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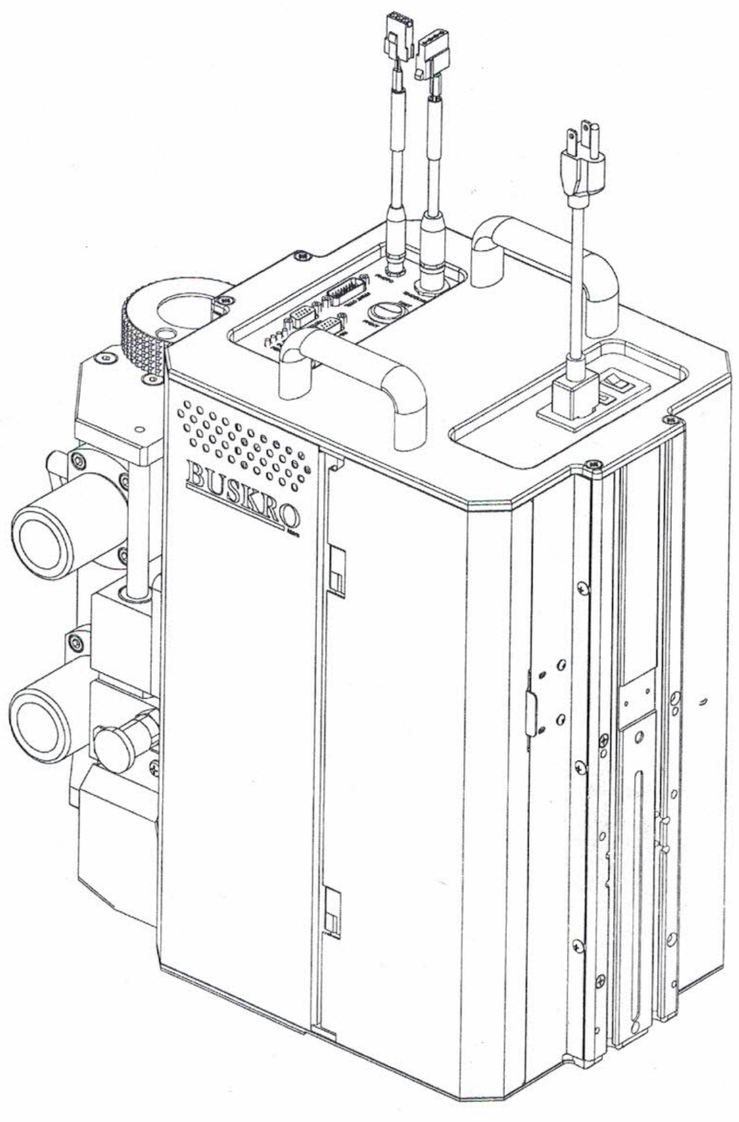
