.

## 1.2 Workstation

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



## Components

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

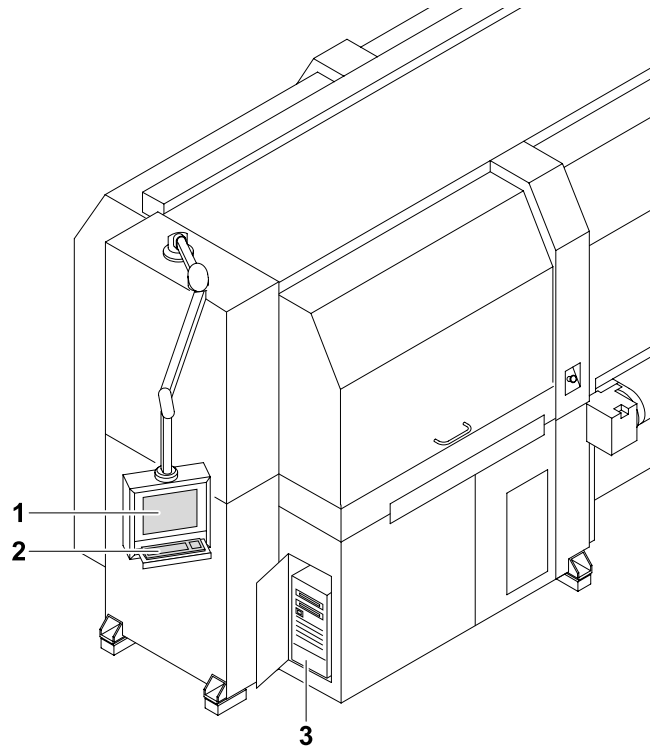


Fig. 9 Workstation

The workstation consists of the computer (3), monitor with touch screen (1) and keyboard (2).

**Function** The workstation makes available the software for controlling the printer.

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 print queue
- Initiation of the printing process

## 1.3 Ink supply unit

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

## Components

- 1 Ink supply unit

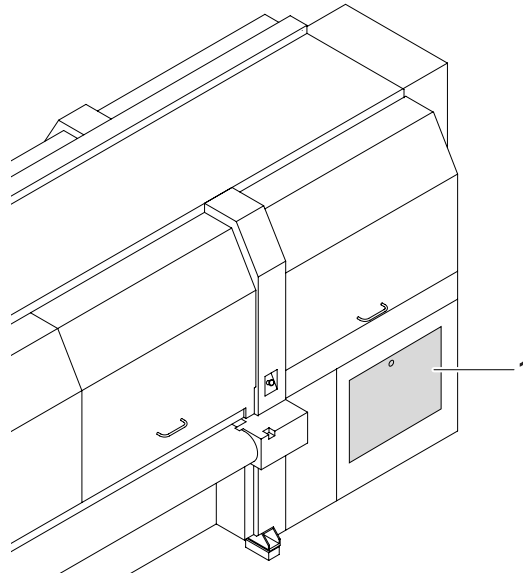


Fig. 10 Ink supply unit

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.

## 1.4 Cleaning system

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

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

- 1 Suction strips
- 2 Catch tank
- 3 Cleaning access point

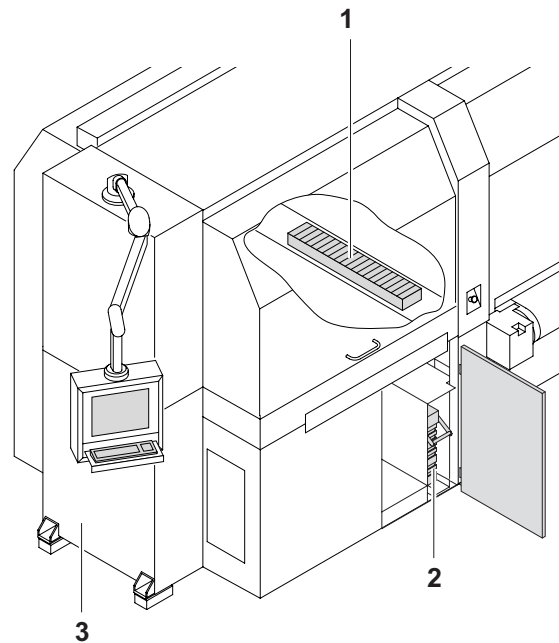


Fig. 11 Cleaning system

**Function** When the purging function is initiated, ink is forced through the print heads and collected in the catch tank (2).

The suction strips (1) suck the ink residue off the print heads.

The cleaning access point (3) allows manual cleaning of the print heads from below.

## 2 Workflow

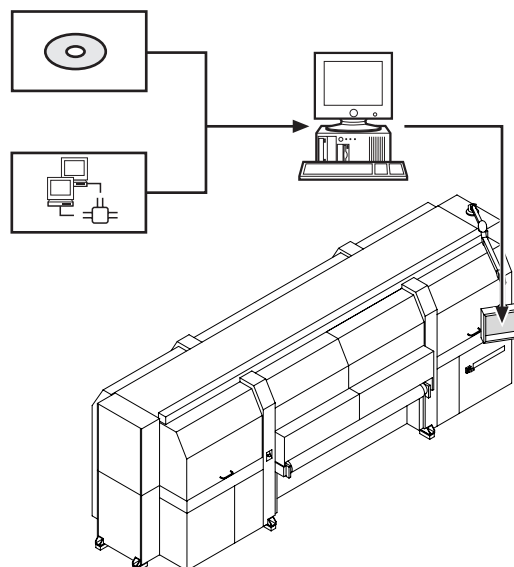


Fig. 12 Workflow

The image files to be printed are loaded onto an external RIP server via CD 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 file is displayed in the input folder and is available for editing additional printing options, such as image cropping, media channel assignment or printing mode (2–5 Pass/HighSpeed/Draft glossy or matt).

## D Installation and commissioning

Installation and commissioning are performed by service technicians authorized by Durst Phototechnik AG.

# E Operation

## 1 An overview of daily tasks

### 1.1 Performing daily tasks

- Preparing printer** ✓ The printer and workstation are switched on
1. Check fill level of ink and refill ink if necessary.
  2. Carry out the daily print head maintenance work (→ Page 93 / Print head maintenance).

- Printing**
3. If printing extends past the medium edge, tape the conveyor belt at the edges of the medium to prevent soiling.
  4. Prepare images on external RIP server and send them to printer.
  5. Select or check print options at the workstation.
  6. Move images to the queue.

#### Perform the daily shutdown

**i** 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.

7. Print a test image.
8. In the software, press the **Maintenance** button.
9. Press the **Printer** tab.
10. Press the **Daily** button under **Printer Shutdown**.
  - ↳ The ink heater is switched off.
  - ↳ The UV lamp system is switched off.
11. So that the printhead carriage remains in the vertical position of the last print, do **not** initialize the printhead carriage.
12. Close all doors in order to prevent ambient light from entering.
13. Exit the software. Do **not** switch off the workstation and printer to do this.

## 2 Workstation

### 2.1 Connection of external devices

#### 2.1.1 Connecting a USB stick/an external USB hard disk

**i** 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.

**CAUTION**

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.

## 2.2 Booting up and shutting down the workstation

### 2.2.1 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.

### 2.2.2 Shutting down workstation

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

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

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

## 3 Switching printer on and off

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

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

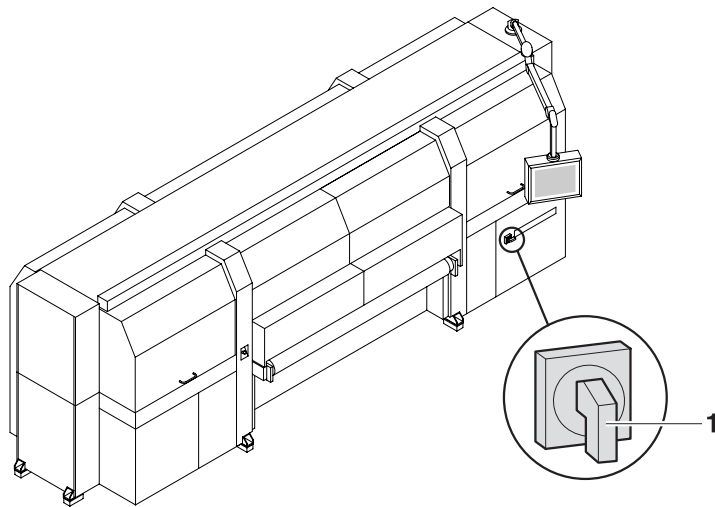


Fig. 13 Location of main switch

### 3.1 Switching on printer

- ✓ The workstation is booted up
  - ✓ The software has been started
1. Switch on printer with main switch (1).
  2. Close flip doors.
  3. In the software, press the **Maintenance** button.
  4. Select **Printer** tab.
  5. Press **Initialize**.
    - ↳ The printhead carriage, table fan and all motors move to the reference position.
    - ↳ The interface between the internal electronics and workstation is initialized.
    - ↳ The UV lamp system is initialized.
    - ↳ The procedure is shown on the screen and is complete after approx. 3 minutes.
- 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.
6. Press the **Medium > Load** button in the software.

### 3.2 Switching off printer

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**

- ▶ Do not touch any cables or electrical components after switching off the printer.

1. Switch off printer with main switch.
2. Secure the main switch with a lock before carrying out maintenance and repair work.

## 4 Basic functions of the software

### 4.1 Installation

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

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

#### 4.1.1 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.

#### 4.1.2 Installing software from CD

- ▶ Insert the printer software CD and follow the instructions on the screen.

#### 4.1.3 Entering software license

- ✓ The software has been started

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


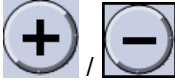

### 4.2 The menu bar

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



Fig. 14 Menu bar

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

Item	Function
	Open operating instructions
	Maximize/minimize program window
	Exiting the software

### 4.3 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. 15 Status bar

### 4.4 Basic operation

You can operate all dialog elements, e.g. buttons, scroll bars and arrow symbols, just by pressing the touch screen.

You can also use the keyboard, trackball and mouse.

#### 4.4.1 Starting the software

- ✓ Monitor and computer are switched on
- ✓ The Linux operating system has been started
- ▶ Double-press  .

#### 4.4.2 Exiting the software

1. Press  .
  - ↳ The **Durst Rho 1000** dialog window appears.
2. Confirm with **Yes**.

#### 4.4.3 Operating dialog elements

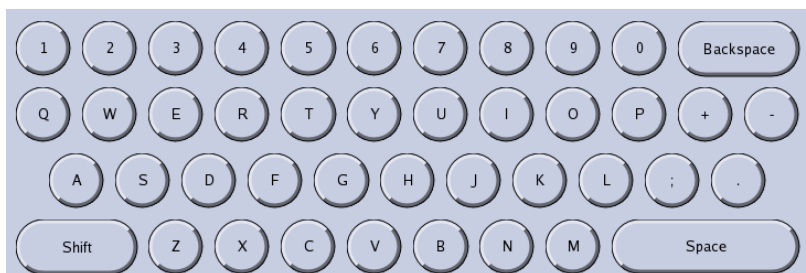
- ▶ Press the desired dialog element on the screen.
  - or –
  - Operate dialog element with keyboard, trackball or mouse.

#### 4.4.4 Selecting entries

- ▶ To select entries such as hotfolders or media, press the desired entry.

#### 4.4.5 Entering data into input fields via the touch screen

1. Press the desired input field.
  - ↳ A virtual keyboard appears.



2. Enter desired text by pressing the corresponding letters/numbers on the virtual keyboard.

## 5 Feed system

### 5.1 Operating modes

The feed system can be operated in 3 operating modes:

- Automatic operation for serial printing
- Semi-automatic operation for printing individual plate media
- Manual operation for individual extra-long plate media

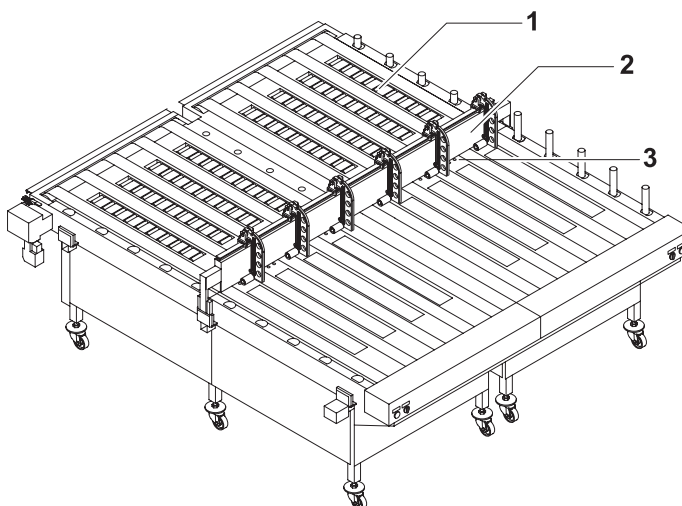


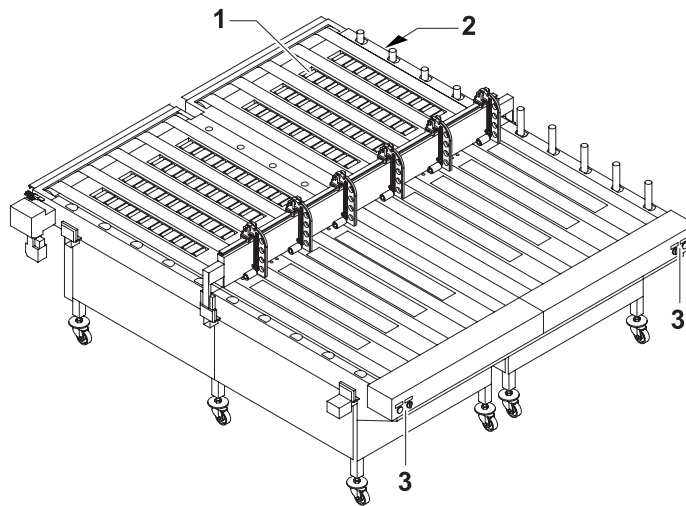
Fig. 16 Feed system overview

**Automatic operation** In automatic operation, the panel media are stacked one on top of another. The front stop (2) holds back the plate media. Only the respective bottom-most plate medium is transported to the printer through the gap between the front stop and the conveyor belt.

**Semi-automatic operation** In semi-automatic operation, the front stop is not used. Pins (3) that move up automatically in this operating mode serve as the front stop. If drawing-in is initiated manually, the pins move down and release the plate medium transport.

**Manual operation** In manual operation, the front stop is not used. In this operating mode, the rolls (1) move up. The plate medium is placed onto the feed system and is pushed manually onto the rolls up to the printer.

## 5.2 Operator panels



**Semi-automatic operation** There is an operator panel (3) on both the right and left sides of the feed system for semi-automatic operation.

The buttons have the following function:

Button designation	Function
Right side: <b>Ready – Right</b> Left side: <b>Ready – Left</b>	Start drawing-in of the plate medium
<b>Auto – Man</b>	Switching between automatic and semi-automatic operation

**Manual operation** Manual operation is prepared on the operator panel for manual operation (2). The **Roll Up – Down** key can be used to move the rolls (1) up or down.

## 5.3 Docking the feed system

### 5.3.1 Procedure

<p>The feed system is very heavy!</p> <p><b>Risk of crushing during docking</b></p> <ul style="list-style-type: none"> <li>▶ Docking must always be done by two people.</li> <li>▶ When pushing, do not reach into the area of the printer guide mechanism.</li> </ul>

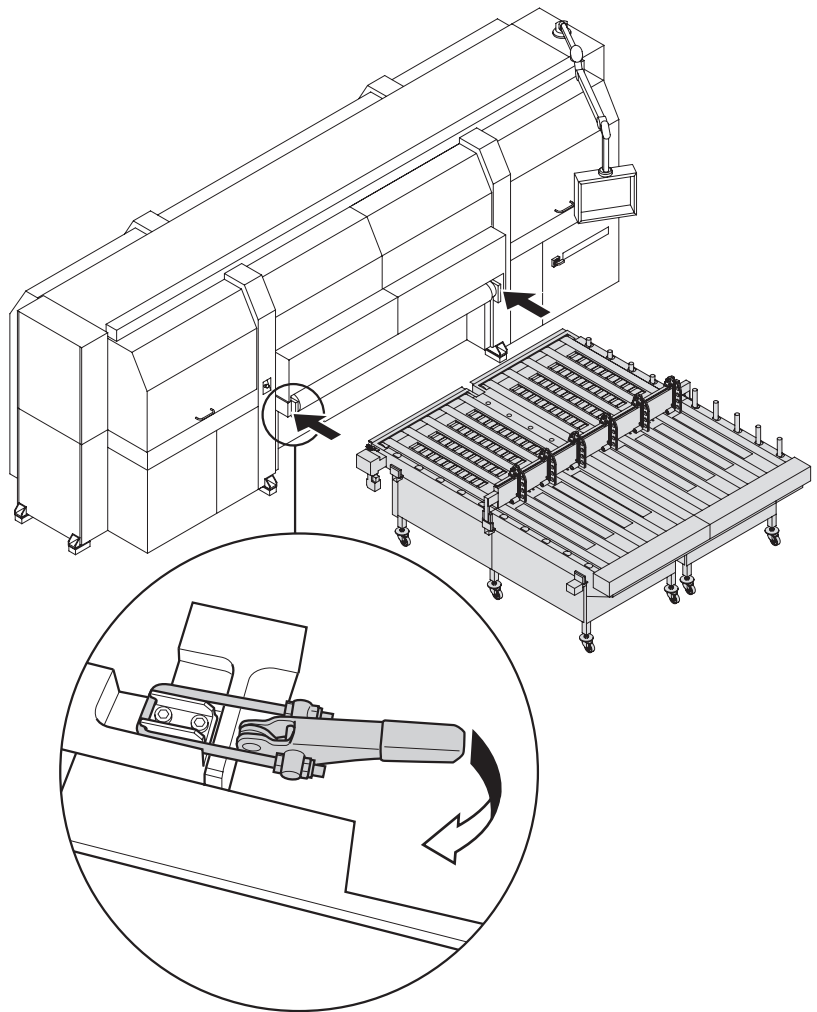


Fig. 17 Docking the feed system

1. Slide feed system into the guide mechanism of the printer.
2. Close clamping lock.
3. Connect the power cable and compressed-air hose to the external supply.

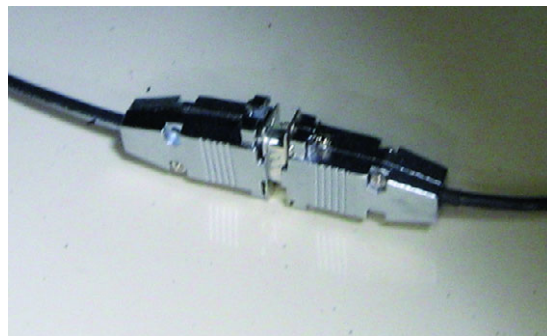


Fig. 18 Connect the control cable

4. Connect the control cable of the feed system to the printer's control cable.

## 5.4 Setting front stop

The front stop must be adjusted to the width and thickness of the plate media. The plate media lying on top are held back. If necessary, the front stop can be completely removed for loading in semi-automatic operation.

