

Operator Manual
:Anapurna M4F
(FW version 1.979)



:Anapurna M_{4F} Operator Manual

(FW version 1.979 rev. 20080808)

Any remarks and/or suggestions on the content of this operator manual can be send to:
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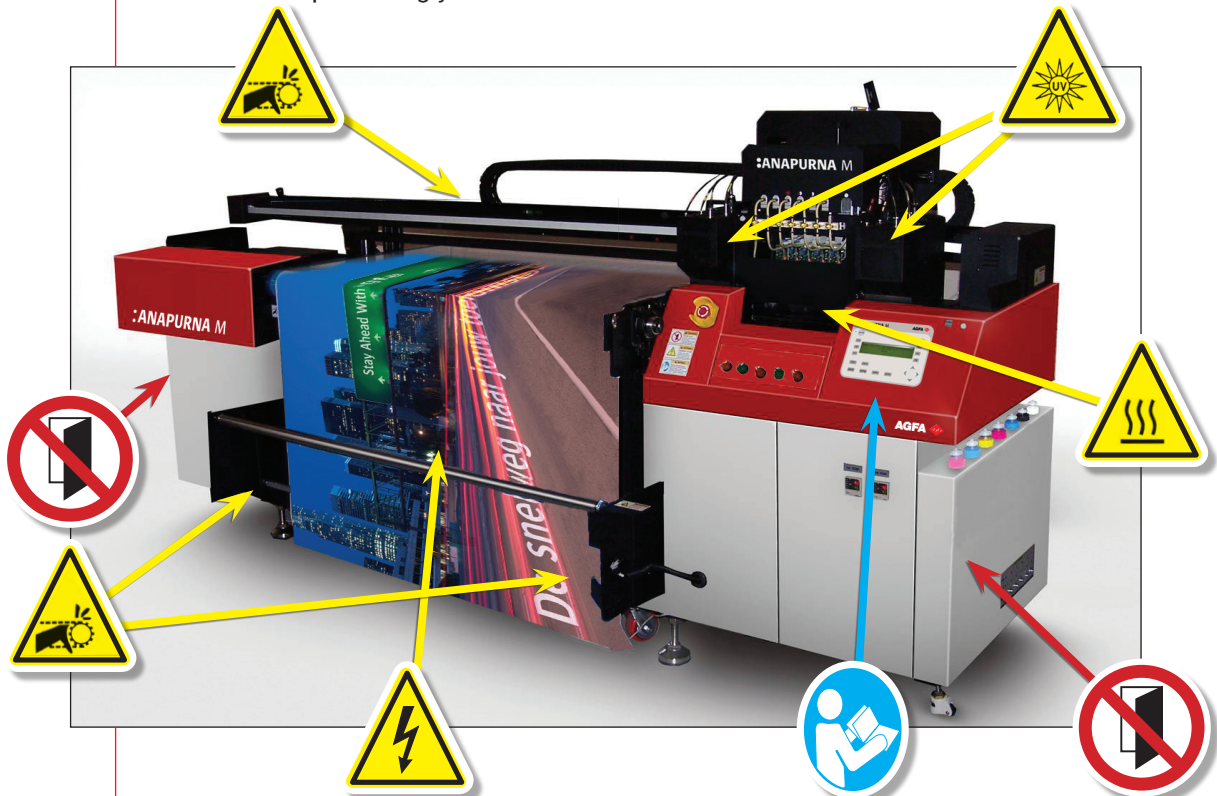
A. INFORMATION.

1. Safety instructions.

Be sure that you follow and understand all the instructions and warnings that are described in this manual when you are using the :Anapurna M4F4F. Working with an U.V. printer always implies that you must be aware of the harm that the U.V. radiation and the U.V. inks can cause.

1.1 Warning labels.

The printer has labels that give simple explanations of operations that require particular care. Read and understand the contents of these labels thoroughly before performing your work.



Moving parts can crush and cut.
Keep guards in place. Lock out power before servicing.



UV Light.
Do Not look directly at light.



BURN HAZARD. Do Not Touch.
TURN OFF POWER and allow to cool before servicing.

**HAZARDOUS VOLTAGE.**

Contact may cause Electric shock or burn. Turn off and lock out System before servicing.

**Avoid injury.**

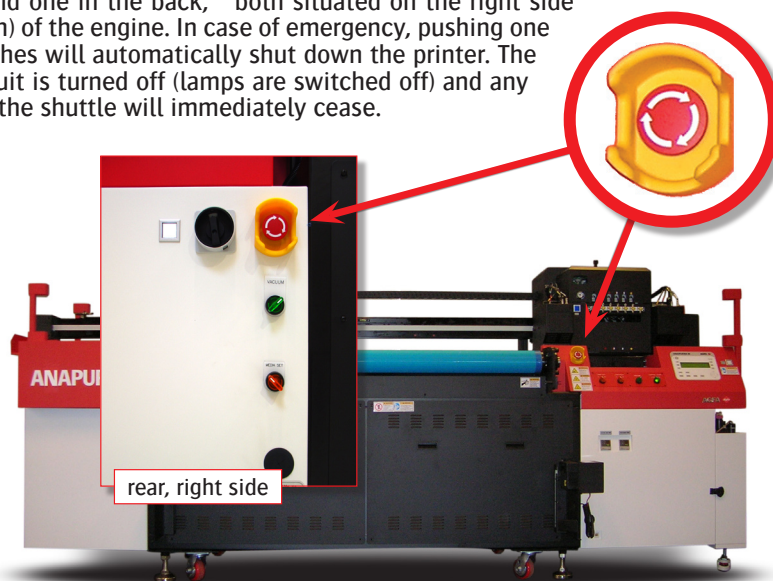
Do Not operate with doors open.
Close all doors before operating machine.



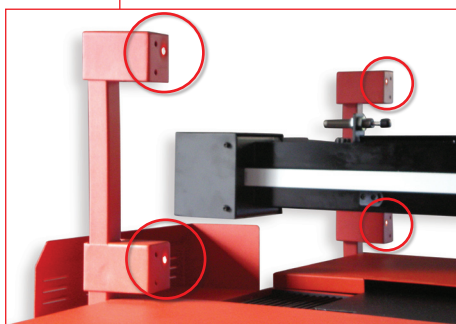
Read and understand operator's manual before using this machine. Failure to follow operating instructions could result in personal injury or damage to equipment.

1.2 Emergency switches.

The :Anapurna M4F4F is equipped with two emergency switches: one in the front and one in the back, both situated on the right side (home position) of the engine. In case of emergency, pushing one of these switches will automatically shut down the printer. The electrical circuit is turned off (lamps are switched off) and any movement of the shuttle will immediately cease.



1.3 Optical safety sensors.



The :Anapurna M4F4F is an industrial inkjet printer with fast moving parts and you must be aware of the risk involved. The shuttle is not provided with security sensors and therefore will not stop when it runs into an obstacle like media or body parts.

The :Anapurna M4F4F is equipped with optical sensors around the working path of the shuttle. On each of the four corners of the engine, you will see a metal tower construction containing two optical sensor assemblies each. If the optical light path gets obstructed, the shuttle will stop at its current position and the lamps will switch off. On the control panel an error message will appear: "<<SYSTEM ERROR>> Safety Sensor".

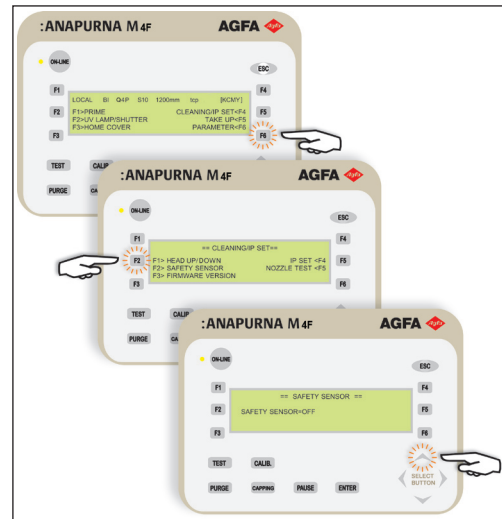


In order to reset the Anapurna M4F you have to press the enter button. This will cause a system restart where the shuttle raises to its highest point and returns to its home position.

When the safety sensor is activated, the print will be canceled and the actual job cannot be restored. You have to re-spool the file by choosing print in the Wasatch print queue.

Agfa strongly advises against disabling the safety sensor since this increases the risk of getting your hands or other body parts caught between the moving parts of the engine. So, you should always make sure that the sensors are activated

The safety sensors can be disabled by going into offline mode (press escape) and by pressing CLEANING / IP SET (F4). The F2 function will now show the SAFETY SENSOR function and by hitting F2, you can use the up button to toggle the value on or off and press enter.



The sensors must always be activated when the engine is powered on!

1.4 U.V. light.

Working with U.V. light, you must keep following safety warning in mind:

- ▶ Avoid direct skin contact
- ▶ Wear protective glasses when looking in the direction of the U.V. light.

The U.V. radiation that is generated when the U.V. lamps are on, can be harmful. Make sure that no body parts are directly exposed to the radiation. Skin burn and irritation will be the consequence when e.g. your hands have direct contact with the radiation.

Don't look directly into the U.V. light, this will damage your eye sight. If you need to look in the direction of the U.V. light, make sure that you wear protective glasses.

a. Detail of the UV light

UV lamps emit not only ultraviolet light, but also visible light, and wavelengths in the infrared spectrum.

In fact, all lamps emit approximately

- ▶ 20% ultraviolet light (the part that creates curing is not visible; cold light);
- ▶ 20% visible light (the inactive part that we see coming out of the lamphouses);
- ▶ 60% infrared light (also an inactive part that is invisible and generates heat).

Short wavelength UV light exhibits more quantum properties than its visible and infrared counterparts. Ultraviolet light is arbitrarily broken down into three bands, according to its anecdotal effects.

- ▶ UV-A is the least harmful and most commonly found type of UV light, because it has the least energy. UV-A light is often called black light. Most phototherapy and tanning booths use UV-A lamps.
- ▶ UV-B is typically the most destructive form of UV light, because it has enough energy to damage biological tissues, yet not quite enough to be completely absorbed by the atmosphere. UV-B is known to cause skin cancer.
- ▶ Short wavelength UV-C is almost completely absorbed in air within a few hundred meters. When UV-C photons collide with oxygen atoms, the energy exchange causes the formation of ozone. Germicidal UV-C lamps are often used to purify air and water, because of their ability to kill bacteria.



1.5 U.V. inks.

Make sure that you always use following safety measures when working with U.V. inks:

- ▶ Wear protective gloves (single-use)
- ▶ When contacted with skin, wash off immediately
- ▶ Dispose uncured ink as chemical waste

U.V. inks are chemical products which contain some additives that can cause dermatitis. Dermatitis is a skin disease that can become irreversible when left untreated. It occurs when a substance penetrates the surface layer of the skin and provokes a reaction from the vulnerable skin beneath. Common symptoms include:

- ▶ skin redness or soreness;
- ▶ itching;
- ▶ rash;
- ▶ cracking or peeling.

The most commonly affected parts of the body are the fingers and the webs between the fingers, closely followed by the back of the hands.

It is very important to avoid skin contact with the U.V. inks. Use splash-resistant gloves when there is a risk of skin contact. Single-use nitrile gloves 0,2mm thick are acceptable. None the less, they only will give a short-term protection. Make sure that you dispose of single-use gloves every time you take them off. If you have skin contact, wash the ink off and rinse the skin with water and soap.



Dispose uncured ink as chemical waste and never mix solvent with U.V. ink waste. Cured U.V. ink don't contain any harmful products and can be disposed off as normal waste. If you spill a big puddle of ink, use an absorbent product like saw dust to clean. Little amounts of spilled ink can be cleaned using a cloth. Don't forget to treat the saw dust and cloths as chemical waste (uncured inks).



Uncured U.V. inks = chemical waste
Cured U.V. inks = normal waste

The shelf life of the :Anapurna M4F inks is 12 months (the expiry date is mentioned on each bottle). Ideal storage of inks is between 4°-10° C; the temperature should not exceed 25°C at any time.

a. Curing Process.

Water based and solvent based inks will dry by evaporation and/or penetration, leaving the colorants into the media. UV Curable ink will only harden out if UV light is exposed to the ink layer on the media. The heat that is generated by the U.V. lamps do not influence the curing process. On non-absorbing media, this ink layer will lay on top of the substrate. On absorbing media the ink layer will partly penetrate the media, explaining the better adhesion on porous media.

The pigmented particles are dispersed in a monomer. This monomer will stay liquid and sits in a solution together with a photo initiator and synergist.

How does it work?

- ▶ When UV light is added, the photo initiator will be activated and will create a free radical;
- ▶ This free radical will be passed onto the synergist;
- ▶ From then the synergist will be active and will bind with the monomer;
- ▶ Now a chain reaction is started and the monomers will crosslink to each other, causing the ink film to get polymerized. The pigments are captured in this chain.

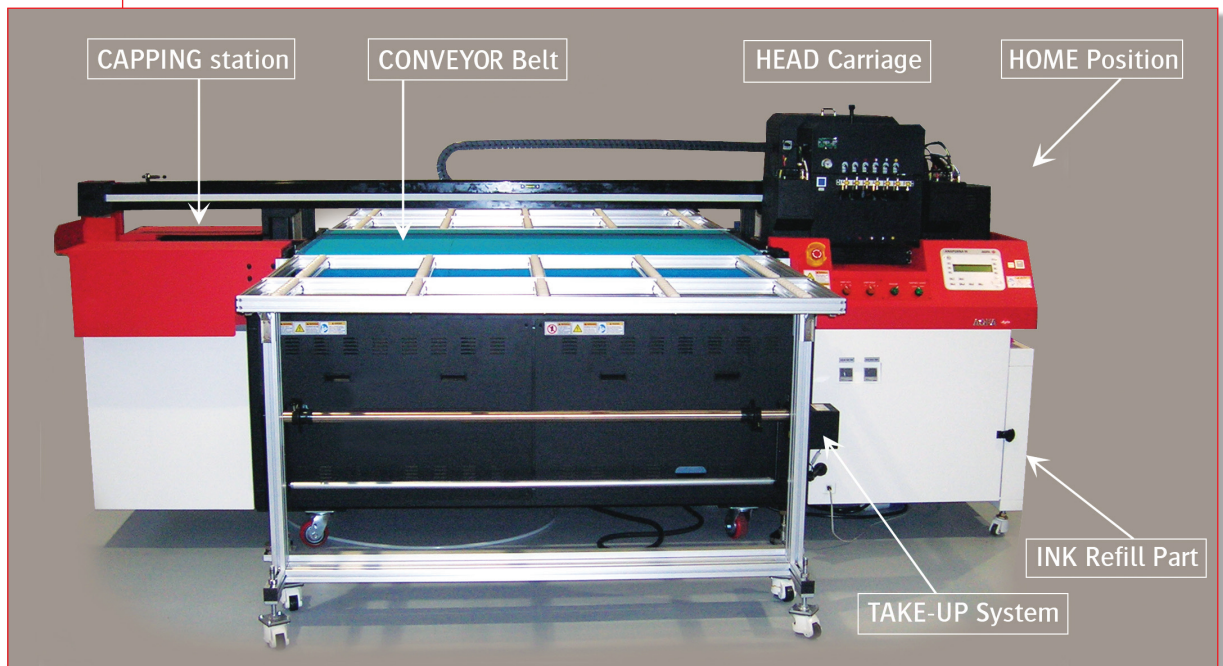
1.6 Extra information.

SDS-sheets (Safety Data Sheets) about Agfa U.V. inks and the pre-site survey document, explaining the re-commended working and installation conditions, are available through your local reseller.



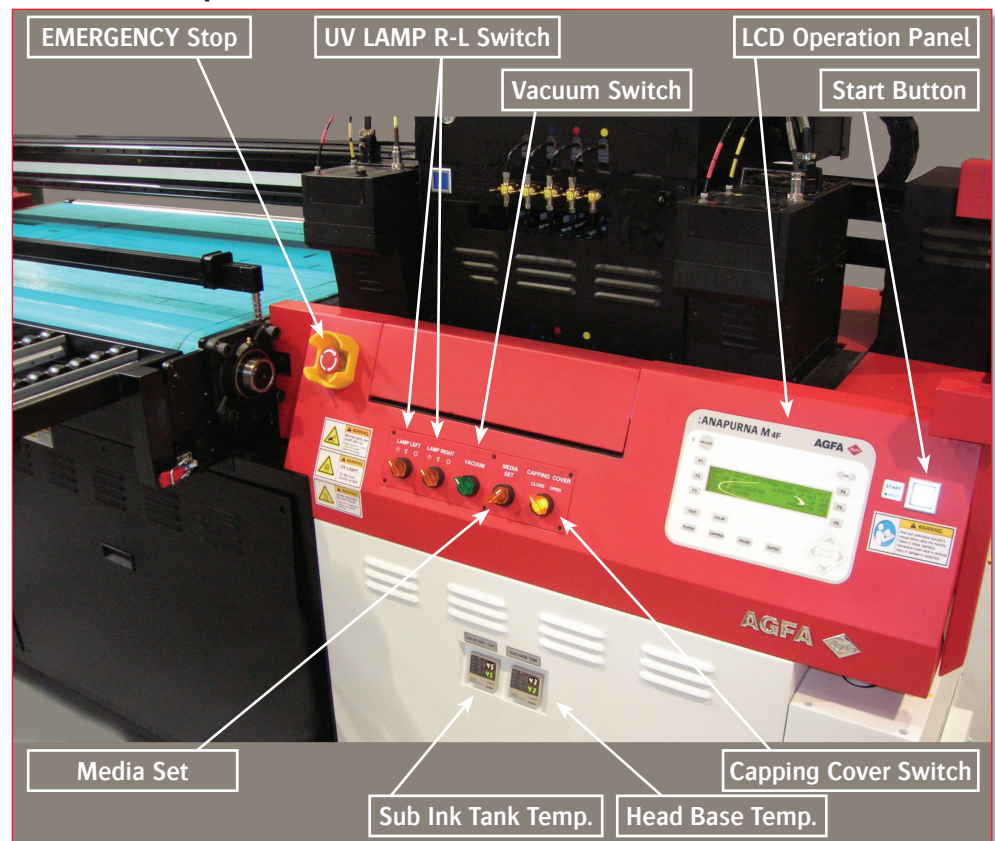
2. Printer overview.

2.1 Front view, parts & locations.

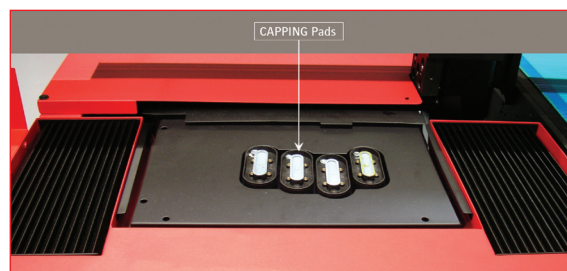
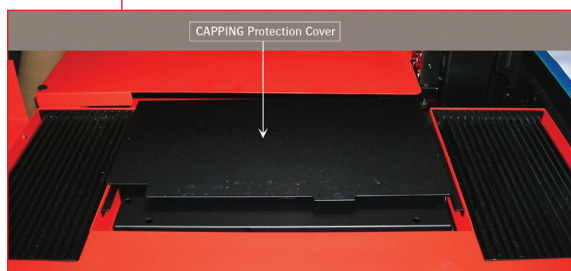


The roll to roll system is optional for the :Anapurna M4f and is not delivered with a standard system.

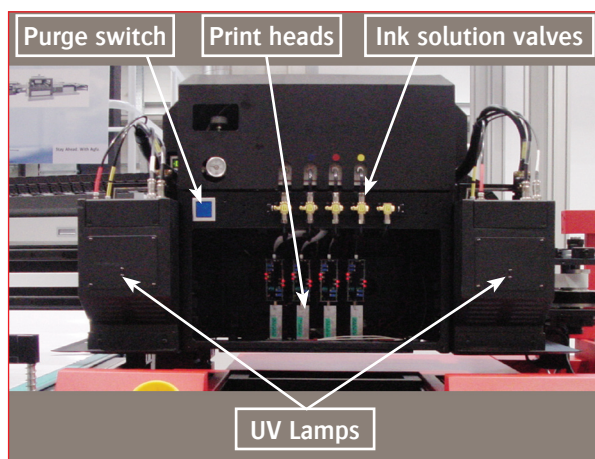
2.2 Home view, parts & locations.



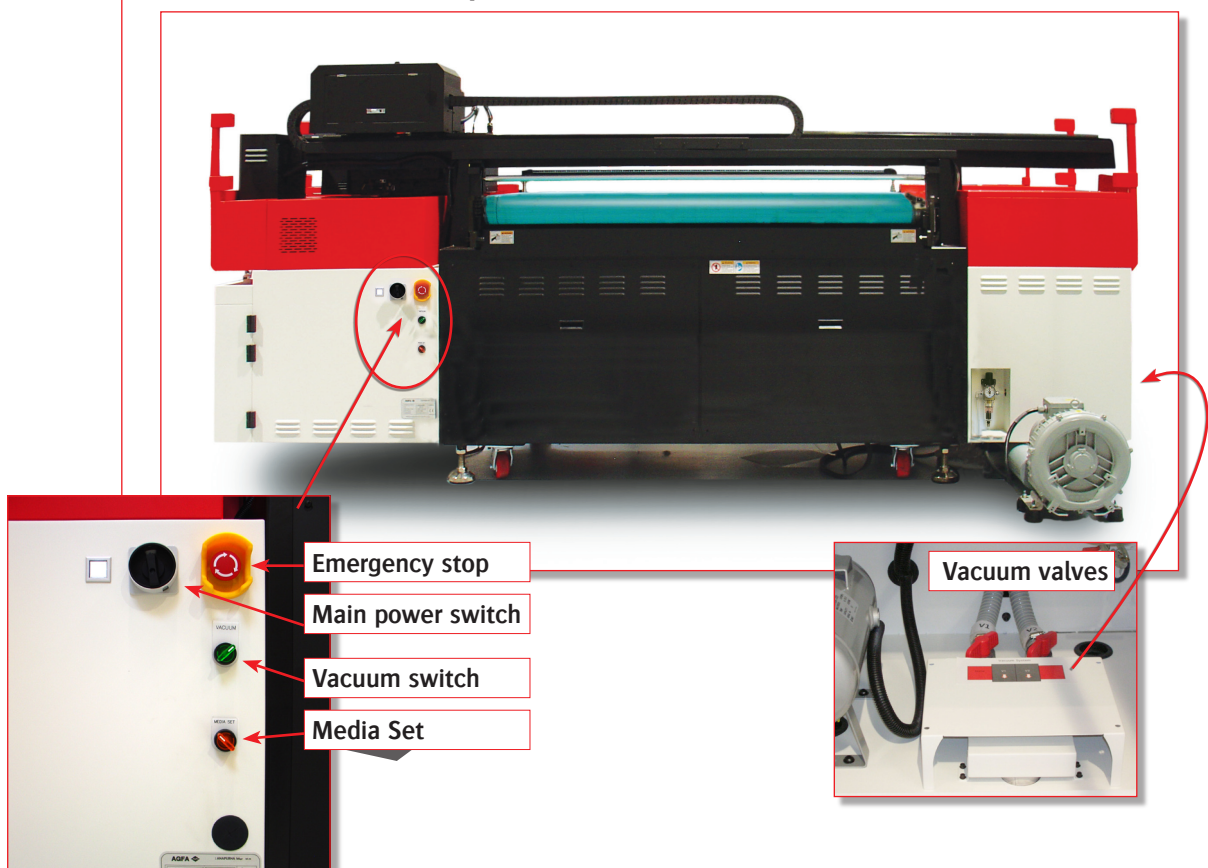
2.3 Capping station view, parts & locations.



