

D-FLEX TWO COLOR G4

MANUAL

DIGITAL PIEZO DOD INKJET

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D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

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IDENTIFICATION

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET



Manufacturer

AMACO GmbH
Dornbirner Str. 19
6890 Lustenau | Austria
www.amaco-solutions.com

Model

D-FLEX TWO COLOR G4

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The naming of non-AMACO products is for informational purposes only and does not constitute a trademark abuse. AMACO makes no warranty as to the selection, performance or usability of these products.
All rights reserved.

Exclusion of liability

We have checked the contents of this document for compliance with the hardware / software described. Nevertheless, deviations can not be ruled out, so we assume no liability for the complete agreement. The information in this publication is reviewed regularly and necessary corrections are included in subsequent editions. Suggestions for improvement are welcomed.

AMACO reserves the right to make technical changes without prior notice.

TECHNICAL DATA

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

MODEL	D-FLEX 284	D-FLEX 355	D-FLEX 426
Print Technology	DOD Piezo Inkjet	DOD Piezo Inkjet	DOD Piezo Inkjet
Print Length max.	400 mm	400 mm	400 mm
Print Width max.	284 mm	355 mm	426 mm
Print Resolution max.	360 x 360 DPI	360 x 360 DPI	360 x 360 DPI
Top Web max.	320 mm	440 mm	600 mm
Weight approx.	110 kg	115 kg	115 kg
Dimensions max.	540 x 415 x 760 mm	690 x 415 x 760 mm	690 x 415 x 760 mm

* Custom versions upon request.

Number of cycle / min. max.	Up to 30 cycles / sec. depending on printing density and format
Number of lanes along printing width	Flexible according to print area
Supply voltage	220 / 240 V 50 / 60 Hz
Input power	0.6 kVA
Air consumption	Negligible
Print format	Fully configurable via software
Data transfer	USB drive and Ethernet 10/100
Kind of objects & code printables	Fixed texts with TrueType typeface Graphics and logos Linear and two-dimensional barcodes
Operator data input variable data	Yes

SAFETY RECOMMENDATIONS

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

AMACO's main objective is to manufacture inkjet printing systems with high quality and performance standards. To achieve this, we carry out strict checks during production and assembly of the final product. The guidelines in this chapter are meant as recommendations to operators and administrators in order to use, maintain and repair the equipment without any risks. A general recommendation is to carefully read and understand this chapter in its entirety before starting any activity with the printer.

D-FLEX TWO COLOR G4 printer is designed to be powered at 230V 50-60Hz.
Only connect the printer to an electric line with an earthing contact.
Before connecting or disconnecting any power supply, disconnect all the devices involved.
Use the printer in a dry environment and avoid remaining in contact with any form of water.

Only perform the actions described in these operating instructions.
Any other action not described herein must only be carried out by specialised personnel or by technical personnel suitably trained beforehand.

Safety signs



Warnings: they identify a potential hazard that may lead to serious injury or even death if adequate precautions are not taken.



Notices: they identify actions that must be carefully understood before proceeding.

Informationen: they identify additional notes that help the operator optimise operations.

Working conditions

Before performing any operation with and on the printer and during its operation, the following working conditions must be adhered to in order to assure safety and prevent subsequent interference by using our devices.

Our devices are only to be shipped and stored in their original packaging. Installation and initial start-up of the printer module are only allowed if all the working conditions and relevant safety guidelines are adhered to.

Initial operations, programming, standard operation, cleaning and maintenance on our printer are recommended only after carefully studying our manuals and only by personnel trained and informed beforehand.

Carefully read the following safety guidelines.



Only use original spare parts.



Attend training on a regular basis.

Safety guidelines



Carefully read and understand the content of the specific Material Safety Data Sheet (MSDS) for your application.

A safety data sheet is provided for every type of ink or purge primer used with the printer, which must be read and understood by the operator before using it. A copy of the MSDS should also be stored in an area near the machine if you plan to store a large amount of liquids in your production plant. Every ink or primer order comes with a copy of the MSDS: please check if you received the right fluid and if the safety data sheet refers to the actual product shipped. If the safety data sheet is not contained in the shipment, request a copy from AMACO by specifying the order number.



Avoid inhaling ink vapours.

Some types of ink are harmful to health. Take the due precautions when handling bottles of ink or when you come in contact with ink, for instance near the printhead nozzles. In the event of inhalation, immediately seek medical advice.



Avoid direct contact with the ink without skin protection.

Wherever there is the risk of coming in contact with the ink or if the specific procedure may lead to contact with it, wear suitable skin protection. In the event of contamination, immediately seek local medical attention and provide the necessary information about the substance (see MSDS).



Follow local regulations to safely dispose of ink containers and waste ink.

Every container with ink or ink residues due to normal use or as a result of the purge procedure must be disposed of according to local disposal regulations. Do not discard the containers or ink into the waterworks or public sewage system. If in doubt, please contact your local body in charge of disposal of special products.



Do not smoke while the system is running.

Ink vapours might be generated and dissolved in the atmosphere during normal operation of the system. There is a risk of explosion and/or flames, which must be strictly prevented. Also avoid smoking in areas where ink is stored and used.



Do not remove the safety signs and warning signs placed on the system.

Removing, tampering with or obstructing safety advice is strictly prohibited in any way and for any reason.

In the event of an accident, this may involve serious harm for the operator and shall relieve the supplier from any liability.



Keep all consumables in a controlled area.

Some fluids, such as ink or purge primers, are potentially hazardous.

Ink and primer have an expiry date and are sensitive to moisture. Store them in an enclosed space with no light and periodically check their expiry date.



High voltage hazard.

Disconnect the master power supply cable of the system before accessing any parts inside the machine.



Avoid direct contact of the ink with the eyes without protection.

Do not use the printer in such a way as to spray ink in the eyes. This might cause serious eye injuries.



Avoid touching the printhead nozzles with any object.

Accidental contact with the printhead nozzles may lead to a printing defect and lower quality and/or prevent the nozzles from spraying. Also avoid working with metal tools near the printheads, as this may lead to electrostatic discharges and/or electrocution.

DESCRIPTION

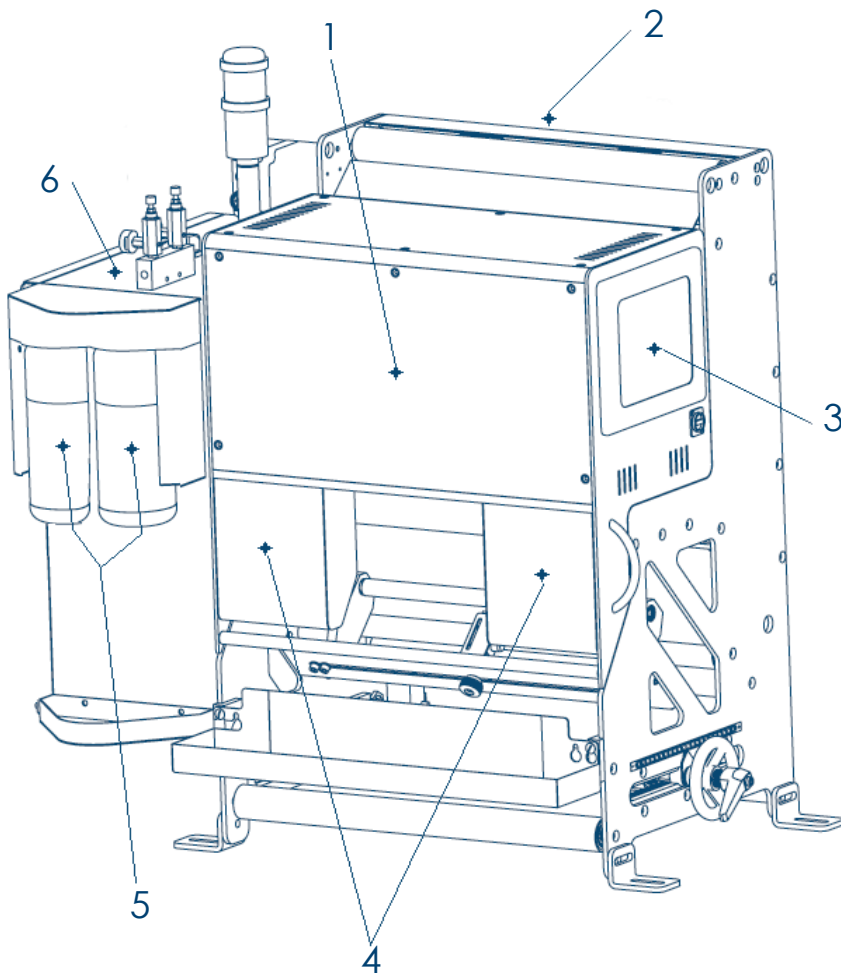
D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

D-FLEX TWO COLOR G4 printers are modular systems that can be configured to adapt to a wide range of applications. Some main models can be defined based on the number and type of their components. To be able to adapt to any custom application, it is possible to customise the printer by number and type of components after discussing this with AMACO's technical department.