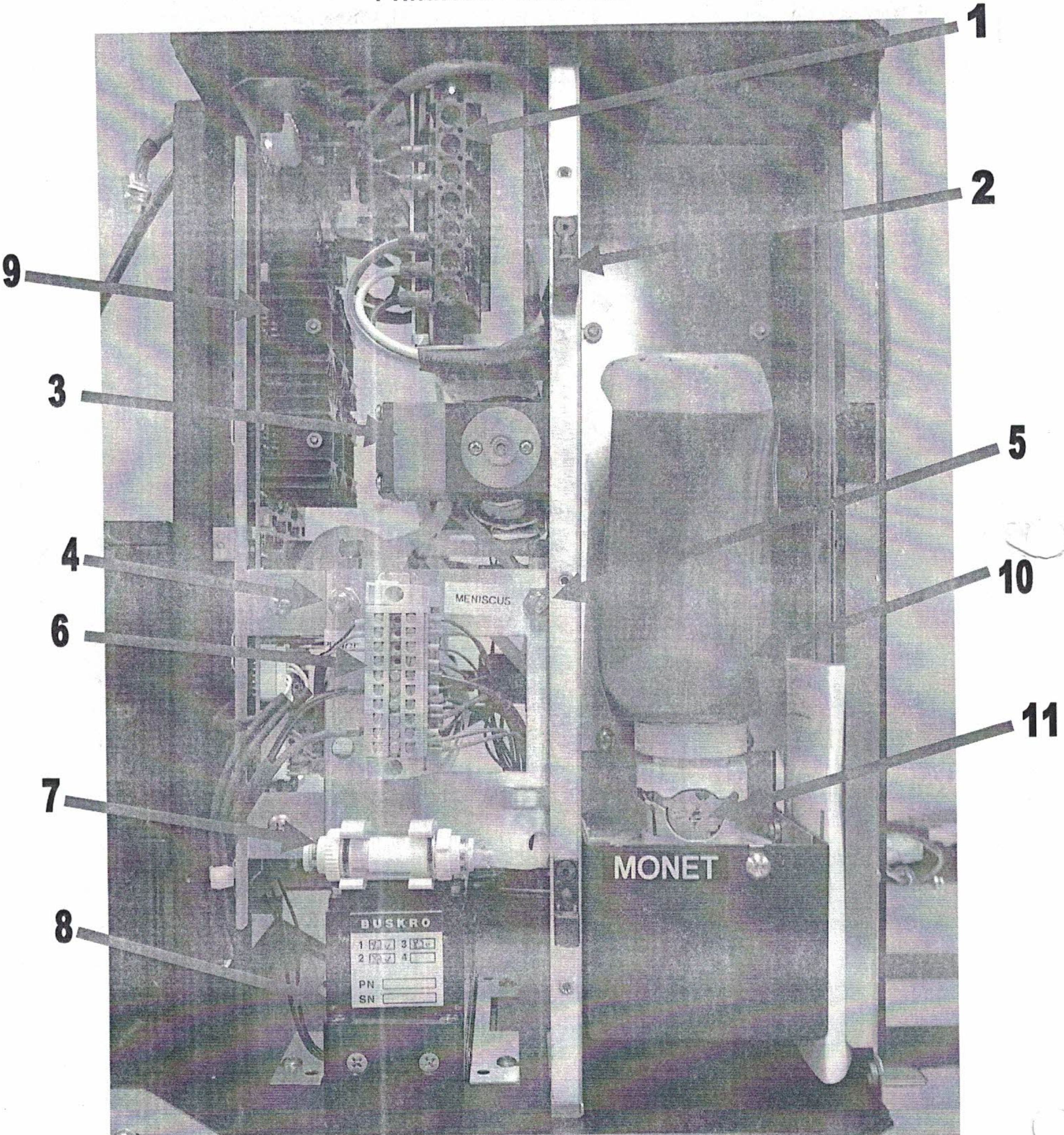
Service Manual