2.4 Head carriage view, parts & locations.



2.5 Rearside view, parts & locations.



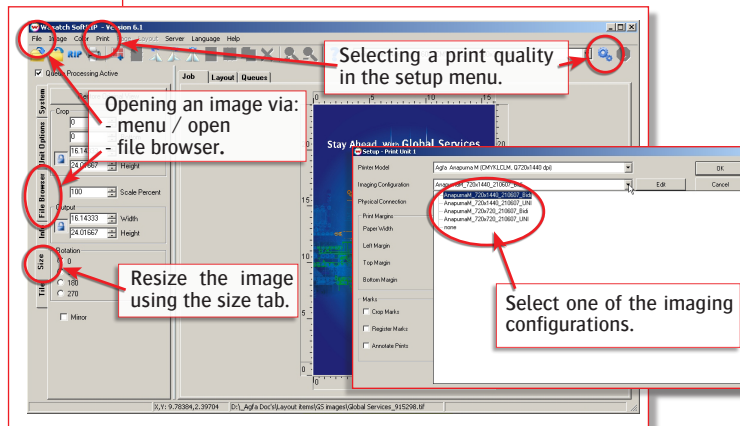


B. OPERATIONS.

1. Making your first print.

1.1 Wasatch SoftRIP: setting up your image.

- ▶ Start up the WasatchRIP by double clicking the shortcut icon on the desktop or by choosing: start, programs, Wasatch SoftRIP on the Windows RIP pc.
- ▶ Open your image via the file menu and the command 'open' or via the file browser tab on the left side of the main window. If you use the file browser tab, you can easily drag and drop the selected image onto the preview part of the main window.

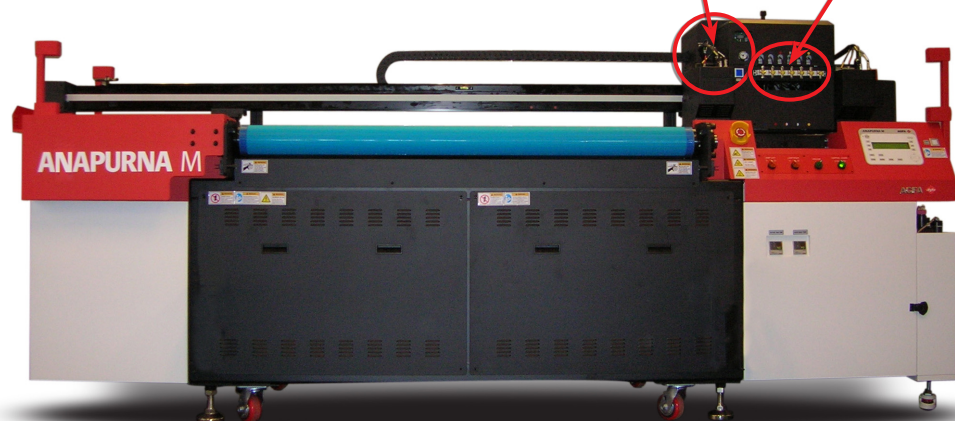


- ▶ Make sure that the output size fits on your media. You can check and alter the dimensions of your print, using the "size" tab on the left side of the main window.
- ▶ Select the resolution of the print in the Setup window. You can access this via the print menu or via the setup icon behind the print unit on top right side of the main window. Agfa is supporting two quality modes: 720x720 dpi or 720x1440 dpi.
- ▶ Close the setup window and choose the rip icon on the main window or via "rip only" in the print menu.
- ▶ The image will be ripped and it will be placed in the print queue.

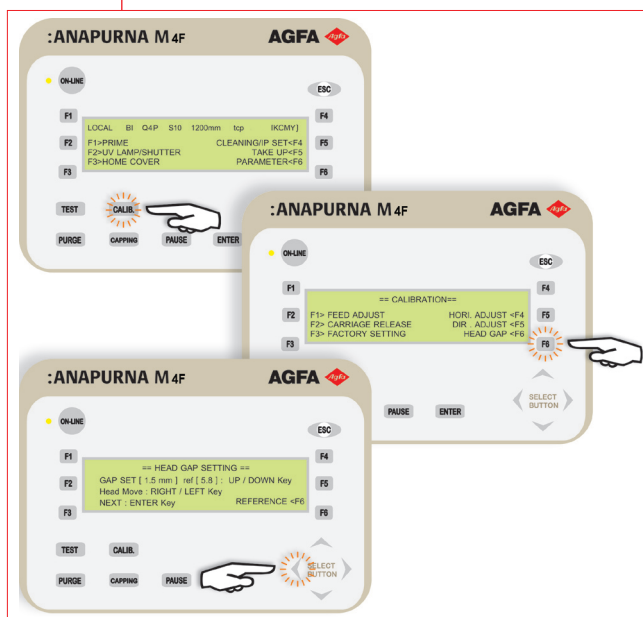
1.2 Starting up the :Anapurna M4F.

When the :Anapurna M4F is in a normal shutdown mode (overnight standstill), the shuttle will be stationed on the right side (home position).

- ▶ Unlock the emergency switches: you find the e-switches on the right side of the engine. One at the back and one in the front, release by turning them.
- ▶ Push the start button; While the shuttle starts rising to its most upwards position, the display will show you some information about the :Anapurna M4F (software version, etc.).
- ▶ When the shuttle is lifted, it checks its home position and lowers itself to a default height. The engine goes to the offline mode.



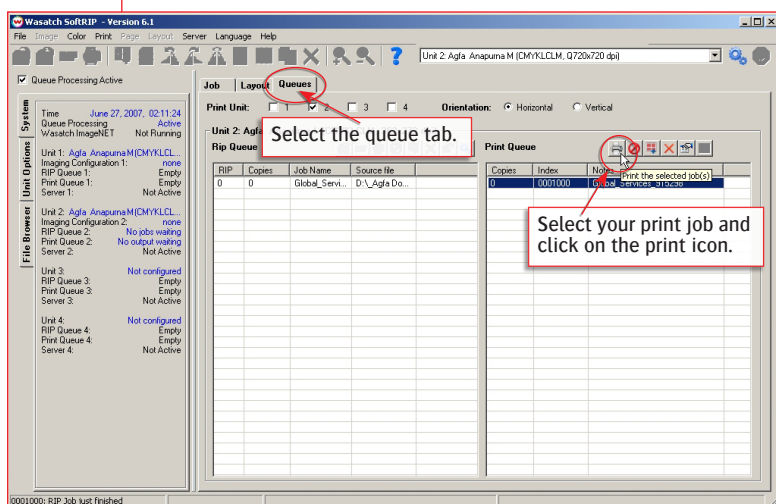
- ▶ Adjust the negative pressure by turning the valve on the top of the shuttle. Make sure that you reach a value of $-.036$. The value is displayed on the left side of the shuttle;
- ▶ Switch the ink valves back to the "1" position;
- ▶ Lower the media set bar by turning the media set button;



- ▶ Position the left side guide, using the scale on the inside of the media set bar;
- ▶ Load your media onto the conveyor belt and position it against the media set bar;
- ▶ Turn the vacuum on and raise the media set bar (switch the media set button);
- ▶ Press "Calibration" button and choose F6 "Head Gap" to set the shuttle to the correct reference height as for the media. Press the left arrow to move the shuttle to the desired position. Make sure that you position the shuttle so the height calibration will be done between the two red dots on the beam;
- ▶ When the shuttle is in position, press "Enter" and the shuttle will lower itself to the reference height. This is a default value and is not the same as the actual head height. Press "Enter" a second time to lower the shuttle to the head gap distance;
- ▶ Move the shuttle back to the home position by pressing "Enter". The "head gap" procedure is now completed and the shuttle is set to the desired distance;

- ▶ Check the state of the print heads by performing a prime print. Turn on the U.V. lamps and press "F1" in the main menu. The lamps start warming up and after 90 sec. the :Anapurna M4F will print a jet test;
- ▶ Close the capping station by turning the switch to "close";
- ▶ The :Anapurna M4F is ready to print when the temperature of the head base plate and the inks have reached the desired values;
- ▶ Press the "Online" button and make sure that the green LED is 'ON'.

1.3 Making your first print.



If the :Anapurna M4F is online and all nozzles are clear, the engine is ready to print. Make sure that your media is loaded and the vacuum is on. Set the U.V. lamps to the desired strength (half or full power).

Choose the queue tab in Wasatch. You find it at the top of the preview window. Select the job that you want to print in the print queue and click on the print icon in the top of the print queue.

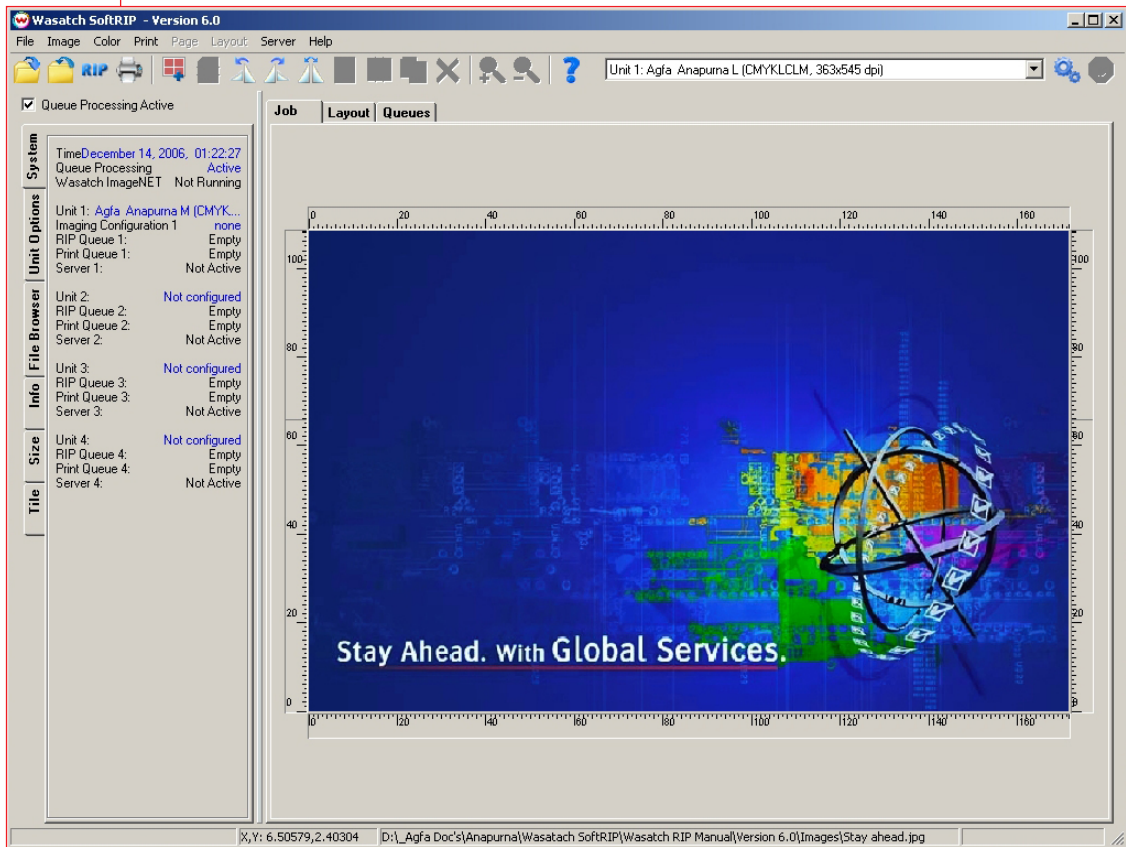
As the engine is in 'online'-mode, the :Anapurna M4F will start printing the job if the uv lamps are ready.



2. The Wasatch SoftRIP AE.

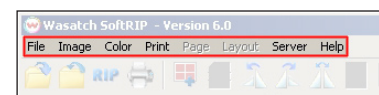
2.1 Main Window - overview.

SoftRIP's Main Screen is briefly described below. These menus and controls are covered in more detail in the wasatch manual.



a. Menu items.

- File:** Use the File menu for opening files saved on disk or network. Files opened here are automatically displayed as screen previews when the Job tab is active, or imported to the current layout when the Layout tab is active. This menu also provides access to the Print Archive tool, and the Preferences window for changing optional settings.
- Image:** The Image menu contains tools for modifying the image currently open in the Job tab, or currently selected in the Layout tab.
- Color:** The Color menu contains key SoftRIP color tools for managing spot colors, color gamut, correction curves etc.
- Print:** Access to printer and Imaging Configuration set up, RIP/processing options and job queues.
- Page:** When active, enables switching among different pages of a multi-page PostScript file.
- Layout:** The Layout menu accesses automated Smart Nesting™ tools, and other features to speed the process of creating efficient layouts.
- Server:** Set up and activation for Hot Folders and Wasatch ImageNET.
- Language:** When enabled, the Language menu selects among non-English languages.
- Help:** Accesses online Help, program info, Service Data Uploader and online product registration.

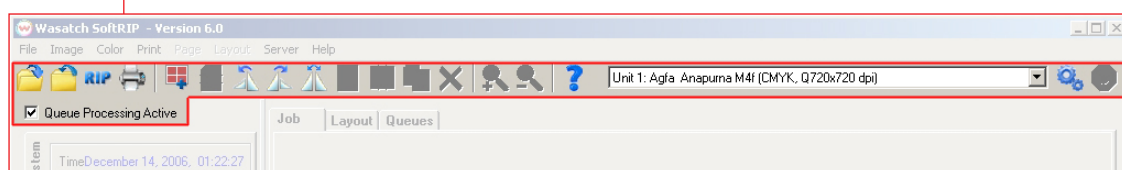


b. Universal Controls.

Unit Window: Selects the printer to use for current job or layout processes. SoftRIP drives up to four printers.

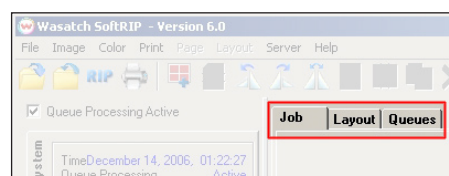
Queue Processing Active: Unchecking this checkbox will completely shut down all new jobs from processing in the queues! Under normal conditions, this box is checked. When unchecked it flashes red. All processing stops when Queue Processing Active is unchecked. Uncheck the box to stop all printing in order to change system configurations or re-prioritize jobs.

Tool Bar: Buttons on the tool bar are active or grayed-out depending on various selections of the tabs found below them on the main window. All tool bar operations can also be accessed from menu selections within the program, and all are documented with tool tips.



c. Top tabs.

The tabs along the left and upper edges of the main window include many of the key file preparation and workflow tools in SoftRIP. Based on your top tab selections, tabs along the left of the screen may appear, disappear, or modify.



Job Tab: When the Job tab is selected, you can open an individual input file, or job, to be prepared for printing. With the Job tab selected, a full set of options for sizing, cropping, scaling, and tiling appear.

Layout Tab: When the Layout tab is selected, you use the full width of your media as a digital canvas upon which you can prepare images to print as part of your complete production run. With this workflow, you can easily drag and drop images into the layout, manipulate them, and nest them to fit efficiently as part of your overall print run. The entire Layout can then be submitted to RIP and print.

Queues Tab: When the Queues tab is selected the view becomes the master production control station of the RIP. On the Queues tab, all RIP and Print queues are displayed with the status of each job updated in real time.

d. Left tabs.

System Tab: Displays the status of all printers and job queues.

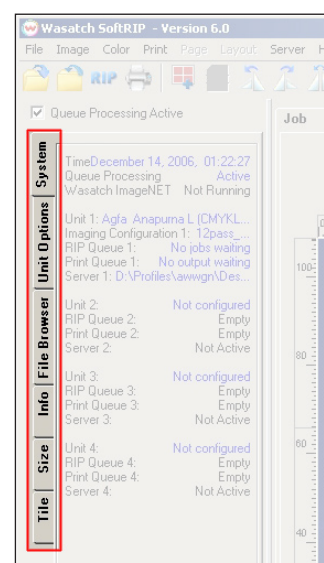
Unit Options Tab: Includes settings for immediate or delayed nesting printing, annotations, crop marks, and registration marks.

File Browser Tab: Lets you quickly drag and drop files into the Job, Layout, or Queues windows.

Info Tab: Displays information about an open job, including real-time values for input and output color at any point on the previewed image.

Size Tab: Controls sizing, cropping, rotation, and mirroring for the current image on the Job tab.

Tile Tab: Provides controls for “paneling” or “tiling” print jobs that are too wide for the current printer.



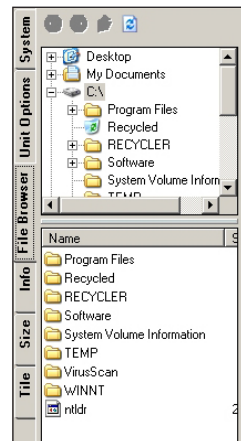


2.2 Open an image.

You can open image in Wasatch via the 'file' menu and the command 'open' or via one of the left tabs: the file browser.

Using the file browser tab, you can quickly search and open images. You can simply select an image in the file browser tab and drag onto the preview window. If an image does not require any file preparation, you can drag and drop it directly from the file browser tab to a RIP Queue. You will be asked whether or not you would like to generate a preview. If you select not to generate a preview, the image will display as "Preview not available" when added to a layout.

Wasatch supports different kinds of file types:
ps, prn, pdf, eps, tif, jpg, gif, png, psd, bmp, csf.



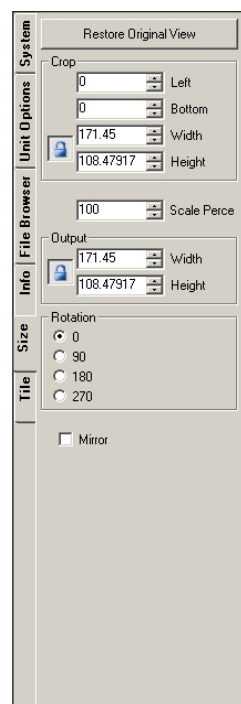
2.3 Cropping, resizing an image.

The Size tab contains several key features that scale and otherwise transform images prior to printing. The Size tab automatically appears on the Main Screen whenever a file is opened. These utilities are found on the Size tab: Sizing (or scaling), cropping, rotating and mirroring.

a. Resizing.

To enlarge or reduce an image, enter a new value in the window next to the Scale Percent heading. Your ENTER or TAB key activates the change. The new dimensions are displayed in the Width and Height windows in the Output area, while the original dimensions are displayed next to Width and Height in the Crop area. If your scaling percentage will produce an image larger than the printer's maximum output format, SoftRIP alerts you by marking the surplus area with a red and black flashing crosshatch. You must either reduce the scaling percentage, or use the Tiling feature.

Computing Scaling Percentage Automatically: SoftRIP will size an image if you enter the desired width or length of the final print in either the Width or Height windows in the Output area. For example, you can enter the printable width of your print media or one dimension of a light box or display hardware. Make sure the Constrain Proportions box to the left of the Width and Height boxes is checked, then press ENTER or TAB to activate the change.



The new percentage appears in the Scale Percent window, while the other dimension (either Width or Height) is displayed in the appropriate window. A cropping marquee also appears around the entire image (see Cropping, below). You only need to enter one dimension in an Output window (Width or Height); if you attempt to enter a value in the other, SoftRIP activates the automatic scaling process. For automatic scaling to work, the Constrain Proportions box next to the Output windows must be checked.

b. Cropping.

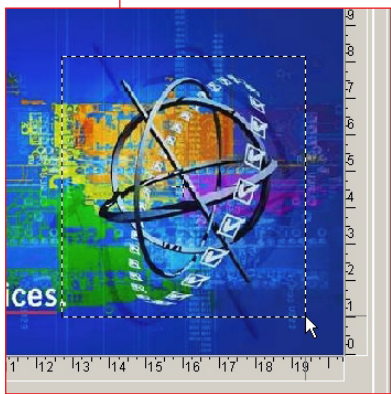
This tool defines a smaller area of the original image and prints only that area. This is true cropping, because only the selected area will be RIP'd. This saves RIPing time and is an excellent tool for printing test strips for color evaluation. The cropping tool can also be used to magnify selected areas of the image (see below under Zoom into Crop Box).

Adjustment modes: There are two options for adjusting marquee borders: free or proportional. Free means that the marquee edge you select moves independently of other edges. Proportional means the width and length stay proportional to the original dimensions of the marquee. The mode of marquee adjustments is selected in the Constrain Proportions boxes, the same way that image width and height are locked during scaling. Check the Constrain Proportions boxes to select a proportional mode; uncheck them for free mode. You may also right-click inside of the



marquee, which will open a popup menu (the other selections on this menu are described below). Selecting Constrain Proportions On corresponds to the proportional mode, and automatically places check marks in the boxes.

► **Left-click on the preview image: activate crop area.**



Activate the crop area by left-clicking anywhere in the image and dragging your mouse to create a dotted line “marquee” box. The marquee defines the area to print, or an area to zoom into. Re-position the borders of the cropping marquee by holding down the left mouse key and dragging. The Width and Height windows in the Crop area display the size of the marquee dimensions on the original image. The Width and Height windows in the Output area display the size of the crop marquee dimensions. Only the area inside the marquee will print.

Matching specific display dimension requirements: For more precise adjustments, enter new dimensions in either the Width or Height windows in the Output area. This must be done in the Free mode (Constrain Proportions turned off). The dimensions of the marquee will not change until you press ENTER or TAB.