### 5.4.1 Removing the front stop

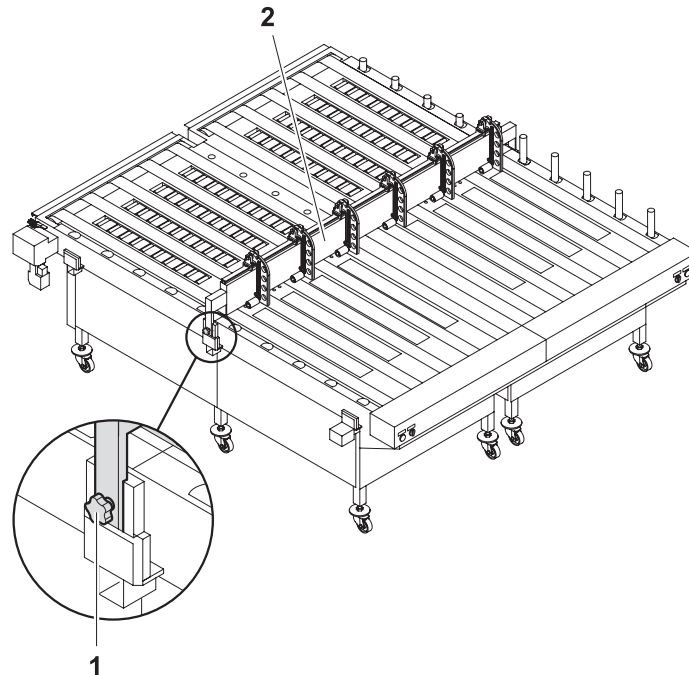


Fig. 19 Removing the front stop

1. Undo the fastening screw (1) on the right and left side of the feed system.
2. Remove the front stop (2).

### 5.4.2 Adjusting the clearance height

Depending on the thickness of the plate medium, the clearance height (the gap between the front stop and the conveyor belt) must be adjusted.

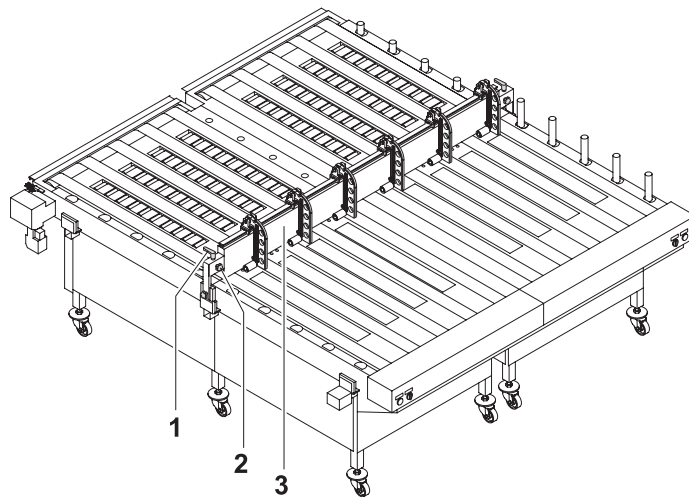


Fig. 20 Adjusting the clearance height

1. Loosen securing screw (2).
2. Use the lever (1) to adjust the height of the front stop (3).
3. Tighten securing screw.

#### 5.4.3 Adjusting the swivel stops

The swivel stops guide the plate media at the sides and keep the webs at a defined distance.

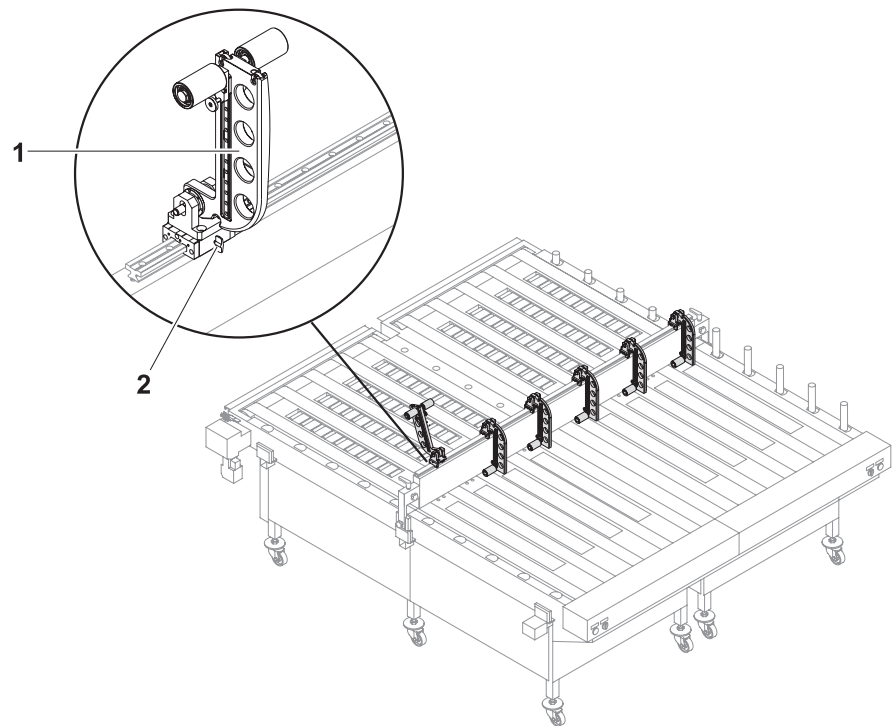


Fig. 21 Adjusting the swivel stops

1. Perform the following steps in order to adapt the swivel stops (1) to the width of the plate media:
  - Loosen securing screw (2).
  - Move the swivel stop on the guide rail according to the desired width.
  - Tighten securing screw.
2. Swivel down the corresponding swivel stops according to the number of intended webs.

## 6 Heavy roll tool (optional)

### 6.1 Docking heavy roll tool

The unwinding unit is docked on the loading side, and the winding unit is docked on the unloading side in the same manner.



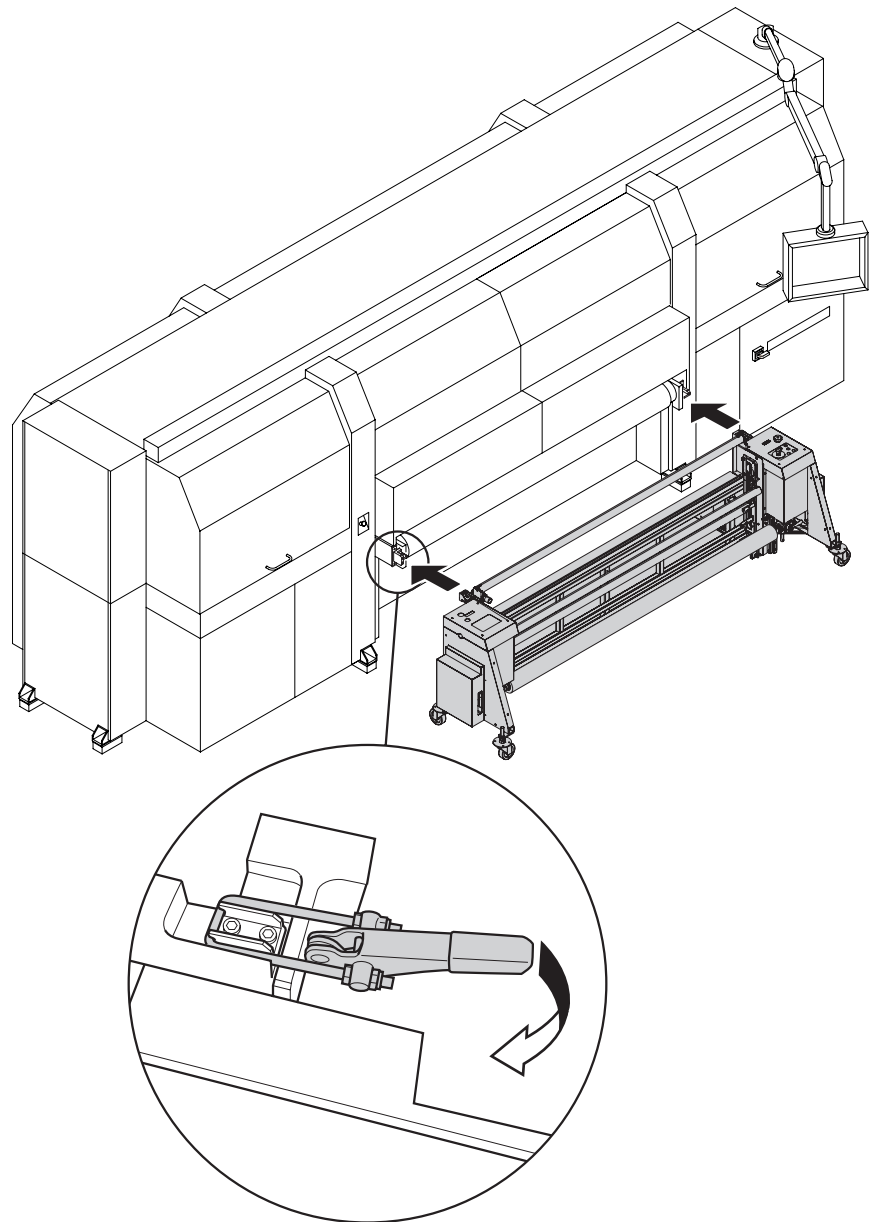


Fig. 22 Sliding the heavy roll tool into the guide and closing the clamping lock

1. Slide heavy roll tool into the guide of the printer.
2. Close clamping lock.

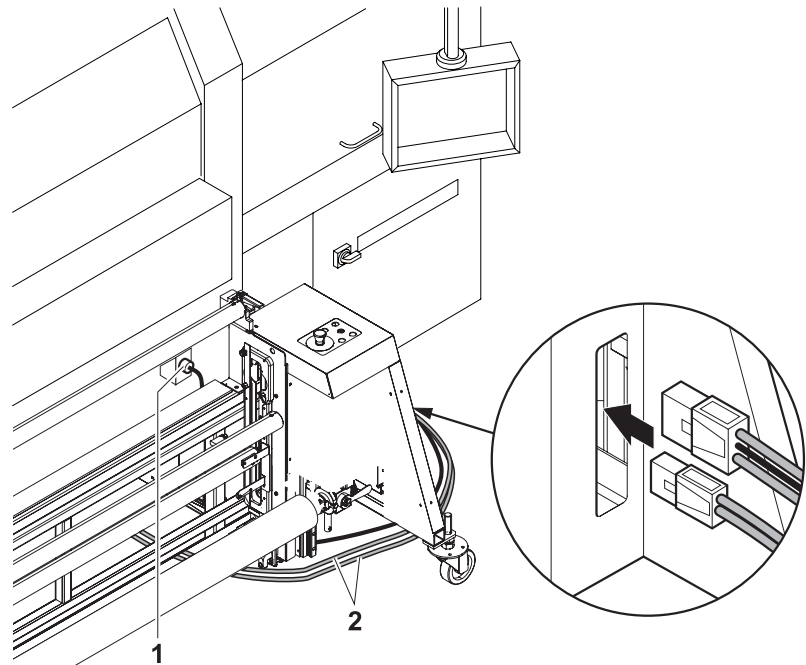


Fig. 23 Connecting the power and connecting cables

3. Connect the power cable to the connector on the unwinding unit and to the connector on the printer (1).
4. Attach the connecting cable (2) to the connectors on both the unwinding and winding units.

## 6.2 Operating drives of the unwinding and winding units

The drives of the unwinding and winding units are operated at the operator panels, one of which is located on each of the right and left sides.

- 1 **UP**
- 2 **DOWN**
- 3 Selector switch
- 4 **REVERSE**
- 5 **FORWARD**

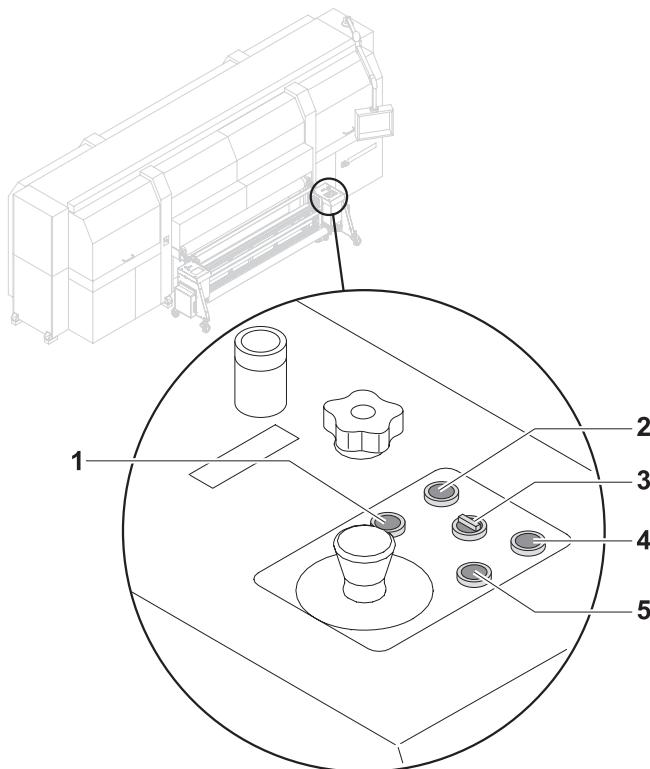


Fig. 24 Operator panel

### 6.2.1 Setting axis drives to automatic operation

- ▶ Depending on the desired rotation direction, set the selector switch (3) to **Autom. Forward** or **Autom. Reverse**.

### 6.2.2 Rotating axis drives forward and in reverse manually

1. Set the selector switch (3) to **Manual**.
2. Press and hold the **FORWARD** or **REVERSE** button as long as desired.

### 6.2.3 Moving unwinding or winding unit up or down

- ▶ Press and hold the **UP** or **DOWN** button as long as desired.

## 7 Loading medium

### 7.1 Loading plate medium

Plate media can be loaded in the following operating modes:

- Automatic: Load thin, flexible plate media for serial printing
- Semi-automatic:
  - Thin, flexible plate media
  - Mirror-inverted printing of the reverse side
- Manual operation: Extra-long plate media

### 7.1.1 Loading plate media in automatic operation

✓ In the software, **Continuous Feeding** is activated in the media channel

1. Set front stop (→ Page 38 / Setting front stop).
2. Set the feed system to automatic operation on the operator panel.

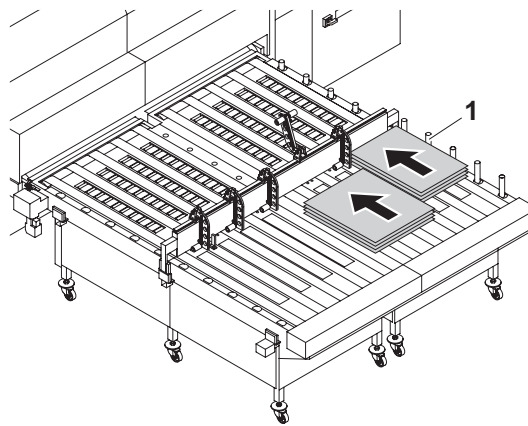


Fig. 25 Place the media onto the loading position

3. Place the desired number of stacked plate media onto the feed system. When doing this, proceed as follows:
  - Position the first web against the right guides (1).
  - Position all other webs on the left. When doing this, place the plate media between the swivel stops.
4. Select the desired media channel in the software.
5. Start printing in the software.
6. Lay further media onto the feed system while the media are being drawn in.
  - ↳ The media are transported automatically to the printer.

### 7.1.2 Loading plate media in semi-automatic operation

For mirror-inverted printing of the reverse side, the front side is used first with the right stop, followed by the reverse side with the left stop.

- ✓ In the software, **Continuous Feeding** is activated in the media channel
1. If necessary, remove the front stop or adjust it so that drawing-in of the plate medium is not hindered (→ Page 38 / Setting front stop).
  2. Set the feed system to semi-automatic operation on the operator panel.
    - ↳ The pins for the front stop move up.

3. Select the desired media channel in the software. Pay attention to the following: If a plate medium is to be printed with the left stop (e.g. for back printing), this option must be activated in the media channel.

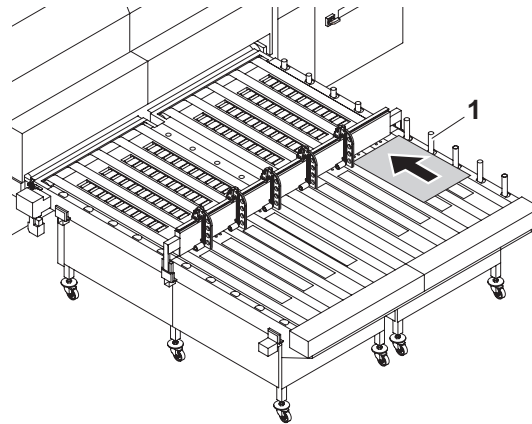


Fig. 26 Place the medium against the guides and pins (here: right stop)

4. Place the plate medium onto the feed system as follows:
    - Place the plate medium against the guides (1). Here, the guides (1) on the right side are used as standard. The guides on the left side are used in conjunction with the left stop (e.g. for back printing).
    - Place the plate medium against the pins at the front side.
  5. Start drawing-in at the corresponding operator panel.
- ↳ The medium is transported automatically to the printer.

### 7.1.3 Loading plate media in manual operation

- ✓ In the software, **Continuous Feeding** is deactivated in the media channel
1. If necessary, remove the front stop or adjust it so that drawing-in of the plate medium is not hindered (→ Page 38 / Setting front stop).
  2. On the operator panel for manual operation, move the rolls up.
  3. Select the desired media channel in the software. Pay attention to the following: If a plate medium is to be printed with the left stop (e.g. for back printing), this option must be activated in the media channel.

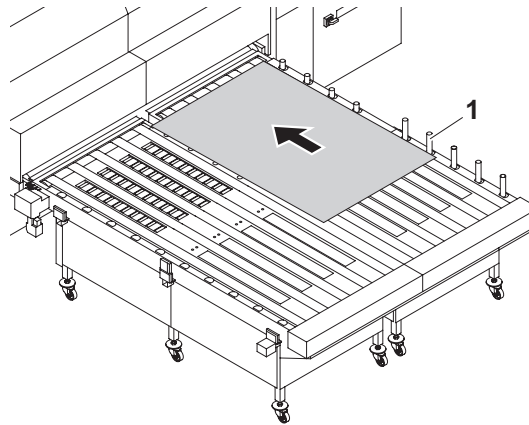


Fig. 27 Place the medium against the guides and pins (here: right stop)

4. Place the plate medium against the guides (1). Here, the guides on the right side are used as standard. The guides on the left side are used in conjunction with the left stop (e.g. for back printing).
5. Push the plate medium manually up to the printer.