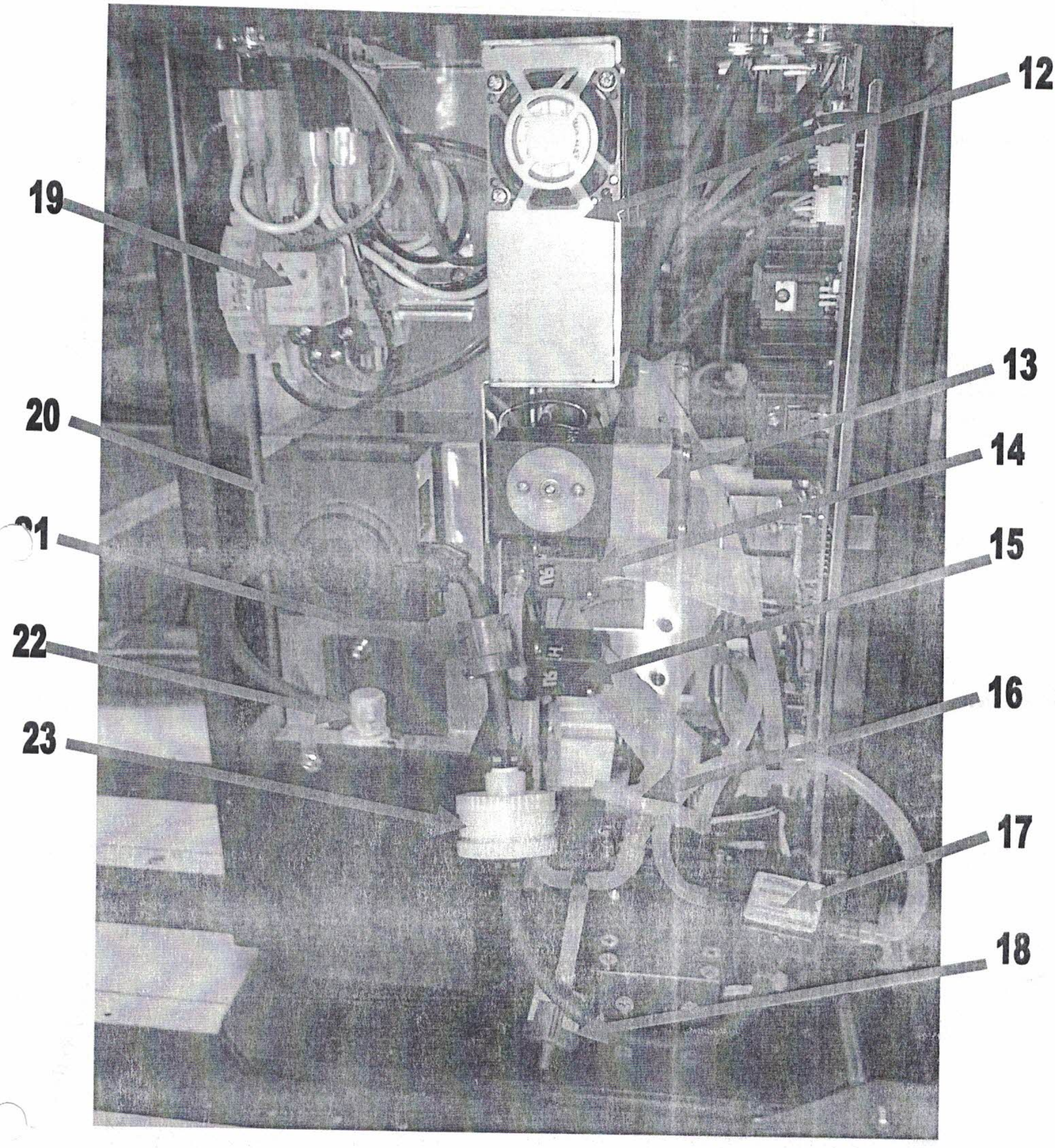
Subject Hybrid Atom Printhead
Issued By Customer Support Team
Date MM/DD/YY 29/06/17