Changing marquee position manually and numerically: The entire marquee area can be re-positioned by clicking in the centre of the marquee and dragging the marquee box. The position of the marquee’s left and bottom edges are displayed in the windows labeled Left and Bottom in the Crop area. The numbers shown represent the distance in inches or centimeters, measured from the respective edge of the original image to the outside border of the marquee.

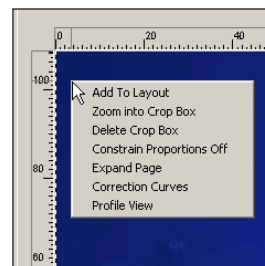
Change the marquee position more precisely by hand-entering new values in these windows. When you enter new numbers to position the marquee, the marquee will not move until the ENTER or TAB key is pressed.

When a crop marquee is “live” on an image preview, right clicking within the marquee launches the popup menu.

► **Right-click on the preview image: pop up menu.**

Right-clicking on the image, will open a pop up menu which offers you the next options:

- **Zoom Into Crop Box:** eliminates areas outside the marquee and allows you to zero in on specific elements of the image. Especially useful for color correction and spot color replacement.
- **Delete Crop Box:** makes the marquee go away and resets the Crop and Output dimensions.
- **Constrain Proportions On or Constrain Proportions Off:** toggles between free and proportional repositioning of the marquee borders.
- **Expand Page:** places a white border around the edges of the image.
- **Replace Spot Color:** launches the Special Colors menu and spot color management features.
- **Correction Curves:** launches the Correction Curves menu.
- **Profile View:** launches the Profile View Utility.

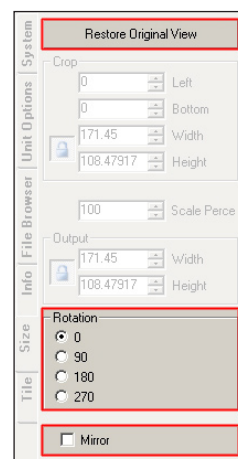


c. Restore Original View.

This option takes you back to the original view of the image.

d. Rotating.

Rotating a landscape image 90° into a portrait format may allow you to print the image in a larger size without tiling. The other rotation degrees allow you to re-position an image that is upside down or otherwise incorrectly oriented.





To select a rotation value, click the corresponding radio button. The effect is immediate (does not require pressing the ENTER or TAB key). Rotation in SoftRIP always works counter-clockwise and is not cumulative. Whatever value you select will be applied based on the original position of the image.

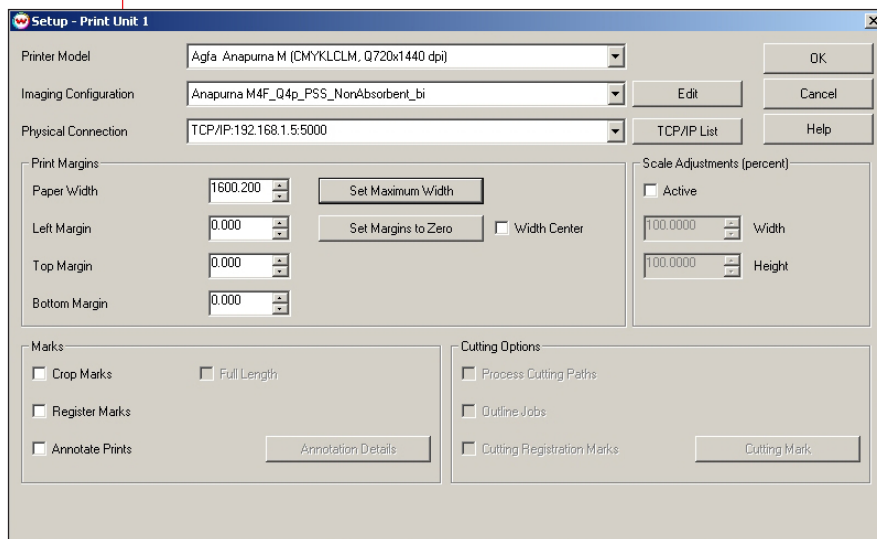
e. Mirroring.

This feature flips the image over. It is used primarily for printing backlit transparencies or other second surface applications. It is also used for images to be transferred to another substrate, such as fabric.

2.4 Choosing an imaging configuration.

Once your image has been adapted to the right output size, you only have to select an imaging configuration before you can start printing. This imaging configuration is the print strategy which will determine the output resolution and the possible use of color management.

You can select the imaging configuration in the setup screen. Launch the Setup screen from the Print menu at the top of the Main Screen.



In the drop down box of the imaging configuration, you find 8 different print strategies:

- ▶ AnapurnaM4F_Q4p_PSS_Absorbent
- ▶ AnapurnaM4F_Q4p_PSS_Absorbent_bi
- ▶ AnapurnaM4F_Q4p_PSS_NonAbsorbent
- ▶ AnapurnaM4F_Q4p_PSS_NonAbsorbent_bi
- ▶ AnapurnaM4F_Q8p_ED
- ▶ AnapurnaM4F_Q8p_ED_bi
- ▶ AnapurnaM4F_Q8p_ED_WideGamut
- ▶ AnapurnaM4F_Q8p_ED_WideGamut_bi

(PSS : Precision Stochastic Screen, ED : Error Diffused Screen)

After selecting one of these configurations, click ok and the image is ready to be ripped and printed.

2.5 Ripping and printing the image.

You can select one of the rip/print icons or use the print menu on top of the main window. You can choose between:

- ▶ RIP AND PRINT.

A PostScript Interpreter bar launches on your task bar during RIPPING, then a Print Spooler bar. Clicking on these bars opens windows that provide information regarding the progress of the job. Once your image is completed ripped, the Anapurna M4F will start printing when it is online.

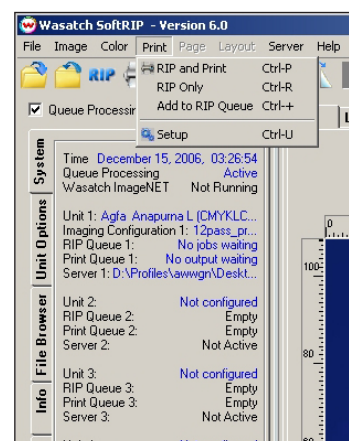


► **RIP ONLY.**

To RIP a job without printing it, select **RIP ONLY** from the **Print** menu. The job will be RIP'd and added to both the RIP and Print Queue listings on the Master Queues screen (more below). If you want to print, you have to select the job in the print queue and hit the print button.

► **ADD TO RIP QUEUE.**

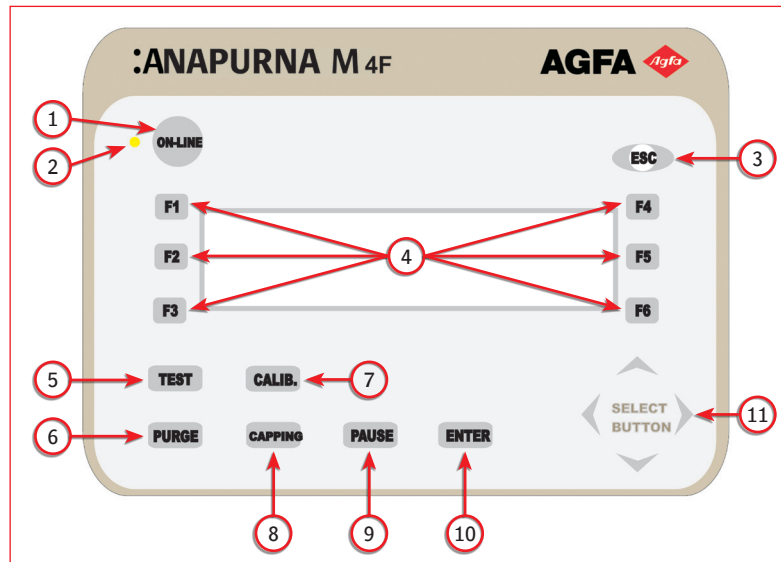
To add a job to the RIP Queue to be RIP'd later, select **ADD TO RIP QUEUE** from the **Print** menu. It will be added to the RIP Queue but not RIP'd.





3. The operator panel. (general overview)

The operator panel on the right side of the :Anapurna M4F, gives you access to all the different settings of the printer. It allows you to perform cleaning routines, to determine working procedures and to enable safety and quality settings.



- (1) ON-LINE : When the LED (2) is on, the system is On-line and is ready to print. Pressing the ESC (3) button will change the status to Off-line, the LED will go out. If you send a job when the engine is in the Off-line status, the LED will start blinking. the job waits until you push the On-line button.
- (2) LED : Indicates On-Line or Off-Line status.
- (3) ESC : Use this button to CANCEL a print and to RETURN from a menu.
- (4) F1~F6 : Function keys to access different menu's and settings.
- (5) TEST : Printing test, F1: Prime, F2: Vert. Alignment, F3: Hor. Alignment.
- (6) PURGE : Similar functions to capping.
- (7) CALIB : Nozzle alignment, head gap.
- (8) CAPPING : To position the head over the capping station.
- (9) PAUSE : To temporarily stop printing, press again to resume.
- (10) ENTER : To save any settings you've changed in a menu.
- (11) Dir. Key : Navigate through the different menu's.



4. Start up & Shutdown Procedures.

4.1 Start up Procedure

- ▶ Turn the compressor ON. Wait for the compressor tank to fill up and compressor motor to cut-off.
- ▶ Turn the Air Drier ON (Air drier is used to take the moisture out of the compressed air).
- ▶ Check the input air pressure on the rear right side of the engine (the gauge should read 0.6 MPa/6 Bar/87 PSI).
- ▶ Clear the table of the Anapurna Engine.
- ▶ Check if the Mains are ON (electrical circuit at the premises).
- ▶ Turn the Main power Switch 'ON' from the Anapurna Engine (Rear Side - Left).
- ▶ Make sure that the Emergency Switches are 'OUT'.
- ▶ Push the ON/OFF Switch; the engine will start booting up
 - ▶▶ At this moment, the carriage will start moving up. The carriage will then move towards the Home Side & move down
 - ▶▶ If the Safety Sensors were not activated; you will get a message on the Control Panel informing that 'The Safety is OFF' (the safety sensors are OFF). You will have two options, Press F2 & the sensors will stay OFF or Press F5 & the Sensors will activate.
Press F5 (the sensors will get activated) & the carriage will start moving up. The carriage will then move towards the Home Side & move down
Agfa recommends that Safety Sensors should stay 'ON'
- ▶ After the boot up, the engine will go into 'OFF-LINE' Mode.
- ▶ Press F3 to push the Home Cover in.
- ▶ Clean the Capping Station (if required) & close the Capping Cover.
- ▶ Check:
 - ▶▶ The Vacuum : Should be around: - .036
 - ▶▶ The Sub Ink Tank & Head Base Temperature: Approx. 45 degrees & 49 degrees respect.

4.2 Making the engine ready for Printing.

- ▶ Turn all the (ink) 2-way valves back to 'I' Position (ink position); (the extreme right hand side valve should already be at 'I' position). Make sure the Home Cover is in (open).
- ▶ Press the PURGE button 2 – 3 times and check the ink coming out of the print heads. If you see any Air Bubbles or Cleaning Solution, do some more purges (Quick Purge or Long Purge).
- ▶ Take a new lint-free cloth and 'Tap' the print heads (No Wiping or Scratching) making sure :
 - ▶▶ There are no ink drops left on the print heads.
 - ▶▶ Do not clean with dirty lint free cloth.
- ▶ Put some media on the bed and turn the Vacuum ON (make sure the media sits flat on the bed).
- ▶ Do a Head Gap:
 - ▶▶ Press 'Calib' and then press F6 (for Head Gap).
 - ▶▶ Press the Left Cursor Key (the carriage will move UP and then left wards). Press 1 or 2 times the left arrow to position the carriage above your media.
 - ▶▶ Press Enter 3 times (with intervals) to complete the Head Gap
When Enter is pressed the first time, do a visual check if the Head Gap Sensor has come down.
Also make sure that the media is under the Head Gap Sensor (otherwise the media height will be recorded incorrectly).
 - ▶▶ Press ESC to go back to OFF LINE MODE screen.
- ▶ Check & adjust the Parameters (margins):
 - ▶▶ Put the Media Set Bar to down position.
 - ▶▶ Press F6 (for Parameters).
 - ▶▶ Go down to 'Margins' & put in the correct values (specially for Left Margin)
 - ▶▶ Also adjust N-point to 'N' & Top Margin to 'zero'
 - ▶▶ Press 'Enter' & move the Media Set Bar back to 'up' position



- ▶ Turn the Lamps 'ON' (may be, to Half Strength).
- ▶ Press the F1 to do a Prime Test (Nozzle Test).
 - ▶▶ If all the nozzles look good, you are ready for printing.
 - ▶▶ If not, you need to do some more purges (Ink Purge) making sure that Home Cover is in.
 - ▶▶ If the print heads do not come good with Ink Purges, you might have to clean the print heads with Cleaning Solution (using the Solution Valve button on the rear side of the carriage).
 - For this, you need to turn the Solution 2-way valve to 'S' position
 - Turn the Ink 2-way valve to 'S' position
 - Press the Solution Valve button (rear side)
 - Purge Ink after this procedure

For more information on cleaning routines; see Section C - Maintenance.

4.3 Shutdown Procedures.

a. Daily Shut Down Procedure.

- ▶ The carriage is at the Home Position (after printing).
 - ▶▶ It is better to check if all the print heads are in good shape (by doing a Prime Test).
- ▶ Turn the Lamps 'OFF'.
- ▶ Let the Lamps cool down (wait for Lamp Fans to go off).
- ▶ Push the Emergency Button 'IN'; the power to the engine will be cut.
- ▶ Make sure the engine gets uninterrupted compressed air supply throughout the night, otherwise follow the weekly shut down procedure.

b. Weekly Shut Down Procedure.

- ▶ The carriage is at the Home Position (after printing).
 - ▶▶ It is better to check if all the print heads are in good shape (by doing a Prime Test).
- ▶ Turn the Lamps 'OFF'.
- ▶ Let the Lamps cool down (wait for Lamp Fans to go off).
- ▶ Make sure that there is plenty of Cleaning Solution in the Main Tank and an extra 1 litre bottle in stock.
- ▶ Perform a 'Head Flush' on all the print heads:
 - ▶▶ Open the Home Cover
 - ▶▶ Switch the 2-way ink valves for Black & Cyan to 'S' position
 - ▶▶ Open the solution 2-way valve (to 'S' position)
 - ▶▶ Push onto the Flush button (on the rear side of the carriage) with intervals >>> 1 second ON and 4 seconds OFF >>> till you see the cleaning solution coming out of Black & Cyan print heads
 - ▶▶ Switch the 2-way ink valves for Black & Cyan back to 'I' position
 - ▶▶ Repeat this sequence for Magenta & Yellow print heads
 - ▶▶ Now, switch all the four 2-way ink valves to 'S' position and press the Flush button for 1 second (cleaning all the print heads at one time)
 - ▶▶ Close the Solution 2-way valve (back to 'I' position)
 - ▶▶ Clean the residue of the cleaning solution on the print heads (just a gentle tap) and clean the base plate
 - ▶▶ Turn the Vacuum Gauge to zero
 - ▶▶ Push the Red Emergency Button
 - ▶▶ Turn the Power Switch 'OFF' (from rear side of the Anapurna)
 - ▶▶ Turn the Mains of the premises 'OFF'
 - ▶▶ Turn the Compressor & Drier 'OFF'

c. Long Stand Still Shut Down Procedure (More than 14 days)

- ▶ Follow "Perform a 'Head Flush' on all the print heads" procedures as discussed in the Weekly Shut Down Procedures.



- ▶ Open the Capping Cover & clean the capping station.
- ▶ Press CAPPING from the control panel; the carriage will start going up, move towards the left side (capping side) & move down on the caps.
- ▶ Push the Red Emergency Button.
- ▶ Turn the Power Switch 'OFF' (from rear side of the Anapurna).
- ▶ Turn the Mains of the premises 'OFF'.
- ▶ Turn the Compressor & Drier 'OFF'.



5. Setting up the :Anapurna M4F. (the calibration menu)

Before you can access the different settings, make sure that the printer is offline. If not, press the 'ESC' button to switch the :Anapurna M4F offline.

When you press the 'CALIB.' button (control panel n° 7), the different calibration settings will pop up on the screen. By choosing a corresponding function key (F1, F2, F3,...), you can change that parameter.

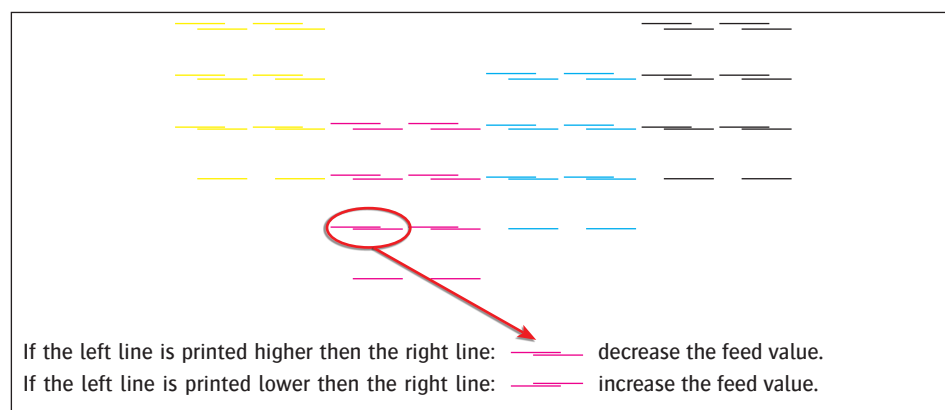
- ▶ F1 : FEED ADJUST
- ▶ F2 : CARRIAGE RELEASE
- ▶ F3 : FACTORY SETTING
- ▶ F4 : HORI. ADJUST
- ▶ F5 : DIR ADJUST
- ▶ F6 : HEAD GAP

In order to achieve the best quality, you have to make sure that these parameters are carefully set. A deviation in one of these parameters, can cause loss of quality. Make sure the head gap procedure has been followed before conducting any calibrations.

5.1 Feed Adjust (F1).

The feed adjust is the parameter which controls the size of each step the conveyor belt will move between different print passes. If this settings is too high, white lines will start to appear between every printing pass. Entering a value that is too low, will make different passes overlap each other. This results in dark lines in your print.

If you want to check the feed adjust, press F1 to enter the feed calibration menu. Select F2 to start the print. In the first pass the printer will print 2x 4 lines of every color. Every pass that follows, a new line will be printed besides one of the first 4. In case that the printed lines are not aligned as one line, you need to adjust the feed value.



size test chart: 13 x 8 cm

5.2 Carriage Release (F2).

You can unlock the shuttle by pressing F2. The servo motor will be turned off and you can move the shuttle by hand. If you want to switch the servo motor back on, choose F1 'servo on and home check'. The shuttle will reposition itself in the home position.

5.3 Factory setting (F3).

In this menu the head voltage, etc. are managed. This setting is protected with a password and can only be accessed by a service engineer.

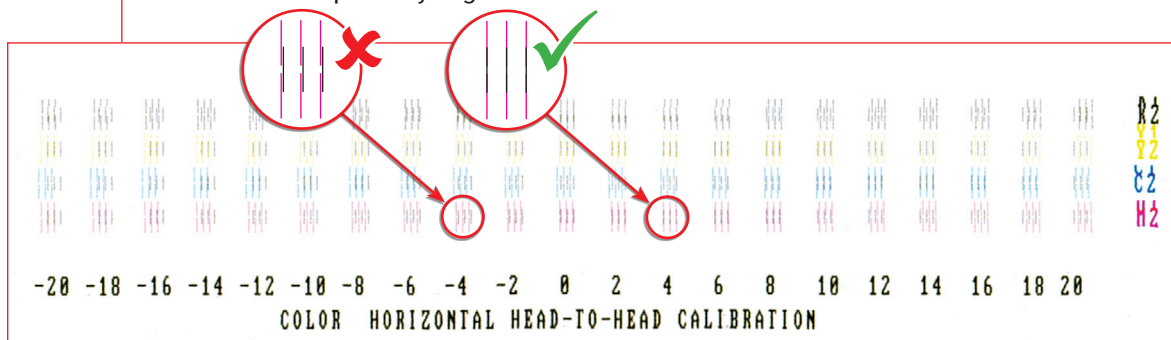
5.4 Hori. Adjust (F4).

The horizontal head-to-head calibration is a tool to align the colored printheads in reference to the black head. It is a software parameter that controls the timing of the firing of the heads.



Every printhead is an assembly of two nozzle rows which are steered separately. Every nozzle row has its own timing. The testchart is made up of different blocks, containing three lines for every nozzle row. For every color, 21 blocks are printed with different firing timings, going from -20 to +20 in steps of 2.

Between the colored lines of the different nozzle rows, black lines are printed. Choose the value per color and per nozzle row (f.e. M1 & M2), where the black and colored lines are perfectly aligned.



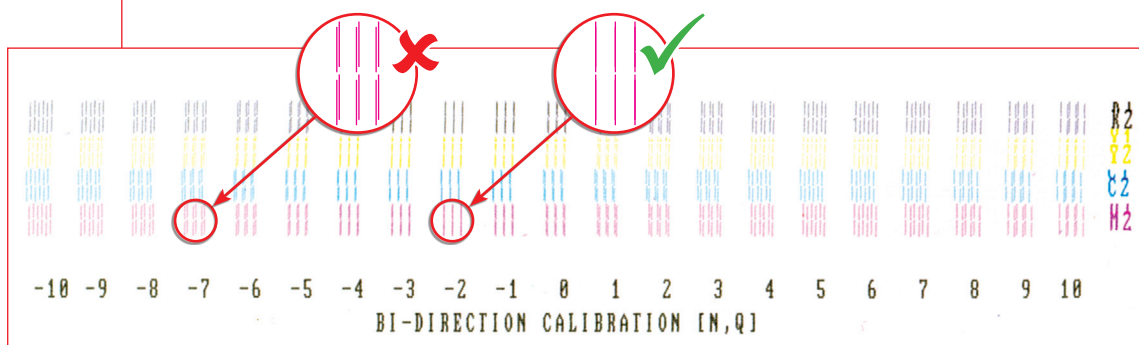
size test chart: 15 x 3 cm

5.5 Dir. Adjust (F4).

The bi-direction calibration chart is a tool to determine the firing time from the shuttle when it prints bi-directional. Because of the head gap and the speed of the shuttle, ink drops will be fired with a different angle if the shuttle goes from left to right or from right to left (firing time delay).