Technology

MODEL	D-FLEX 284	D-FLEX 355	D-FLEX 426
Print Technology	DOD Piezo Inkjet	DOD Piezo Inkjet	DOD Piezo Inkjet
Print Length max.	400 mm	400 mm	400 mm
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Print Resolution max.	360 x 360 DPI	360 x 360 DPI	360 x 360 DPI
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Overview



1. Printer head with matrix plate to assemble the printheads and printed circuit boards.
2. Assembly frame with intermittent paper displacement device.
3. Operator panel to control all printer features.
4. Hydraulic control system to control ink for piezoelectric printheads.
5. Ink cartridge with pump to feed the printhead ink system.
6. Electrical panel to control the electrical connections and the main power supply.

INSTALLATION

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

The following instructions concern the standard procedure to install the printer on the packaging machine if no installation by AMACO is required.



Warnings: to follow these instructions, you are required to adhere to the general safety rules of your country or community throughout the operation.

To be able to carry out a more efficient job and prevent the risk of injuries and/or damage as much as possible, these operations must be performed simultaneously by at least two people.

AMACO shall not be held liable, for any reason and in any way, for any damage to the system or injury to personnel operating on the system.

Unpacking

The contents have been packed with the greatest possible care to reduce the risk of damage to a minimum, although potential damage during transport cannot be definitely ruled out. Please contact the supplier if the packaging has visible external damage or stains from liquids.

Use cutting tools with short blade.

Inside the packaging there are some plastic hoses, part of the final product, that may be damaged by cutting tools. Pay attention in order to avoid damaging them.

Do not turn the package upside down or drop it.

The machine has ink tanks that communicate directly with the external atmosphere. When the packaging is opened, you may notice a smell of ink or solvent. For the above reasons, this is to be regarded as something normal, especially if the packaging was in transit for a long time or it was left in direct sunlight. If one of these cases occurs, we recommend leaving the packaging open for a suitable length of time before continuing unpacking.

Follow the safety precautions below.

We recommend using suitable machinery and wearing protective clothing when taking out and handling the machine, such as:



Lifting system.

The total dry weight of the machine is more than 100 kilograms. We recommend using a suitable lifting system when moving the machine to take it out of the packaging and during installation in the final destination site.



Safety gloves.

For all unpacking and installation operations, wear gloves suitable to the type of work to be carried out. Pay special attention when handling ink contained in the machine, as contact with skin may cause irritation. In this case, we recommend using latex-free gloves.



Overalls.

For all unpacking and installation operations, use special gowns or overalls according to the type of work to be carried out. Pay special attention to ink contained in the machine, as it is very difficult to remove stains from fabrics.



Safety footwear.

Although the complete machine consists of a single solid piece of hardware, a screw may loosen during transport, causing some pieces to detach from the main frame. We recommend wearing safety footwear to avoid accidental contact.

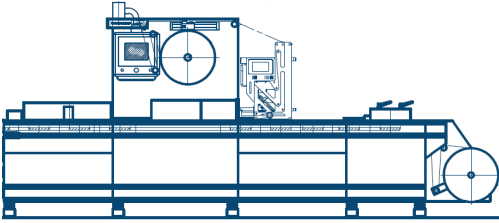


Important warning.

After internal tests, we prepare the printer for safe and correct transport.

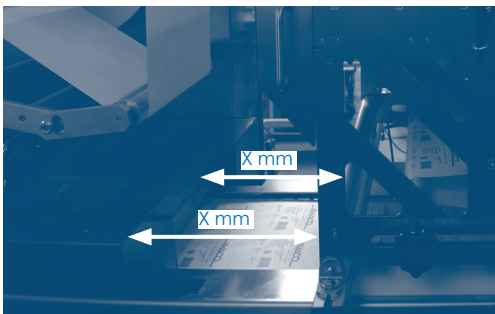
AMACO shall not, for any reason and in any way, be held liable for the state of the goods received by a third-party supplier.

Mechanical assembly

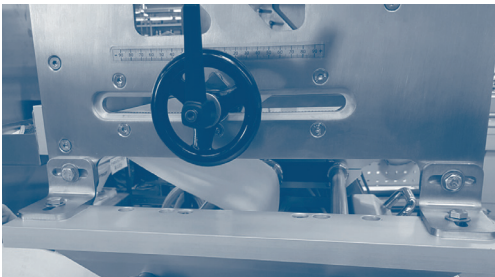


As a general rule, the printer must be installed in keeping with the specifications of the packaging machine, by checking its position and assembly against the layout supplied.

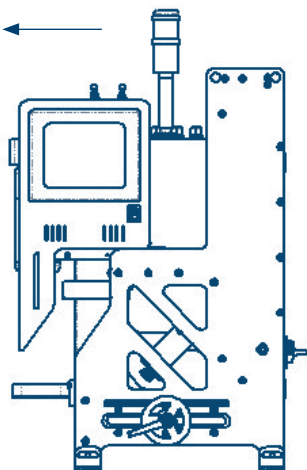
Standard fastening involves four M8 threaded holes in the area where the printer is to be placed.



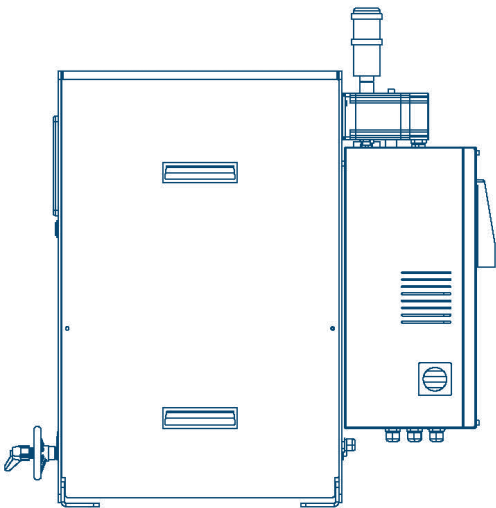
Pay special attention to ensuring the printer is parallel to the packaging machine, by taking the sealing bell as a reference. Also use a level to assure perfect levelling.



Secure the printer with 4 M8 screws in the holes.

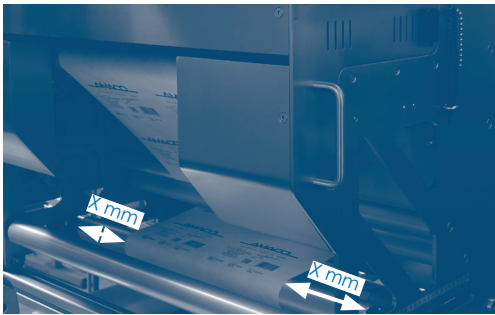


Isolate the printer from any source of electricity. Stand in a safe, steady position next to the printer, with the space needed to operate. Move the printer head outwards.

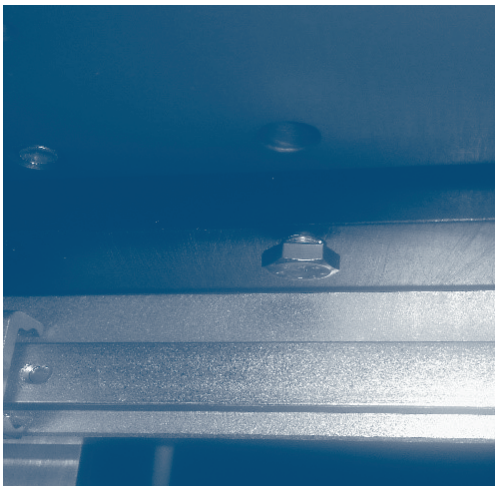


Take out the protective guard at the back to make it easier to insert the top film.

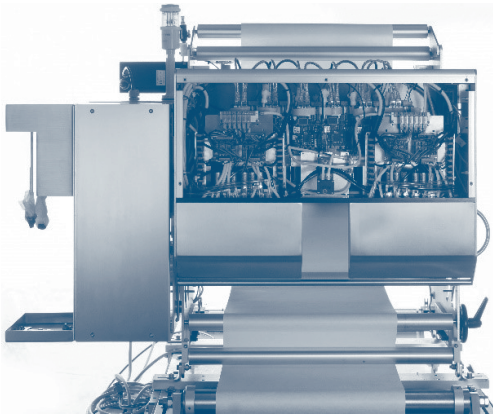
Refer to the label on the operator panel side for correct film threading.