## 7.2 Loading roll medium

A roll medium is loaded in the following steps in turn:

- Initiating loading procedure in the software
- Inserting roll medium on the loading side
- Inserting empty core on the unloading side
- Guiding roll medium through the printer
- Aligning the roll medium
- Setting the roll-end sensor
- Commissioning unwinding and winding units

### 7.2.1 Initiating loading procedure in the software

- ▶ Select the desired media channel in the software. Ensure that **Roll Medium** and **Heavy Roll Tool** are activated in the media channel (→ Page 69 / Managing media channels).

### 7.2.2 Inserting roll medium on the loading side

1. Move unwinding unit to the bottom position.

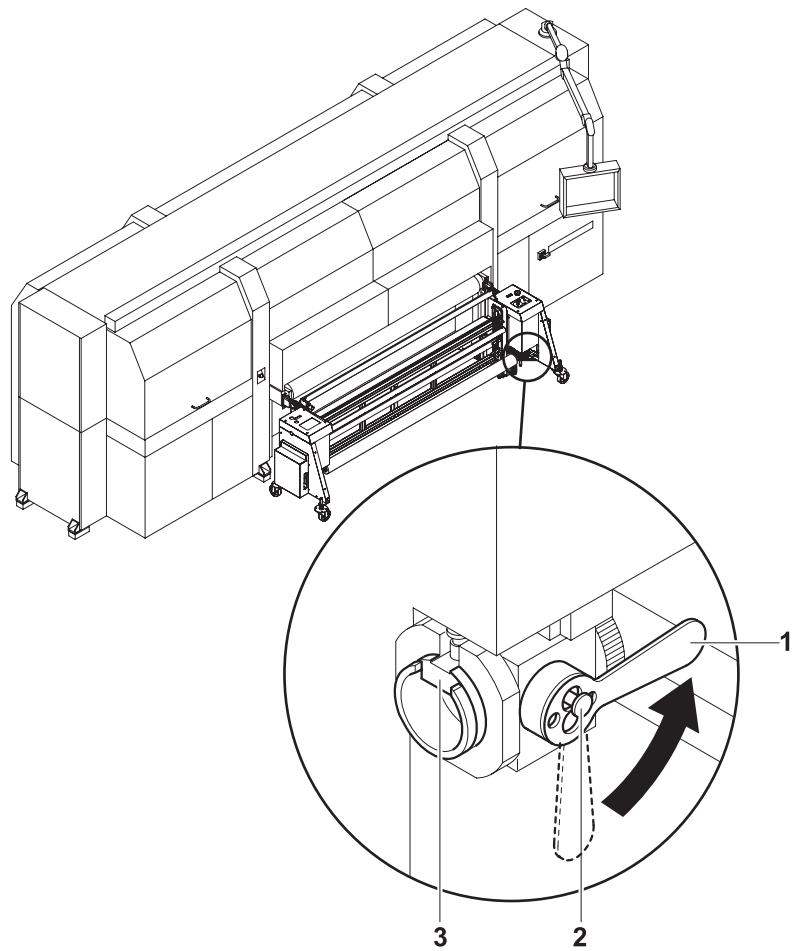


Fig. 28 Decouple roll mount from drive and rotate roll mount

2. Disengage locking button (2) for coupling.
3. Rotate lever (1) to the horizontal position to decouple the roll mount from the drive.
4. Turn roll mount manually until the groove (3) faces upward.

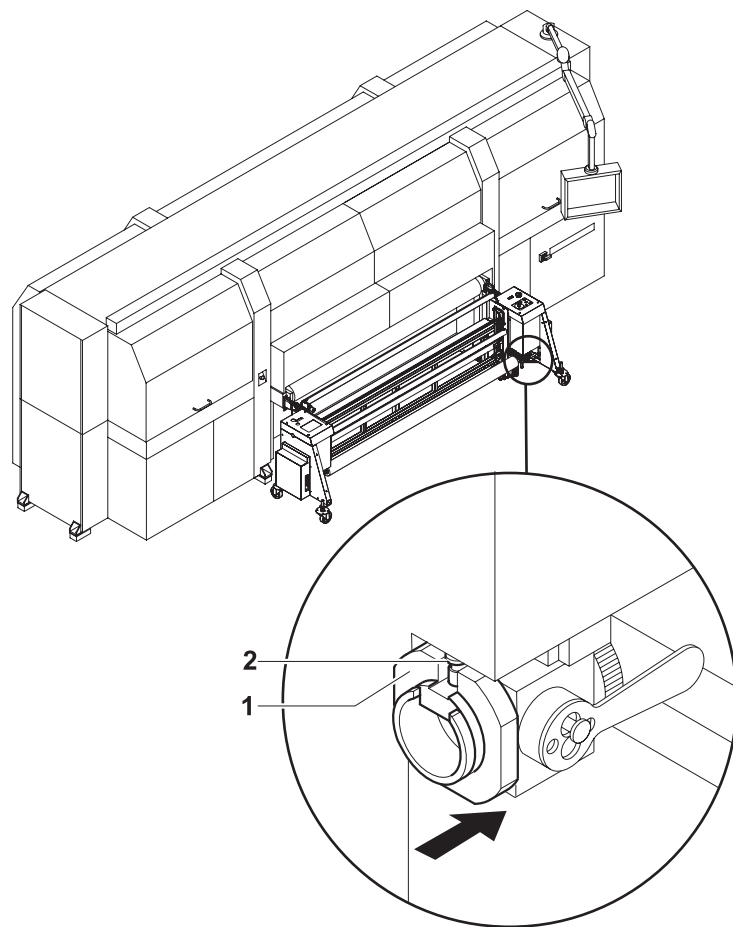


Fig. 29 Opening the groove

5. Open grooves of the right and left roll mounts in the following manner:
  - Disengage locking button (2).
  - Slide sliding ring in such a way (1) that the groove is exposed.

**⚠ 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.

6. Using a hand lift, position the roll with the axis in such a way that the axis ends are located above the grooves in the roll mounts.
7. Move unwinding unit to the top position. Allow the axis ends to slide into the grooves and take the roll upward.



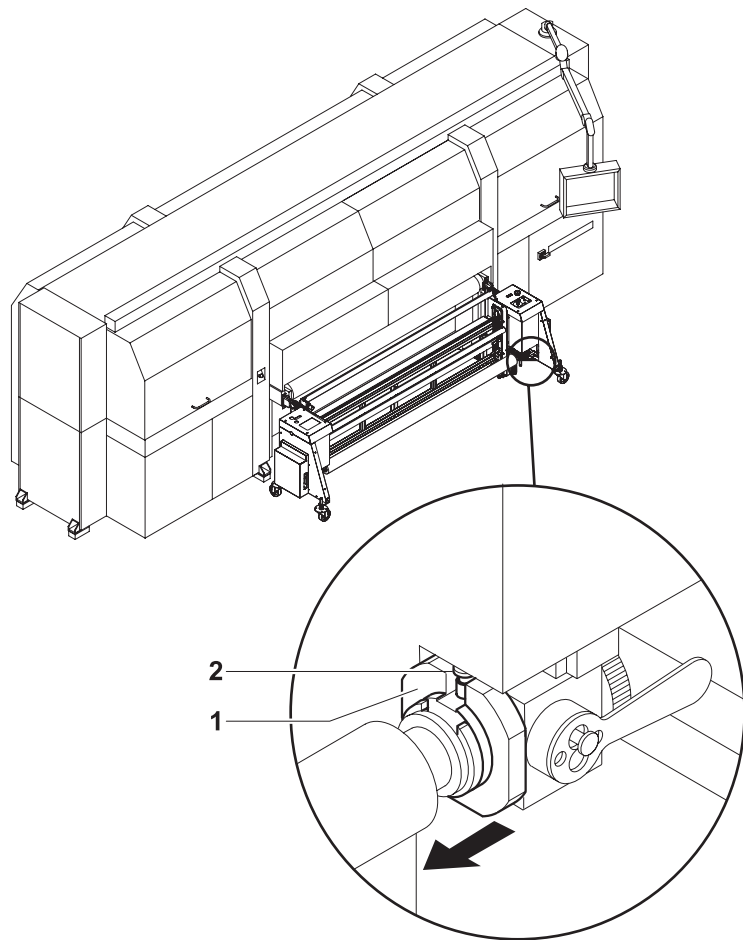


Fig. 30 Securing the axis with a sliding ring

8. Secure both axis ends as follows:
  - Disengage locking button (2).
  - Slide sliding ring (1) over the axis end.
  - Lock locking button.

### 7.2.3 Inserting empty core on the unloading side

- ▶ Insert empty core to wind up the roll medium in the same manner as the roll medium on the loading side.

### 7.2.4 Guiding roll medium through the printer

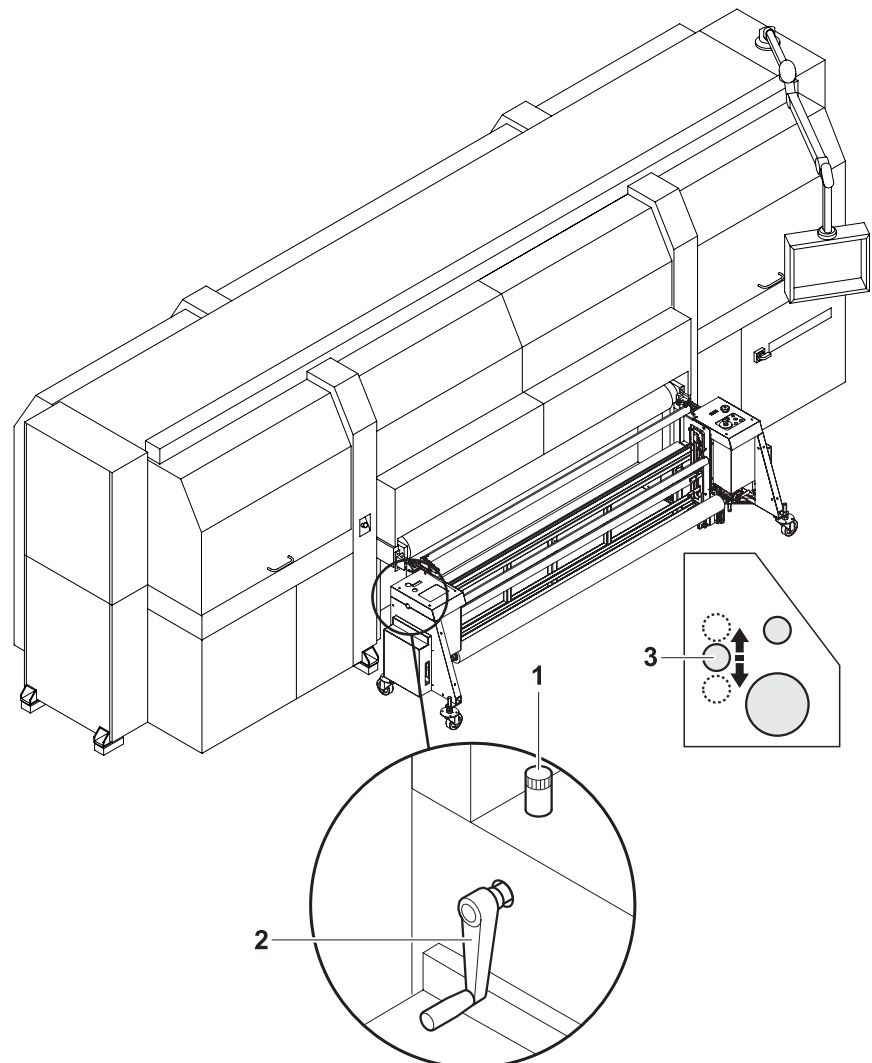


Fig. 31 Moving the tensioning roller upward (movement of the tensioning roller (3) shown schematically)

1. To make threading of the roll medium around the tensioning roller easier, carry out the following measures on the unloading and loading sides:
  - Loosen the set screw (1).
  - Move tensioning roller (3) upward with crank (2).
  - Secure the tensioning roller with the set screw.

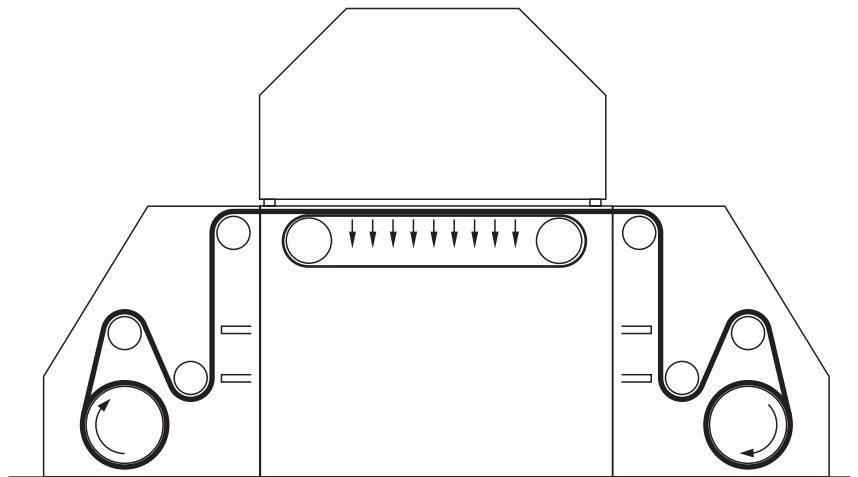


Fig. 32 Guide roll medium around tensioning roller and redirection rolls (here: schematically for front printing)

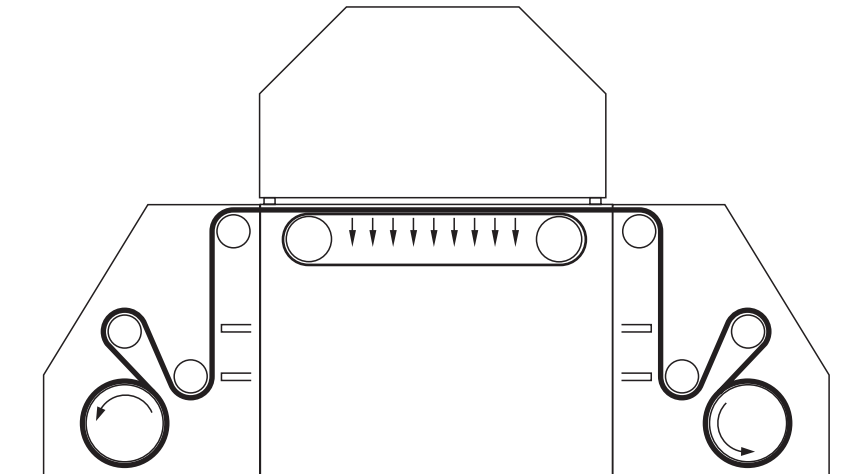


Fig. 33 Guide roll medium around tensioning roller and redirection rolls (here: schematically for back printing)

2. Guide roll medium around tensioning roller and redirection rolls.
3. Guide roll medium through the printer.
4. Guide the roll medium around the redirection rolls and tensioning roller in the same way at the winding unit and attach it to the empty core.
5. Return tensioning rollers to bottom position on unloading and loading sides.

### 7.2.5 Aligning the roll medium

Carry out the following measures on both the loading and unloading sides.

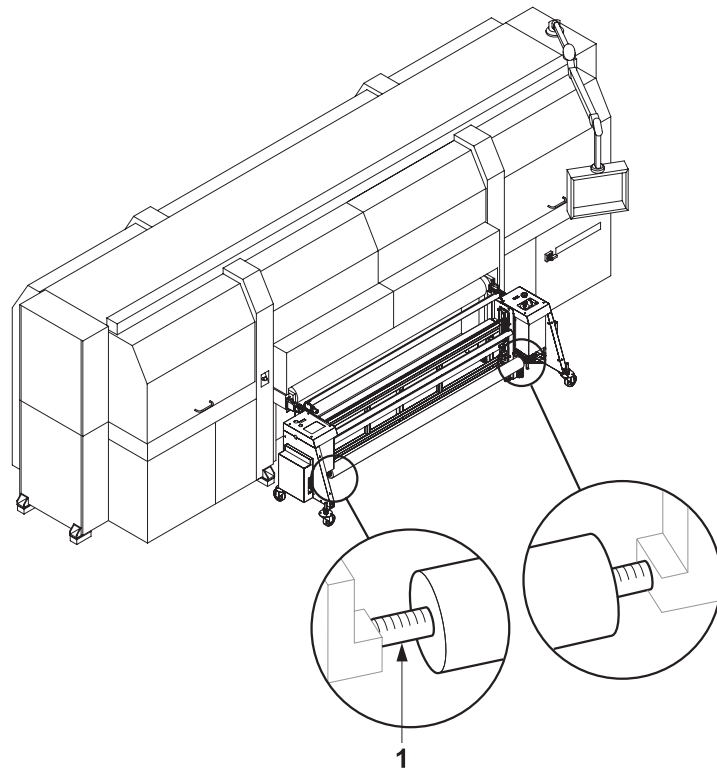


Fig. 34 Aligning the roll medium

1. Pre-position roll on the axis manually using the markings (1).

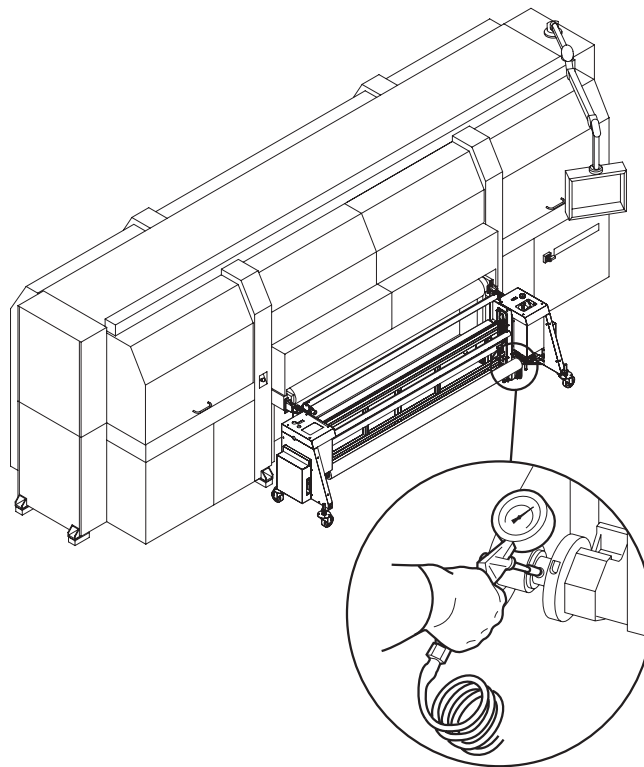


Fig. 35 Blowing compressed air into the valve

2. To secure the roll on the axis, position the air blow gun on valve and blow compressed air into valve. When doing this, pay attention to the permissible air pressure as stated by the manufacturer.
  - ↳ The roll is secured to the axis via the locking jaws.