Like in the horizontal head-to-head calibration, blocks of three lines are printed per color and per nozzle row. This chart is printed bi-directional and only the block with the correct setting will show three lines. In all the other blocks and values, you will see 6 lines per color and per firing row. 3 lines are printed from left to right, 3 lines are printed from right to left.

Choose the correct value for every color and every nozzle row and enter these values into the dir. adjust window.



size test chart: 15 x 3 cm

Make sure that you always check the bi-directional alignment when you change the head gap (for e.g. 1,6 mm instead of 1,3 mm) of the shuttle.

5.6 Head Gap (F6).

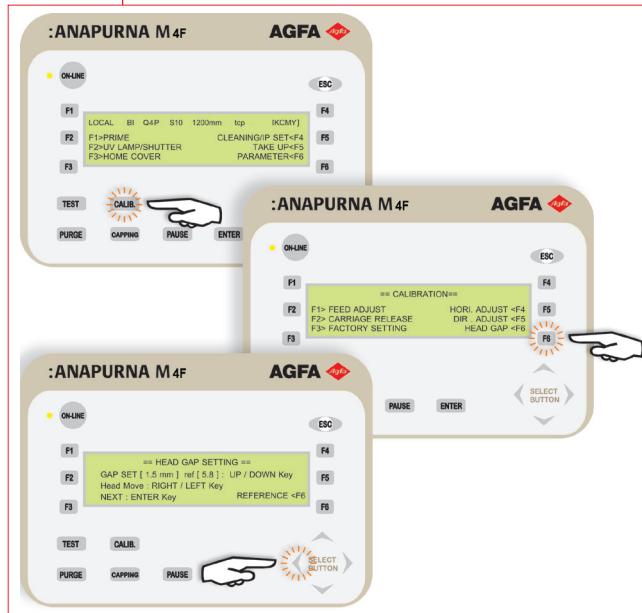
By pressing F6, the head gap setting procedure opens. It allows you to set the gap between the base plate and the media which you are using. Make sure that you follow this procedure every time you use a different media and after every start up procedure.

The head gap setting window allows you to enter a value for the head gap. Default setting is 1,3 mm. Increasing this value will also increase the risk of printing artefacts. Printing in a bi-directional mode also influences artefacts in a negative way. So if you want to print with a bigger head gap, it would be advisable to print uni-directional. Make sure that you never use a head gap >2,5 mm.



The reference height (ref) is the height to which the shuttle will move right before lowering itself to the actual head height. This value was measured and entered in the factory. It can only be changed by a service engineer by pressing F6. It is also protected by a password.

The head gap procedure is activated by pressing the left arrow on the control program. The complete procedure looks as follows:



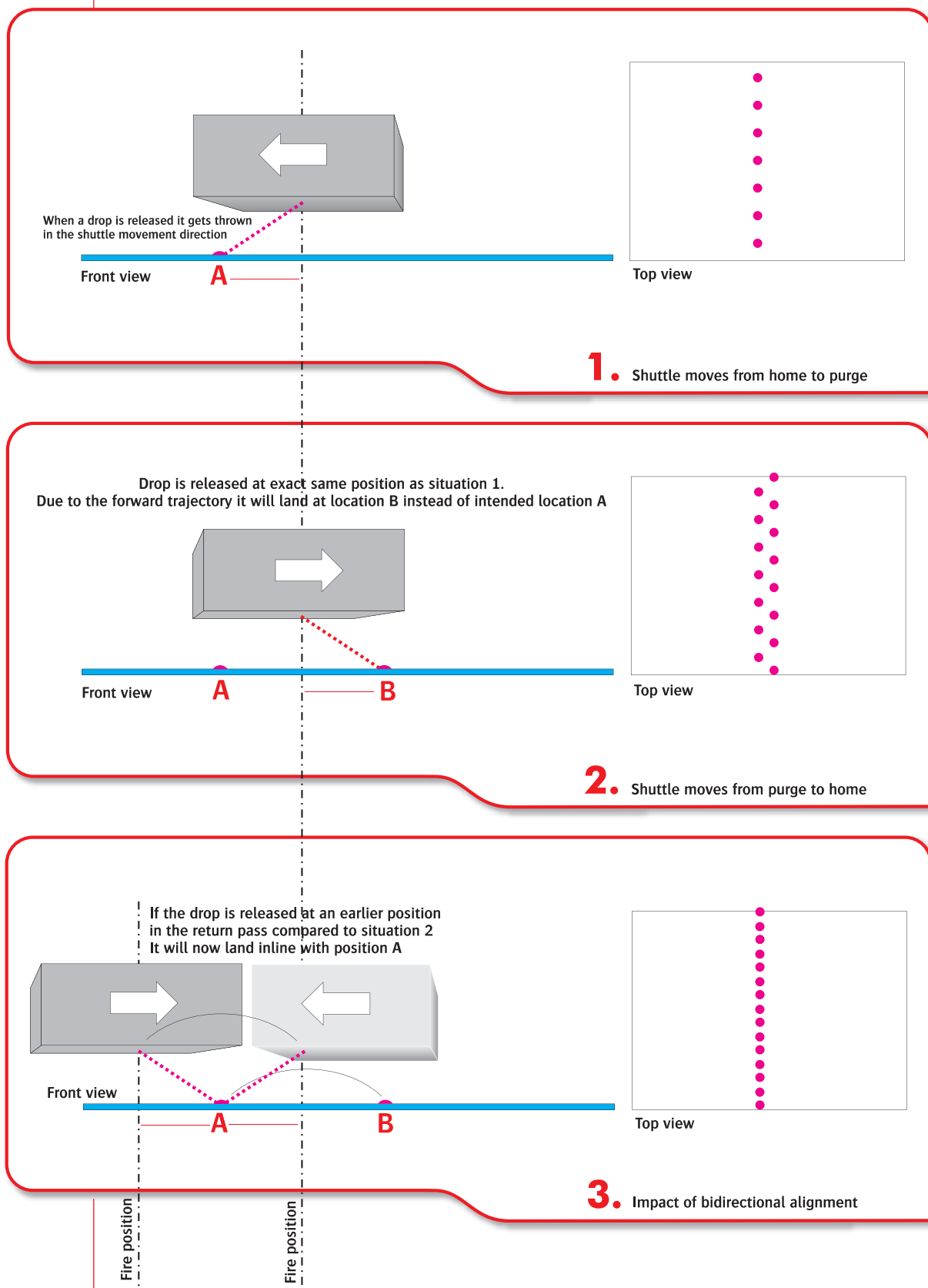
- ▶ Press the “Calibration” button and choose F6 “Head Gap” to set the shuttle to the correct height. Press the left arrow to move the shuttle to the desired position. Make sure that you position the shuttle so the height calibration will be done between the two red dots on the beam.
- ▶ When the shuttle is in position, press “Enter” and the shuttle will lower itself to the reference height. This is a default value and is not the same as the actual head height. Press “Enter” a second time to lower the shuttle to the head gap distance.
- ▶ Move the shuttle back to the home position by pressing “Enter”. The “head gap” procedure is now completed and the shuttle is set to the desired distance.

Make sure that you follow this procedure every time you use a different media, after every start up procedure and after each new gap value.



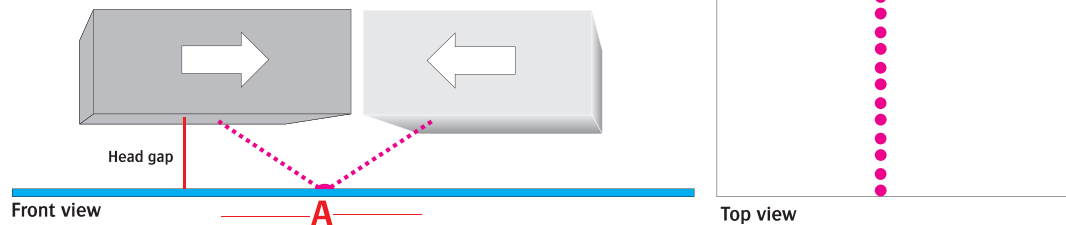


5.7 Importance of the bi-directional alignment.



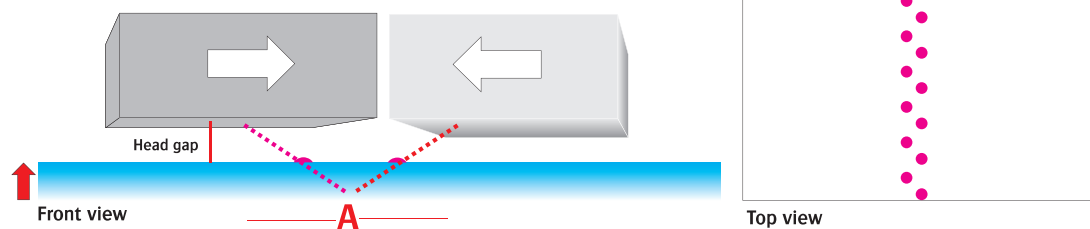


This situation shows a correct bidirectional alignment for this particular media and head gap



4. Impact of gap and media thickness

In situation 5 we have loaded a thicker media without adjusting the head gap. This results in a smaller gap and a shorter travel path for the dots. If we do not adjust the bidir alignment the dots will not line up



5. Change in head gap without adjusting bidir



A correct bi-directional alignment is crucial for an accurate dot placement. The bi-directional alignment is depending on the shuttle speed and the head gap. Whenever one of those changes, the bi-directional alignment needs to be checked.

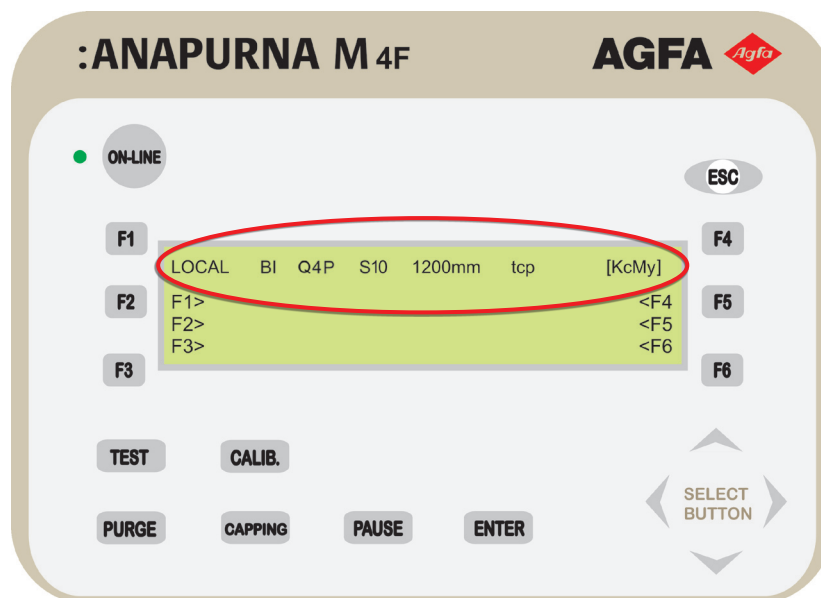


6. Changing the parameters. (the main menu)

The main menu gives you information about the selected printing strategy. It also allows to change certain parameters like roll to roll or rigid settings, u.v. lamp settings,...

6.1 Information bar.

On the top of the main menu, you find different parameters telling you something about the selected printing options:

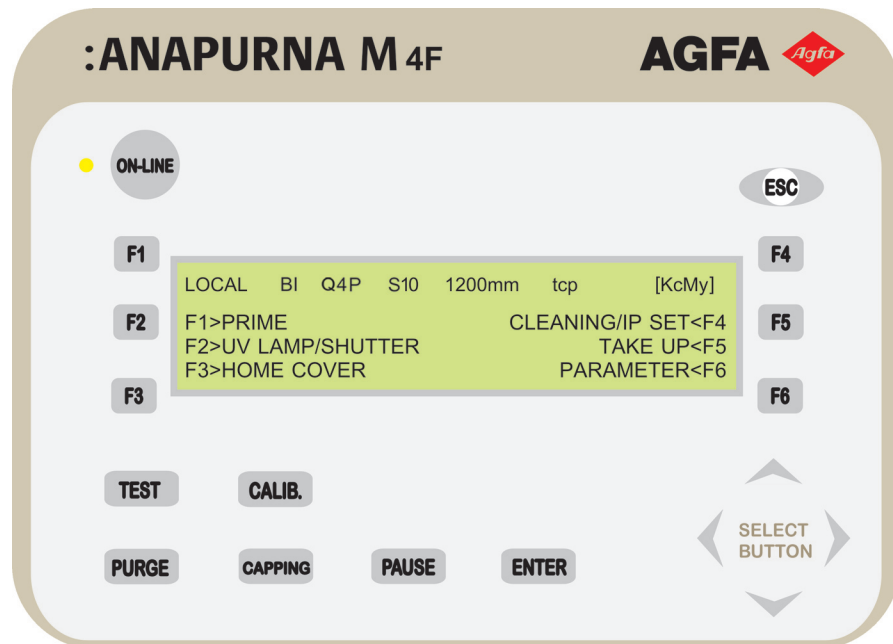


- ▶ **LOCAL / HOST** : The printer control mode tells you which parameters are going to be used. If the printer is set on host, the parameters coming out of the the Wasatch SoftRIP will be respected. If the local mode is selected, the setting information coming out of the Wasatch SoftRIP will be overruled and will be replaced by the settings determined on the :Anapurna M4F itself.
- ▶ **BI / UNI** : In the bi-directional mode, the printer will be print in two directions: from left to right and from right to left. In uni-directional mode, the shuttle will return to home position without printing. The drops are only fired when the shuttle moves from left to right.
- ▶ **Q4P** : The number of passes are related to quality mode that was selected. It are the number of passes that the shuttle needs to complete one printing line ($720 \text{ dpi} = \text{Q4P} / 1440 \text{ dpi} = \text{Q8P}$).
- ▶ **S10** : The speed of the shuttle can be changed by a value between 1 (slow) and 10 (fast). The default setting S10 is the most optimized speed. Decreasing the speed will not provide better quality and will only limit your production capacity.
- ▶ **1597mm** : The standard setting will be 1597mm, which is the maximum printing width of the :Anapurna M4F. If you change the media width in the Wasatch SoftRIP f.e. to 1000mm, the control panel will display this value (if the control mode is set to HOST)
- ▶ **tcp / TCP** : The tcp parameter gives you information about the status of your LAN communication link. If TCP is displayed in capital letters, data is being received by the printer. Lower case letters mean that the printer is waiting for data.
- ▶ **[KCMY] / [kcmy]** : The condition of the sub ink tanks are indicated by the letters KCMY. Every sub ink tank (color) has its own sensor and if the letter of corresponding color is displayed as a capital, the sub ink tank contains enough ink. If the level in the sub ink tank is too low, a lower case letter will appear. Normally, the corresponding pump will start pumping new ink into the sub ink tank.



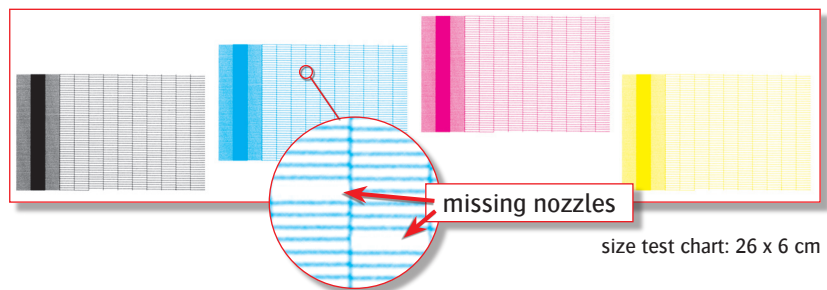
6.2 Function keys. (parameters)

The main menu gives you access to 6 features via the 6 function keys.



► F1 > Prime

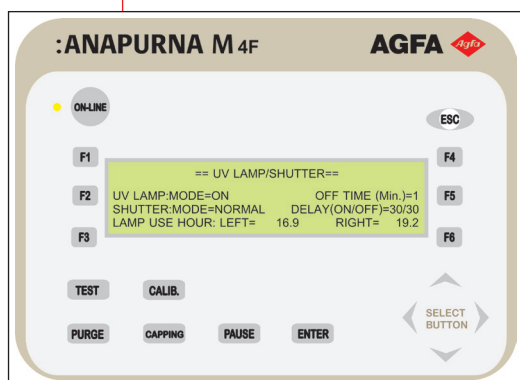
This prime test is the best way to check if all the nozzles are firing. By pressing F1, a warm up time for the u.v. lamps will be initiated when the lamps are not already online. The testchart looks like a fence per color. You can immediately see if one or more nozzles are missing.



Make sure that a left margin (p.32) is set before you do a prime test. You can also use other test charts to check the condition of the print heads (p.37).

► F2 > UV LAMP / SHUTTER

By pressing F2, you enter the panel which controls the u.v. lamps settings. The bottom line shows you the burning hours of the u.v. lamps. This counter can be resetted only by a service engineer. The other settings can be changed by using the arrows on the control panel. Pressing left or right will make the cursor move between the different parameters. Pressing up or down will change the value of that one setting. You can change these parameters:



► UV LAMP: MODE= ON (default) / OFF

If ON has been selected for this mode, the lamps will come online when a print is started. If set to off, the print will start without turning the lamps on.

► SHUTTER: MODE= NORMAL (default) / BOTH

Changing the value from normal to both, will change the timing of the shutters. If "both" is selected, both shutters will open at the same time. The printer will

use both lamps during one printing pass. If the "normal" mode is selected, only the tale lamp will open the shutter. The printer will first print and then immediately cure with the lamp that follows the print heads.

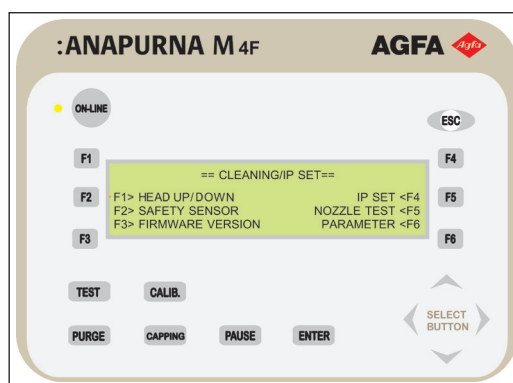
- » OFF TIME (MIN)=20 (default) (value between 0 and 60)
This indicates the number of minutes the UV lamps will stay on after a printed job is finished. This value ranges from 0 to 60 minutes.

If this value is set to 0, the lamps will immediately turn of when the print is finished. The advised time for this setting is 20 minutes. Every lamp loses 30 minutes of its lifetime whenever it is switched on, so it would be better to leave the lamps burning between two jobs (if the time between these jobs is not more then 30minutes).

- » DELAY (ON/OFF)= 30/30 (default) (value between 0 and 99)
This value enables you to delay the point where the shutter of the lamps opens and closes. The value is expressed in centimeters and ranges from 0 to 99.

- » F3 > HOME COVER
By pressing F3, the home cover protection plate slide backwards. This gives you easy access underneath the print heads.

- » F4 > CLEANING / IP SET
The cleaning/ip set window contains information and parameters about safety, network connection and the capping function.



- » F1 > HEAD UP/DOWN
By pressing F1, the shuttle will raise to the most upward position and the home cover will open. You can easily access the heads for inspection or cleaning. To close the cover and lower the shuttle to the last defined height, press the head up/down function again.
- » F2 > SAFETY SENSOR (default = ON)
This function allows you to enable or to disable the optical sensors surrounding the engine. Use the arrows to toggle between ON or OFF.



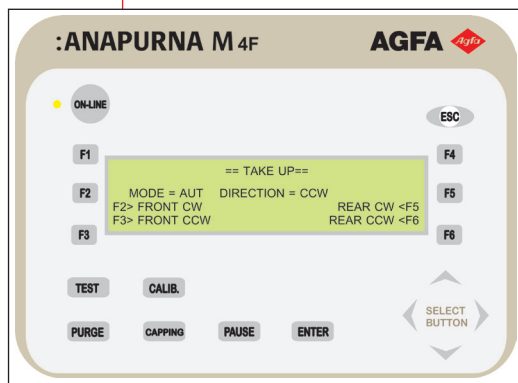
The sensors must always be activated when the engine is powered on!

- » F3 > FIRMWARE VERSION
If you want to check the version of the firmware that is running on the engine, press F3. The necessary information will be displayed.
- » F4 > IP SET
The ip set control enables you to set and change the Anapurna's IP address. The default IP address is set to 192.168.1.5. Make sure that the :Anapurna



M4F and the Wasatch working station are configured in the same ip range (port 5000).

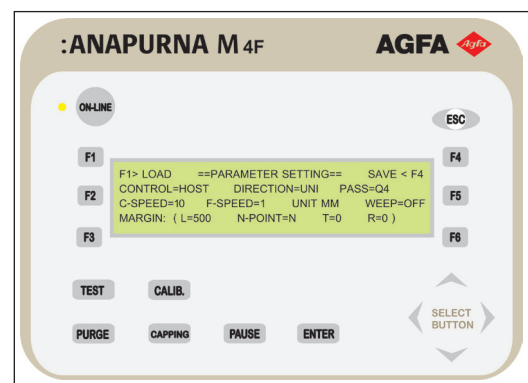
- ▶ **F5 > Nozzle test**
Pressing F5 enables you to execute a nozzle test. All nozzles of a specific head will fire for a few seconds. If you watch closely you can see a cloud of ink appear underneath the nozzle face. You can choose to test the nozzles of one head (F1, F2, F4, F5) or all heads at once (press ENTER).
- ▶ **F5 > TAKE UP** (operational if the roll to roll system is installed - optional)
If you want to use the roll to roll feature of the :Anapurna M4F, the take up window will give you access to the controls of the front and rear motor. Use the left and right arrows to move the cursor from the mode to the direction settings.
- ▶ **MODE = AUT (default) / MAN**
You can toggle between AUTO and MANUAL, using the up and down arrows. The auto setting means that the winder and unwinder motors will be driven by the optical sensors underneath the print table. In the manual mode, the motor will be driven by the function keys F2, F3, F5 and F6.
- ▶ **DIRECTION = CW / CCW**
This feature toggles between CW and CCW rotation direction of the motor roller, defining the way motor will turn.



When the mode is set to manual, you can move the roll to roll system by using the function keys F2, F3, F5 & F6. Press and hold down the key for as long as you want the motor to rotate.