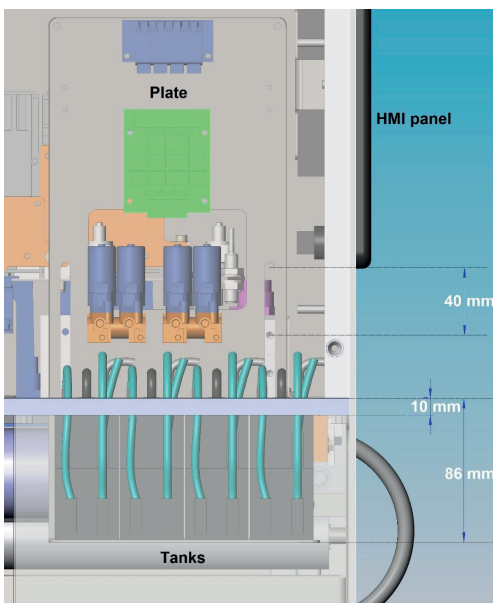
Place the printer as much as possible in the middle of the packaging machine, so that the middle of the film that will run through it matches more accurately the middle of the printheads.



To preserve the most sensitive components, block the printhead plate on its shorter side. Before commissioning, remove the 2 screws securing this plate.



Remove the printer head guard, secured with 5 flat countersunk head screws, which can be taken out with a \varnothing 3mm Allen wrench.



To prevent ink leaks during transport, lower the position of the tanks with the specific plate.

Before commissioning, place the support plates up to 20 mm from the maximum possible position.

Electrical connection

All the electrical connections must be carried out by following the specific technical diagrams of the printer model you are installing. Also adhere to the general safety rules of your country or community and work under the supervision of a technician authorised by AMACO or a person suitably trained by AMACO.

AMACO shall not be held liable for any unsteady or unsafe connection that may result in injury to persons or system malfunction.

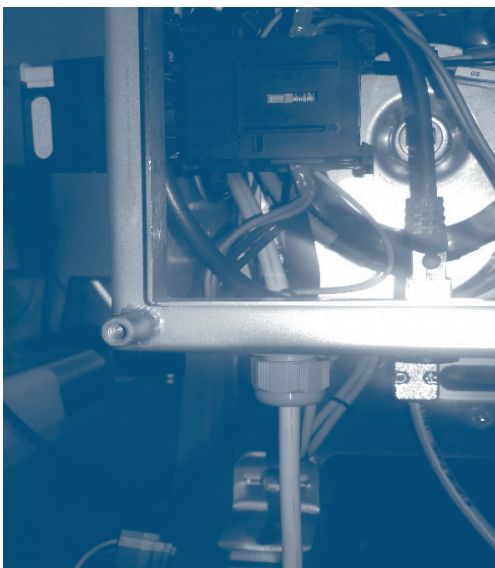


Provide suitable electromagnetic protection

[EMC]: some system cables work at high voltages. If these cables need to be replaced, please use screened cables whenever possible to provide suitable protection from noise and insulation from RF (radiofrequency) emissions.

When available, some cables with quick release plug are designed to ensure they can only be reconnected in the right direction, thereby avoiding polarity inversion or incorrect plugging in. The customer is responsible for ensuring the cables are in good working order and preventing their contact with liquids.

In the event of visible damage, rust or cut cables, replace them immediately. Contact AMACO's technical department for details about how to order new original parts. The printer is designed to be able to work with an external system, receiving its input signals and transmitting other output signals. The voltage of these signals is always 24V DC, unless otherwise specified.



Loosen the 4 M6 screws to take out the guard protecting the electrical panel. Connect the power supply cable to a steady source of electricity. Preferably use a safety switch or a designated fuse for the printer, which is usually inside the packaging machine.

If not available, we recommend providing for one. If this is not possible, connect directly to the power supply of the packaging machine. The printer must always be powered at 230V AC.

ATTENTION:
Connect the signal cable from the printer to the packaging machine.
The printer can receive and send various synchronisation signals, which will be explained in the following pages.



INPUT SIGNALS

Start printing: The first signal, and the only one required, is the start printing signal and we recommend setting it between 0.2 and 0.5 seconds.

Status: A second signal is the status signal: it is sent by the packaging machine and indicates whether there are any operations in progress at that moment, thereby inhibiting operation of the printer. As in the other cases, this signal is optional and disabled by default.

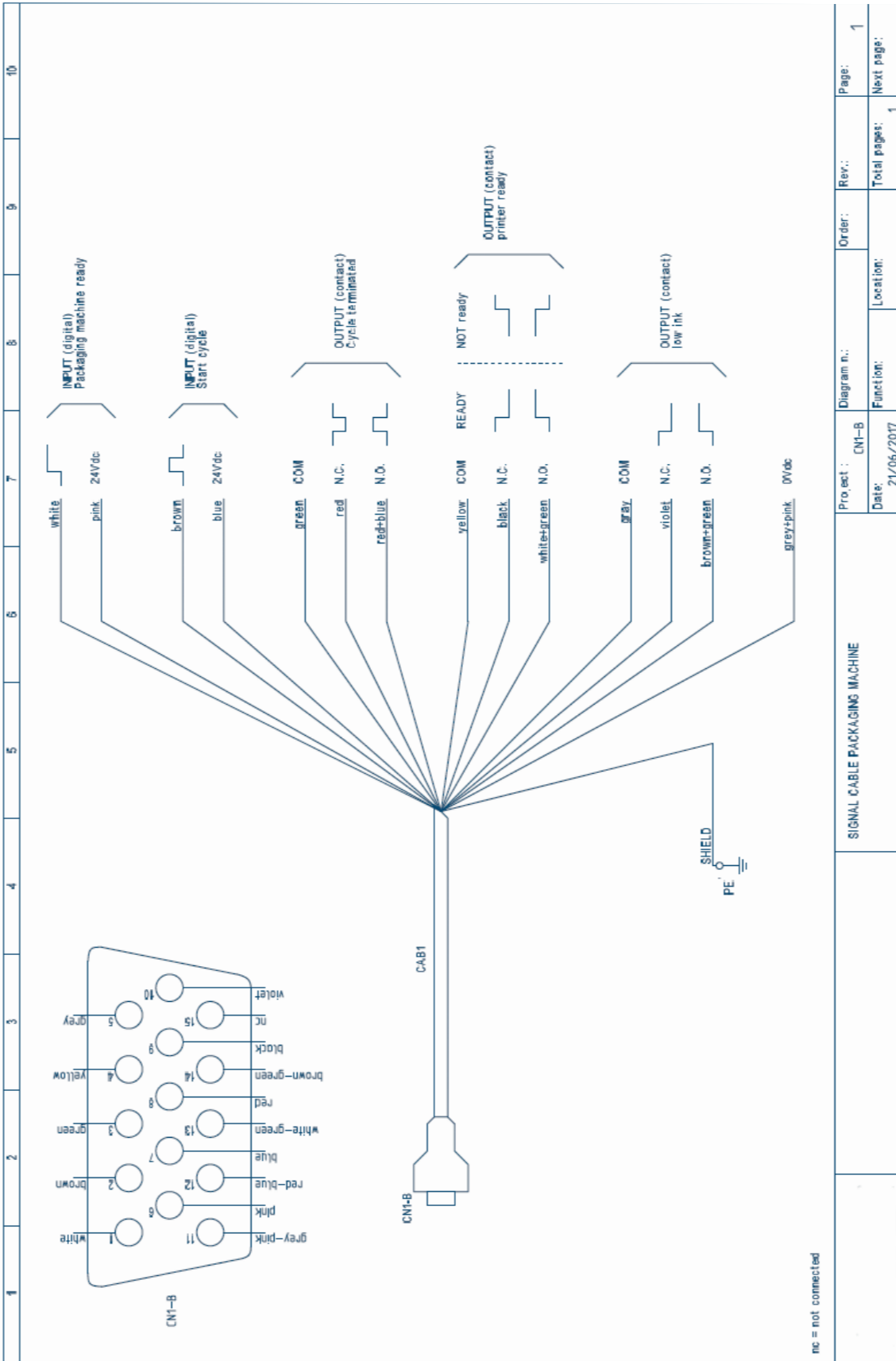


OUTPUT SIGNALS

Stop printing: This is a dry contact that can be controlled directly by the packaging machine. Its purpose is to inform you that the printing cycle has been completed and a new one will subsequently start.