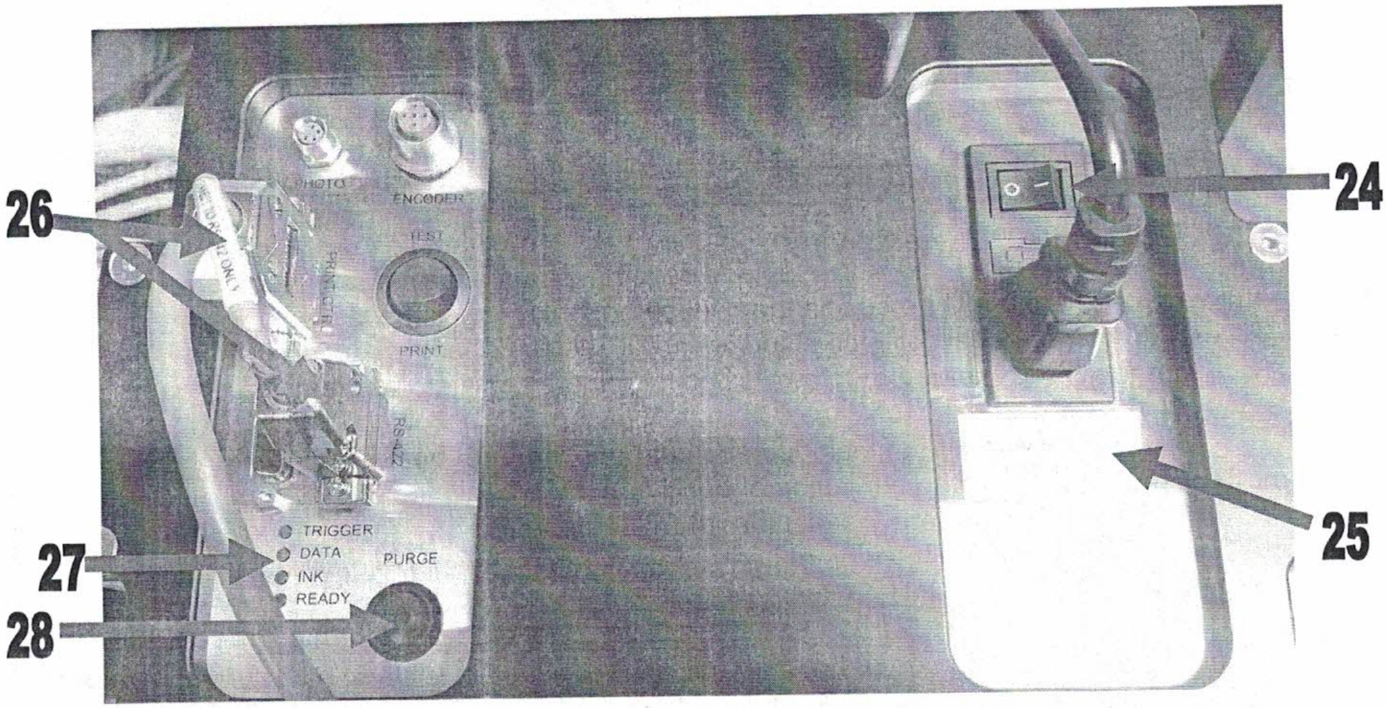
Printhead Front View



Printhead Rear View



Printhead Top View



Parts Description:

1) 24VDC Power Supply (front view) – Supplies power to QPI board, Peristaltic pump, Lung/Meniscus pumps, and solenoids.
2) Ink Bottle Cover Hinge – Cover must be kept closed on UV systems to prevent light exposure to the ink bottle. The ink bottle cover must be removed from it's hinges in order to access the mounting screws of the other front cover for removal.
3) Lung Pump - Used to remove air and gas bubbles from the ink.
4) Purge Adjustment Needle Valve – Used to adjust the output purge pressure from the purge pump. See pages 12-13 for adjustment procedure.
5) Meniscus Adjustment Needle Valve – Used to adjust the output meniscus vacuum from the meniscus pump. See pages 12-13 for adjustment procedure.
6) Terminal Block Assembly
7) Meniscus Vacuum Filter – Used to filter the air that enters the meniscus pump and tubing. See page 7 for maintenance schedule
8) Printbar – Available in 2.5" 200 & 300 DPI or 1" 256 DPI
9) QPI Board – Main control board for the printhead
10) Ink Bottle - 375ml ink bottle available in Monet, Cezanne, and Renoir inks.
11) Ink Bottle Quick Disconnect
12) 24VDC Power Supply (rear view)
13) Meniscus/Purge Pump – Supplies both Meniscus vacuum and Purge pressure to the printhead
14) Meniscus/Purge 3-way Solenoid Valve – Switches the meniscus vacuum to purge pressure when purging the printhead.