- ▶ **F2 > FRONT CW** : the front motor will turn clock wise.
- ▶ **F3 > FRONT CCW** : the front motor will turn counter clock wise.
- ▶ **F5 > REAR CW** : the rear motor will turn clock wise.
- ▶ **F6 > REAR CCW** : the rear motor will turn counter clock wise.

- ▶ **F6 > PARAMETER**
The function key F6 will give you access to the parameter setting menu. This menu contains general printer setup and print controls. You can save up to 10 different sets of parameters.



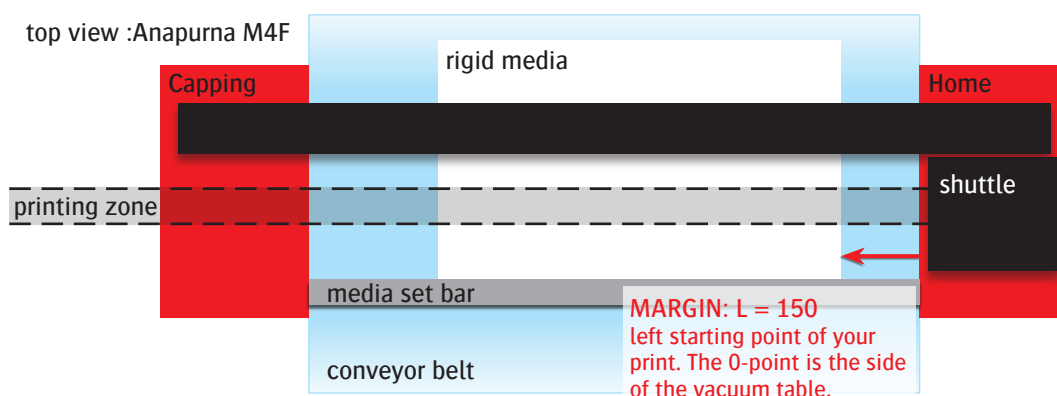
- ▶ **F1 > LOAD**
If you press F1 to load up a set of parameters, you can only choose between the numbers which have a set available. Use the up and down arrow to toggle between the different numbers, press ENTER to activate the selected set.
- ▶ **F4 > SAVE**
F4 gives a save command, dedicate a number between 0 and 9 to your set of parameters. Use the up and down arrow to toggle between the different numbers, press ENTER to activate the selected set.

The different controls in the second part of the control panel are parameters to set the printing quality, printing speed and margin values. Use the left and right arrow to move the cursor between the different controls, press up or down to change the values. Press enter to save a changed value.



- » **CONTROL = HOST (default) / LOCAL**
The printer control mode tells you which parameters are going to be used. If the printer is set on host, the parameters coming out of the the Wasatch SoftRIP will be respected. If the local mode is selected, the setting information coming out of the Wasatch SoftRIP will be overruled and will be replaced by the settings determined on the :Anapurna M4F itself.
- » **DIRECTION = UNI / BI**
In the bi-directional mode, the printer will be print in two directions: from left to right and from right to left. In uni-directional mode, the shuttle will return to home position without printing. The drops are only fired when the shuttle moves from left to right.
- » **PASS = Q4 / Q8**
The number of passes is related to the quality mode. You can choose between two qualities, resolutions: 720 x 720dpi (Q4) or 1440 x 720dpi (Q8).
- » **C-SPEED = 1 to 10 (default : 10)**
The speed of the shuttle can be changed by a value between 1 (slow) and 10 (fast). The default setting (10) is the optimum speed. Decreasing the speed will not provide better quality and will only limit your production capacity.
- » **F-SPEED = 1 to 5 (default : 1)**
The feed speed setting is the speed which the conveyor will move forward between printing passes. This value can be changed between 1 (slow) and 5 (fast). If the shuttle starts to print the next pass when the conveyor belt is still moving, you should increase the speed of the belt.
- » **UNIT MM / INCH**
You can choose between millimetres or inches and change the units of the margins.
- » **WEEP = OFF (default) / ON**
The automatic weeping function will make the print heads fire with a certain time gap when the carriage is at the home position. You can select an interval between 0 and 99 seconds. This feature can be turned off because the nozzles KM512MN print heads will not be blocked during stand still. This feature is especially developed for the use of solvent inks and has to prevent the curing of ink inside the print nozzles.
- » **MARGIN: L = 150**
You can enter a left margin, a starting point where the shuttle starts printing. If the margin is set to 0, the :Anapurna M4F will start printing on the right side of the vacuum table.

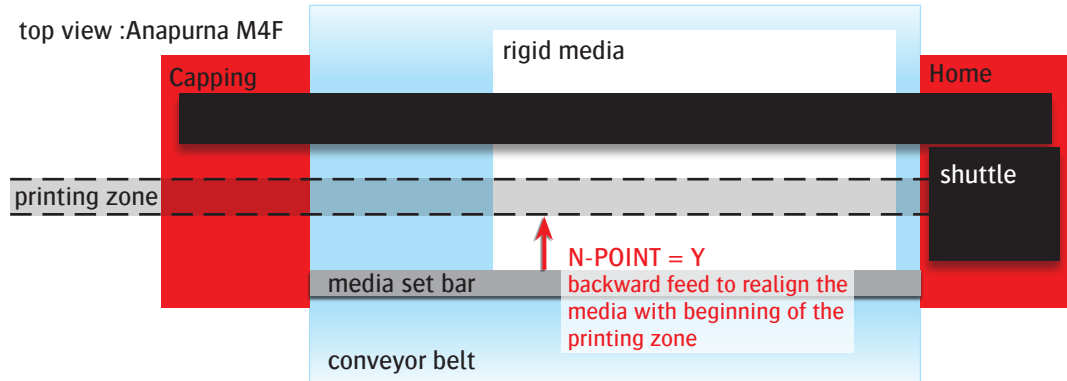
This is also important when you want to perform a prime test. Insert the distance on the table where you want ot perform the test print.





» **N-POINT = Y / N**

This enables (Y) or disables (N) the backward feed at the start of your print. When you print on rigids, you use the media set bar to align the rigid at the front of the print table. After raising the media set bar, the rigid needs to be fed backwards in order to be properly aligned with the starting point of the shuttle.

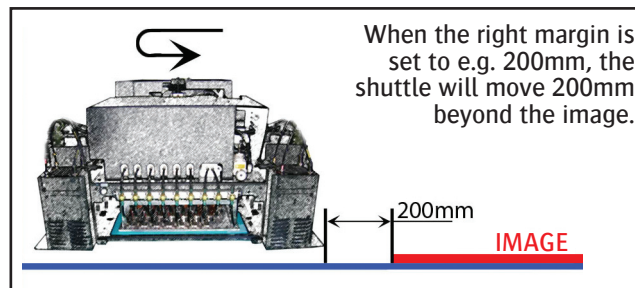


» **T = 0**

The top margin is the distance that the media will be fed before printing. This value is set in mm or inches, according to the units that are defined in the unit control setting.

» **R = 0**

The R parameter sets the right margin in mm or inches. The right margin is distance the shuttle goes past the last printed point. This is useful for heat sensitive media to avoid the lamps sitting over the edges for longer times.



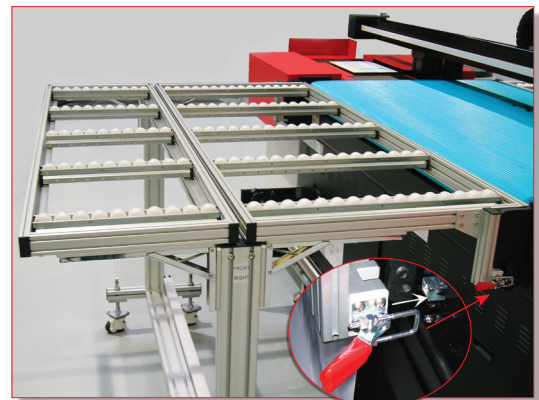
6.3 Media setup. (rigids and roll to roll)

The :Anapurna M4F offers you the choice between handling rigids or roll media. You can print one or more rigids at the same time or use the automatic winder and unwinder system for roll fed media.

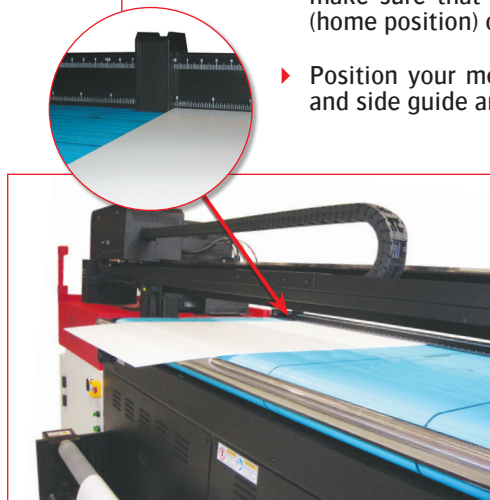
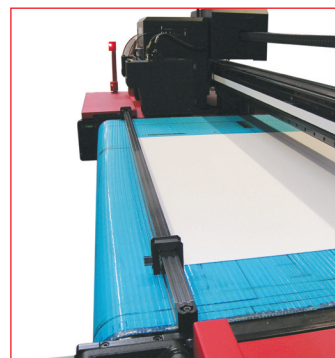
a. Rigid media.

The media set bar will help you to position the rigids on the printing table. Lower the media set bar by turning the media set switch (front or rear side at the home position). When you use the media set bar, the n-point and left margin have to be correctly set.

The two support tables that are delivered with the engine, will help you to process rigid material. The tables can be locked to the engine with a clip on system which you can find on the left and right side of the tables. Both tables have a width of 1m60 and are 1m20 long. You can load rigid media very easily following the next steps:



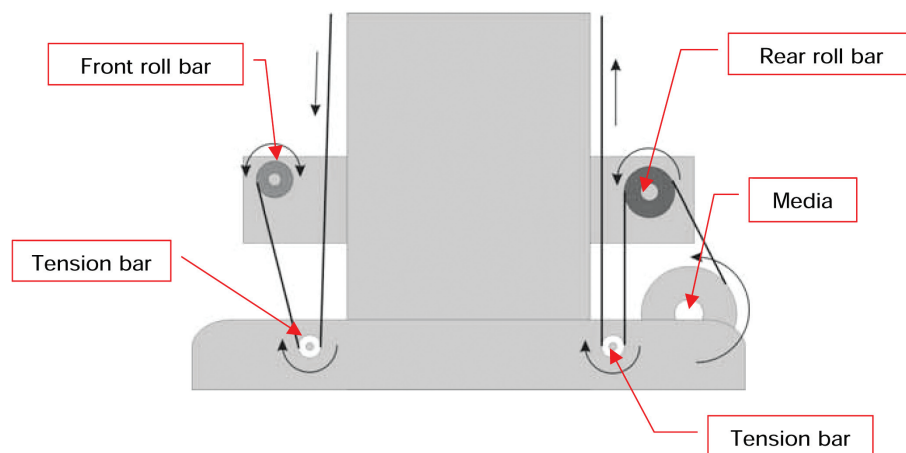
- ▶ Lower the registration bar by turning the 'media set' button.
- ▶ Position the left guide on the registration bar using the scale on the inside of the registration bar.
- ▶ Before you put your rigid on the vacuum table, make sure that the shuttle is on the right side (home position) of the printer.
- ▶ Position your media against the registration bar and side guide and turn on the vacuum.



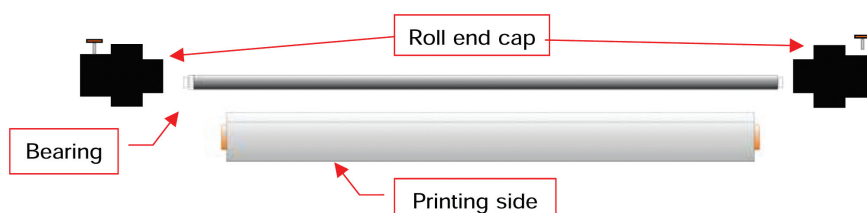
- ▶ Raise the registration bar by switching the 'media set' button back.
- ▶ Follow the head gap procedure (p.24) to make sure that the shuttle is set on the correct height.
- ▶ Check the left margin and n-point parameters (p.32,33) so that the :Anapurna will start printing on the right spot.
- ▶ Push the online button and the printer is ready to print.

b. Roll media. (roll to roll system is optional)

If you work with roll media, you can use the auto feed system of the :Anapurna M4F. It contains two tension bars, a front and rear roll bar and a media roll bar.



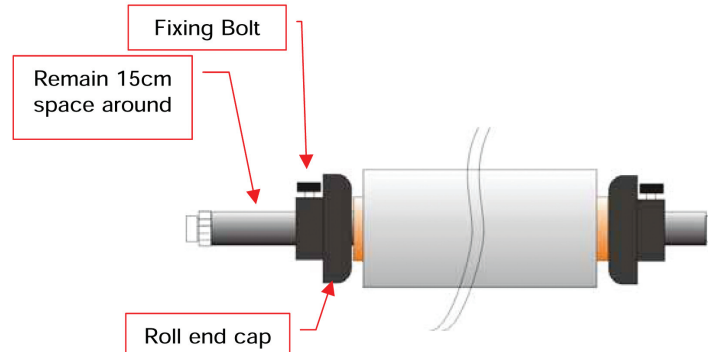
The tension bars prevent distortion and waves on the media by applying a constant tension. The rear roll bar will unwind the media and is steered by a motor which gets impulses from the signal sensors. The front roll bar can be steered in two directions. It will rewind your printed media, holding a constant tension to reduce distortion. Make sure that you always insert the tension roll bars in a correct way. The ball bearing must be placed inside the guide. When you position the bars, make sure that the both sides are positioned as high as possible into the left and right unit. Gently lower both sides so that the bars stay completely horizontal for the best use.





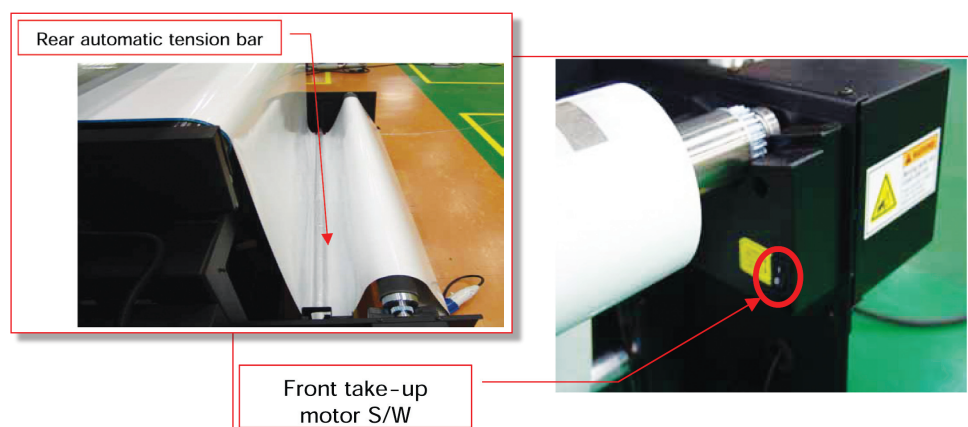
Loading roll media can easily be done by using the next procedure:

- ▶ Mount your media in the center of the media roll bar. Use the end caps to fix the position of the roll on the bar. Make sure that the bearing of the roll bar is positioned on the left side of the printer and put the media roll bar in its holders.
- ▶ Unwind a part of the media and position it, over the rubber rear roll bar, on the



conveyor belt and switch on the vacuum. If the auto feed system is on, the rubber roller will start to feed media until it hangs in loop blocking the beam of the optical sensor.

- ▶ Position the rear tension bar and make sure that it is positioned horizontal to keep an even media tension
- ▶ Go to the front of the engine, switch of the vacuum and pull the media so you can attach it to the rewinder system. The media has to be aligned with the side of the conveyor belt, so it will run straight. Mount your media on the front roll bar (attach the left, right and center of your media) and switch on the front take-up motor.
- ▶ Make sure that the distance between the edge of the media and the edge of the vacuum table is the same at the front and rear side (difference <1mm).



- ▶ Position the front tension bar and keep it as horizontal as possible, ensuring an even tension from left to right. Switch on the vacuum again and the media is ready to be printed.

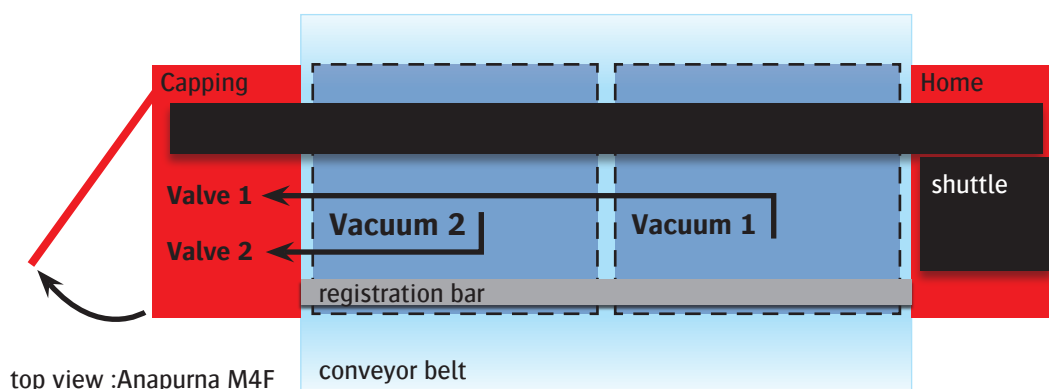


c. Vacuum system.

The vacuum table of the :Anapurna M4F is divided in two equal parts. Each part of the table gets the vacuum from an independently controlled valve. The vacuum pump (ring blower) is controlled by a single switch (front or rear side) but the output can be controlled by two separate valves. These valves are positioned underneath the capping station; access is through the side door. Valve 1 controls the part of the table at the right side (home position), valve 2 is connected to the left side (purge position).



Depending on the position and size of the media, the vacuum can be controlled through these valves.



top view :Anapurna M4F

If the media only covers one of the two parts of the vacuum table, e.g. vacuum 1, the suction underneath your media can be increased by closing the valve of the unused part of the table.



C. MAINTENANCE.

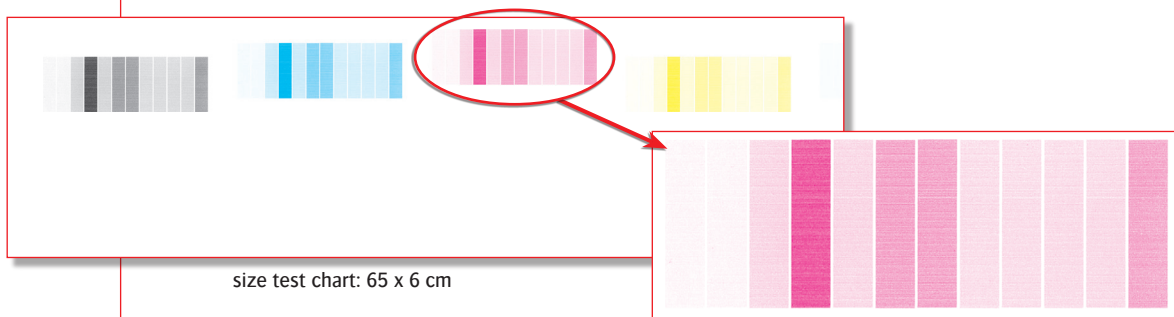
1. Test Menu.

Before you can access the different settings, make sure that the printer is offline. If not, press the 'ESC' button to switch the :Anapurna M4F offline. The test button on the control panel (control panel n° 9) gives you access to 4 different test features:

- ▶ F1 : PRIME
- ▶ F2 : PRIME2
- ▶ F4 : BELT TEST
- ▶ F5 : DIR TEST

1.1 Prime (F1).

Make sure that a left margin (p.32) is set before you do a prime test. If you press the F1 function key, you will print the following testchart:

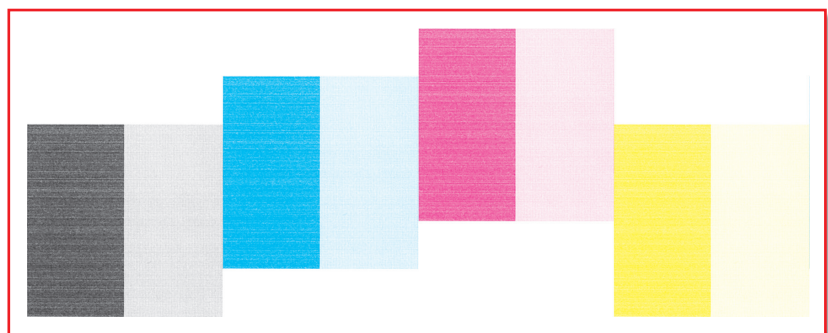


For every color a patch will be printed which contains 12 different blocks. Every block shows you a certain quality and resolution setting or a certain nozzles that are being fired.

1.2 Prime2 (F2).

Make sure that a left margin (p.32) is set before you do a prime test. The prime2 test looks like follows:

size test chart: 33 x 8 cm



Two blocks are printed per color. The first block is a solid block showing you the physical resolution that is printed in one pass (360 x 360 dpi). The second block is built up out of lines of 360 dpi, so all the nozzles are firing at the same time with a certain interval.

1.3 Belt test (F4).

The belt test will allow you to check the positioning of the belt by letting it turn continuously. Pressing F1 will start the conveyor belt motor, F2 will stop the movement of the belt. Don't let the belt test run for more than 3 minutes to eliminate the risk of



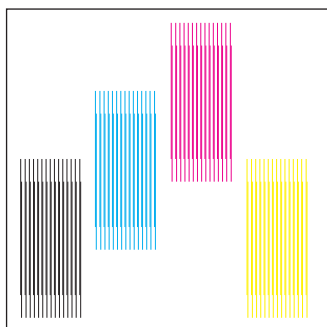
overheating the conveyor motor. Make sure you give a break of 1 minute before starting the next belt test.

- ▶ F1 : RUN
- ▶ F2 : STOP

1.4 Dir test (F5).

The direction test is a quick test to check the bi-directional alignment of your shuttle. It will print 15 lines per color from right to left and from left to right. Per block you will have to see 15 clear lines. If they start looking double and you can count 30 lines, the bi-directional setting is not correct. Adjusting the bi-directional alignment is discussed in Section B - 5.5.

The F5 function will print the bi-directional test file in 720 dpi.