Alarm: Generic alarm signal of a fault status to the packaging machine which stops its work cycle.

Ink low: Non-blocking warning signal, useful to trigger audio or visual low ink alerts or if the ink has run out.



Project :	CN1-B	Diagram n.:	Order:	Rev.:	Page:
Date:	21/06/2017	Function:	Location:	Total pages:	1
SIGNAL CABLE PACKAGING MACHINE					Next page:
					1



Connect all the connectors of the branch board for the ink level signals by following the indications on the wiring diagram.

The board is used to constantly check the right level of ink in the tanks.

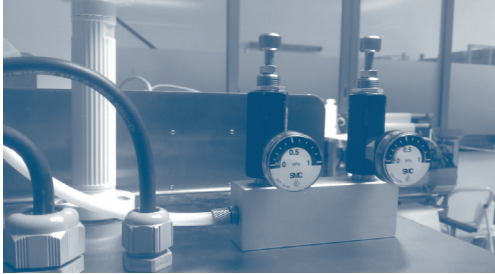
Close the guard protecting the tanks again.



Activate all the switches installed in the electrical panel.

After double checking all the wiring and connections, close the electrical panel protective guard again.

Pneumatic connection



Carry out the following operations referring to the hydraulic/pneumatic diagram:

Connect the compressed air hose (\varnothing 6 mm) from the packaging machine to the right inlet on the top of the electrical panel.

ACHTUNG:
Adjust the pressure for the printhead plate between:
0.4 Mpa << MN 1 >>
0.5 Mpa

Set the film brake pressure between:
0.2 Mpa << MN 2 >>
0.3 Mpa

FIRST START-UP

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

Ink loading



If needed, the ink pump can automatically switch on to top up the ink.

Otherwise, if the operator panel shows the LOW INK level alarm, it can be topped up by pressing this message.

Once loaded on the printer, the specific ink colour cannot be modified, unless the ink circuits are washed and fully dried [including the printheads]. In any case, this requires the written permission of AMACO's technical service.

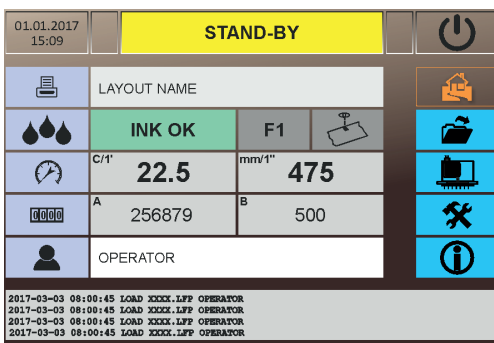
After this operation, the bottle of ink can be immediately removed without topping it up, in order to empty the tanks and quickly trigger the NO INK alarm.

This way there will be minimal contamination between the old ink and the new one.



Remove the heat-shrink sheath positioned on the bottle needle: pay attention to any drops of ink leaking out of the system.

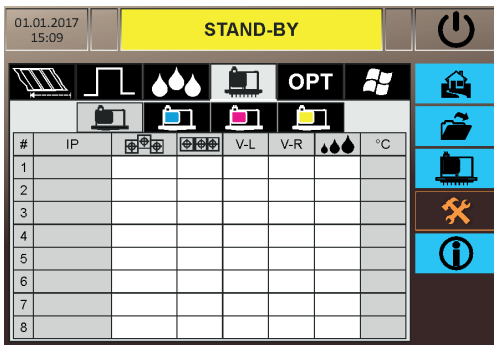
We recommend performing this procedure with the help of another person, who will dab the suction needle as soon as the sheath is removed from its housing.



If the printer is turned on, it will automatically suggest the NO LAYOUT status. Alternatively, it will display STAND-BY, if an artwork has already been pre-loaded.

Printhead alignment

The delay (alignment) and overlap (stitching) values are adjusted for each printhead during the internal testing printouts.



Proceed by increasing or decreasing the value by pressing the appropriate cell.

The alignment is in the second column of the table, while the overlap is in the third.

As a wide scale of values is available, we recommend changing the value by at least ten units at a time.

Finally, print the default printing pattern to check the adjustments made. The pattern is already pre-installed and always available on the hard disk of each printer. We recommend carrying out some printing samples before going ahead with full production.



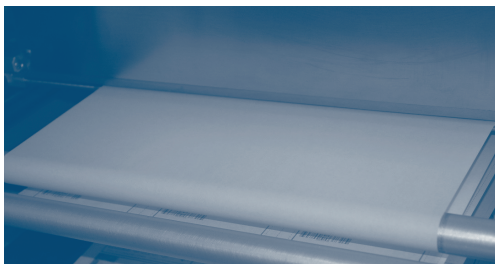
Initial situation (exaggerate)



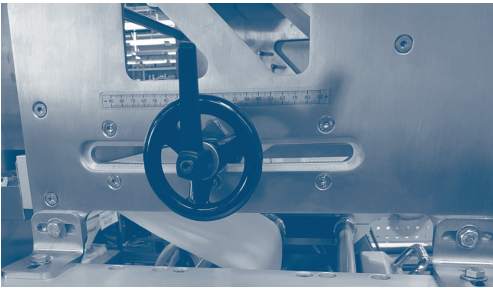
Optimal result

Print positioning

The printer is designed to ensure that, once the print label has been loaded, it can be mechanically moved on the blister if its position is not satisfactory. One of the following three cases might be possible:



Case A – White paper (without positioning mark): If the print is not properly aligned longitudinally, adjust the phase roller, setting half the desired deviation as value. By setting a positive value, printing will start earlier, while it will be postponed by setting a negative value.

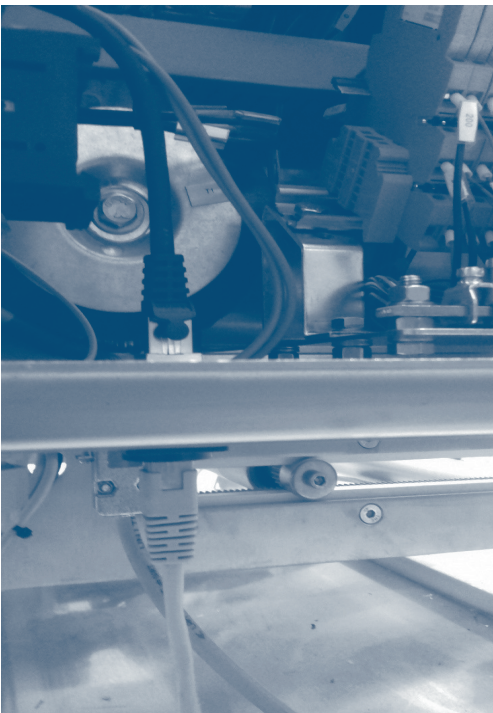


Case B – Pre-printed paper with positioning mark, but printer with no identification photocell: Follow the indications of case A, bearing in mind that when the position of the phase roller (Picture 4.3.2) is changed, you also need to change the position of the packaging machine's photocell, which controls correct centring of the pre-printed paper on the packaging.



Case C – Pre-printed paper and mark identification photocell installed: Make sure you adjust the printer photocell (Picture 4.3.3) in a position that ensures you no longer need to change it for the current packaging. In this situation, the phase roller may be useful if close to the positioning mark and the initial position needs to be brought forward to avoid losing a printing cycle.

Network connection



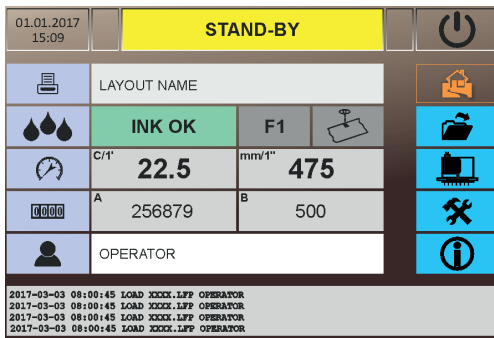
All the electronic components have a network board connected to the internal LAN of the printer, in order to control and communicate with them at any time, also during remote support sessions. To connect the printer to the local company network, just use a standard RJ45 Ethernet cable and insert it in the connector located at the bottom of the electrical cabinet, tagged as „CN2“ in the wiring diagram. You might need to use a crossover Ethernet cable if you wish to connect the printer directly to the PC.