15) Meniscus Locking Solenoid – Closes when the printhead is powered down, locking in the built up meniscus vacuum. This will prevent the printhead from loosing ink during shutdown.
16) Meniscus Filter – Filters the air that is purged through the printhead and also prevents ink from backing up into the meniscus pump in the event of an ink overfill.
17) Lung Degassing Module – Removes air bubbles and gas bubbles from the ink.
18) 0.32 PSI Check Valve – When ink cools from operating temperature to room temperature, a vacuum pressure builds inside the printbar. This check valve will open when this occurs allowing air to enter into the meniscus line relieving this pressure. This will prevent air from entering through the jetting orifice. **note: the arrow on the check valve should point towards the meniscus filter.
19) Relay – This relay is available in 120VAC for North America and 230VAC for the rest of the world and must match the input voltage (item # 25). This closes immediately when powering down the printhead, closing the meniscus locking solenoid (item # 15).
20) Peristaltic Pump – Pumps ink from the ink bottle to the printbar.
21) 1.0 PSI Check Valve – Opens when the peristaltic pump starts pumping ink, then closes when the pump stops pumping. This prevents ink from siphoning back from the printbar to the bottle. **note: the arrow on the check valve should point towards the ink filter (item # 23).
22) Ink Connector Fitting – Quick disconnect between the ink bottle and the peristaltic pump.
23) Ink Filter – Filters the ink that is pumped from the ink bottle to the printbar.
24) Power Switch – Applies power to the printhead
25) Power Input – Input voltage to the printhead. This can be 110 VAC, or 220 VAC depending on the model purchased.
26) Hybrid Cable – Connects the printhead to the Buskro PCM through the Print ctrl port and the RS-422 port so that the printhead can communicate with the computer.
27) LED Communication Display –

Trigger– will illuminate when the photo-eye is blocked. (Only works for Standard Atom)

Data – will blink when sending a PDL layout file to the printhead. You must wait for the LED to illuminate solid before printing. (Only works for Standard Atom)

Ink – will illuminate when ink is pumping from the bottle to the printbar reservoir.

- will blink when the ink bottle is empty or if a pump fail error occurs. There is a 5 minute timeout where a pump error will occur if the LOIS does not read full within this time frame.

Ready – will illuminate when printhead is at operating temperature and ready to purge and print.

28) Purge Button – Used to purge the printhead.

Note: The encoder input, photo eye input, RS-232 port and test/print switch are not used in the Hybrid Atom printhead. They are only used in the Standard Atom printhead.

Description:

The Hybrid Atom utilizes the 2500 series jetting arrays, but without the necessity of a Controller. All ink delivery (IDM) and pressure vacuum (PVM) components are contained directly inside the printhead. It requires a Computer Module (PCM) equipped with an Image Accelerator Card (IAC) like the BK-PCM-8 and is connected through a special Hybrid Cable. The Photo Eye and Encoder sensors connect directly to the PCM through the Field Connection Board (FCB). The Atom is currently available in 1" 256 VDPI, or 2.5" at 200 or 300 VDPI.

System Requirements:

- Hybrid Atom printhead
- Buskro PCM equipped with an IAC
- Compose IQ V10.04 or higher
- Dongle with Atlas or Master License
- BK230 series bridge
- Meniscus gauge (PN 9100338A)
- Purge gauge (PN 9104392)
- Syringe Purge Kit (PN PURGEKIT)
- Photo-eye sensor (connected directly to PCM)
- Encoder (connected directly to PCM)

Printhead Setup:

Encoder Resolution: Under Setup – Options in Compose. For 1" and 2.5" Atom printheads, set the Encoder 1 resolution to 660 DPI or 652 DPI

Printhead Selection: Under Setup - Print Heads, select the driver that matches the head type (eg Atlas2530, Atlas2530cz, or Aurora2530 for 2530 and Atlas1025, Atlas1025cz, and Aurora1025 for 1"). The Atom uses the standard printhead drivers.

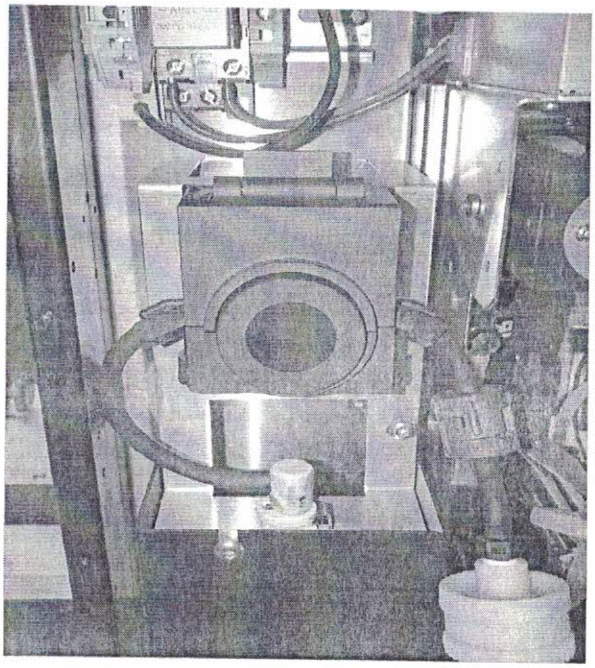
Maintenance:

Description	Frequency	Part Number
Measure Meniscus Vacuum and Purge Pressure	Every 2 months or when print quality degrades	9100338A 9104392
Replace Ink Bottle	When empty	BKINK-MONBK4B (Monet) BKINK-RELBK4B(Renoir) BKINK-CEZBK4B(Cezanne) BKINK-LEGBK4B(Legar)
Replace Meniscus Vacuum Filter (item 7)	Every 4-6 months – When meniscus setting can not be reduced to set point.	9105078
Replace Meniscus Filter (item 17)	When dirty or contaminated with ink.	9100965
Replace Check Valves (items 18 and 21)	Every 12 months	9105081 (0.32 psi) 9106790 (1.0 psi)
Replace Ink Filter (item 23)	Every 12 months	9102090A (Atlas) 9103390A (UV)

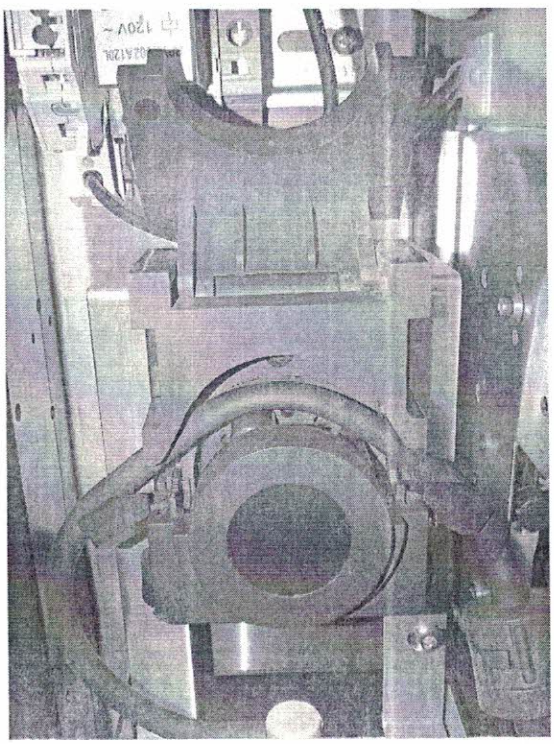
Replace Ink Tubing inside the peristaltic pump	Every 6 months or when pump failure frequently occurs.	9108116
Replace Lung De-gassing Module (item 17)	Every 12 months	9105992
Cycle the ink – Purge, print 25 good test labels	Every 3 days of non use	N/A

Maintenance kits have been created which will include enough parts to maintain an ATOM printhead for a year. These kits will contain all required tubing, filters, check valves, and the degassing module that are referenced in the Maintenance section above. Part numbers for these kits are BK-PM-ATLASATOM (Legar, Monet and Cezanne) and BK-PM-UVATOM (Renoir).