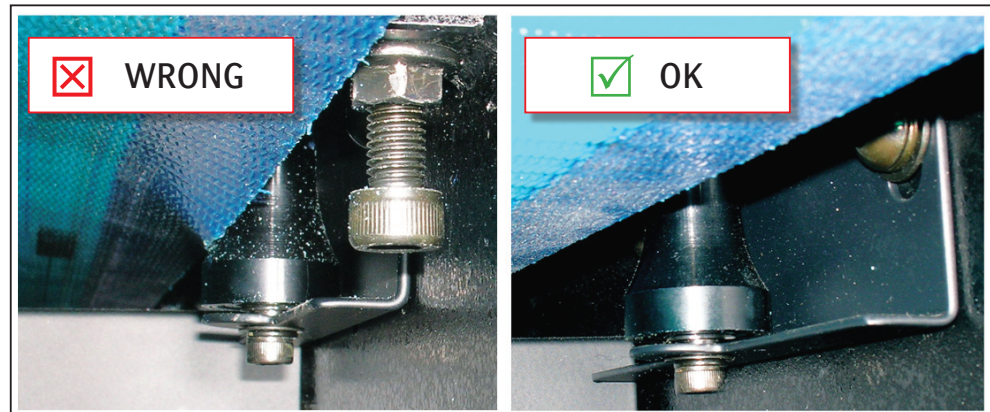
size test chart: 65 x 7 cm



2. Alignment of the conveyor belt.

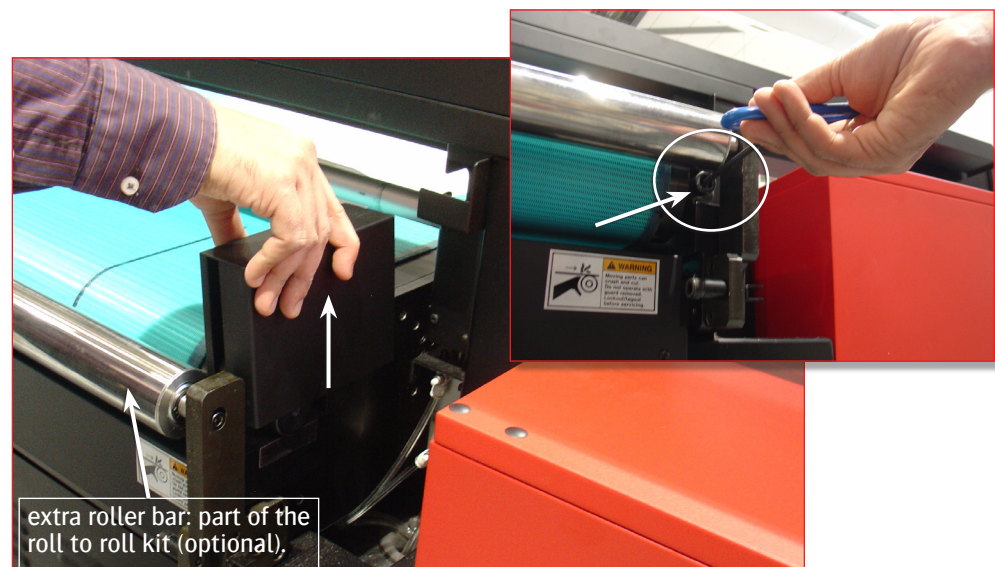
The woven conveyor belt is transported by a step-motor. It lies on top of a vacuum table with a honey grid structure. It is very important to have a perfect aligned conveyor belt. It should have a linear movement without any side deviations.

On the bottom of the vacuum table, you see a tool in the shape of an hour glass. If the conveyor belt touches this device, it should be realigned.



Procedure:

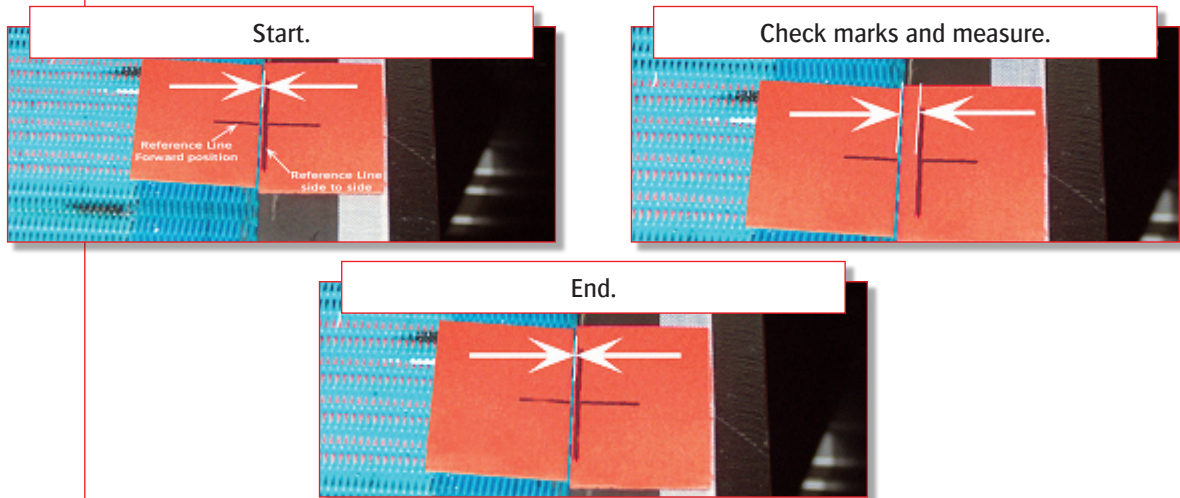
- ▶ Loosen the conveyor belt. Remove the metal covers on the backside (both left and right), completely unscrew left and right bolt.



- ▶ Position the conveyor belt:
 - ▶▶ The belt's joint need to be positioned in the middle underneath the printing table.
 - ▶▶ Measure the distance on the left/right side of the printing table; start vs. end of the conveyor belt. This measured distance should be equal, on front- as well as on rear-side of the engine.
- ▶ Tighten the conveyor belt: Screw left and right bolt, alternate between left and right bolt, with maximum 1 complete turn each at a time.



- ▶ Transport test:
 - » Mark belt vs. printing table.
 - » Move conveyor belt for at least 10 minutes.
 - » Check marks on belt and printing table and measure the difference.



- ▶ Adjust the belt tension:
 - » Loosen the conveyor belt completely.
 - » Re-Position the conveyor belt and use the same marks on the belt vs. the printing table.
 - » Tighten the conveyor belt, taking in account the measured difference. Adjust belt tension by the same amount as the measured difference.
 - » When the measured difference is smaller than 0,5cm: Enhance tension with the same amount on the side where belt was moving to.
 - » When the measured difference is higher than 0,5cm: Enhance tension with half of the measured difference on the side where belt was moving to and reduce the tension with half of the measured difference on the side where belt was moving from.
- ▶ Transport test
 - » Move conveyor belt for at least 10 minutes
 - » Check marks on belt and printing table
 - » If needed, adjust position of belt.
 - » The position of the belt should not move more than 2mm. Rotate the bolts at the REAR stand to CW or CCW to control the tension. Those small adjustments can be done while belt is moving.

Remark : The position of the conveyor belt can still move a little bit during daily production.

Always make sure, when printing "borderless" that the belt is masked, so printing on the belt is reduced to a minimum. When you have printed onto the conveyor belt, try to remove the ink with some cleaning solution.

The amount of vacuum can become insufficient when the belt is completely printed. The ink will block the air channels in the woven structure of the belt. This also effects the condition of the vacuum table. The build-up of ink underneath the belt can cause loss of vacuum and head strikes.

You can order the conveyor belt as a spare part.



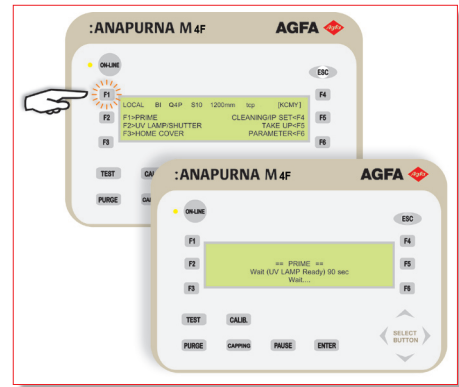
3. Maintenance Routines.

Before you start printing, you should perform a nozzle check to see if all nozzles are present and firing. After loading the media, follow the head gap procedure (p.24) so the head height is correctly set.

Check the condition of the print heads by performing a prime test. Press F1 in the main menu of the control panel (p.29). If one or more nozzles are missing, you will have to clean the heads with one of the following procedures:



Do NOT use acetone to clean the print heads. It will damage the printheads unreparably !

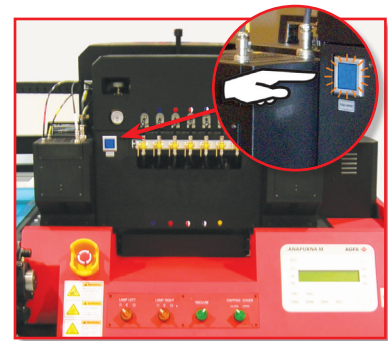


3.1 Purging, Flushing, Bleeding.

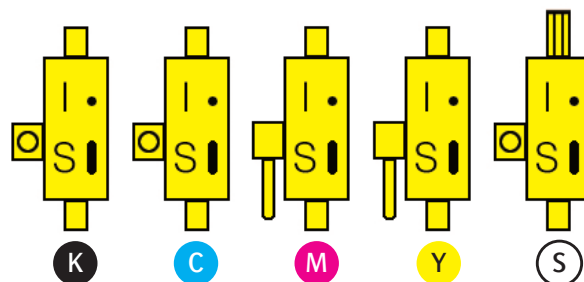
► Purge (using ink).

If you purge the printheads, you are going to apply air pressure in your subink tanks. By doing this, you will force ink through the nozzles. You can purge one or more heads at the same time.

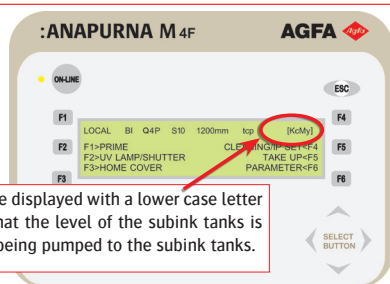
Make sure that the valves of the print heads which you want to purge are set to "I". The other valves have to be switched to "S" (solution valve : "I"). Push the purge button to apply pressure. Use short intervals or one longer push.



The black and cyan print head will be purged when pressure is applied.



A quick purge is an impulsive purge (press and release the purge button very quick). You press the purge button no longer than one second.



Cyan and yellow are displayed with a lower case letter (c,y). This means that the level of the subink tanks is too low and ink is being pumped to the subink tanks.

With a long purge, you press the purge button for up to 3 seconds. This is done to ensure that there is enough ink in the print heads.

If you purge too long, the ink refill system will not be able to keep up. This may result in air being introduced in your system. You can check the condition of the subink tanks in the main window of the control panel. On the right top of the panel, you can read out the different colors. If the color is mentioned with a capital letter, the sub ink tank is full. If it is a lower case letter, ink is being pumped to the sub ink tank.

When you purged the heads with ink, wipe the heads with a fiber free cloth to remove the excess ink. Turn all the ink valves back into the "I" position and redo the prime test.

The refill system is protected with a timer. If the system has to pump too long, it will stop to prevent overflowing in case of a leak.

The control panel will give you a warning:

<<Pause System refill>>

Press the pause button to continue the refilling of the sub ink tanks.

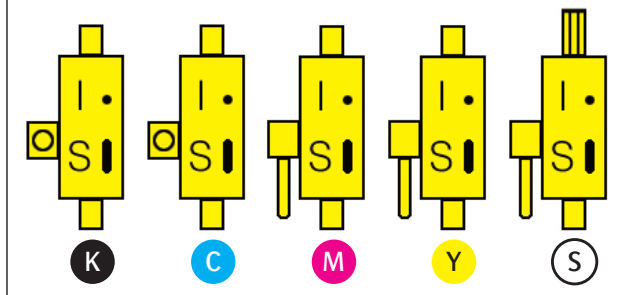


► **Flush (using solution).**

If purging the heads does not resolve the blocked nozzles, you can use the flushing procedure to treat the print heads with cleaning solution.

Switch the right valve to "S". This is the solution valve and solution liquid can now start running into the grey bar towards the ink valves. Switch the valves of the heads which have to be flushed to "S". The solution liquid can now run via the gray bar and the valve into the print heads.

The magenta, yellow and solution valves are switched to "S".



On the backside of the shuttle, you can open a cover which gives you access to the pneumatic system on the shuttle. On right side you can find the solution valve. By pressing this button, air pressure will be applied onto the solution sub ink tank. Use short intervals until you see clear solution curtain coming out of the print heads.

Close the solution valve by switching it to "I". Use a fibre free cloth to clean the heads by wiping them from back to front.

Refilling the flushed heads with ink again, can be done with the purge procedure. Make sure that only the flushed heads will be purged, so switch all other valves to "S".

► **Bleed (negative pressure to -.010).**

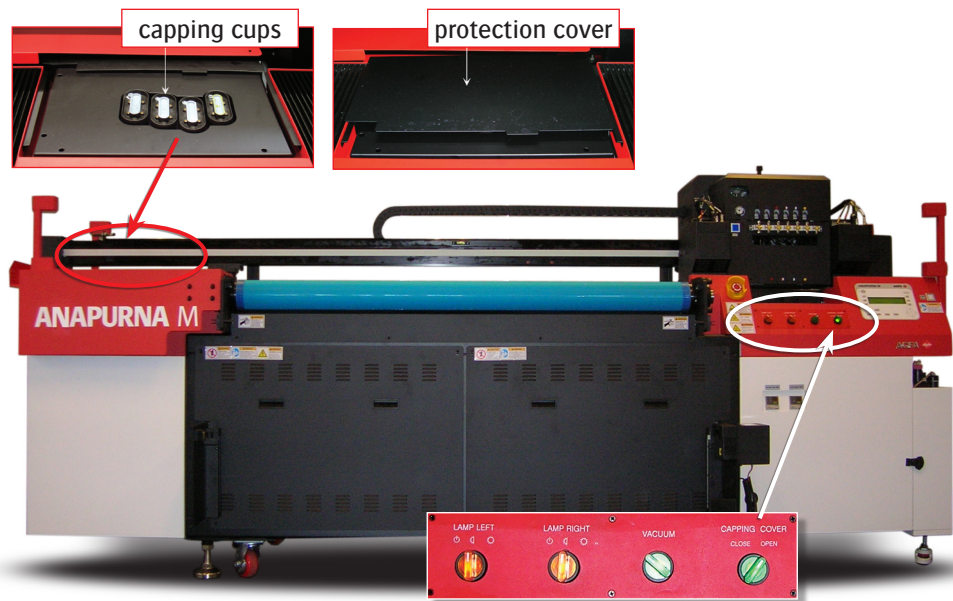
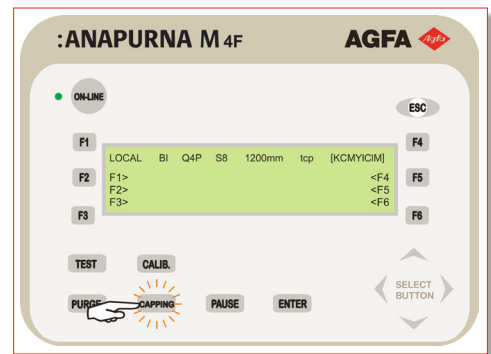
Bleeding the print heads is performed to get rid of any air in the ink system. You turn the negative pressure system to a value around -.010 (make sure that the home cover is open). The print heads will start leaking. Let them drip for several minutes, turn the negative pressure back to -.036 and perform a quick purge routine.

The head bleed can also be performed after a weekend or long stand still of the engine.



3.2 Capping.

By pressing the capping button, the shuttle will move to the left side of the printer. Make sure that the capping plate is open by turning the green switch on the control side. The shuttle will lower itself so the head base plate touches the capping station. The cups of the capping station will seal themselves on the print heads. The print heads are now shielded from dust and sunlight (u.v. radiation). This procedure can be performed on weekends and is required for long stand stills.

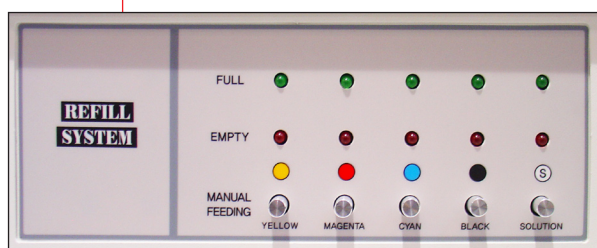


3.3 The ink circuit.

The inks in the :Anapurna M4F are transported via a pumping mechanism through the different components of the ink circuit:

ink tank → pump → filter → energy chain → sub ink tank → 2 way-valve → print head

- ▶ The main ink tanks are located in the door on the right side of the printer. Every ink tank can contain 1,6 liter of ink and has a low level detection at 0,3 liter. When a low level is detected, the engine will not print the next job until the empty tank is refilled.



The main ink tanks can be refilled during printing. Open the door and refill the tanks, keeping the door in clean condition. You should only refill a color when the low level alarm goes off. Shaking the bottle is not necessary and you should pour the complete ink bottle in the tank.

When the alarm goes off, you can check the ink level indicators on the refill panel which color is running empty. The top row lights are the ink level indicators.

Always pour the complete ink bottle in the ink tank.





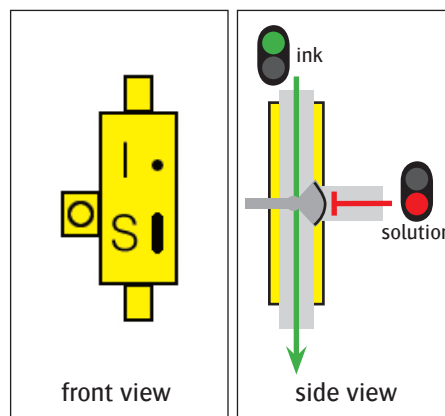
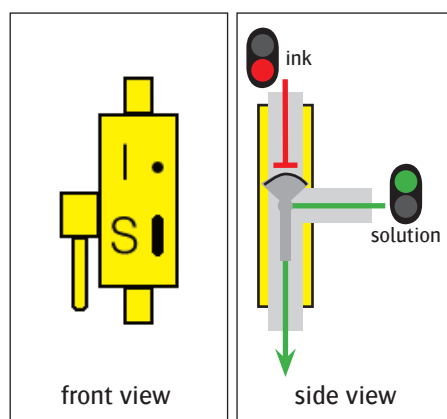
- ▶ The inks are pumped via the ink pumps, the ink filters and the energy chain into the sub ink tanks. These sub ink tanks have a volume of 35 ml per color and are temperature controlled. You can read out the temperature of the sub ink tanks on the display on the right side of the printer.

The temperature display has two values. The upper value (red) is the actual temperature measured in the sub ink tank. The second value is the requested value or the target temperature.

The normal temperature setting for the sub ink tanks on the :Anapurna M4F is 45°C and the temperature for the head base plate is 49°C.

- ▶ The inks will flow via a 2 way valve in the print heads. These valves will allow you to switch between ink or solution that has to run to the print head. They are used for cleaning the print heads or when you switch of the engine.

When the valve is in horizontal position ("I"), ink can flow through. Solution, which is coming from the right (solution bar) is stopped.

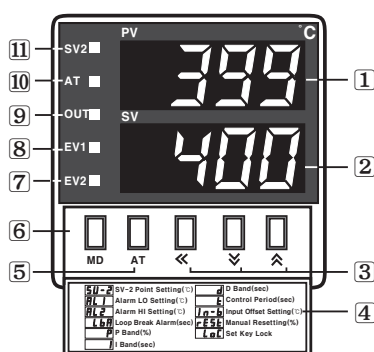


When the valve is in vertical position ("S"), solution can flow through. Ink, which is coming from the top is stopped.

- ▶ The print heads are mounted on a base plate which is also temperature controlled. The ideal temperature for the head base plate of the :Anapurna M4F is 49°C. A display on the right side of the printer (home position) shows you the actual and target values for the head base plate. You can change the target value as follows (cfr. sub ink temperature display).

3.4 Changing the temperature settings.

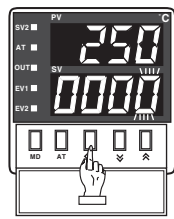
To change the target temperature, open the small lid on the display and use the setting controls:



- 1 PV : Processing value indicator (Red)
- 2 SV : Setting value indicator (Green)
- 3 << >> : Key shifting the display
- 4 Information for operation mode
- 5 AT Key : The mode key to excite Auto tuning function
- 6 MD Key : Mode key
- 7 EV2 : Event 2 output signal lamp
- 8 EV1 : Event 1 output signal lamp
- 9 OUT : Output signal lamp
- 10 AT : The signal lamp flickers while Auto tuning is being executed
- 11 SV2 : SV2 lamp for SV2 operation

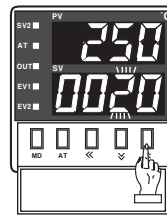
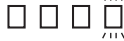


How to change the value:

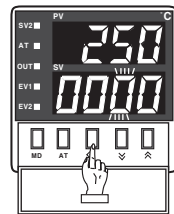


- ① In case of changing the set value at status of RUN, press << key.

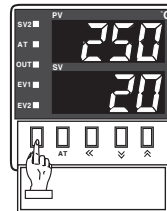
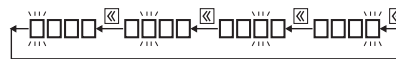
10° digit will flash at SV.



- ③ Press < or > at the flicker digit, and then change the set value.



- ② Press << key, and then the flicker will be shifted step by step.

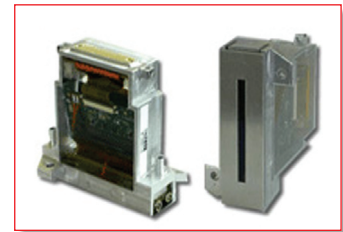


- ④ Press [MD] key when the setting is completed. It will stop flickering, then return to RUN mode.

3.5 Print heads and negative pressure.

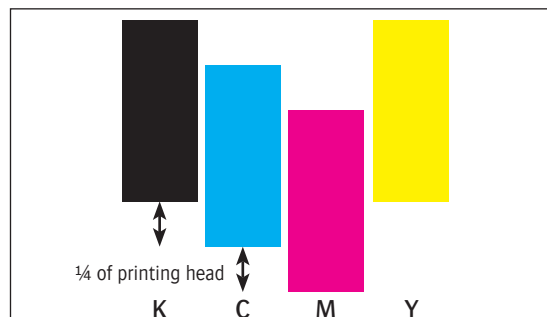
a. The print heads.