Notes: It might be required to contact your IT manager to obtain the necessary data and information to communicate with the printer via the company's local network. By default, the external IP address of the printer is 192.168.0.150 and it communicates via port 13001.

OPERATOR PANEL

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

Assembly view



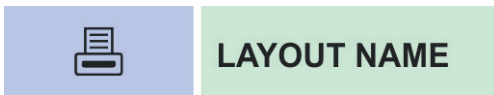
Our human-machine interface (HMI), commonly known as operator panel, consists of an 8" touch-screen panel that automatically starts up after the operating system is loaded. The homepage shows the printer status in real time and lets you access the various menus.



Real-time printer status



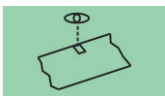
Stand-by / Resume printing



Artwork currently loaded and its print preview (by pressing the icon)



Ink level, with 3 different colours:
Ink OK | Low Ink | No Tinte



ON / OFF photocell and other functional set-ups.

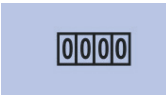


C/1' 22.5

mm/1" 475

Speed counters: C/1' Cycles per minute

mm/1" Millimetres of film handled per minute



A 987654

B 500

Blister counters: A Total from the starts

B Related to the label currently loaded



OPERATOR

Users: Name of active operator and login / logout features (by pressing the icon).

```
2017-03-03 08:00:45 LOAD XXXX.LFP OPERATOR
2017-03-03 08:00:45 LOAD XXXX.LFP OPERATOR
2017-03-03 08:00:45 LOAD XXXX.LFP OPERATOR
2017-03-03 08:00:45 LOAD XXXX.LFP OPERATOR
```

Log: Log file with preview of the last 5 actions.



Artworks: Press to select a layout to be printed and to manage the printer files.



Printheads: Used to carry out the quickest and most practical operation to improve printing sharpness and quality, called "purge".

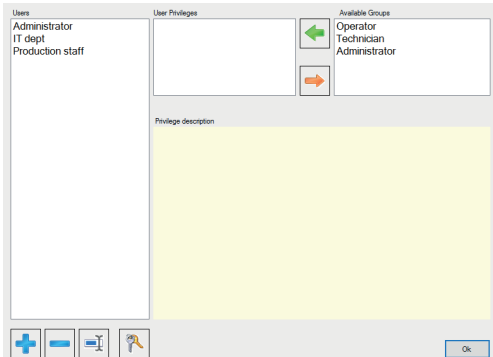


Settings: To access the full user interface menu, with settings grouped by movement, ink circuits, printing alignment and network connection.



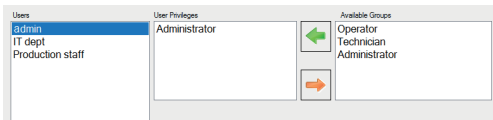
Information: This contains all the information about system versions, counters and displays the input and output signals.

Users

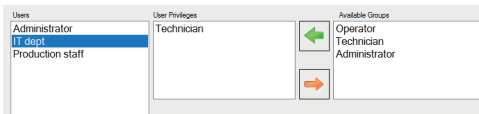


Click the Users icon to display the management window. Use the icons at the foot of the page to add and remove users, rename them and edit their access password. There are three different user levels: Administrators, Technicians and Operators.

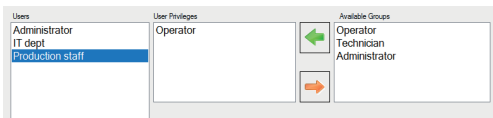
Below is a brief description of each one: you can obtain the version with the full specifications from AMACO.



Admin: Administrators are allowed to carry out any action without restrictions, which means they have full access to the labels, settings and user management.

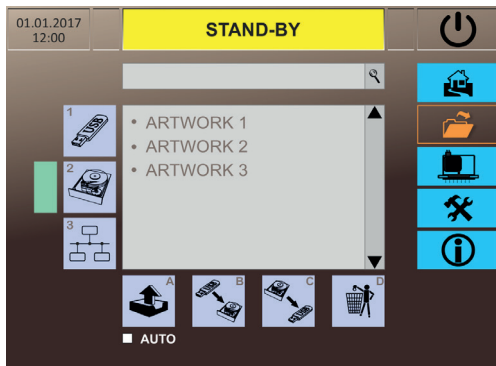


IT dept: Technician users can print labels (open menus and load them), confirm variable data (if any) and manage their position on the printout (via offset and delay corrections).



Production staff: Operators can only select and print labels, and confirm any variable data.

Artworks



The main box shows the list of files, which can be easily identified via the search bar in the top section.

(2) The printer can store thousands of artworks, making use of the many gigabytes on its SSD disk. They can be loaded via a USB pen drive (1) or via the company's network (3) by simply selecting the desired source. The default choice is the hard disk.

Once selected, the layout can be controlled with the buttons located at the bottom.

A: The button (A) is used to immediately load for printing.

Auto: The Auto option can be used to automatically load the same layout from the next machine restart. We recommend using it whenever the operator cannot be present in front of the machine, for instance if the packaging machine has an automatic loader.



B: If the USB pen drive has been selected as the data source, the "Copy on disk" button (B) can be used to copy the file on the printer's disk. The artwork must be in the main directory of the USB unit. If it is in a subfolder or its extension is not supported, it will not be read by the system.

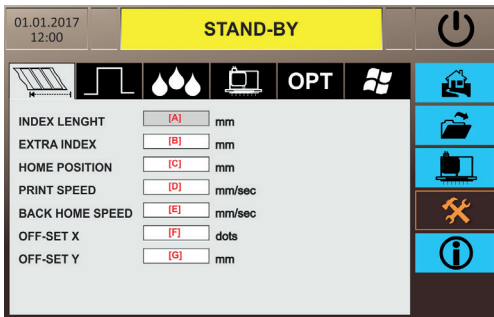
ATTENTION:
The copy will overwrite any existing file with the same name in the internal memory.

C: Copying can also be carried out with the opposite method. The artwork will be saved in the main directory of the USB unit and will overwrite any print file with the same name.

D: To eliminate an item in one of the data sources (D), just double click it. This will activate a green bar and from then on, clicking the icon will permanently delete the artwork.

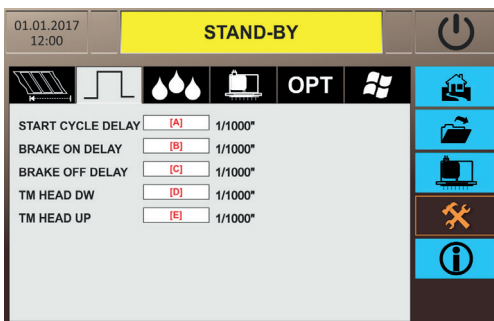
ATTENTION:
clicking the icon will permanently delete the artwork.

Settings



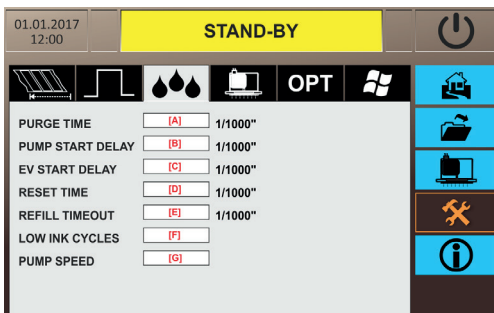
- A)** Label length, non-editable information.
- B)** Additional stroke required to cover the print areas beyond the machine index, whilst still remaining within the pitch sensor limit.
- C)** Displacement start and return position.
- D)** Feed speed, which can be optimised depending on the size of the printed ink drop.
- E)** Return speed, logically maintained higher or at least identical to the printing speed.
- F) G)** Longitudinal and transversal printing delay.*

*Changing this value adds or removes a print area, thereby modifying the label edges.



- A)** Start-up delay after receiving the start printing signal.
- B)** Time delay before engaging the film brake.
- C)** Time delay before releasing the film brake.
- D)** Timeout to push the printhead plate downwards (printing position)*
- E)** Timeout to move the printhead plate back up (standby position)*

*Only available for printing models with a fixed printhead plate.



A) Default: 2500 milliseconds
Time for which the pump is switched on to increase pressure inside the tank to allow the ink to be ejected quickly from the printheads. An excessive amount might cause the bottle to be emptied prematurely and, as a result, air would enter the ink system.

B) Default: 0 seconds
Air pump delay.

C) Default: 500 milliseconds

Solenoid valve delay, activated after the pump's operating time. During this time, ink will continue flowing down at a gradually lower pressure.

D) Default: 2500 milliseconds

Time to the end of the operation, when the normal atmospheric pressure is naturally restored inside the tanks.