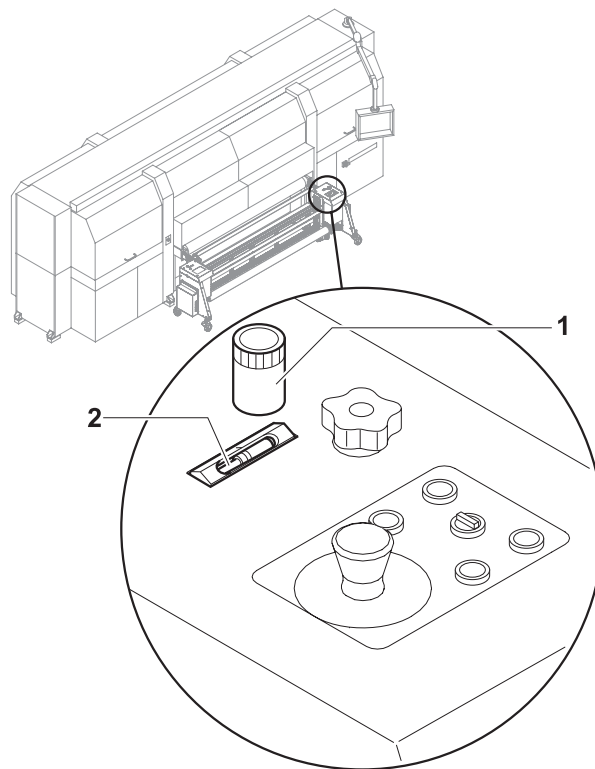


Fig. 36 Carrying out horizontal fine positioning

3. Using the controller (1), position the medium horizontally in such a way that it contacts the stop.  
↳ The horizontal position is shown on the scale (2).

### 7.2.6 Setting the roll-end sensor

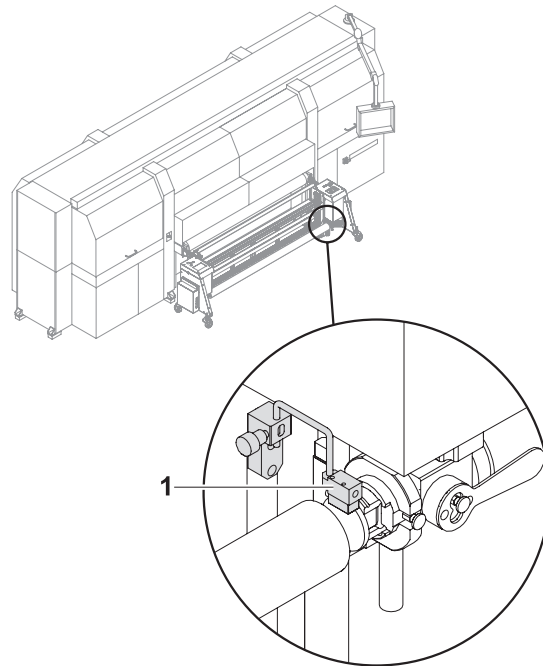
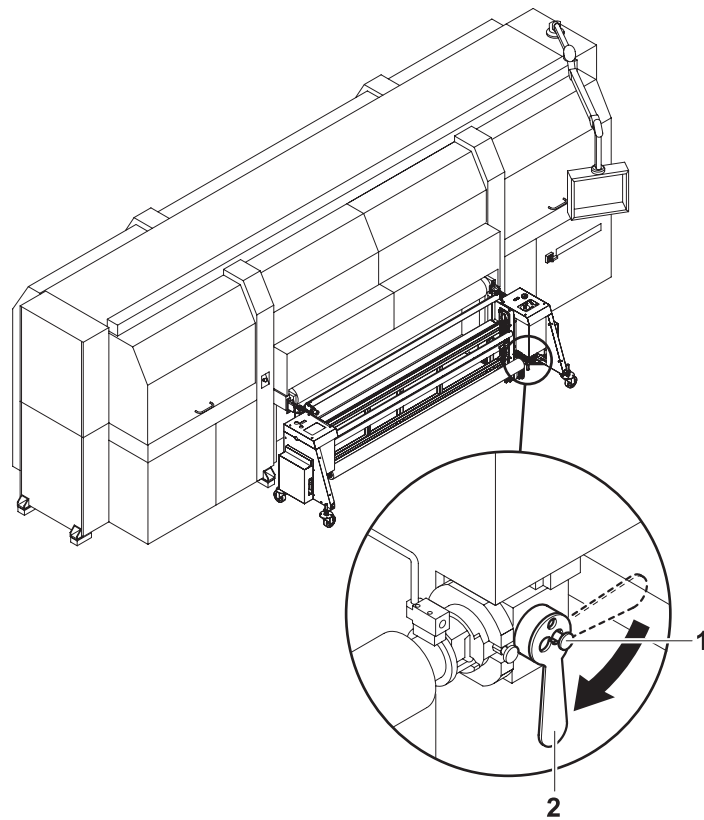


Fig. 37 Setting the roll-end sensor

- ▶ Set the roll-end sensor (1) on the unwinding unit to the desired height.

### 7.2.7 Commissioning unwinding and winding units

Carry out the following measures on both the loading and unloading sides.



1. Turn lever (2) down to the vertical position to couple the roll mount to the drive.
2. Engage locking button (1).
3. Set drive to automatic operation at the operator panel.



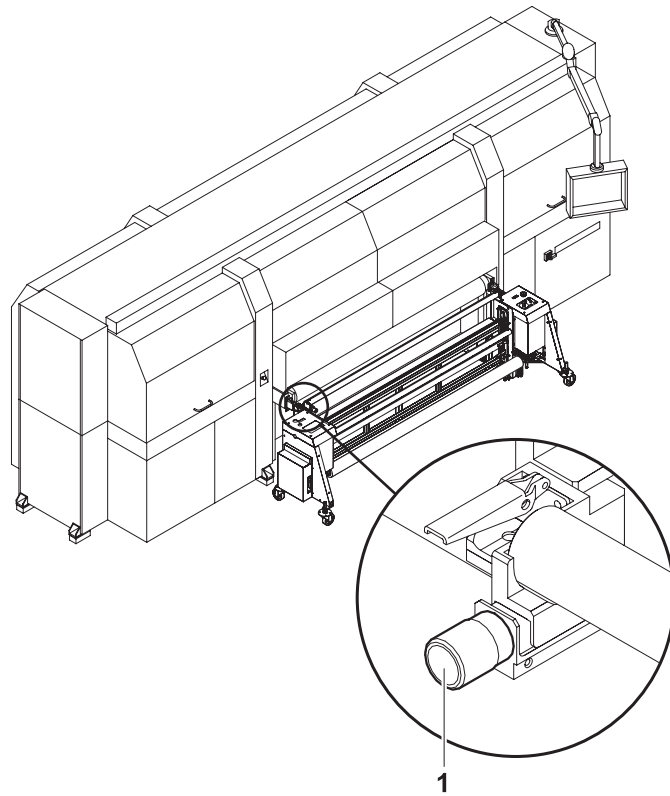
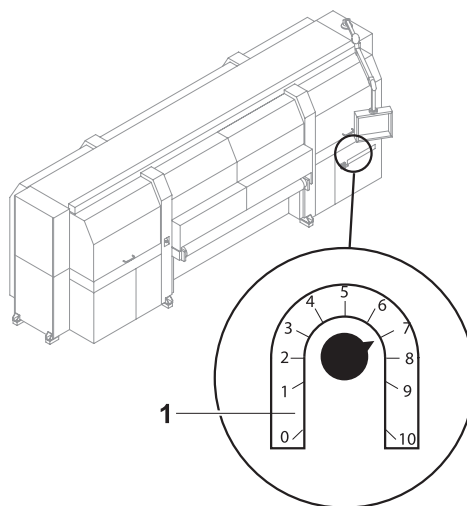


Fig. 38 Adjusting for straight running

4. If necessary, adjust the roll medium for straight running, e.g. if it is throwing folds, with the straight-running controller (1).

## 8 Adjusting the suction power

The suction power can be adjusted with the controller (1).



## 9 Setting up printer

### 9.1 Input folders

You can create, rename and delete input folders individually on the **Input Queue** tab.

#### 1 Navigation window



Fig. 39 **Input Queue** tab

The input folder **InputQueue** is already created as standard, and cannot be deleted.

#### 9.1.1 Editing the input folder

##### Open the Input Queue tab

1. Press **Setup**.
2. Select the **Input Queue** tab.

##### Creating a new input folder

- ✓ The **Input Queue** tab is open

  1. Press **New**.
  2. Enter a name in the **Name** input field.
  3. Enter the desired path in the **Queue Path** input field.
  4. Press **Save**.

##### Renaming input folder

- ✓ The **Input Queue** tab is open

  1. Select the desired input folder in the navigation window.

2. Press **Edit**.
3. Change the name in the **Name** input field.
4. Press **Save**.

### Deleting input folder

- ✓ The **Input Queue** tab is open
1. Select the desired input folder in the navigation window.
  2. Press **Delete**.
  3. Confirm with **Yes**.

## 9.2 Measurement units

You set the measurement unit in the **General** tab:



Fig. 40 **General** tab

### 9.2.1 Setting the measurement unit

#### Opening the General tab

1. Press **Setup**.
2. Select the **General** tab.

#### Setting the measurement unit

- ▶ Press the desired button under **Dimension Units**.

## 9.3 Software validation

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



Fig. 41 General tab

### 9.3.1 Entering license number and software options

#### Opening the General tab

1. Press **Setup**.
2. Select the **General** tab.

#### Entering license number and software options

1. Press the **Edit** button under **Software Validation**.
2. Enter desired values.
3. Press **Save**.

## 9.4 Global encoder offset value

You enter the global value for the encoder offset value in the **General** tab:



Fig. 42 **General** tab

The global encoder offset value applies for all printing.

You can enter an additional encoder offset value for a special medium in the corresponding medium channel. The encoder offset value in the medium channel is then added to or subtracted from the global encoder offset value of the **General** tab.

### 9.4.1 Entering global encoder offset value

#### Opening the General tab

1. Press **Setup**.
2. Select the **General** tab.

#### Entering encoder offset value

1. Press the **Edit** button under **Media Transport Options**.
2. Enter desired value.
3. Press **Save**.

## 9.5 Media families

As you must create separate media channels for the different medium thicknesses and blanks for each material, the number of media channels can become unclear very quickly. For this reason, you have the option of combining multiple media channels into a media family, e.g. KAPA or corrugated cardboard. Each media family is clearly uniquely identified by an ID number (**Family ID**). If a job is transferred from the RIP server to the input folder (**Input Queue** tab) of the printer, it provides its ID number right away, thus indicating the media family to which it belongs. If you select the media channel for a job in the input folder, the software only offers you for pre-selection those media channels that are part of the job's media family.

In the **Media Family** tab, you can create new media families and edit or delete existing media families.

### 1 Navigation window

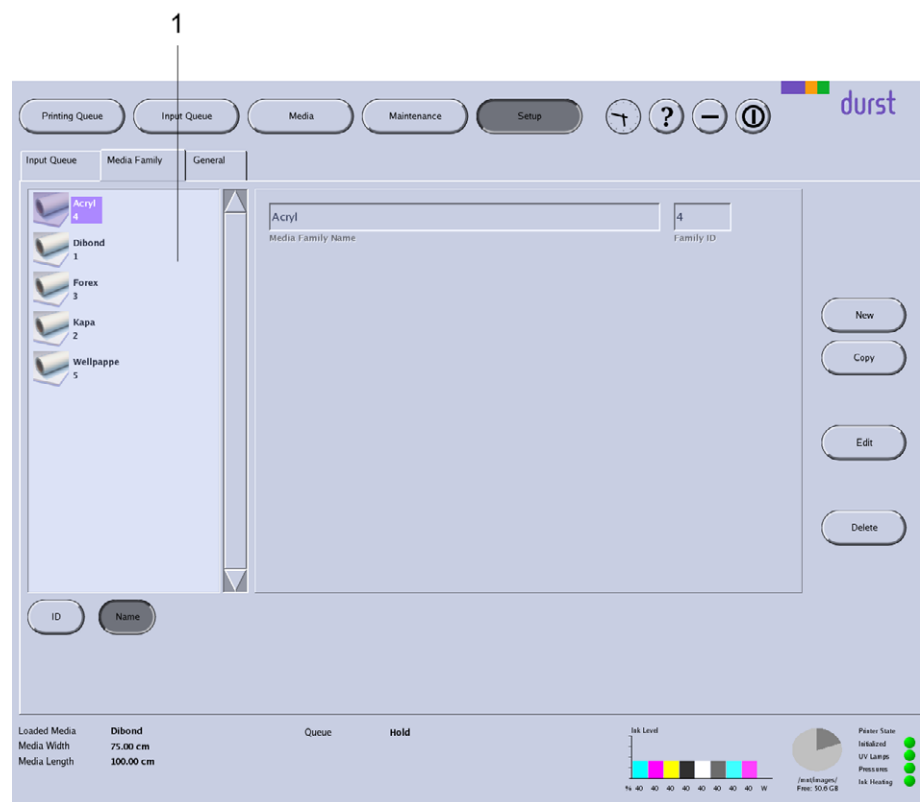


Fig. 43 Dialog window **Media Family**

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

### 9.5.1 Buttons on the right edge of the dialog window

**New** A new media family is created with the **New** button.

**Copy** You copy the selected media family and save it with a new name with the **Copy** button.

**Edit** Parameters of the selected media family are modified with the **Edit** button.

**Delete** The selected media family is deleted with the **Delete** button.

## 9.5.2 Managing media families

### Open the Family ID tab

1. Press **Setup**.
2. Select the **Media Family** tab.

### Creating new media family

✓ The **Media Family** tab is open

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

### Deleting media family

✓ The **Media Family** tab is open

1. Select desired media family in the navigation window.
2. Press **Delete**.

## 10 Operating and maintaining the printer

The following functions are available to you in the tabs under the **Maintenance** button:

- Basic printer functions
- Purging
- Service instructions
- Ink batch tracking

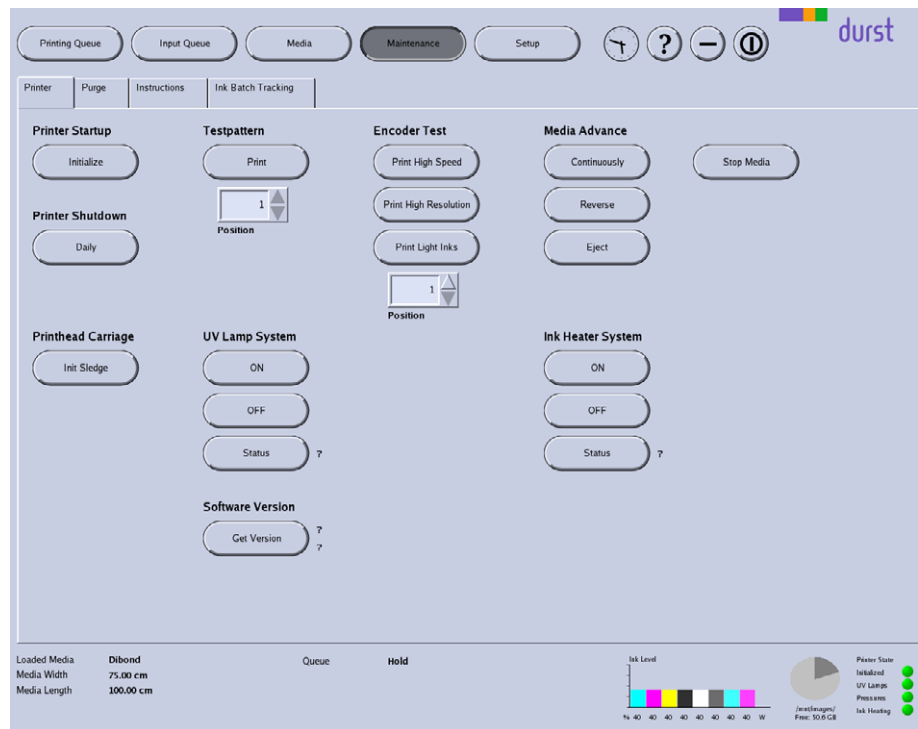


Fig. 44 Tabs under the **Maintenance** button.

## 10.1 Printer functions

In the **Printer** tab, these are some of the functions that you can operate:

- Initialization
- Shutdown
- Test print
- UV lamps
- Encoder test
- Medium advance
- Ink heating



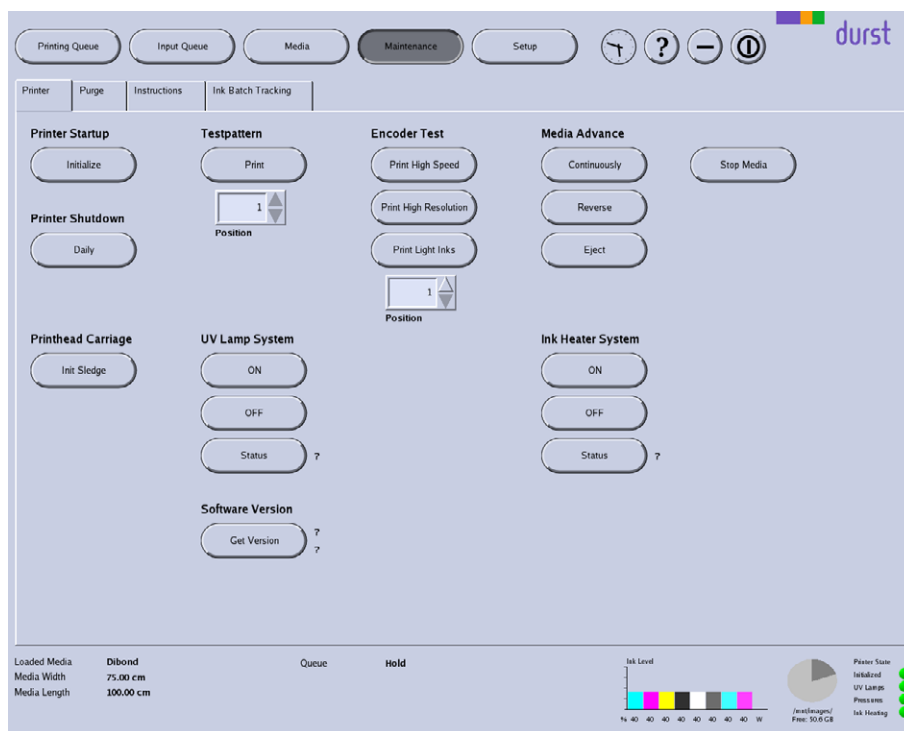


Fig. 45 Printer tab

- Printer Startup** All units of the printer move to the reference position. This option is recommended if the printer was switched on manually.
- Printer Shutdown** The **Daily** button enables you to perform the daily printer shutdown.
- Printhead carriage** The printhead carriage is initialized
- Testpattern** **Print:** The **Print** button initiates the printing of a test pattern, which can be optimized either for high print speed (**Print High Speed**) or high resolution (**Print High Resolution**). The test pattern is not placed in the **Printing Queue** dialog window, rather it is printed immediately.
- Position:** Plate media can be printed with test patterns multiple times. Using the **Position** selection list, you specify the image line on which the respective test pattern is to be printed by repeatedly loading the medium. The software calculates the required advance automatically.
- Encoder Test** You can print an encoder test image with the desired quality with the buttons under **Encoder Test**. When pressing the corresponding button, the encoder test image is transferred directly to the **Printing Queue** dialog window.
- Position:** Plate media can be printed with encoder test images multiple times. Using the **Position** selection list, you specify the image line on which the respective encoder test image is to be printed by repeatedly loading the medium. The software calculates the required advance automatically.
- Media 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**.
- Eject:** The medium is transported out of the printer.