The :Anapurna M4F is equipped with 6 Konica Minolta heads. The KM512 product range consists of type L, M, S, corresponding to unit drop volume capabilities of 42pl, 14 pl and 4pl respectively. Further more, the KM512 is also divided into H type and N type, which stands for "with heater" and without "heater".



The :Anapurna M4F is using the KM512 MN heads (14pl without heater), suitable for high quality 720 dpi multi-pass printing. Every print head is made up of two nozzle rows, each containing 256 jets, resulting in a physical resolution of 360 dpi.

The different print heads are positioned on the head base plate in a V-shape, every color having its own designated place:



b. The negative pressure system.

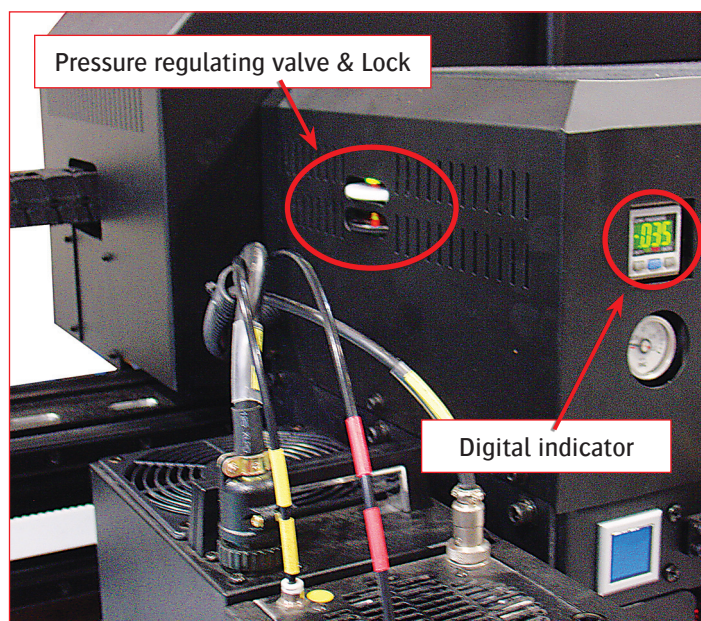
The negative air pressure system is keeping the print heads from dripping. Without this system, the laws of gravity will make sure that the ink will flow out of the print heads and you will not be able to print.

The negative pressure is generated by a venturi system which converts positive pressure in negative pressure. The amount of pressure is controlled by the pressure regulating valve and is displayed on the pressure gauge. Both are located on the left side of the shuttle. The normal pressure setting for the :Anapurna M4F is -.036.

A too high setting will cause one or more missing nozzles. The ink will be sucked in side the printhead. If the pressure is too low, gravity starts doing its job and ink will start dripping out of the heads, possible creating pooling. This is a condition of

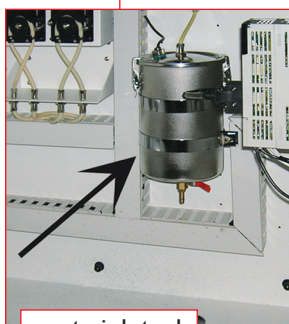


a pool of ink that has been formed underneath the head. If the head fires more ink, the drops will not be able to get through the pool causing failing nozzles.



3.6 Ink waste.

Cleaning, purging and flushing your print heads always creates some waste: contaminated cloths and gloves, purged ink and solution,... Make sure that uncured u.v. ink waste is always treated as hazardous, chemical waste.



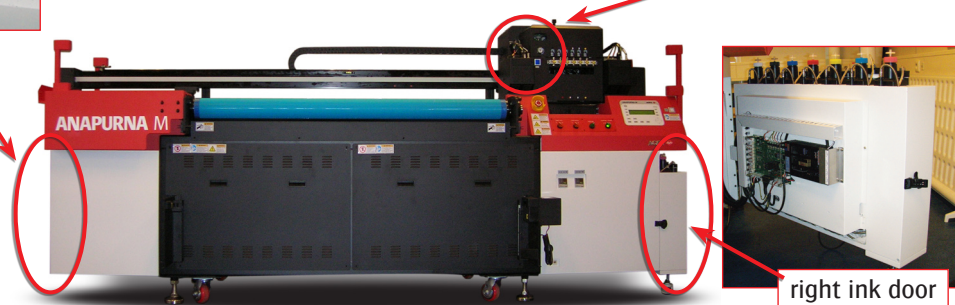
waste ink tank

The ink and solution waste that is created during purging or flushing, ends up in a waste tank. This tank is located inside the left compartment of the printer. When the waste tank is almost full, the control panel will display a warning. You can drain it via the tap underneath the tank.

Make sure that the drained waste is processed as chemical waste. Don't mix the u.v. waste with solvent inks.



pressure control



3.7 Maintenance on Sub Air tank (Over Flow Tank).

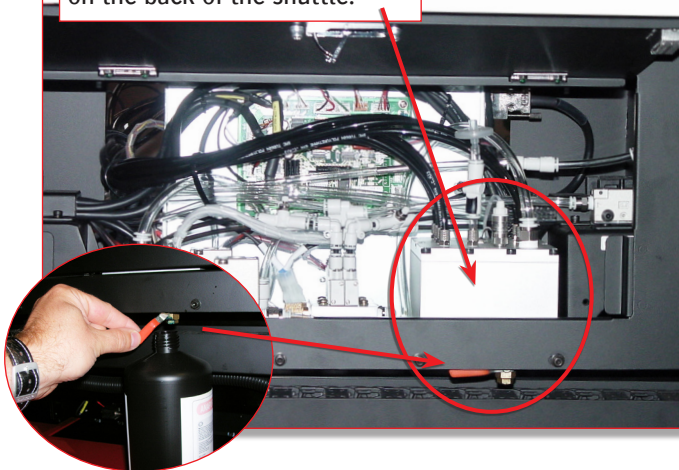
The sub air tank is the buffer which will prevent that any ink will be sucked into the aircsystem. It is important to make sure that this container is empty.

- ▶ Turn all the ink 2 way valves to 'S' position.
- ▶ Keep the Solution 2-way valve to 'I' position.
- ▶ Drop the Negative Vacuum down to zero (with the negative vacuum gauge).



- ▶ Wear gloves, get an empty ink bottle and a rag.
- ▶ Go to the rear side of the carriage, place the rag under the Sub Air Tank.
- ▶ Open the rear carriage door (if required).
- ▶ Put the empty bottle under the drain valve (of Sub Air Tank).

sub air tank or over flow tank is on the back of the shuttle.

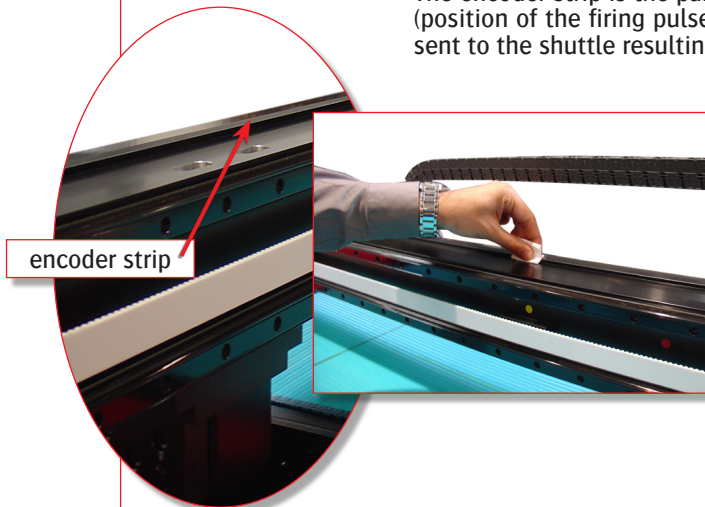


- ▶ Open the (orange handle) drain valve on the Sub Air Tank and check if any ink comes out.
- ▶ Let all the ink flow out, remove the bottle, clean the drain valve with the rag and close the valve.
- ▶ Return to the front side of the carriage and turn the Negative Vacuum back to normal value (approx -.036).
- ▶ Turn all the ink 2-way valves back to 'I' position.
- ▶ Perform a Quick Purge.
- ▶ Clean the print heads with a lint free cloth (a gentle tap, no wiping).
- ▶ Perform a PRIME TEST to check if all print heads are working well.

3.8 Cleaning the Encoder Strip.

The encoder strip is the part that defines the x-position of the carriage (position of the firing pulse). If the strip is dirty, wrong signals will be sent to the shuttle resulting in printing artefacts.

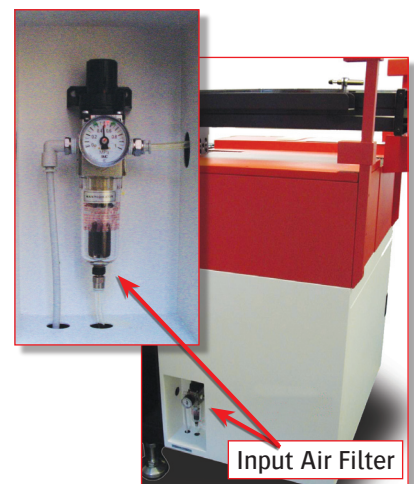
encoder strip



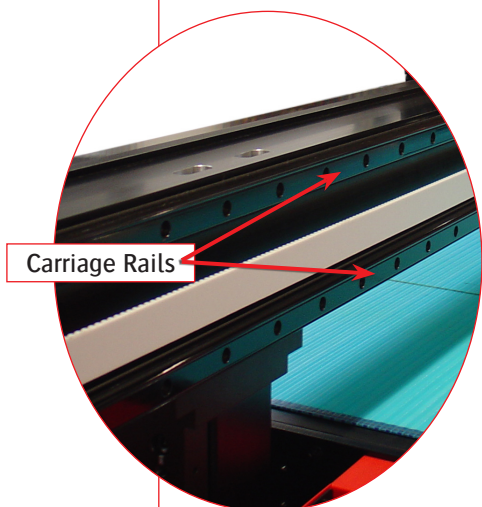
- ▶ The Encoder Strip is a transparent plastic strip located on top of the carriage beam.
- ▶ To clean, take a lint free cloth, put some iso on the cloth and wipe the strip gently from the right to the left.
- ▶ To clean the strip on the Home Side, perform the Carriage Release (p.23) function to move the carriage away (to access the Encoder Strip).

3.9 Maintenance on input Air Filter.

- ▶ Go to the rear right side of the engine.
- ▶ The input compressed hose goes into an Air Filter.
- ▶ There might be some moisture sitting on the bottom side of the Air Filter.
- ▶ Rotate the black screw at the bottom of the filter to release the moisture/water present in the Air Filter.
- ▶ Once drained, tighten the screw.



3.10 Lubricating the Carriage Rails.

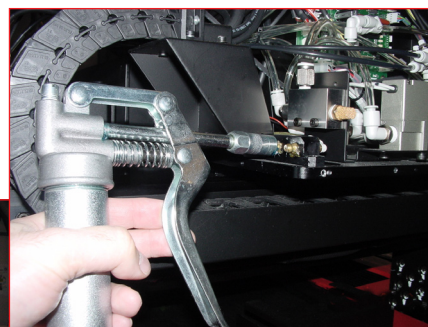
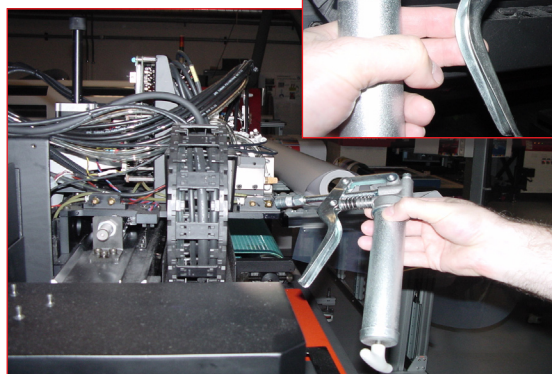


- ▶ The carriage moves on two rails.
- ▶ Dust settles on these rails which is then dragged onto the carriage bearings.
- ▶ For effective movement of the carriage, the operator should clean & lubricate the rails.
- ▶ Take a clean cloth, put some lubricating oil (3 in 1 machine oil or sewing machine oil) and clean both the rails.
- ▶ To clean the rails on the Home Side, use the Carriage Release function.
- ▶ Once the rails are free of any dust and grease build-up, apply very little amount of lubrication oil onto the rails with the help of a cloth.
- ▶ Make sure that the oil does not drip down (the applied quantity should be minimum).
- ▶ The operator needs to make sure that when he feels the rail with his finger, it should not be dry.
- ▶ To lubricate the rail on the Home Side, use the Carriage Release (p.23) function.



3.11 Greasing the Carriage Bearing Blocks.

- ▶ Type of Grease: Lithium Based or Urea Based (JIS No.2).
- ▶ Application Quantity: 1.5 to 2.0 gms approx. per block.
- ▶ Perform 'Lubricating the Carriage Rails' procedures before applying grease to the bearings.
- ▶ Use a grease gun with a flexible extension to apply grease through the nipples on the Bearing Blocks.
- ▶ There are two nipples, one if for the X movement (Right / Left) of the carriage and the other is for the Y movement (Up / Down) of the carriage; both nipples need to be greased.
- ▶ Do not run the engine straight away, move the carriage manually a few times so that the grease can spread over the guide (moving the carriage manually by using the Carriage Release function).





3.12 Checking the UV Lamps.

- ▶ UV lamps are consumable and have a certain life.
- ▶ Once the UV lamps reach their life, the operator will observe that the curing power of the lamps have gone down (resulting in poor adhesion to those media which were performing well before).
- ▶ Customer needs to order a set of UV lamps (Part # E26HX) so that when needed, these could be replaced.

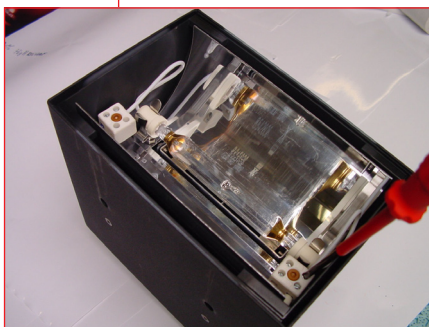
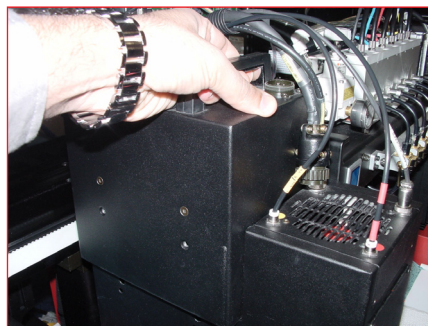
How to analyze that lamps are nearing their life ???

- ▶ Through printing:
For example, if the adhesion on Metamark 5 is not good (with lamps at Full Power, Carriage Speed 7, 8 Pass Bi Direction mode); then its fair to say that lamps need replacement.
- ▶ Visual Check:
For this purpose, you need to take the lamp assembly out (Refer to Changing the Lamps) and visually check the condition of the lamp (without touching the lamp surface); the glass of the lamp should be clear. If it has turned white of dark yellow / brown; the lamps need replacement.

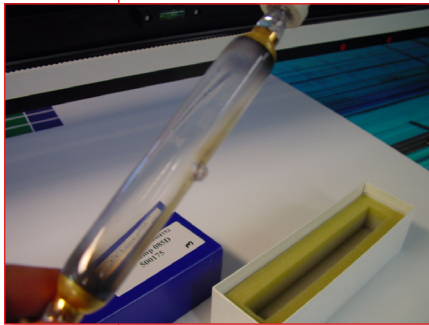
3.13 Replacing the UV Lamps



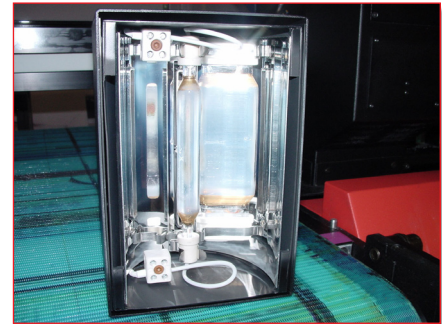
- ▶ Tools Required: 4 mm L –key, a small flat screw driver & cotton gloves.
- ▶ Parts Required: 2 x E26XH (UV Lamps for Anapurna M4F).
- ▶ Power the engine down (Power OFF by pushing in the Emergency Button).
- ▶ Make sure the lamps are not warm (let the lamps cool down).
- ▶ Remove the data connector going in the lamp assembly.
- ▶ Take the 2 L-key screws out (using the 4 mm L-key).
- ▶ Lift the lamp assembly out of the housing using the handle on the top of the lamp assembly.



- ▶ Tilt the lamp assembly and you will be able to access the lamp.
- ▶ Unscrew the 2 flat screws connecting the lamp wires to the connector (one on each side).
- ▶ Wear Cotton Gloves while handling the lamp.
- ▶ Take the lamp out of the housing.
- ▶ The new lamp comes with a isopropyl tissue; before putting the new lamp in, wipe / clean the lamp with the isopropyl tissue making sure there are no finger marks / grease marks left on the glass.
- ▶ Do not touch the lamp glass while putting it in the housing; if you do, please clean the lamp glass again with the isopropyl tissue.

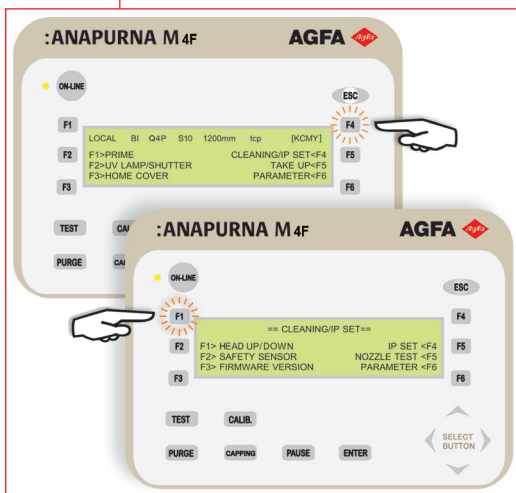


- ▶ The bubble on the lamp glass should stay on the inner side (should not face the media while printing).
- ▶ Put the wires back into the connectors and make sure they are secure.
- ▶ Put the lamp assembly back into the carriage housing.
- ▶ Reconnect the UV data cable on the top of the lamp assembly.
- ▶ Turn the Power 'ON' & the engine is ready for printing.



3.14 Cleaning the UV Lamp Crystal Glass.

- ▶ Turn the lamps OFF and wait till they cool down.
- ▶ Press ESC so that engine is in OFFLINE mode.



- ▶ Press F4 (Cleaning/ IP Set).
- ▶ Press F1 (Head UP/DOWN) : The carriage will move up (to the maximum possible position).
- ▶ Press the Emergency Button to power OFF the engine.
- ▶ Turn all the 2 way Ink Valves to 'S' Position; leave the Solution Valve to 'I' position.
- ▶ Take a clean rag, put some isopropyl on the rag and clean the glass under the lamp housing (you can access the glass as the carriage is at the top most position).
- ▶ Make sure the glass is clean, if not you might need to use a scraper very gently to take out any ink residue.
- ▶ To clean the glass from the inner side, take the lamp assembly out of the housing (as described in 3.13 Replacing the uv lamps).

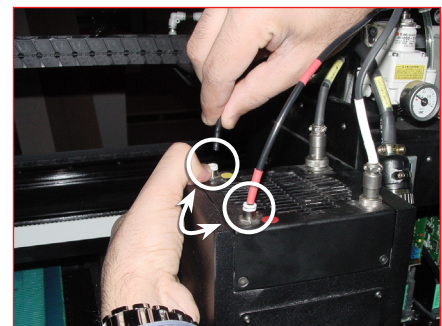
- ▶ Observe: there are two pneumatic tubes going into the lamp housing at the top; one of them has a red sticker and the other has a yellow sticker (We will call them the Yellow Tube and the Red Tube).

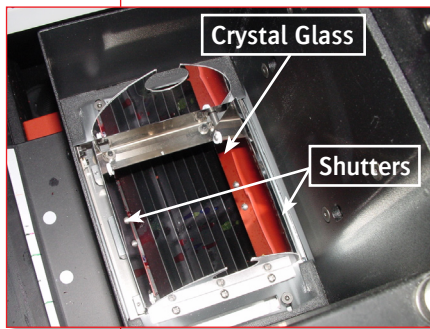
- ▶ Take the yellow tube out of the connector by pressing the connector in and pulling the tube out.

- ▶ Also, take the red tube out and put it in place of the Yellow tube. Please be aware, when you take the Red tube out, the compressed air will start leaking – no need to worry, just insert the Red tube in place of Yellow Tube; keep the Yellow Tube hanging outside.

- ▶ The moment you put the Red Tube in, the shutters will open and you can access the glass from the top.

- ▶ Take a clean rag with some isopropyl and clean the glass from the inner side; making sure the glass is clean.





- ▶ Put the Red tube back to its position (the shutters will close), put the Yellow tube back to its position.
- ▶ Put the UV lamp assembly back in the housing : Put the data connector back on the UV lamp assembly and put the 4 mm screws back on.
- ▶ Switch back all the 2 way ink valves to 'I' position.
- ▶ Take the Emergency Switch out and turn the Engine ON; do some Quick Ink Purge.
- ▶ Follow the procedures to perform a Prime Test before you start printing.

3.15 Power Shut Down or Compressor Break-Down Procedures.

In an uneventful situation of power shut down or compressor break-down, please follow the following procedure:

a. Power Break Down (during printing or otherwise)

- ▶ Turn all the ink valves to 'S' position.
- ▶ Keep the Solution valve to 'I' position.
- ▶ Move the carriage very slowly towards the home position (manually).
- ▶ When the power is reinstated, power the engine ON and perform a solution 'flush' on all the print heads.
- ▶ Purge the ink, making sure all print heads have got rid of the solution.
- ▶ Follow the procedures to do a Prime Test before printing a job.

b. Compressor Break Down

- ▶ Make sure carriage is at home position.
- ▶ Turn all the ink valves to 'S' position.
- ▶ Keep the Solution valve to 'I' position.
- ▶ Push the Emergency Button to power the engine down.
- ▶ When compressor is up and running, turn the engine ON and perform a large ink purge.
- ▶ Follow the procedures to do a Prime Test before printing a job.



During printing when the compressed air pressure drops down (insufficient) the carriage will move towards the home position and the control panel will display an error message:

<<ERROR / AIR PRESSURE LOW>>

3.16 Bleeding the ink filters.

The print technology used on the :Anapurna range of printers, uses a closed ink circuit that should be free of air. Even a small amount of air can cause printing artefacts, such as missing nozzles or leaking print heads.