E) Default: 5000 milliseconds

System standby time before any NO INK alarm, during which the ink pump will try and top up the tanks.

F) Default: 100

Printing cycle countdown, with a LOW INK condition, to allow the ink bottles to be replaced with no machine downtime and no production loss. After this time, the printer will display the NO INK alarm and stop.

G) Default: 3

Ink pump power to remove it from the bottle and replenish the hoses. The available interval is from 1 to 5.

Printheads

Every printer is already set up during AMACO's internal testing, in relation to each one of these values for optimal printing. The drop size 2 (double drop) is set as the standard value. The list of these settings includes:



Color selection



Alignment

V-L

1st voltage (left)



Drop size (range 1-3)

IP

IP address (read-only)



Stitching

V-R

2nd voltage (right)

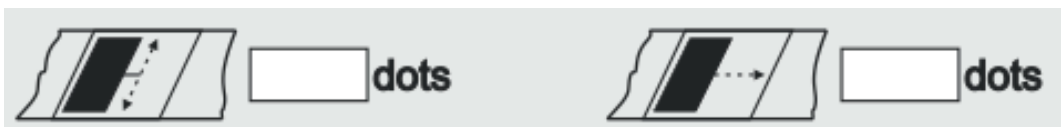
°C

Temperature
(°C, read-only, if available)

At the bottom of the page it's possible to setup the single color printhead offset, useful in case of double-color printer. In fact, this helps to align the two colors with better precision. Express the value in dots, that means a printing point.

Printheads array is composed by 1024 nozzles, arranged in approx. 72mm of linear space. Note that before using this feature, is necessary to align with each other the printheads of the same color.

Note that before using this feature, is necessary to align with each other the printheads of the same color.



Below the screenshots of the operator panel with the table of the printheads. They can be filled with the current settings to obtain a backup copy if needed.

#	IP			V-L	V-R		°C
1							
2							
3							
4							
5							
6							
7							
8							

dots
 dots
 %

Color 1

#	IP			V-L	V-R		°C
1							
2							
3							
4							
5							
6							
7							
8							

dots
 dots
 %

Color 2

#	IP			V-L	V-R		°C
1							
2							
3							
4							
5							
6							
7							
8							

dots
 dots
 %

Color 3

#	IP			V-L	V-R		°C
1							
2							
3							
4							
5							
6							
7							
8							

dots
 dots
 %

Color 4

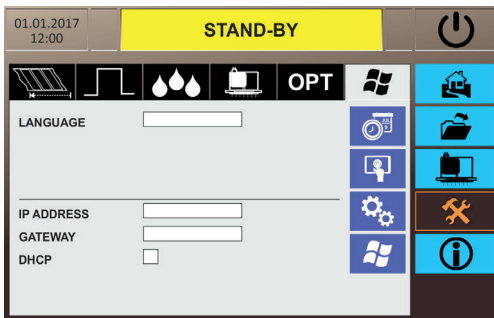
Options

01.01.2017 12:00 **STAND-BY**

OPT

SPLICING TAPE
 OFFSET TAPE/HEAD mm
 STEP AFTER HEAD
 STEP TAPE/HEAD

Tab options: When the „Splicing Tape“ control box is active and the OFFSET has been set, the printhead plate will move up at the right time, letting the splice go through and avoiding the risk of nozzle damage. This delay value is expressed in millimetres. With “Step after splice”, you can also skip printing for a set number of cycles of the packaging machine after the tape has gone through



Tab system: The last option is designed to change the system language or configuring the printer for external network communication. For instance, to send artwork from your workstation in the office or for remote support connections.



Calendar: Calendar To set the system date and time.



Calibration: To recalibrate the touch screen.



Updates: Version updates released by AMACO on a USB pen drive.



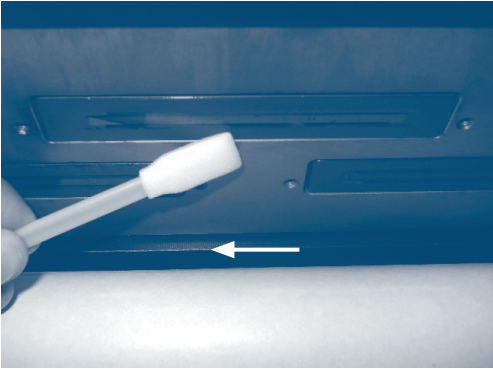
Windows: Exit from the operating system, reserved to AMACO personnel.

ROUTINE PROCEDURES

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

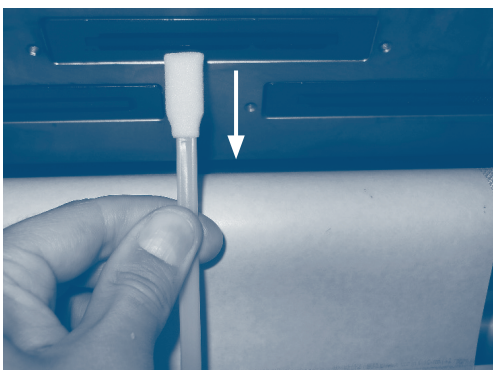
Printhead maintenance

If there are ink residues that formed during normal use of the machine or after a purge, follow this procedure to clean any printheads involved.



Use the special pad to soak up the ink on the edge of the printhead, avoiding any collisions with its centre while rubbing with the pad.

Carry out a couple of printing cycles and check for any thin lines. The best way to identify printing issues is by printing a full square.



Should you find one or more lines, dab the nozzles in the area corresponding to the missing line and move the pad outwards, crosswise to the nozzle unit.

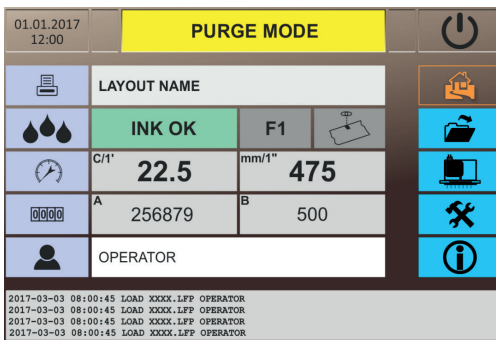
As an alternative, soak the pad with ink and dab the clogged area.

Perform some printing tests and, if needed, repeat the previous point.

If the problem is not solved, you might need to purge the system's ink circuits.

Cleaning the nozzles

If there are different lines in various areas of the printhead, or one or two thick lines, normal dabbing might no longer be effective: there might be air bubbles inside the nozzle unit. The problem can be solved with a purge by following the steps below.

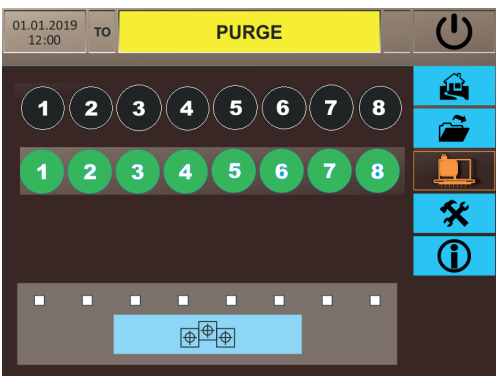


Ensure you have exited the "PRINTING" status. Use the handle to gently take out the printhead in its maximum external position.

The operator panel will go into standby and show the message: "NO INK TRAY".



Place the purge tray under the printheads by engaging it to the supports, in order to obtain the PURGE MODE status.



Go in the designated menu of the HMI panel. Start the purge procedure by pressing the icon of the printhead you wish to clean, from 1 to 8.



In general, the purging action might start up the ink pump. If after this procedure all the tanks involved have still not been sufficiently replenished, the operator panel will show the LOW INK message. As this is not an alarm message, it does not indicate a system problem. The status before the alarm can be restored by pressing the message on the panel, until PURGE MODE is shown again.

If the operator panel shows the NO INK alarm, check the contents of the ink bottle: if empty, replace it with a new one as described in the next chapter.

In the lower part of the page is available the „Pattern“ printing feature: it is useful to check which nozzles print correctly and which others are obstructed by air bubbles. Every checkbox stands for a printhead: just select the ones interested and press finally the blue button to print. Purge procedure is precisely useful to free the nozzle from air, avoiding white lines from printing.

Changing the ink bottle

The printer has been designed to avoid interrupting production: this means being able to change the ink bottle during the normal work shift without machine downtime.



Unscrew the ink bottle from its inlet, by turning it clockwise.