**Stop Media:** The advance is stopped.

## 10.2 Cleaning

You set the cleaning parameters and initiate the purge cycle and print head suction cleaning in the **Purge** tab.

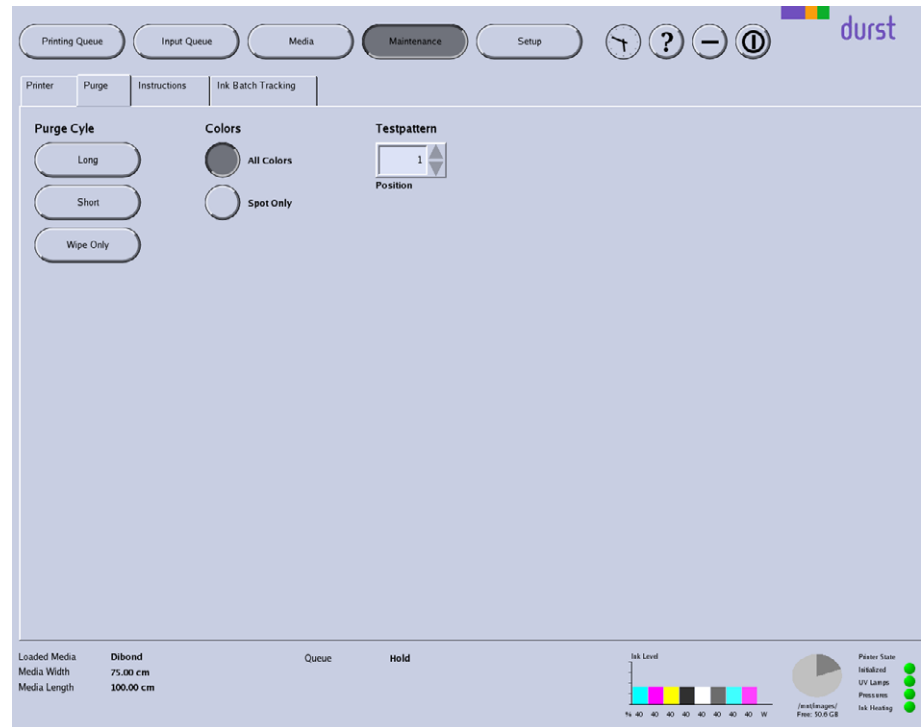


Fig. 46 **Purge** tab

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

**Wipe Only:** Print head suction cleaning

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

**Testpattern** A test pattern is printed automatically after the cleaning cycle. With the **Position** selection list, you determine the image line into which the test pattern should be printed. The software calculates the required advance automatically.

## 10.3 Service instructions

The following functions are available to you in the **Instructions** tab:

- Important service intervals for print head maintenance
- Instructions
- Films
- Time intervals for reminder messages

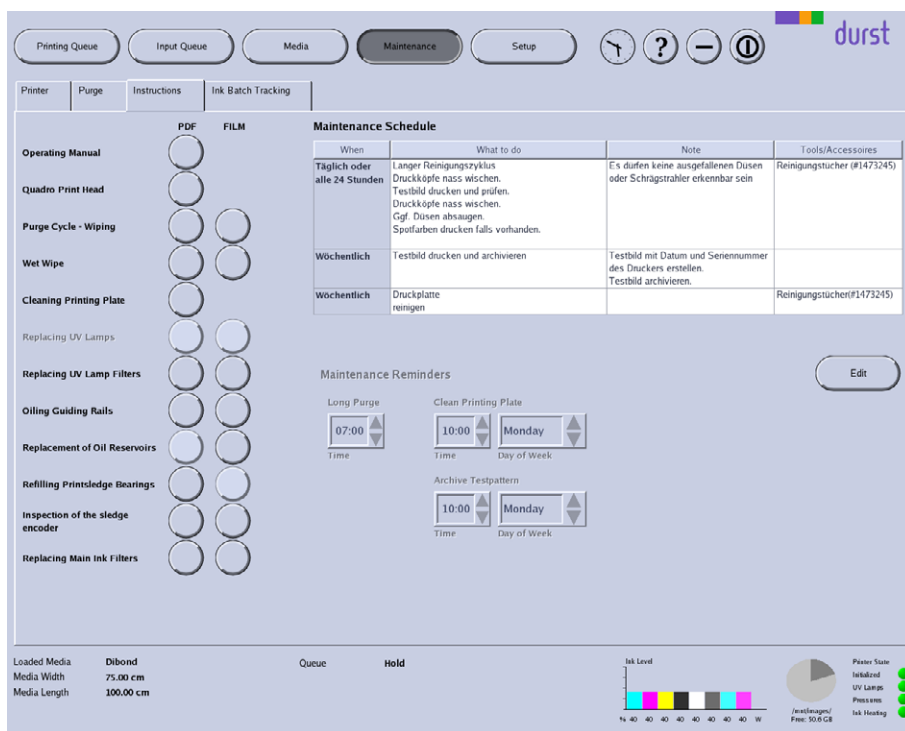


Fig. 47 Instructions tab

**Maintenance Reminders** Under **Maintenance Reminders** you can set the time intervals for reminder messages for the following activities:

- Cleaning cycle
- Cleaning the printing plate
- Archiving the test pattern

### 10.4 Ink batch tracking

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

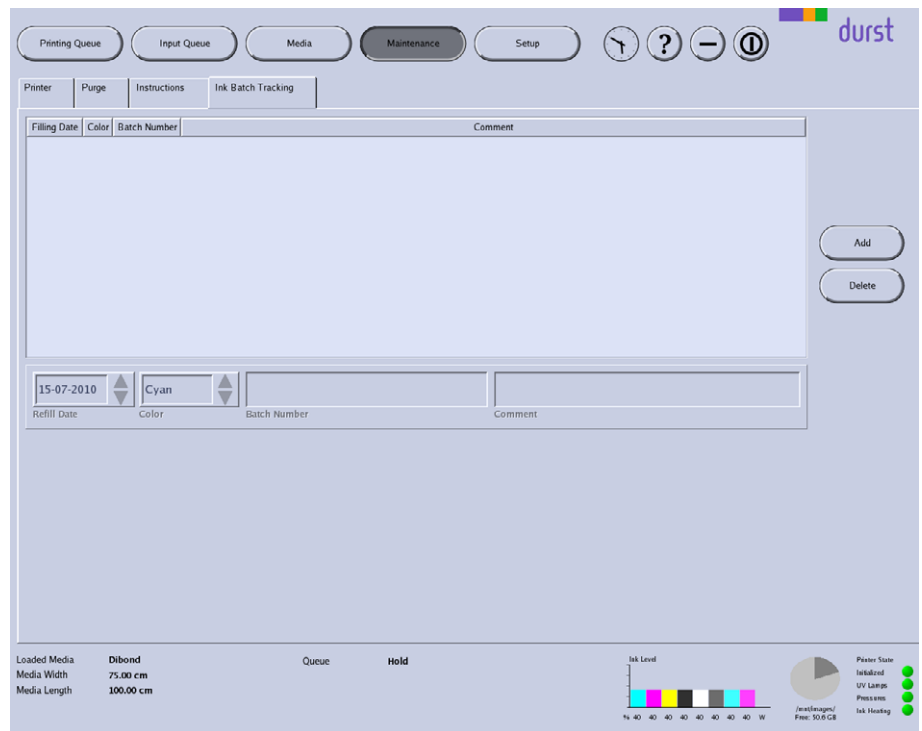


Fig. 48 Ink Batch Tracking tab

## 11 Managing media channels

In the **Media Definition** and **Default Job Options for Media** tabs under the **Media** button, you can create new media channels and edit or delete existing media channels.

1 Navigation window

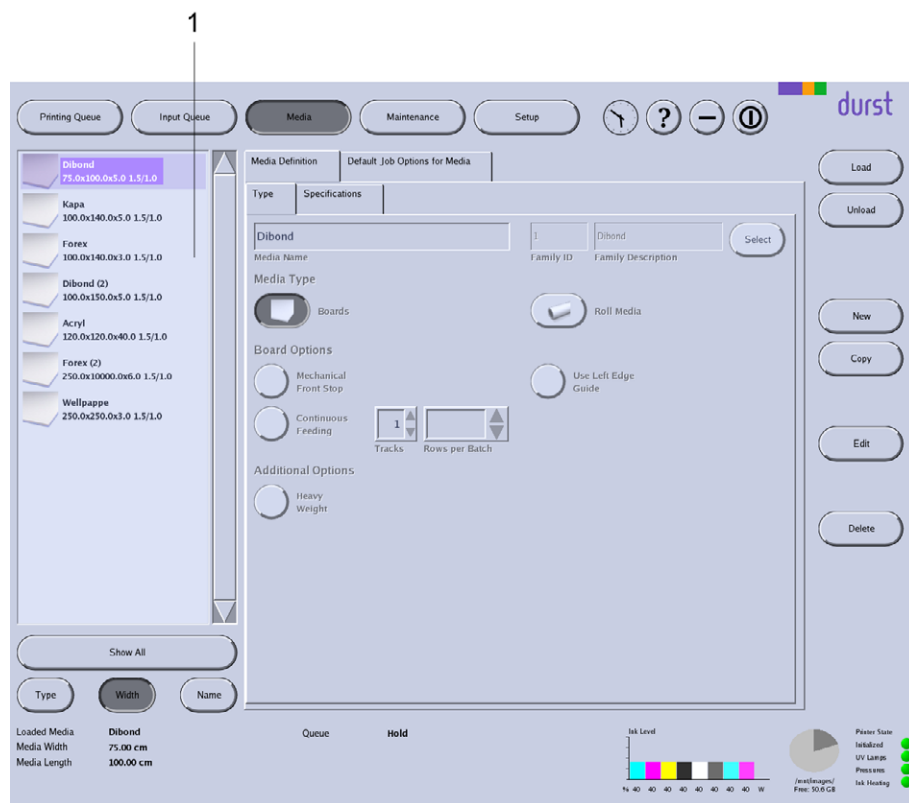


Fig. 49 Tabs under the **Media** button.

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

### 11.1 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 **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.

### 11.2 Media definition

Specify the media in the **Media Definition** tab.

### 11.2.1 Media type

The following are some of the parameters that you can define in the **Type** sub-tab:

- Name
- Media family
- Type: Plate or roll medium

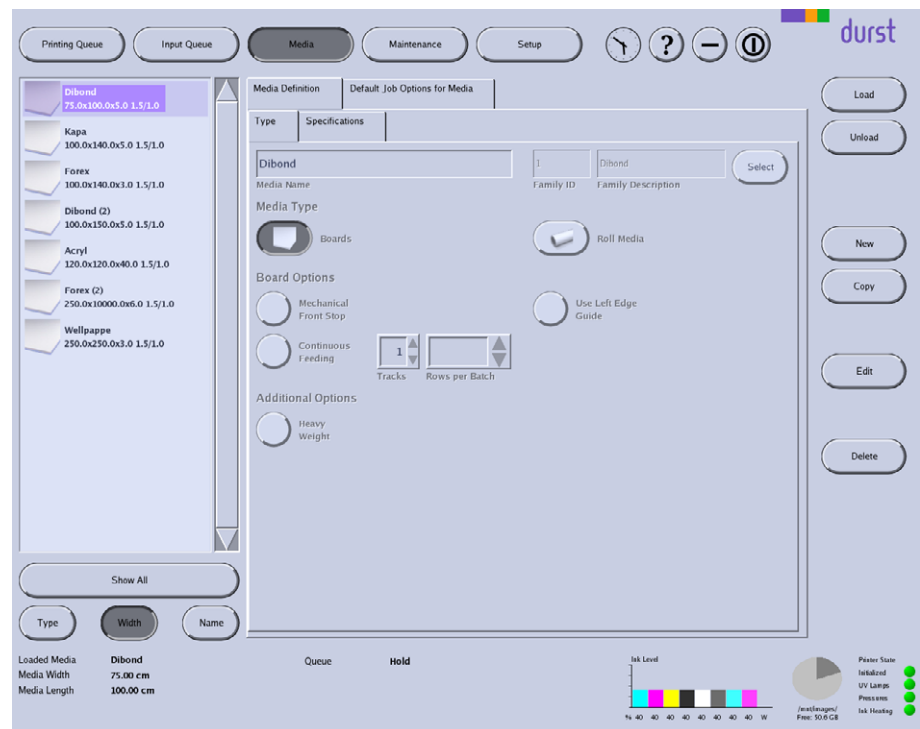


Fig. 50 **Type** sub-tab

**Continuous Feeding** You press the **Continuous Feeding** button if you use the feed system for serial printing. This allows you to print plate media continuously without having to reload each plate medium.

**Roll Media** You press the **Roll Media** button when you are loading a roll medium.

**Rows per Batch** With the Rows per Batch selection list field, you can set the number of rows after which the feed system should perform a forced stop. All plates fed in up to that point are first fully printed and transported out of the printer. The measuring system then registers the plate edges of the next batch again in order to avoid measuring errors during image positioning.

**Additional Options** When printing heavy media, striping may occur due to slippage between the medium and the conveyor belt. You can minimize slippage with the **Heavy Weight** button.

### 11.2.2 Media specification

Define the following parameters in the **Specifications** sub-tab:

- Dimensions
- Distances
- Parameters for media transport
- UV drying

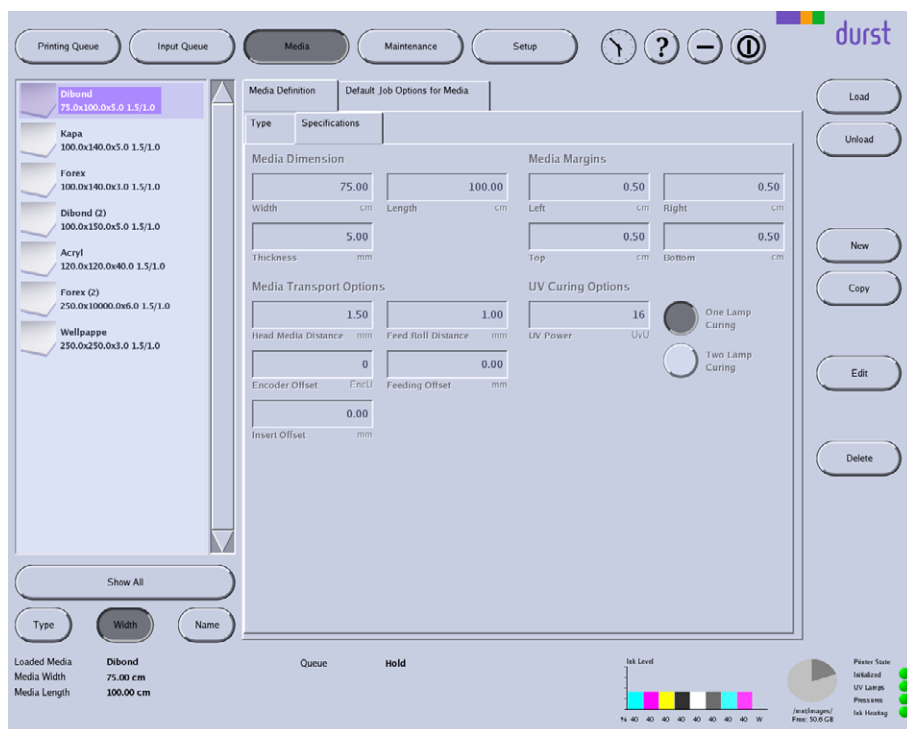


Fig. 51 Specifications sub-tab

**Media borders** In the input fields under **Media Margins**, you define the printable area of the medium by entering a left, right, top or bottom media border (**Left, Right, Top, Bottom**).

**UV Curing Options** Under **UV Curing Options**, you set the power and number of UV lamps for curing the printed medium. We recommend setting the power as low as necessary. In most cases, one UV lamp is sufficient for this reason.

If the power level is too high, sensitive media can yellow or stretch. For this reason, it may be necessary to not carry out full curing so as to protect the medium.

In special cases, such as when printing glass, you will require more power. In such cases, it makes sense to increase the power level and work with two UV lamps.

**Media Transport Options** **Encoder Offset:** If the advance causes striping during printing, you can enter an encoder offset value. This value is added to or subtracted from the global encoder offset value (**General** tab).

**Feed Roll Distance:** You can change the contact pressure on the medium via the spacing of the transport rollers. With a value of "0", the contact pressure is at its maximum.

**Feeding Offset:** If you are loading a flexible medium with rounded corners, the optical sensor may detect the edge of the medium too late. This will result in a printing offset. You can compensate for this offset by entering a correction value.

## 11.3 Standard job options

In the **Default Job Options for Media**, you can define the standard preset print options, borders and alignments for the media channel.