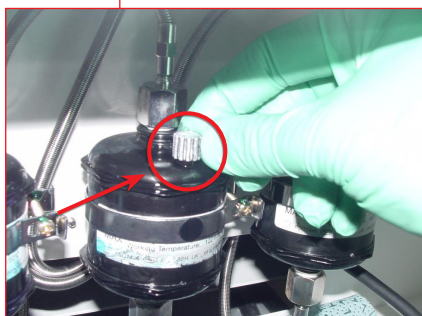


Missing nozzles is mostly caused by air built up in the print heads. You can get rid of it by purging or bleeding the print heads.

If your ink circuit is already contaminated with air before the ink reaches the shuttle, the air build-up will happen in the ink filter. These filters are positioned in the ink door of the engine. Bleeding the ink filters will force the air out of the ink circuit.



- ▶ Take the 6 screws of the refill system panel (on ink door) and remove the panel.
- ▶ Put it gently on the floor, making sure that the data cable is not disconnected and you can still reach the manual feeding buttons.
- ▶ Place some cleaning towels underneath the air filters.
- ▶ Wear rubber gloves.
- ▶ Loosen the white air cap on top of the filter
- ▶ Wait until ink is coming out. You can press the manual feeding button to speed up the process.
- ▶ Tighten the white air cap.
- ▶ Make sure that you clean up all the ink that came out.



3.16 Replacing the air filters.

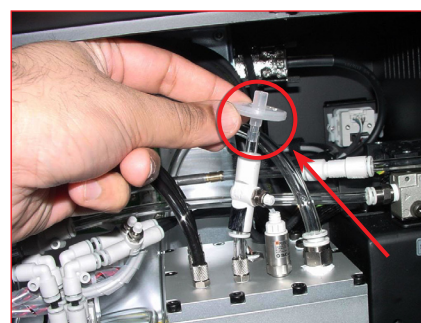
Clogged air filters can result in ink drop out during printing. The air filters can be found at two locations (Part # : D2+2509046) :

a. On top of sub air tank.

- ▶ The air filter on top of the sub air tank should be replaced after 6 months. The filter is plugged into the tube so you can just pull it off.

b. On top of main ink tanks.

- ▶ The air filters of the main ink tanks should be checked every 6 months and replaced if dirty and clogged.





4. Periodic Maintenance.

4.1 Daily Maintenance.

- ▶ General cleaning of the printing area (Safety).
- ▶ Dusting the Anapurna, making sure its clean (general cleaning).
- ▶ Clean the Capping Station.
- ▶ Clean the Home Side (using Carriage Release function).
- ▶ Ink Purge (quick) and cleaning the print heads with lint free cloth (no wiping, just tap on the print head is enough) [p.41]
- ▶ Check print heads by doing a Prime Test (F1 from Control Panel) [p.29].
 - ▶▶ Clean print heads with Cleaning Solution if Prime test is not good.
 - ▶▶ Its good to do a Prime Test at the end of the day to check Print heads.

4.2 Weekly Maintenance.

- ▶ Perform Daily maintenance checks.
- ▶ Drain the compressor (make sure there is no water in the tank).
- ▶ Drain the Air Filter for any moisture (on the Anapurna Engine) [p.47].
- ▶ Check and empty the Waste Tank (Anapurna Engine) [p.46].
- ▶ Clean the Carriage Rails using a cloth with some lubrication oil [p.48].
 - ▶▶ Make sure the oil does not drip down on the belt.
 - ▶▶ You can use '3 in 1' lubrication oil or 'sewing machine' oil.
 - ▶▶ Use 'Carriage Release' function to clean the rails on the Home Side [p.23].
- ▶ Clean the Encoder Strip with a clean lint free cloth [p.47].
 - ▶▶ You can use isopropyl alcohol.
 - ▶▶ Do not use Cleaning Solution or Solvents.
 - ▶▶ Use 'Carriage Release' function to clean the Encoder Strip on the Home Side [p.23].
- ▶ Check the sub air tank (over flow tank) for any ink [p.46].
 - ▶▶ Turn all the Ink Valves to 'S' position.
 - ▶▶ Keep the Cleaning Valve to 'I' position.
 - ▶▶ Turn the Negative Vacuum down to zero.
- ▶ Check Conveyor Belt for alignment (running a Belt Test) & adjust if required [p.39].
- ▶ Check for Conveyor Belt surface (prints on the surface resulting in poor vacuum and ink build up on the belt surface).

4.3 Monthly Maintenance.

- ▶ Perform Daily & Weekly maintenance checks.
- ▶ Grease the Carriage Bearings [p.48].
 - ▶▶ Type of Grease: Lithium Based (JIS No.2) or Urea Based (JIS No. 2).
 - ▶▶ Quantity : 1.5 – 2.0 gms for each Bearing block.

4.4 Six Monthly Maintenance.

- ▶ Perform Daily, Weekly & Monthly maintenance checks.
- ▶ Check the conditions of UV Lamps & replace if necessary.
 - ▶▶ Performed by operator.
 - ▶▶ Part # for UV lamps : E26XH (Qty : 02).
- ▶ Replace the Air Filters [Ref:].
 - ▶▶ On top of the Main Ink Tanks.
 - ▶▶ On top of the Over Flow Tank (Air Tank).
- ▶ Check the condition of Conveyor Belt.
 - ▶▶ Conveyor Belt should move straight.
 - ▶▶ Not covered with prints.
 - ▶▶ Good Vacuum through the belt.



- ▶ Replace the Conveyor Belt if necessary.
 - ▶▶ Performed by Service Engineer.
 - ▶▶ Part # : D2+2503028

4.5 Weekend Maintenance.

(Performed at the end of every week; engine sitting idle for 2 – 4 days).

Perform a 'Head Flush' on all the print heads.

- ▶ Open the Home Cover.
- ▶ Switch the 2-way ink valves for Black & Cyan to 'S' position.
- ▶ Open the solution 2-way valve (to 'S' position).
- ▶ Push onto the Flush button (on the rear side of the carriage) with intervals >>> 1 second ON and 4 seconds OFF >>> till you see the cleaning solution coming out of Black & Cyan print heads.
- ▶ Switch the 2-way ink valves for Black & Cyan back to 'I' position.
- ▶ Repeat this sequence for Magenta & Yellow print heads.
- ▶ Now, switch all the four 2-way ink valves to 'S' position and press the Flush button for 1 second (cleaning all the print heads at one time).
- ▶ Close the Solution 2-way valve (back to 'I' position).
- ▶ Clean the residue of the cleaning solution on the print heads (just a gentle tap) and clean the base plate.
- ▶ Turn the Vacuum Gauge to zero.
- ▶ Push the Red Emergency Button.
- ▶ Turn the Power Switch 'OFF' (from rear side of the Anapurna).

At Restart (start of the working week):

- ▶ Power Switch to 'ON' position
- ▶ Turn out the Emergency Button & power-on the engine (pressing START)
- ▶ Wait till the base plate temperature reaches 49° C.
- ▶ Open the Home Cover
- ▶ Turn the Vacuum gauge to restore the negative vacuum to approx -.036
- ▶ Switch all the 2-way ink valves to 'I' position, leave the solution valve at 'I'
- ▶ Perform a Long Purge (with intervals of 2 seconds ON and 4 seconds OFF) till ink is coming out of the print heads
- ▶ Take a new lint free cloth and clean the ink residue from the print heads (just a gentle tap, no wiping)
- ▶ Perform a PRIME TEST to check the print heads

4.6 Long Stand Still Preparation / Maintenance

(Engine sitting idle for more than 14 days)

- ▶ Follow "Perform a 'Head Flush' on all the print heads" procedures as discussed above in weekend maintenance (do not turn the engine OFF)
- ▶ Open the Capping Cover & clean the capping station
- ▶ Press CAPPING from the control panel; the carriage will start going up, move towards the left side (capping side) & move down on the caps
- ▶ Push the red Emergency Button
- ▶ Turn the Power Switch 'OFF' (from rear side of the Anapurna)

At Restart (start of the working week):

- ▶ Power Switch to 'ON' position
- ▶ Turn out the Emergency Button & power-on the engine (pressing START)



- ▶ The carriage will start moving up and move towards the Home Side; wait till the booting process is complete
- ▶ Clean the capping station and close the Capping Cover
- ▶ Wait till the base plate temperature reaches 49° C
- ▶ Open the Home Cover
- ▶ Turn the Vacuum gauge to restore the negative vacuum to approx -.036
- ▶ Switch all the 2-way ink valves to 'I' position, leave the solution valve at 'I'
- ▶ Perform a Long Purge (with intervals of 2 seconds ON and 4 seconds OFF) till ink is coming out of the print heads
- ▶ Take a new lint free cloth and clean the ink residue from the print heads (just a gentle tap, no wiping)
- ▶ Perform a PRIME TEST to check the print heads



APPENDIX 1. Operator training checklist.

(This document is an overview of all topics that should be explained clearly by a certified engineer to an operator. If all topics are checked, the operator is certified to work with the :Anapurna M4F).

A. INFORMATION.

1. Safety Instructions.

- a. Anapurna Engine.
 - Know the Emergency 'Stop' buttons.
 - Make sure that the 'Safety Sensors' are working (turned 'ON'). (While at OFFLINE Mode, Press F4 & then F2).
 - Before printing, make sure no one is around the engine.
 - After printing, always put the engine to 'OFF LINE'.
- b. UV Light.
 - Do not look directly into the UV Light when printing.
 - Don't expose your skin directly to UV light.
 - If you need to look at the direction of the light, wear protective glasses.
- c. UV Inks.
 - UV Inks (and waste) are chemicals, when handling the ink, wear protective gloves to protect your skin. Also wear protective glasses to avoid splashes.
 - Storage of inks. Ideal between 4° & 10° C. No more than 25° C at any time
 - Shelf Life of inks.
 - Take care when filling the main ink tank / cleaning tank.
 - Keep waste separate from the ink bottles.
 - Dispose off waste as per local council regulations.
 - Never mix solvent waste or aqueous waste with UV waste (as per local council regulations).

2. Printer Overview.

- a. Terminologies used (Home Side, Purge side or Capping side etc).
- b. Anapurna Shuttle (carriage) Layout.
 - Print Heads, sub tanks etc.
 - 2 way ink valves / solution valve.
 - UV Lamps.
- c. Purge Button (Ink), Flushing Button (Cleaning Solution).
- d. Negative Vacuum 'Gauge' & 'Digital Indicator'.
- e. Ink Supply System.

B. OPERATIONS.

1. Wasatch SoftRIP AE.

- a. Wasatch basics.
 - Printing Modes (4 pass, 8 pass, bi-dir, uni-dir).
 - Imaging Configurations.
 - Media Width.
- b. Ripping & Printing.
 - Supported File formats.
 - File preparation: size, scale, crop, mirror, rotate, tiling.
 - Selection of correct Imaging Configuration (print mode).
 - Sending to Rip Queue (Or Rip & Print).

2. Anapurna M4F – Start Up Sequence.

- a. Compressor & Drier (to get compressed dry air)
- b. Exhaust (of the room)
- c. Main Switch (Power), Circuit Breakers (if applicable), Power switch.
- d. Emergency Buttons on Anapurna Engine.
- e. Power 'ON' (Start Button).

All boxes →
should be
checked by
the operator.



3. Anapurna Control Panel.

- a. 'ON Line' & 'OFF Line'.
- b. Local & Host.
- c. Head Gap (Calib).
- d. Parameters: Left, Top & Right Margins + Null Point (Y or N).
- e. Nozzle Check (Prime).
- f. 'Pause' function.
- g. Cancelling a print.

4. Setting up the :Anapurna M4F & changing the parameters.

- a. Print Head Test (Prime : Menu F1 on Control Panel).
- b. Roll to roll print (optional).
 - Media Loading.
 - Vacuum Settings on the bed.
 - Set Gap (Head Height Calibration in regard to the media thickness).
 - Set Margins (Parameters).
 - UV Lamps (Power settings: Full / Half and Mode settings: Normal / Both).
- c. Rigid media printing.
 - Media Set Bar.
 - Vacuum Settings of the table.
 - Set Gap (Head Height Calibration).
 - Left & Top Margins.
 - Input / output Support Tables.
 - UV Lamps (Power settings: Full / Half and Mode settings: Normal / Both).
- d. Negative Pressure Settings.

C. MAINTENANCE.

1. Print Head Purging / Cleaning (Function of 2 way valve).
 - a. 'Quick' Purge if 'Prime Test' (nozzle test) not good.
 - b. 'Long' Purge.
 - c. Head 'Bleeding' (drop the negative pressure down to -.010).
 - d. Head Cleaning using Cleaning Solution.
2. Periodic Maintenance.
 - a. Daily, Weekly, Weekend, Long Break engine preparation.

D. MISCELLANEOUS.

1. Consumables Required (How to order).
 - a. Inks, Cleaning Solution.
 - b. Recommended Media (Appendix 3 - Substrate list).
2. Have you received the Operator Manual?
3. Have you received the Anapurna M4F Ink MSDS?
4. Have you printed samples on Anapurna engine using flexible & rigid media.
5. You are comfortable and you have received sufficient information to work with the :Anapurna M4F.

Trainer's Name + Signature

Operator's Name + Signature



APPENDIX 2. Key operator training checklist.

(This document is an overview of all topics that should be explained clearly by a certified engineer to an operator. If all topics are checked, the key operator is certified to work with the :Anapurna M4F).

A. INFORMATION.

1. Safety Instructions.

- a. Anapurna Engine.
 - Know the Emergency 'Stop' buttons.
 - Make sure that the 'Safety Sensors' are working (turned 'ON'). (While at OFFLINE Mode, Press F4 & then F2).
 - Before printing, make sure no one is around the engine.
 - After printing, always put the engine to 'OFF LINE'.
- b. UV Light.
 - Do not look directly into the UV Light when printing.
 - Don't expose your skin directly to UV light.
 - If you need to look at the direction of the light, wear protective glasses.
- c. UV Inks.
 - UV Inks (and waste) are chemicals, when handling the ink, wear protective gloves to protect your skin. Also wear protective glasses to avoid splashes.
 - Storage of inks. Ideal between 4° & 10° C. No more than 25° C at any time
 - Shelf Life of inks.
 - Take care when filling the main ink tank / cleaning tank.
 - Keep waste separate from the ink bottles.
 - Dispose off waste as per local council regulations.
 - Never mix solvent waste or aqueous waste with UV waste (as per local council regulations).

2. Printer Overview.

- a. Terminologies used (Home Side, Purge side or Capping side etc).
- b. Anapurna Shuttle (carriage) Layout.
 - Print Heads, sub tanks etc.
 - 2 way ink valves / solution valve.
 - UV Lamps.
- c. Purge Button (Ink), Flushing Button (Cleaning Solution).
- d. Negative Vacuum 'Gauge' & 'Digital Indicator'.
- e. Ink Supply System.

B. OPERATIONS.

1. Wasatch SoftRIP AE.

- a. Wasatch basics.
 - Printing Modes (4 pass, 8 pass, bi-dir, uni-dir).
 - Imaging Configurations.
 - Media Width.
- b. Ripping & Printing.
 - Supported File formats.
 - File preparation: size, scale, crop, mirror, rotate, tiling.
 - Selection of correct Imaging Configuration (print mode).
 - Sending to Rip Queue (Or Rip & Print).
- c. Advanced settings (Wasatch SoftRIP AE manual).
 - Color related info (color curves, color replacement,...).
 - Use of ink restrictiona and ink limits.
 - Setting up an Imaging configurations (the standard Agfa configurations).
 - Print Strategies (immediate printing, manual layout,...).
 - Hot folder set-up.
- d. Hardware setup (Wasatch SoftRIP AE manual).
 - Do not load any design software (DTP applications).
 - Never download anything from the internet.

All boxes →
should be
checked by
the operator.



- Make sure the network card is 100/1000 Mbps.
- Make sure of a high speed hub or switch (if printing through hub / switch). Recommended to have 2 network cards in the CPU; one for the office network & the other for the Anapurna engine (cross over network cable).
- How to connect Wasatch with the :Anapurna M4F.

2. Anapurna M4F – Start Up Sequence.

- a. Compressor & Drier (to get compressed dry air)
- b. Exhaust (of the room)
- c. Main Switch (Power), Circuit Breakers (if applicable), Power switch.
- d. Emergency Buttons on Anapurna Engine.
- e. Power 'ON' (Start Button).

3. Anapurna Control Panel.

- a. 'ON Line' & 'OFF Line'.
- b. Local & Host.
- c. Head Gap (Calib).
- d. Parameters: Left, Top & Right Margins + Null Point (Y or N).
- e. Nozzle Check (Prime).
- f. 'Pause' function.
- g. Cancelling a print.

4. Setting up the :Anapurna M4F & changing the parameters.

- a. Calibrating the engine.
 - Horizontal Alignment.
 - Bi Direction Alignment.
 - Step Size (Feed).
 - Carriage Speed.
- b. Print Head Test (Prime : Menu F1 on Control Panel).
- c. Roll to roll print (optional).
 - Media Loading.
 - Vacuum Settings on the bed.
 - Set Gap (Head Height Calibration in regard to the media thickness).
 - Set Margins (Parameters).
 - UV Lamps (Power settings: Full / Half and Mode settings: Normal / Both).
- d. Rigid media printing.
 - Media Set Bar.
 - Vacuum Settings of the table.
 - Set Gap (Head Height Calibration).
 - Left & Top Margins.
 - Input / output Support Tables.
 - UV Lamps (Power settings: Full / Half and Mode settings: Normal / Both).
- e. Negative Pressure Settings.

C. MAINTENANCE.

1. Print Head Purging / Cleaning (Function of 2 way valve).
 - a. 'Quick' Purge if 'Prime Test' (nozzle test) not good.
 - b. 'Long' Purge.
 - c. Head 'Bleeding' (drop the negative pressure down to -.010).
 - d. Head Cleaning using Cleaning Solution.
2. Heater Settings (How to change settings on the digital controls).
 - a. Sub Ink Tanks.
 - b. Head Base.



3. Advanced Scheduled Maintenance.
 - a. Adjustment of the conveyor belt.
 - d. UV lamp replacement.
 - e. Cleaning of crystal glass.
 - f. Cleaning / Lubricating the Carriage Rail & Greasing the Carriage Bearings.



4. Periodic Maintenance.
 - a. Daily, Weekly, Weekend, Long Break engine preparation.

D. MISCELLANEOUS.



1. Consumables Required (How to order).
 - a. Inks, Cleaning Solution.
 - b. Recommended Media (Appendix 3 - Substrate list).



2. Have you received the Operator Manual?



3. Have you received the Anapurna M4F Ink MSDS?



4. Have you printed samples on Anapurna engine using flexible & rigid media.



5. You are comfortable and you have received sufficient information to work with the :Anapurna M4F.

Trainer's Name + Signature

Operator's Name + Signature



APPENDIX 3. Substrate list.

(The substrates in the list are used by Agfa Graphics as reference media in the demo centres. The adhesion indicator is just a reference as there are more than one variables which influence curing/adhesion characteristics.)

Family	Type	Chemistry	Manufacturer	Adhesion
Wet Strength Paper	Grey Back Coated Paper	Paper	Marchi	+
Banner Vinyl	Seemee Backlit	PVC	Verseidag	+
Self Adhesive Vinyl	Metamark MD5	PVC	Metamark	+
Card Board	Eclipse Opaque	Paper	Burgo (IT)	+
White Liner Top Coated Display Board	Eska Screen 1250g	Paper	Kappa Attica	+
Foam PVC Board	Forex Classic 3 mm	PVC	Alcan Airex	+
Polypropylene Sheet	Priplak Classic	PP	Pripalk	+/-
Textile	Textile Seemee light	Polyester	Verseidag	+
Metal Plate	Dibond Digital	Alu Composite	Alcan Singen	+
Foam OVC Board	Foamlux	PVC	Brett Martin	+
Polypropylene Fluted Display Board	Bi Print 650 gms 3.5 mm	PP	IPB	-
Polypropylene Fluted Display Board	Buplex PP 3mm	PP	TBD	-



APPENDIX 4. Tips & Tricks .

Gloss Banding.

Gloss banding is a phenomena present in all UV inkjet systems. This happens when we try to print bidirectional (specially solid colors). To avoid gloss banding, print jobs in uni-direction mode.

Winder/Unwinder sensors.

When loading a roll of media, always put the roll in the centre of the bed. If the roll is 1370 mm (54 inches) wide or 1270 mm (50 inches) wide, it will have no issues regarding the feed sensors. This is mostly to do with media with shorter widths.

When the media width is lower than (say like 1000 mm (39 inches) & the media is loaded in the centre), the sensor can not “sense” the tensioning bar presence (or the media presence) and the unwinder motor will not operate.

Solution is to put a piece of paper core on the tensioning bar so that the sensor can see the paper core instead of the media and stop feeding (the feed motor stops).

Vacuum Pump Control.

When printing on wider media (1.4 meters / 55 inches or wider) with normal vacuum (both vacuum valves open to 100%), there might be a situation that media will not move properly on the bed because of high suction (more vacuum then required as there are no bleed holes left on the bed). This might also cause ripples on the media as it advances & feeds towards the suction area.

Solution is to turn the vacuum valves to approx. 45 degrees so that only partial vacuum is available on the table; allowing the media to feed properly.

Media.

Always check if the media is qualified (compatible) for UV inkjet printing. Please contact media supplier and ask questions.

Before printing, check if the media is not damaged. The rigid media should be able to sit flat on the table otherwise you will not be able to print (head crashes). Also handle the media in a way to avoid finger prints on the surface. Observe heat and static sensitivity of the substrate.

Efficient use of UV Lamps.

UV lamp life includes printing hours + warm up time of the lamps + cool-down time of the lamps. For e.g. if you have printed an image for 5 minutes and shut the engine down, you have consumed 30 minutes (warm up time) + 5 minutes (printing time) + 30 minutes (cool-down time) = 1 hour & 5 minutes (65 minutes). The efficient use will ensure longer lamp life.

Also, if you are printing a job in Half Power (throughout the day), it will be good that you run a Prime Test in the morning, afternoon and evening at Full Power and leave the lamps ON at Full Power for 3 – 5 minutes. It has been observed that lamps perform better this way.

Borderless Printing / Dual Board Printing.

When printing borderless or with extra bleed (to print on the whole area), always put a frame like structure around the media. This can be done by putting some masking tape on all sides of the media. If this is not done, the ink will go onto the belt and eventually cause vacuum blockage / head crashes.

Dual board printing requires the setup to be done in Wasatch (Manual Layout or Template). Always make sure that you include all margins (left, centre, right) before putting the media on the table.