Pay attention to the needle: as it is in contact with the liquid, it might release a few drops. We recommend wearing latex gloves when performing this procedure.

In the event of a previous NO INK alarm, from now on you can press this message to reset it.

01.01.2017 12:00	STAND-BY		
	NOME LAYOUT		
	LOW INK	F1	
	C1' 22.5	mm ³ /l" 475	
	A 256879	B 500	
	OPERATOR		
<small>2017-03-03 08:00:45 LOAD XXXX.LFF OPERATOR 2017-03-03 08:00:45 LOAD XXXX.LFF OPERATOR 2017-03-03 08:00:45 LOAD XXXX.LFF OPERATOR 2017-03-03 08:00:45 LOAD XXXX.LFF OPERATOR</small>			

The system is fitted with sensors that constantly analyse the ink level: if it gets too low, the LOW INK warning is displayed. In the meantime, the yellow light also starts flashing to alert to the changed status.

Nothing changes during production: if there is still enough ink in the bottle, the alarm is automatically reset.



Low ink status: This is the ideal time to replace the bottle. Indeed, the printer will start an internal countdown for the remaining number of printouts before stopping in the NO INK alarm status. By default this counter is set to 100, an average value where there is a high likelihood of replacing the bottle in time.

PRINTER STATUS

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

Information

PRINT STATUS	MEANING
Pause	The system is ready to load a layout and receive the printing command from the packaging machine.
Packaging machine not ready	The system received an alarm signal from the packaging machine. After restoring the correct status, press this message on the operator panel to continue.
Loading	The print artwork is being loaded and will be printed as soon as the START signal is received.
Purge mode	The printhead has been placed in an external position, the purge position.
Purge	The printheads are performing the purge procedure and eject ink.
Paper splice	This message is displayed when the splice between two films is running under the printheads. The printer will stop and authorise the printheads to move up, letting the adhesive tape go through without damaging them. Printing will then automatically resume with a new cycle.

Notes

PRINT STATUS	MEANING
Printhead not positioned	This message is displayed when the splice between two films is running under the printheads. The printer will stop and authorise the printheads to move up, letting the adhesive tape go through without damaging them. Printing will then automatically resume with a new cycle.
No artwork	No print artwork has been currently loaded. Load a layout via the Ethernet or with a USB pen drive.
Excessive pitch	As it shifted, the mobile carriage positioned at the back of the machine has read the end-of-stroke sensor and is no longer able to go back to the Home position. Ensure the length of the label does not exceed the possible physical limit of printer movement.
File loading error	The print artwork could not be loaded correctly for the following reasons: <ul style="list-style-type: none">• Invalid layout size;• The variable data contained could not be read;• The file contains a code error. Press the message to exit and check on the computer that the file meets all the requirements.

PRINT STATUS	MEANING
No tray	This message appears when the printhead is in the purge position, but the ink tray is not positioned correctly, preventing the sensor from reading it properly. Check the position of the tray and sensor.

Alarms

PRINT STATUS	MEANING
Safety guards open	The rear safety guard is not fitted on or has not been engaged correctly. Check its position, the message will automatically disappear.
Drive error	After placing back the rear protective guard, the motor control device (inverter) and the safety systems are automatically reset; during this time, the drive prevents operations on the machine and shows this message. If the "READY" status does not come back, try and reset the message.
Electronics error	A communication error might have involved the XB4 board(s). Check whether the network connector has been inserted correctly and powered correctly (there should be a blinking green LED).
Printhead sensors error	A fault occurred on one or more sensors, meaning that the status cannot be read correctly. Try and adjust one or more sensors possibly involved.
PLC error	The PLC is not connected directly or cannot communicate with the internal network. Check the connections and restore them if needed, then press the message to reset it. If this is not the case, an unexpected complication might have occurred: contact AMACO's technical service to solve the failure.
Brake error	A mechanical failure prevented the film brake from operating. Check that the pneumatic system is fed with the right pressure and that the indicator shows the correct figure.
Printheads blocked down	A fault prevented the printheads from moving up or their sensor did not detect the movement. Check the pneumatic pressure of the system or adjust the sensor to solve the problem.
Printheads blocked up	A fault prevented the printheads from moving down or their sensor did not detect the movement. Check the pneumatic pressure of the system or adjust the sensor to solve the problem.
No start	<ul style="list-style-type: none"> If a printer photocell is installed: Check whether the positioning mark is actually read: it might be smaller than the minimum reading size or slightly moved away from the photocell focus point. If a printer photocell is not installed: There is a connection issue after receiving the "START PRINT" signal from the packaging machine: check the electrical connections and if the fault persists, contact AMACO's technical support.
No ink	The ink sub tanks are empty. The printer will not start until they are topped up. Therefore, replace the empty ink bottle with a new one and press the message to reset it. More than one (automatic) operation of the ink pump might be required. When the level is restored, the system will show the READY status.

Q & A

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

Hardware section

PROBLEM	SOLUTION
White lines on the printout or poor quality apparently caused by low ink levels	Purge the printhead where the problem occurred and wait at least 30 seconds to allow for ink absorption. Then clean with the pad, paying attention not to touch the nozzles.
Poor quality with ink present: no white lin	Ensure the printing film is properly stretched out and is not too far from the nozzles (1-2 mm). The paper tension does not depend on the printer, so check the reel on the packaging machine.
Layout not centred on the blister or printing position not perfectly identical after several printing cycles	The printer cannot change the position of the label. Ensure the position of the paper is constant, identical at each machine cycle. If the paper always stops in the same position, printing is also carried out in the same point. In any case, if there is a significant change of the printing position, check the belt and all the parts involved in the movement of the transfer carriage. Also check that all the rollers are fixed correctly and have no backlash.
Printer in PRINTING mode, but the transfer device does not move after several machine cycles	This condition means that the printing command is not given by the packaging machine or has not reached the printer. Check the connection of the 15-pin connector under the main electrical box. Check the inside of the packaging machine's electrical cabinet to make sure there actually is a connection to the printer. Incoming signals can be checked by observing the corresponding LEDs on the PLC.
The carriage makes noises as it moves or triggers alarms during or after the displacement	Check if there is anything blocking carriage movement and check the connection between drive and motor. Also check the LEDs on the drivers: a red light indicates an alarm. In this case, restart the printer via the master switch. If the problem persists, contact AMACO's support service.
„NO INK“ alarm persists even after resetting on the HMI	The printer cannot refill the ink in at least one of the tanks. The ink bottle might need to be replaced. Otherwise, the ink hose might be clogged: check the state of the ink valve. By checking the ink circuit up to its origin, you can also see the actual level of ink in each tank and whether the ink valves switch on correctly. Another cause might be the ink filter: it might no longer work efficiently, especially if it has never been changed in the past year.
When you try to purge a printhead, the ink does not drip out of the nozzles	This might happen if the ink pump does not work properly. If the ink pump has always been on, check the air valve corresponding to the printhead involved. Generally, when the air pump is damaged, none of the printheads can be purged. If a malfunction is detected on the air valve alone, the problem might be due to a disconnected cable. In any case, you can carry out the due checks by opening the ink circuit box.
The top film tends to move crosswise from where it has been positioned	Check the rollers. They might have not been fixed correctly (mechanical play) or not be parallel the other ones and to the printer.