### 11.3.1 Print options

The following are some of the parameters that you can define in the **Default Job Options for Media** sub-tab:

- Print Quality
- Print Direction
- Print Finishing
- Print Refinement and Special Effects
- Spot Colors
- Curing Delay

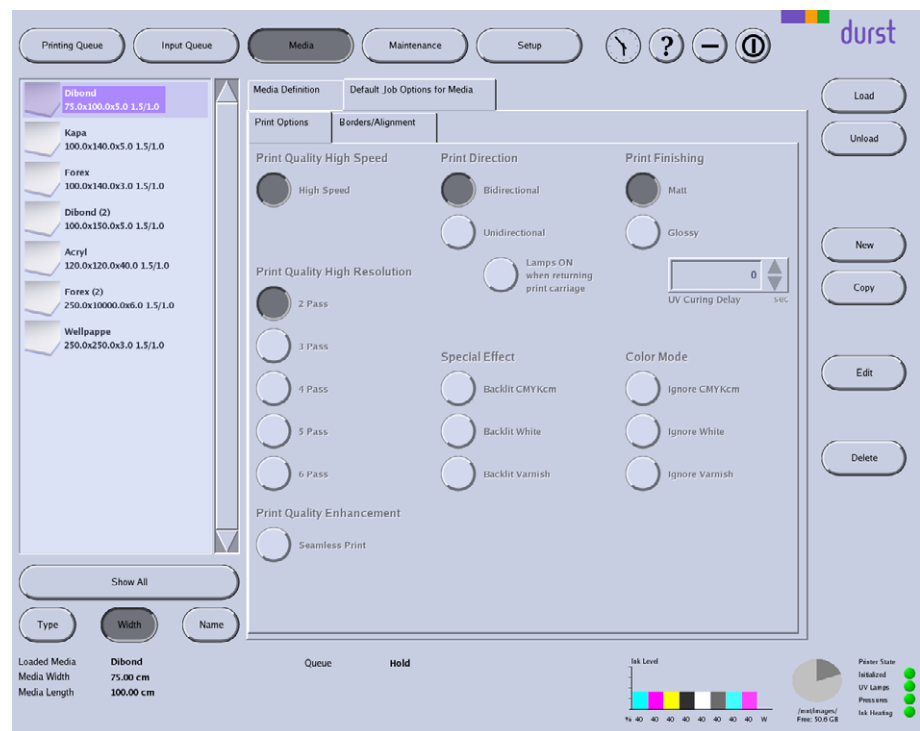


Fig. 52 Default Job Options for Media sub-tab

**Print Direction Bidirectional:** The ink is applied in both directions when the printhead carriage moves. This increases print speed.

**Unidirectional:** The ink is only applied by the printhead carriage upon its outward traversal.



**Lamps ON when returning print carriage:** This option is recommended if you have selected **Unidirectional** and are printing a slowly-drying medium.

### 11.3.2 Image border and alignment

The following are some of the parameters that you can define in the **Borders/Alignment** sub-tab:

- Border distances
- Alignment
- Oversize

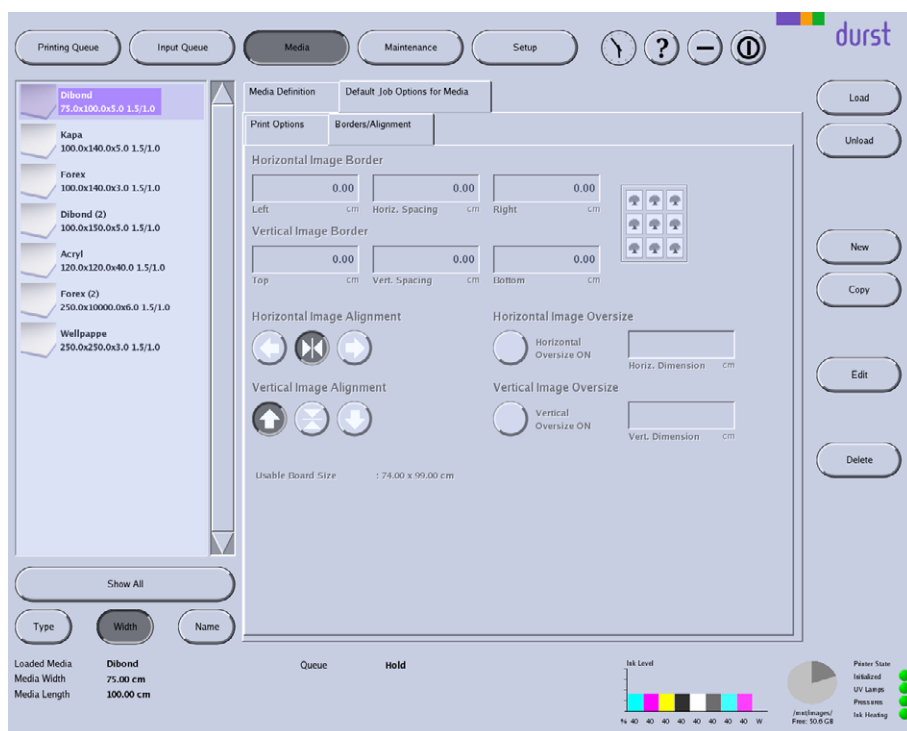


Fig. 53 **Borders/Alignment** sub-tab

**Image Border** Under **Horizontal Image Border** and **Vertical Image Border**, you can enter an image spacing between the individual images and to the left or right border of the printable area.

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. The printable area is defined by the medium borders you entered in the **Specifications** sub-tab under **Media Margins**.

The total spacing of the image, for example to the left medium edge, is the sum of the left media border (**Left from Media Margins**) and the left image border (**Left from Horizontal Image Border**).

- 1 Left image border
- 2 Medium border
- 3 Image

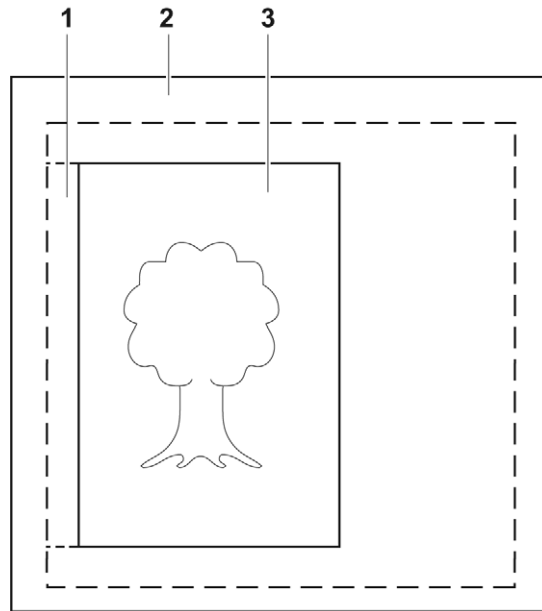


Fig. 54 Borders (schematic example)

In the **Horiz. Spacing** and **Vert. Spacing** input fields, always enter the horizontal or vertical spacing between the images.

**Alignment** Using the buttons under **Horizontal Image Alignment** and **Vertical Image Alignment**, you can align the image on the medium vertically (top, bottom, centered) and horizontally (left, right, centered). Here, the image and its defined image border (**Horizontal Image Border** or **Vertical Image Border**) are considered to be a unit and are aligned as one.

- 1 Medium
- 2 Top image border
- 3 Image
- 4 Image and image border unit
- 5 Vertical centering axis

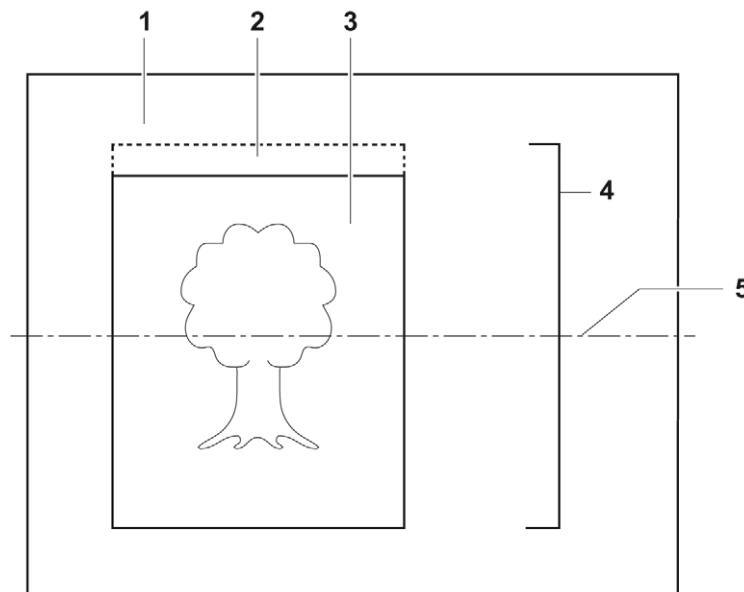


Fig. 55 Alignment of image with image border (schematic example for centered alignment)

**Image Oversize** To ensure that the medium is printed up to the border, you can enter an oversize for overprinting under **Horizontal Image Oversize** and **Vertical Image Oversize**. The software then clones the pixels at the image border and inserts them at the border according to the oversize. Here, printing occurs in the image border, image spacing or medium border by the oversize value.

- 1 Oversize
- 2 Medium border
- 3 Image
- 4 Image spacing

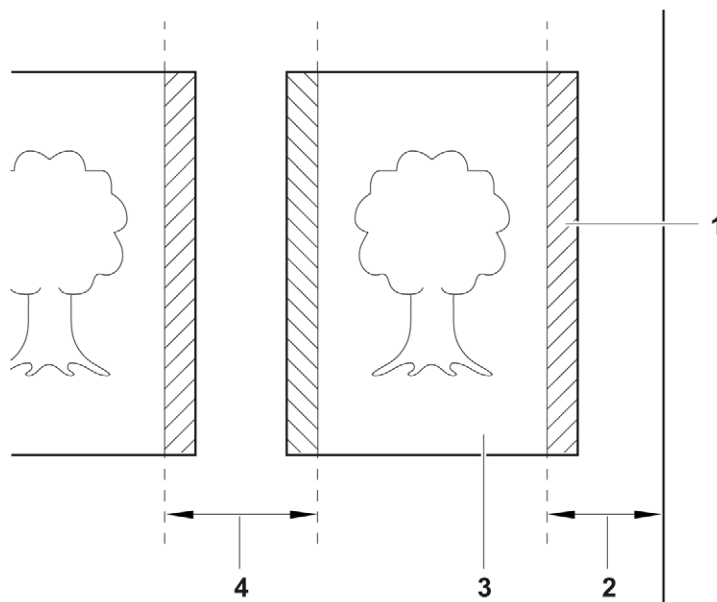


Fig. 56 Overprinting with images with borders (schematic example)

## 11.4 Creating, editing and deleting media channels

### 11.4.1 Creating new media channel

1. Press **Media**.
2. To create a media channel with completely new data, carry out the following steps:
  - Press **New**.
  - Select the **Media Definition** tab.
  - Select the **Type** sub-tab.
  - Enter a name in the **Media Name** input field.
  - Press **Select**.
  - Select media family.
  - Edit other media parameters.
3. 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.
  - Edit other media parameters.
4. Press **Save**.

### 11.4.2 Editing existing media channel

1. Press **Media**.

2. Select desired media channel in the navigation window.
3. Select desired tab or sub-tab.
4. Press **Edit**.
5. Edit desired parameters.
6. Press **Save**.

### 11.4.3 Deleting media channel

1. Press **Media**.
2. Select desired media channel in the navigation window.
3. Press **Delete**.

### 11.4.4 Loading/unloading media channel

- ✓ The media channel is created
1. Press **Media**.
  2. Select desired media channel in the navigation window.
  3. Press **Load/Unload**.

## 12 Printing

Once the job has been prepared on the RIP server and transferred to the workstation of the printer, printing occurs in the following steps:

- Job in the input folder (→ Page 76 / Input folder)
- Transfer job to the print queue (→ Page 76 / Input folder)
- Control printing process in the print queue (→ Page 80 / **Printing Queue**)

### 12.1 Input folder

You prepare the jobs for printing in the **Input Queue** dialog window. As soon as a job is transferred from the RIP server to the workstation, it appears in the input folder.

You define the printing parameters in the **Basics**, **Print Options**, **Borders/Alignment** and **Size** sub-tabs.

## 1 Navigation window

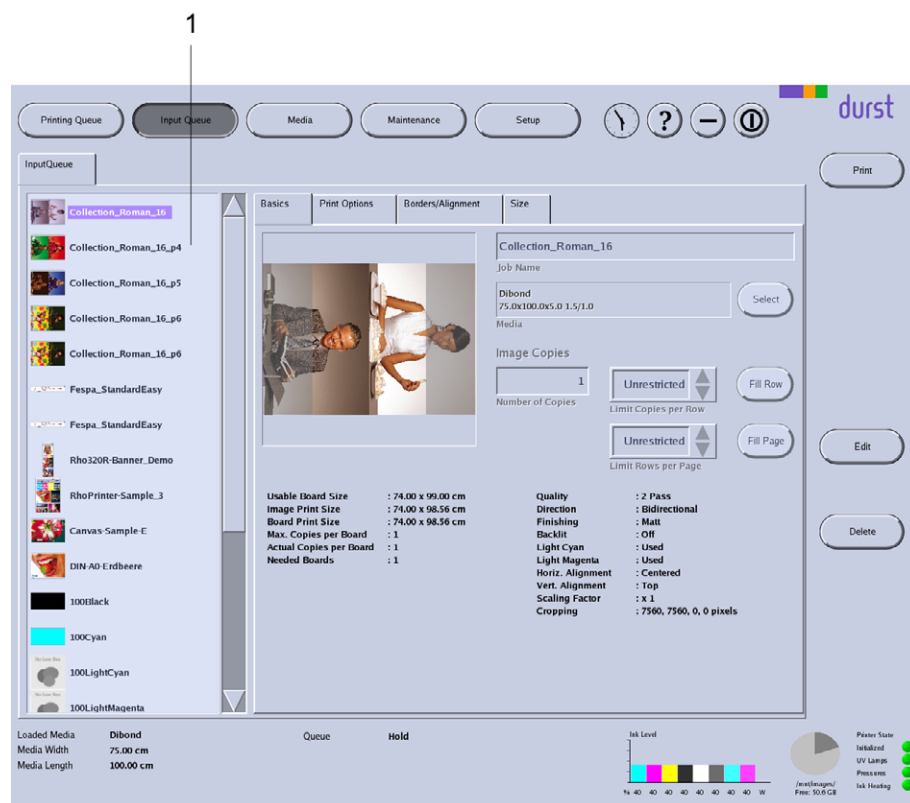


Fig. 57 Input folder

**Navigation window** Jobs intended for preparation are displayed in the navigation window (1).

**Sub-tabs** The **Print Options** and **Borders/Alignment** sub-tabs correspond to the **Default Job Options for Media** and **Borders/Alignment** sub-tabs in the **Media** (→ Page 69 / Managing media channels) tab. You can modify the preset parameters for a job individually under **Media** in these sub-tabs.

### 12.1.1 Basic settings

You can define the following basic settings in the **Basics** sub-tab:

- Job Name
- Media Channel
- Number of Copies
- Maximum number of images in a row and rows per page

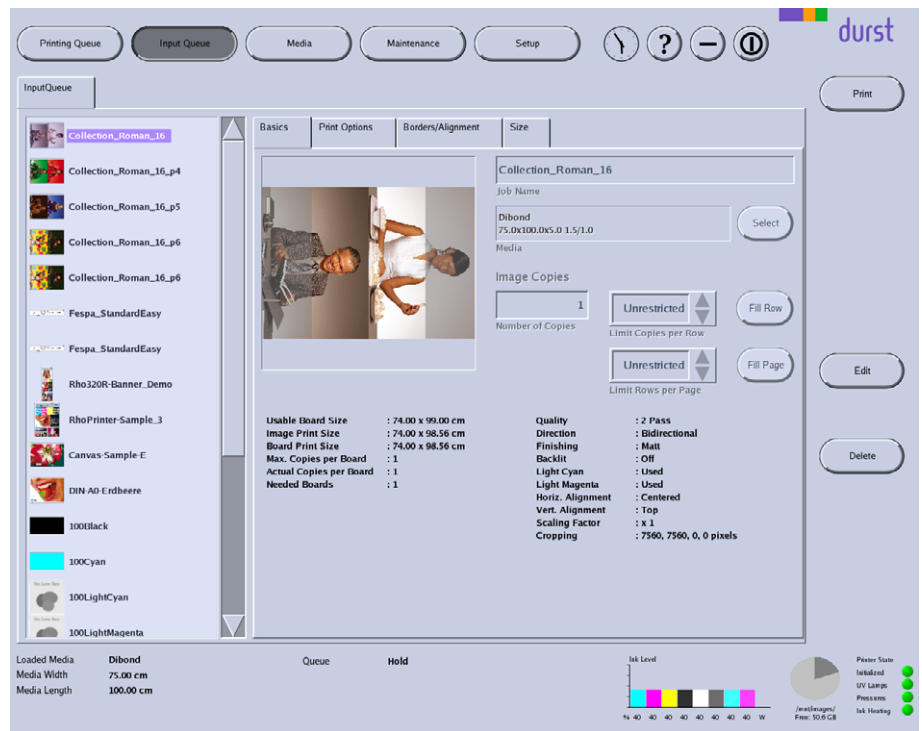


Fig. 58 Basics sub-tab

If you want to select a media channel (list field via **Media**), the software only offers you for pre-selection those media channels that are part of the media family of the marked job.

## 12.1.2 Image crop

You can change the image crop of the ripped image in the **Size** sub-tab.

### 1 Sliders

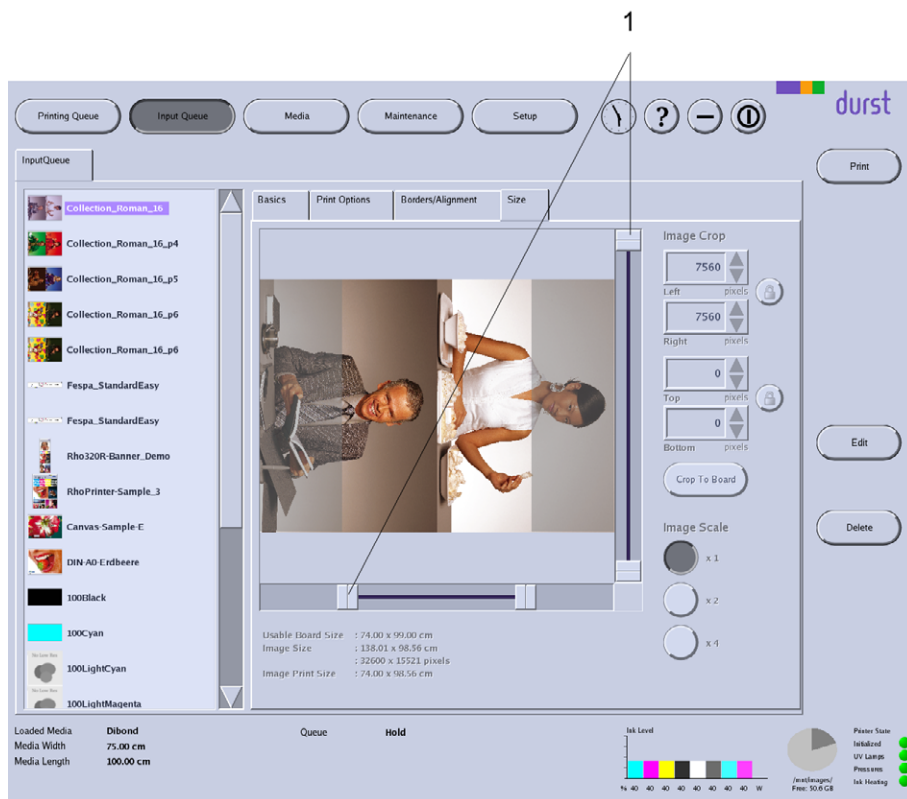


Fig. 59 **Size** sub-tab

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 or select it with the arrow keys under **Image Crop** in the respective input fields **Left**, **Right**, **Top** and **Bottom**.
- Select the crop with the sliders (1).

If you want to move a selected image crop while maintaining the height/width,

you can lock the height/width with the  button.

**Crop To Board** With the **Crop To Board** button, you automatically crop an image starting from the top-left corner and precisely to the size of the plate medium. The requirement here is that the image is larger than the plate medium.

**Image Scale** You scale the image with the buttons under **Image Scale**.

## 12.1.3 Preparing a job and transferring it to the Printing Queue

### Preparing a job

1. Press **Input Queue**.
2. Select desired job in the navigation window.

3. Select the desired sub-tab **Basics**, **Print Options**, **Borders/Alignment** or **Size**.
4. Modify desired parameters.
5. Press **Save**.

#### Transferring jobs to the print queue

- ✓ The job is prepared

  1. Select job in the navigation window.
  2. Press **Print**.

- ↳ The job appears in the **Printing Queue**.

## 12.2 Printing Queue

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

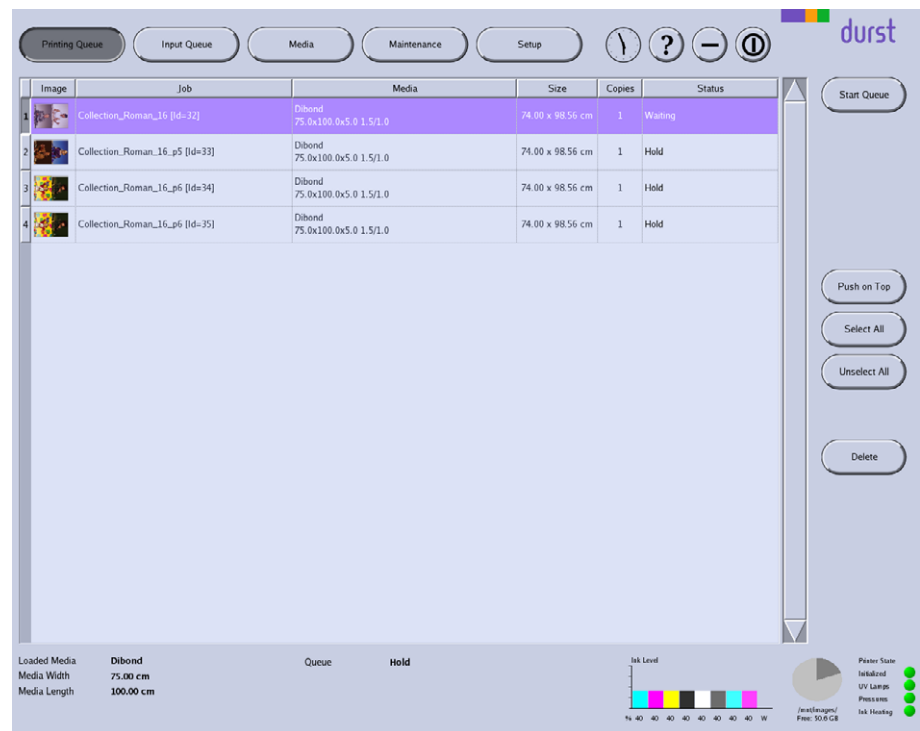


Fig. 60 **Printing Queue** dialog window

- Start Queue** The printing process for the selected job is started with the **Start Queue** button.
- Push on Top** The selected job is moved to the front of the queue with the **Push on Top** button.



### 12.2.1 Controlling the printing process in the Printing Queue

- ✓ If printing occurs over the edge of the medium, the conveyor belt is taped at the edges of the medium.
- 1. Press **Printing Queue**.
  - ↳ The **Printing Queue** dialog window appears.
  - ↳ All jobs in line for printing are displayed in the queue.
- 2. 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.

## F Service

### 1 Inspection and cleaning intervals

When?	What?
Daily	<ul style="list-style-type: none"> <li>▶ Check covers visually.</li> <li>▶ Carry out the daily print head maintenance work (→ Page 93 / Print head maintenance).</li> </ul>
Weekly	<ul style="list-style-type: none"> <li>▶ Check condition of the encoder ruler and have it purged by Durst service technicians if heavily soiled.</li> </ul>
Weekly (recommended: on the last working day in conjunction with the weekly shutdown)	<ul style="list-style-type: none"> <li>▶ Carry out the weekly print head maintenance work (→ Page 93 / Print head maintenance).</li> </ul>
Monthly	<ul style="list-style-type: none"> <li>▶ Check air filter of UV lamps and change if necessary (→ Page 88 / Checking and replacing air filter).</li> <li>▶ Clean exhaust grate.</li> <li>▶ Change filters of the ink distributor (→ Page 87 / Changing the filters of the ink distributor).</li> </ul>
Annually	<ul style="list-style-type: none"> <li>▶ Have print heads checked and, if necessary, adjusted by Durst service technicians.</li> <li>▶ Change main ink filters (→ Page 90 / Changing main ink filters).</li> </ul>
If necessary	<ul style="list-style-type: none"> <li>▶ Clean housing of the printer (→ Page 90 / Cleaning housing).</li> <li>▶ Remove leaked ink.</li> <li>▶ Clean conveyor belt.</li> <li>▶ Clean catch tray of the scraper blade (→ Page 86 / Clean the catch tray of the scraper blade.).</li> </ul>
In case of fault or defect	<ul style="list-style-type: none"> <li>▶ Check fuses and, if necessary, have replaced by Durst service technicians (→ Page 90 / Checking fuses).</li> </ul>

### 2 Basic information

Scattered light from the UV lamps reduces print quality. Scattered light may be present in the following cases:

- Black painted surfaces are scratched and thus take on a reflective surface.
- The light trap carrier is not installed.
- ▶ Do not touch black painted surfaces with hard objects, e.g. knives.

- ▶ Ensure that the light trap carrier is always installed.
- ▶ Repaint discolored black painted surfaces on the transport system or light trap with black paint.

### 3 Initialization after closing the flip doors

Once you have closed the flip doors after service work, you must reinitialize the printhead carriage.

- ✓ The flip doors are closed
- ▶ Initialize printhead carriage in the software (→ Page 63 / Operating and maintaining the printer).

### 4 Emptying catch tank

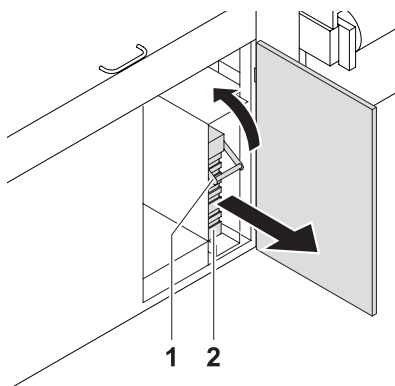


Fig. 61 Emptying catch tank

#### ⚠ WARNING

Contact with ink!

#### Health hazard

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

1. Open door.
2. Slide handle 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 handle downwards using the grip.
7. Close door.

## 5 Refilling ink

Refilling involves the following procedure:

- Placing Cubitainer into the loading compartment
- Starting refilling procedure

### WARNING

Contact with ink!

#### Health hazard

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

### CAUTION

Unsuitable ink!

#### Damage to the print heads

- ▶ Use only Durst ink.

#### Placing Cubitainer into the loading compartment

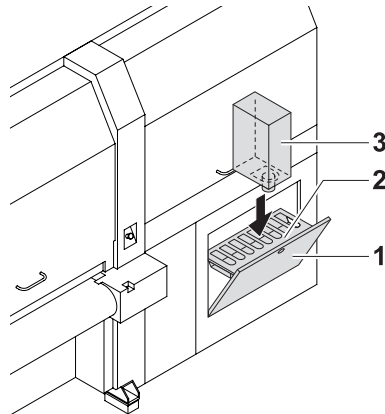


Fig. 62 Placing Cubitainer into the loading compartment

1. Pull out cover (1) of the loading compartment (2).
2. Prepare Cubitainer (3) for the desired color (Y, M, C or K).
3. Shake Cubitainer.
4. Place Cubitainer with the connector facing downwards in the loading compartment.

**Starting refilling procedure** ✓ The Cubitainers are located in the loading compartment

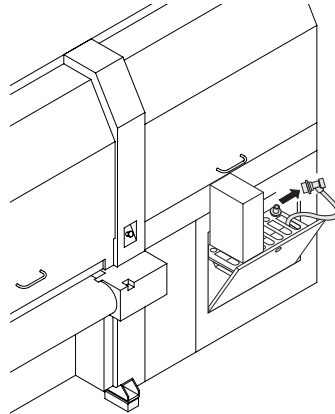


Fig. 63 Taking the fill hose out of the parked position

5. Once the ink has been identified correctly, take the respective fill hose out of the parked position.

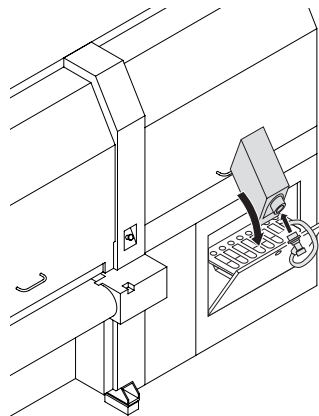


Fig. 64 Connecting the fill hose

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 the coupling after filling.
9. Return refill hose to the park position.
10. Remove empty Cubitainer.

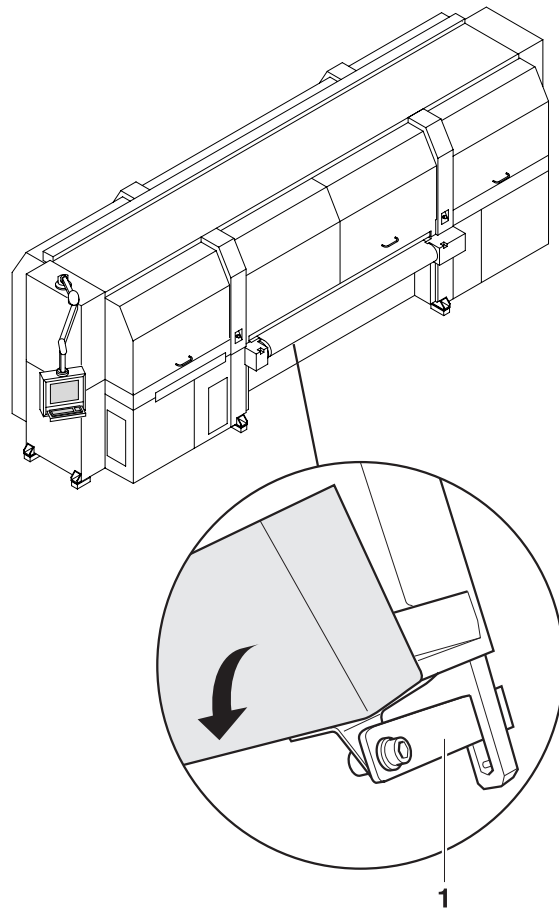
## 6 Clean the catch tray of the scraper blade.

**⚠ WARNING**

Contact with ink!

**Health hazard**

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



1. Press the bar (1) upwards.
2. Fold down the catch tray (2).
3. Clean the catch tray.

## 7 Changing the filters of the ink distributor

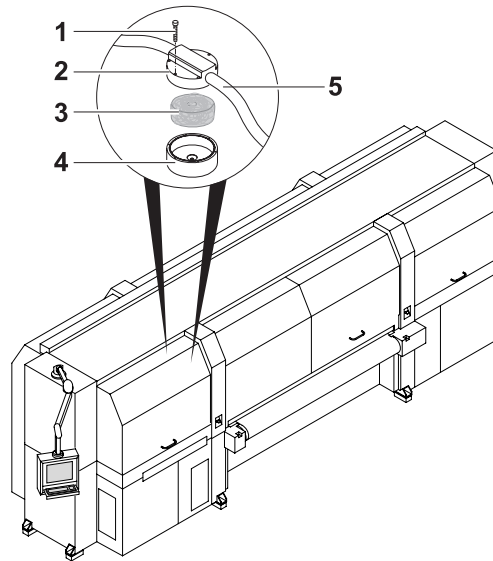


Fig. 65 Changing the filters of the ink distributors

### **WARNING**

Contact with ink!

#### **Health hazard**

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

1. Remove the hoses (5).
  2. Completely unscrew and remove the ink distributor.
  3. Undo all screws (1) on the top part (2).
  4. Remove the filter (3).
  5. Insert a new filter into the bottom part (4) so that the yellow side is at the top.
- i** The power of the suction strips will drop off if the seal between the top and bottom parts is defective. For this reason, the filter material may not be clamped in between the sealing ring and top part at any point.
6. Place the top part on. When doing this, ensure that the filter material may not be clamped in between the sealing ring and top part at any point.
  7. Screw the top part firmly into place.
  8. Screw on the ink distributor.
  9. Connect the hoses.

## 8 Checking and replacing air filter

**⚠ WARNING**

Energized components!

**Risk of death via electric shock**

- ▶ Switch off printer with the main switch.
- ▶ Secure the main switch with a lock.

**⚠ WARNING**

Hot surfaces!

**Risk of burns**

- ▶ Wait at least 1 hour after switching off until the UV lamps have cooled down before attempting replacement.
- ▶ Wear protective gloves.

**CAUTION**

Encoder ruler could be scratched!

**Reduced functionality of the printer**

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

1. Switch off printer with the main switch.
2. Secure the main switch with a lock.
3. Manually push the printhead carriage to a suitable position.
4. Disconnect printer from the power supply.
5. Lift up the corresponding front panel.



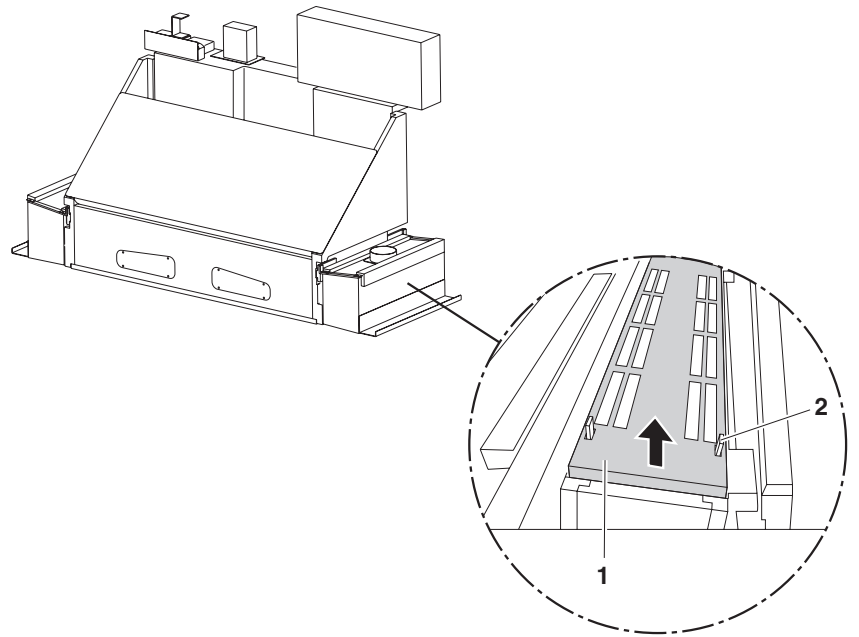


Fig. 66 Removing the air filter

6. Press the retaining clamps (2) apart slightly.
7. Remove mount (1).
8. Check air filter for soiling.

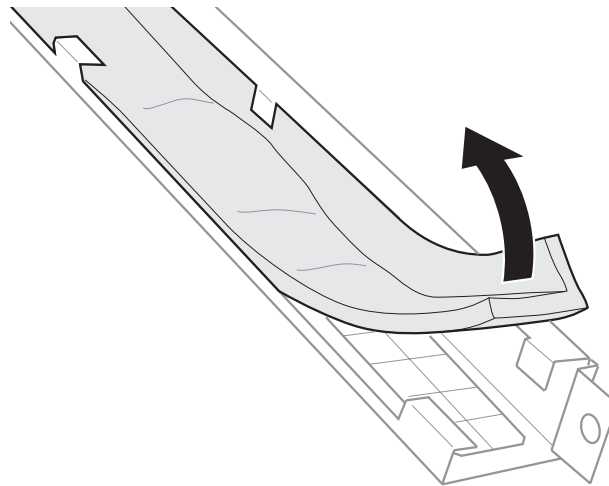


Fig. 67 Checking and, if necessary, replacing the air filter

9. If the air filter is black, replace it.
10. To reassemble, reverse the disassembly procedure.

## 9 Cleaning housing

### ⚠ 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.

## 10 Checking fuses

### ⚠ CAUTION

Wrong fuses!

#### **Damage to the printer**

- ▶ Allow only Durst service technicians to change fuses.

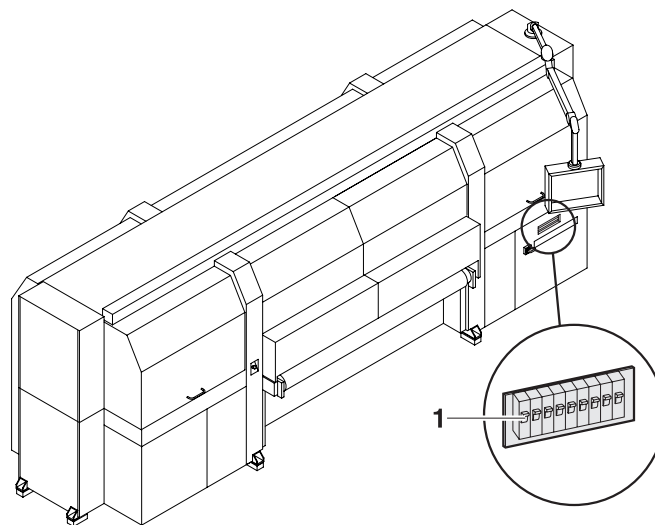


Fig. 68 Checking fuses

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

## 11 Changing main ink filters

The main ink filters prevent the print heads from being damaged by soiled ink.

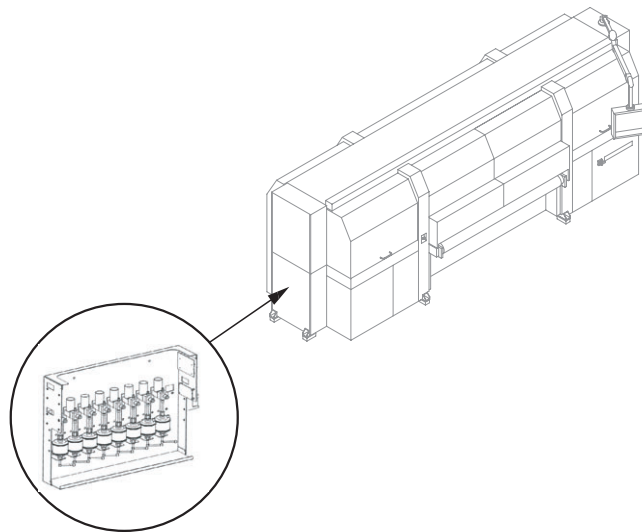


Fig. 69 Location of the main ink filters

**⚠ WARNING**

Energized components!