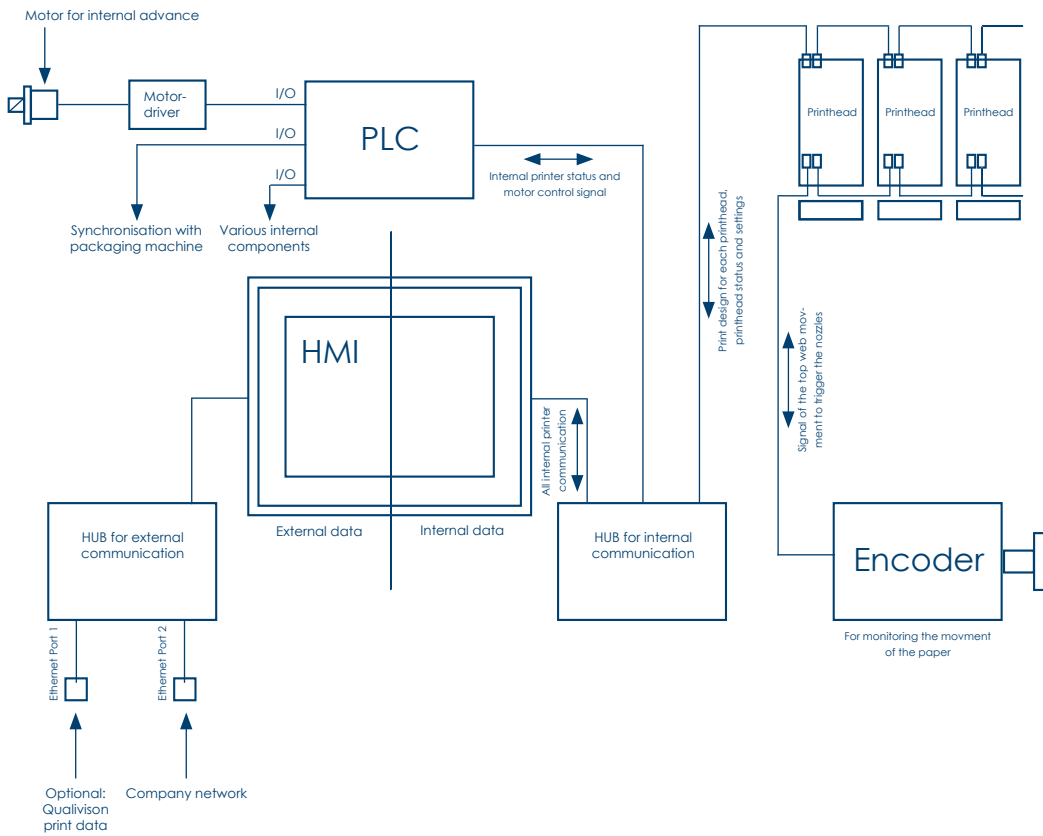
PROBLEM	SOLUTIONS
Thick white line(s) on the printout after various purges	Even with serious difficulties in removing a white line on the printout, it is very unlikely that the printhead is damaged. The air bubble is probably too big to be removed only with a purge procedure. In this case, it is necessary to start a cleaning cycle with the help of a syringe. Once coupled through the colder through a piece of hose acting as bridge, extract air only until the ink goes up through the hose. This operation allows the air bubbles to come out of the hose and not through the nozzles (generally a greater amount of air).
A printhead does not print, even if all the connectors are inserted	Check that the printed circuit board has been inserted correctly in the printhead slot and that its status LEDs (blue) turn on. >Only for D-FLEX printers: The continuous movement of the carriage might damage a cable or a hose inside the plastic chain that moves to follow it. In this case, replace the damaged part.
Drops of ink leak from the printheads	If one or more printheads are leaking ink from the nozzles, the tank position may be too high. Move it down by using the sliding guide.

Software section

PROBLEM	SOLUTION
„HARDWARE FAULT“	This means that at least one printed circuit board failed to start up. Power cycle the machine, waiting about 30 seconds before turning it on again.
The printer does not load the label during LOADING	If the printer takes more than a couple of minutes to load the artwork, try and load again. The average loading time is about 45 seconds.
The printer does not load the label: LABEL LOADING ERROR status	Something prevented the creation of the print layout. Use the LabelFarm labelling software to check if there are issues on any object. Usually, you just need to open properties. When the object is identified, remove it and create it again.
„NO INK“ alarm	The ink bottle has not been replaced in time. Firstly, replace the ink bottle with a new one (the printer does not need to be turned off), then press the NO INK button on the operator panel homepage until the ink reaches the printhead nozzles and the alarm is automatically cleared.
Various printing layout composition issues	Refer to the relevant AMACO document or send a specific request.

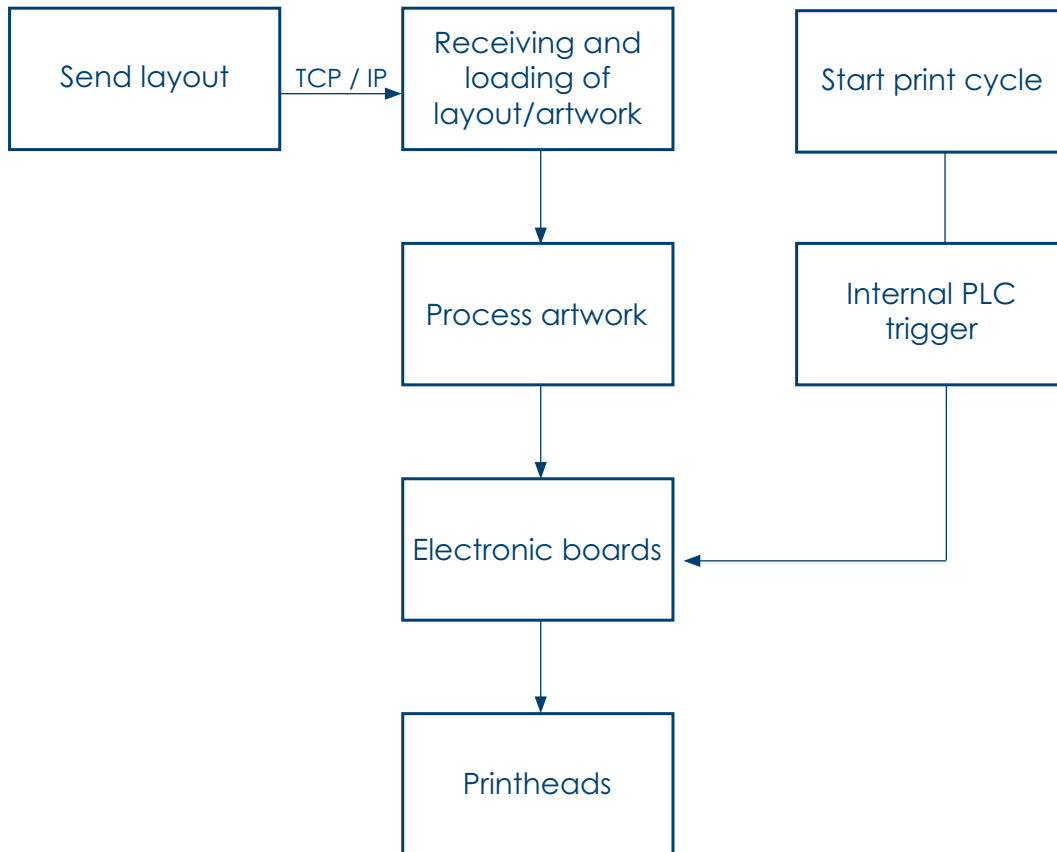
FLOW DIAGRAM HMI PRINT

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SCHEMA PRINT SYSTEM

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COMPLIANCE INFORMATION

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

This device complies with Part 15 of the FCC standards.
Its operation is subject to the following two conditions:

1. The device cannot cause harmful interference
2. The device must accept the interference received, including interference that might cause unwanted operation.

This device has been tested and is compliant with the intended limits for a Class A digital device, pursuant to Part 15 of the FCC standards. These limits are designed to provide responsible protection against harmful interference when the equipment is used in a business environment. This equipment generates, uses and may irradiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, it may cause harmful interference to communications. The operation of this equipment in a residential area may cause harmful interference. In that case, users are required to correct the interference and bear the costs. Use screened cables with this unit to assure compliance with FCC Class A limits.

This equipment complies with the following European directives:
Machinery directive (2006/42/EC);
Low Voltage Directive LVD (2006/95/EC);
Electromagnetic Compatibility Directive EMC (2004/108/EC).

EMC DIRECTIVE

D-FLEX TWO COLOR G4 | DIGITAL PIEZO DOD INKJET

All the machines and auxiliary equipment supplied by AMACO comply with EN and FCC standards, which include the necessary tests to ensure the equipment supplied meets the electromagnetic compatibility (EMC) requirements of the European Union and the FCC CFR47 standard related to electromagnetic emissions.

None of the devices supplied by AMACO or its supplied connection cables may be modified or altered, under any circumstances, as the equipment might no longer comply with the directives. The person or company performing these changes might be subject to prosecution by authorities. As required by the EMC directive, all items of auxiliary equipment that may be added to products supplied by AMACO (e.g. sensors, connection cables, box junctions, and so on) during the normal service of a system must be supplied and installed in compliance with the EMC directive.

The person or company supplying and installing these auxiliary components or assemblies is responsible for assuring said compliance and in the event of non-compliance, is liable in case of prosecution by authorities.

We strongly recommend ensuring that all personnel involved in the installation of the systems are familiar with the EMC directive and are trained on the right installation methods required to ensure their installation complies with the directive.

The following guidelines are designed to highlight the most important rules of good practice when installing the D-FLEX TWO COLOR G4 AMACO device, but do not exempt installers from knowledge of the directive, nor do they in any way relieve liability for the equipment installer's actions.