**Risk of death via electric shock**

- ▶ Switch off printer with the main switch.
- ▶ Secure the main switch with a lock.

**⚠ WARNING**

Ink pump starting up!

**Ink flowing out poses a health risk**

- ▶ Switch off printer with the main switch.
- ▶ Secure the main switch with a lock.

**⚠ 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. Secure the main switch with a lock.
3. Screw off cover plate.
4. Place a cloth under the ink filters to catch ink running out.



Fig. 70 Opening top fitting

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



Fig. 71 Closing ink filter

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

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

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



Fig. 72 Inserting new ink filter

9. Connect new ink filter at bottom and top connections.
10. Remove the cloth.
11. Screw on cover plate.
12. Dispose of used ink filters according to local regulations.

## 12 Print head maintenance

### 12.1 Required tools/accessories

- Protective gloves
- Safety goggles
- Cleaning cloths (WW3009)
- Cleaning solution (Faceplate Solution)
- New silicone tube out of sealed pack

### 12.2 Daily work

#### 12.2.1 Start of shift and, if necessary, during the shift

Nozzles can fail due to contaminated media or extended downtimes. The following work must be done daily before the start of the working day (once every 24 hours in the case of 24-hour operation), and if necessary during the shift:

1. Carrying out the long cleaning cycle (→ Page 94 / Carrying out the long cleaning cycle).
2. Preparing the printer for manual cleaning (→ Page 95 / Preparing the printer for manual cleaning).
3. Wet-wiping of the YM and MY print heads (→ Page 97 / Wiping print heads wet).
4. Start printing within the next half hour. The print should fulfill at least the following parameters:
  - Duration: min. 20 min
  - Width: 2 m
  - Material: Kapa
  - Quality: 4-pass bi-directional
  - Color tone: Dark images
5. If several nozzles have failed and angled jets are evident, vacuum of nozzles (→ Page 98 / Vacuuming the nozzles).

#### 12.2.2 End of shift

- ▶ Perform the daily shutdown (→ Page 30 / Perform the daily shutdown).

### 12.3 Weekly work

#### 12.3.1 Start of shift after weekend or longer shutdown

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 prints are retained.

2. Archive test image.

### 12.3.2 Shutdown over the weekend or up to max. 4 days

The following work must be carried out on the morning of the last working day:

1. Carrying out the long cleaning cycle (→ Page 94 / Carrying out the long cleaning cycle).
2. Preparing the printer for manual cleaning (→ Page 95 / Preparing the printer for manual cleaning).
3. **Wet-wipe all** print heads (not only YM and MY print heads) (→ Page 97 / Wiping print heads wet).
4. Print a test image.
5. Start printing within the next half hour. The print should fulfill at least the following parameters:
  - Duration: min. 20 min
  - Width: 2 m
  - Material: Kapa
  - Quality: 4-pass bi-directional
  - Color tone: Dark images
6. If an additional long cleaning cycle is performed on the same day, wet-wipe at least the YM and MY print heads afterwards.

## 12.4 Basic procedures

This chapter describes the procedures specified within the scope of daily and weekly print head maintenance.

### 12.4.1 Carrying out the long cleaning cycle

1. After cleaning the printer, prepare for printing again in reverse order.
2. In the software, press the **Maintenance** button.
3. Press the **Purge** tab.
4. Press the **Long** button under **Purge Cycle**.
  - ↳ The printhead carriage moves over the catch tank.
  - ↳ Purging is started.
  - ↳ All print heads are first purged row by row, and are then cleaned by the suction bar.
  - ↳ The ink is collected in the catch tank.
  - ↳ After purging, the printhead carriage moves into the park position.
  - ↳ You are asked whether a test image should be printed.
5. Press **No**.
  - ↳ The ink heater is switched off.
  - ↳ The UV lamp system is switched off.

### 12.4.2 Preparing the printer for manual cleaning

- ✓ The printhead carriage is in the reference position

#### ⚠ 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.

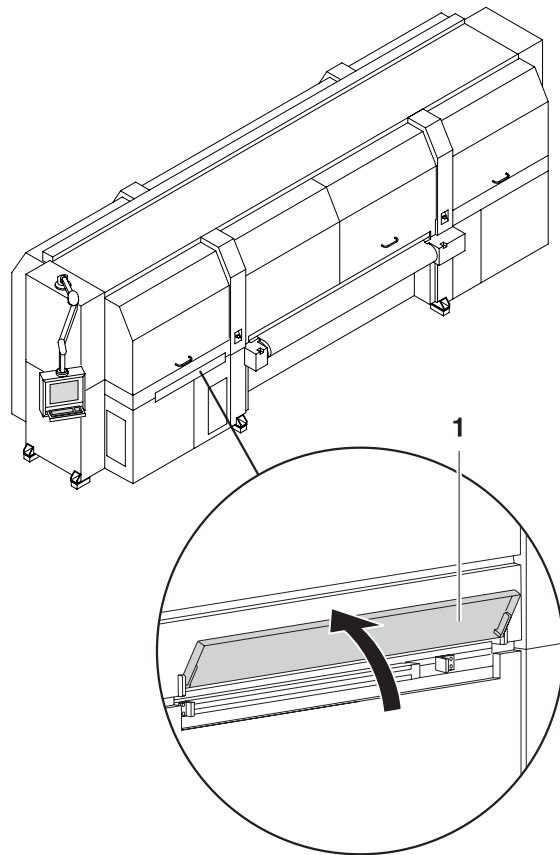
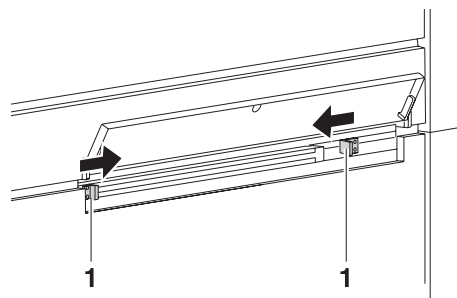


Fig. 73 Opening the panel

1. Open panel (1).



2. Press the bar (1) inwards to unlock the guide rails.

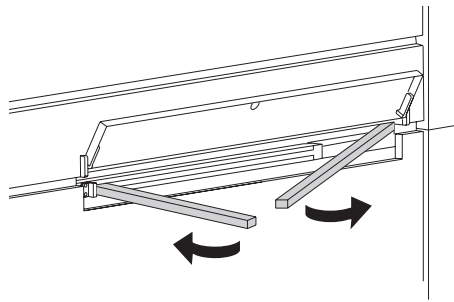


Fig. 74 Folding out the guide rails

3. Fold out guide rails.

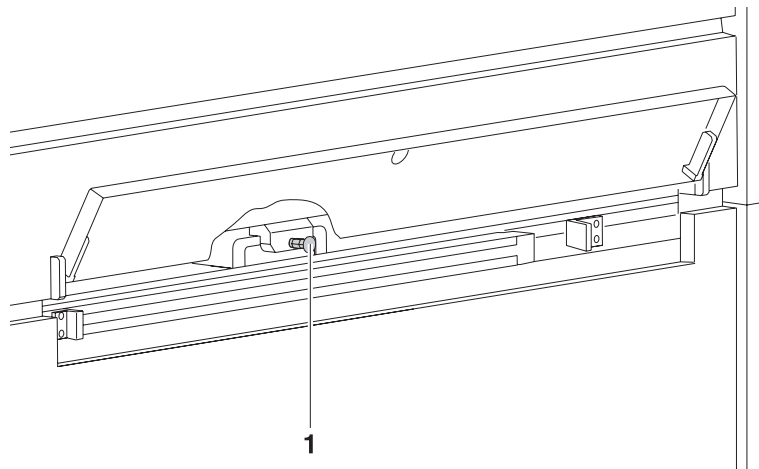


Fig. 75 Loosening the handle

4. Pull out the locking knob (1) and loosen the handle.

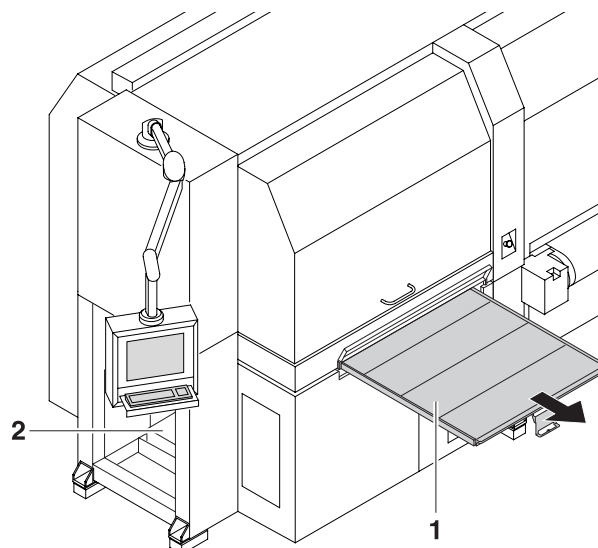


Fig. 76 Pulling out the light trap carrier

5. Pull out the light trap carrier (1) by the handle.
6. Open the cleaning access point (2).



### 12.4.3 Wiping print heads wet

- ✓ The long cleaning cycle has been carried out

**⚠ 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.

**⚠ WARNING**

Hot surfaces!

**Risk of burns**

- ▶ Do not touch UV lamps.

1. Pour cleaning solution into dispenser bottle.



Fig. 77 Saturating cleaning cloth with cleaning solution

2. Saturate cleaning cloth with cleaning solution.

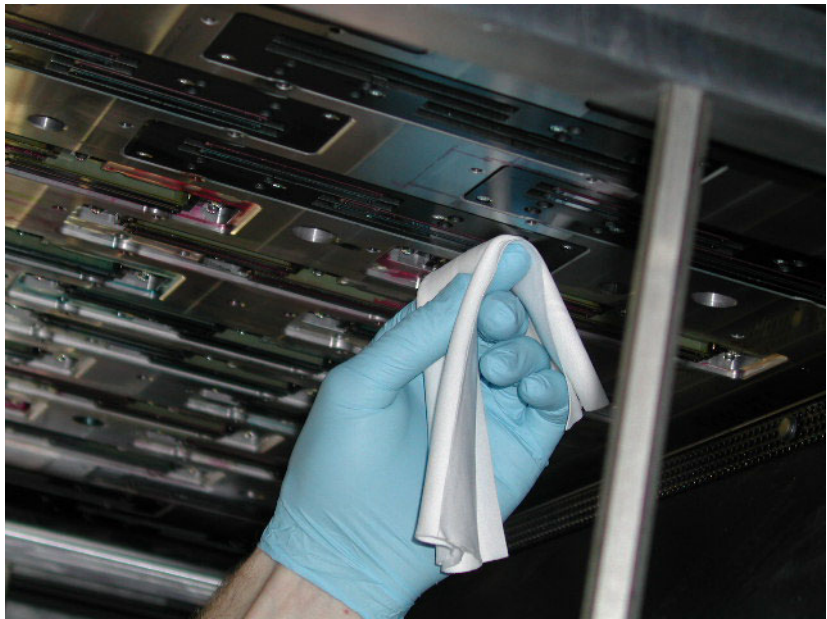


Fig. 78 Wiping the print head

3. Depending on requirements, wet-wipe the YM and MY print heads or all print heads in the slot direction once from the back forwards.

#### 12.4.4 Vacuuming the nozzles

##### **▲ 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.

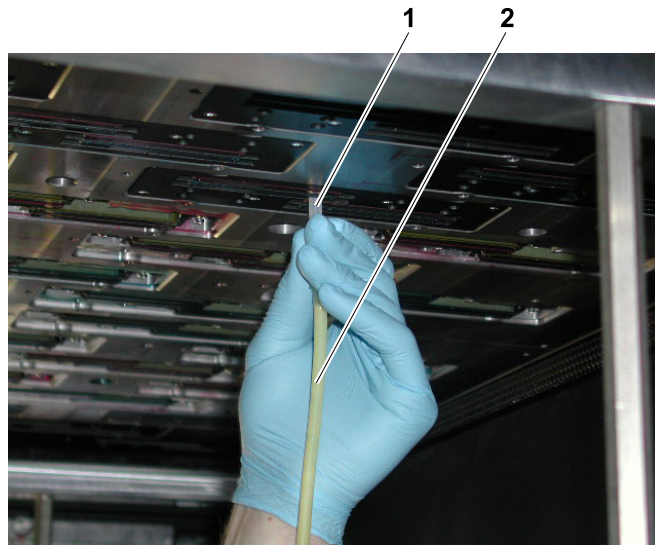
##### **▲ WARNING**

Hot surfaces!

**Risk of burns**

- ▶ Do not touch UV lamps.

1. Prepare printer for manual cleaning (→ Page 95 / Preparing the printer for manual cleaning).
2. Take a new silicone tube out of a sealed pack.



3. Place silicone tube (1) on the suction hose (2).
  4. Open valve of the suction system.
  5. 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.
- **i** If the valve is not closed after vacuuming, the vacuum for degassing the ink drops off. This could cause nozzles to fail during printing.
6. Close valve.
  7. Empty the catch glass when it is half full.
- **i** If nozzles are still not printing to the required quality, you must perform the following steps in order to be able to make warranty and guarantee claims.
8. If several nozzles have failed, carry out the following steps:
    - Print out a test image and check it.
    - Notify Durst customer service.

## 13 Disposal

### 13.1 Disposing of ink, cleaning cloths and Cubitainers

- ▶ Dispose of ink, cleaning cloths and air filters in an environmentally-friendly way in accordance with regional regulations.

## **G Decommissioning and disassembly**

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

# H Appendix

## 1 Technical data

### 1.1 General specifications

Parameters		Value
Power supply	Europe	230/400 V AC, 3 N AC, 50 Hz, 60 kVA
	US	Only via external economy transformers
Max. current consumption	Europe	86 A/Phase
	US	48 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)
Fuses		Fuse type F374-63/0.5 (500 mA)
Dimensions	Width	720 cm + 180 cm with swivel monitor
	Length	With feed system: 11 m
	Height	<ul style="list-style-type: none"> <li>■ With closed doors: 237 cm</li> <li>■ With opened doors: 259 cm</li> </ul>
Space requirement	Area	11 x 15 m
	Required room height	280 cm
Weight		8500 kg
Emission sound pressure level		76 dB(A)
Safety standards		Pursuant to applicable guidelines

### 1.2 Print specifications

Parameters		Value
Printing mode	High Speed	500 m <sup>2</sup> /h
	Productivity Mode	400 m <sup>2</sup> /h
	POP Production Mode	300 m <sup>2</sup> /h
	POP Backlit Quality Mode	200 m <sup>2</sup> /h
	High Quality Mode	150 m <sup>2</sup> /h
Resolution		600 dpi

Parameters		Value
Colors	Standard	CMYK
	Optional	<ul style="list-style-type: none"> <li>■ CMYKW and 1 spot color</li> <li>■ CMYK and 2 light and 2 spot (white/white or white/varnish)</li> <li>■ CMYKcm (c = light cyan, m = light magenta)</li> <li>■ Orange</li> <li>■ Blue</li> <li>■ Rigid Board Ink Set</li> <li>■ POP Ink Set</li> <li>■ Process Color Addition (combination of 2 colors): Orange + Blue or Orange + Green</li> </ul>
Ink supply unit		<ul style="list-style-type: none"> <li>■ Continuous ink feed with 10 l (2.19 gal) ink tanks per color</li> <li>■ Color can be refilled during operation</li> <li>■ Refill ink comes in 5 l (1.09 gal) Cubitainers; can be disposed of while assembled</li> </ul>
RIP	Software	Caldera Grand RIP + with the Durst Rho 1000 printer driver for Linux and Macintosh operating systems
	RIP input file formats	All formats supported by Caldera®

### 1.3 Media specifications

Parameters	Value
Rigid media	Uncoated and coated plate media: Examples: <ul style="list-style-type: none"> <li>■ Rigid-foam plates</li> <li>■ Flexible-foam plates</li> <li>■ Aluminum</li> <li>■ Acrylic glass</li> <li>■ Polycarbonate</li> </ul>
Minimum ignition temperature	150 °C (302 °F)
Maximum printing width	250 cm
Maximum printing length	Limited only by medium length
Maximum medium thickness	<ul style="list-style-type: none"> <li>■ Standard: 40 mm</li> <li>■ Industrial model: 70 mm</li> </ul>
Minimum plate size	DIN A3 (92.7 x 42 cm)

## 1.4 Workstation

Parameters	Value
Operating system	Red Hat Enterprise Linux
Ports	<ul style="list-style-type: none"> <li>■ USB</li> <li>■ Ethernet: 100/1000 Mbps</li> </ul>

## 1.5 Requirements for installation site

Parameters	Value
Maximum altitude	2400 m (8000 ft) above sea level
Temperature range	+20°C to +30°C
Relative humidity	25 to 80%, non-condensing
Hot air output/feed	4500 m <sup>3</sup> /h (158900 cu.ft./h)
Compressed-air connection	6 to 8 bar with 5 l/min (70 psi at 1.3 gal/min) (dry air only)
Exhaust quantity of the exhaust equipment	Min. 1000 m <sup>3</sup> /h (35.315 cu.ft./h) Recommended: 2300 m <sup>3</sup> /h (81.224 cu.ft./h)
Illumination	Min. 500 lx

## 2 Accessories and spare parts

Accessory/Spare part	Description	Order code	
Rho Rigid-Board-Ink Set	Cyan UV ink	2 x 5 l (2 x 1.3 gal)	LTKC1R30DM
	Magenta UV ink		LTKM1R30DM
	Yellow UV ink		LTKY1R30DM
	Black UV ink		LTKB1R30DM
	Light Cyan UV ink		LTKC1LR30DM
	Light Magenta UV ink		LTKM1LR30DM
	Varnish UV ink		LTKV1R30DM
	White UV ink		LTKW1RBS
Air filter for the UV lamp heads	–	LB2099041	
Adjusted print head	Fully pre-adjusted print head with distributor tank, mounting structure and electronics	LC2021400	
Hardware service contract	–	Rho Hardware Contract	
Rho 1000 Operator Kit	<ul style="list-style-type: none"> <li>■ 100 protective gloves</li> <li>■ 1 pair safety goggles</li> <li>■ 1 package cleaning cloths</li> <li>■ 2 l purging solution</li> <li>■ 2 syringes</li> </ul>	ZW24010	
Protective gloves	Nitrile protective gloves N-DEX	4235060	

<b>Accessory/Spare part</b>	<b>Description</b>	<b>Order code</b>
Safety goggles	Safety goggles UVEX 9195	1351015
Cleaning cloths	WW3009 150 x	1473245
Cleaning solution	Faceplate Solution	IR30001
Syringe (optional)	50 mL syringe	E4235850
Silicone tubes	Hose sections	E1460180





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