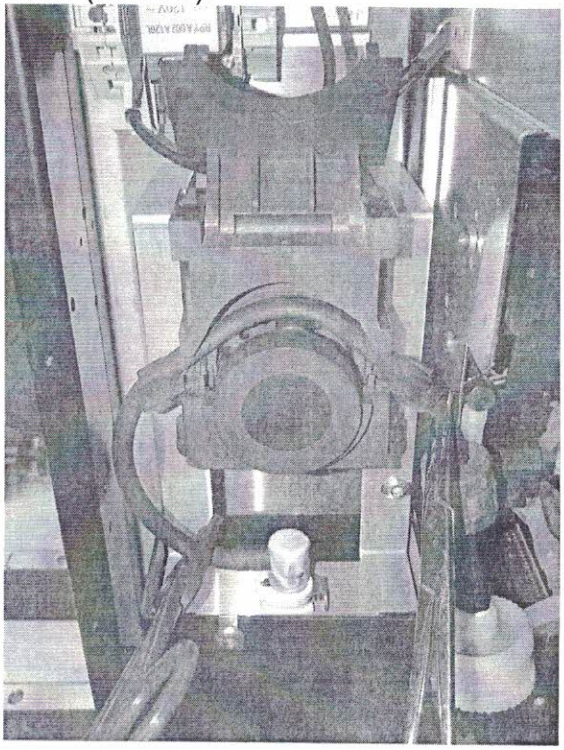
Replacing Tubing Inside the Peristaltic Pump:



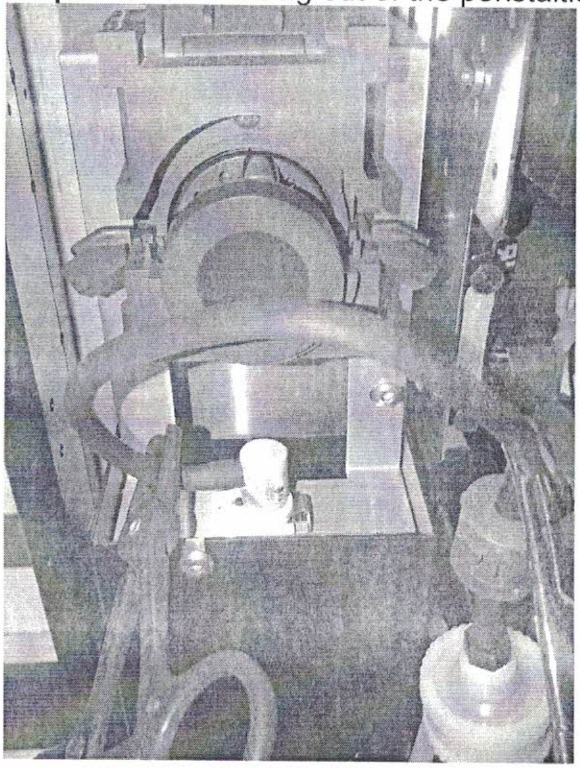
Step 1: Pull on the top front cover of the peristaltic pump until it is fully open.



Step 2: Using Forceps, pinch off the tubing at the ink connector (item 22) and the check valve (item 21).



Step 3: Pull the tubing out of the peristaltic pump.



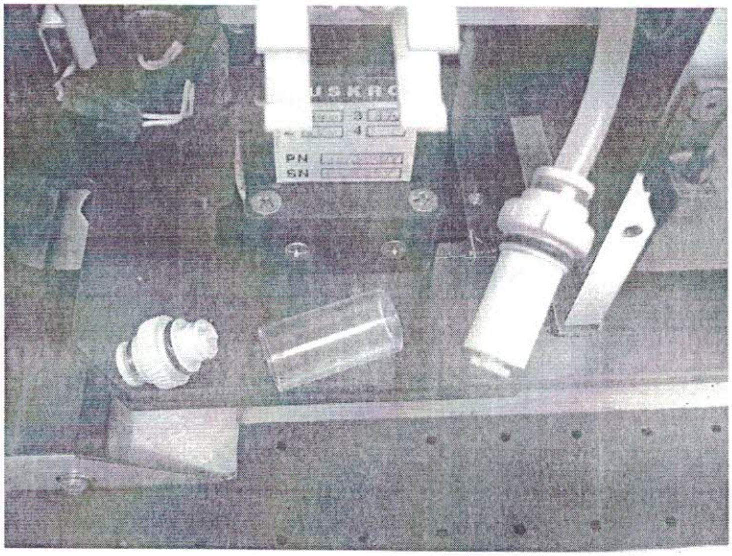
Step 4: Cut a piece of the shiny tubing to match the length of the tubing that is currently installed.
Step 5: Remove the existing tubing from the Atom printhead and discard. (if you cut a slit in the tubing over the barbed fittings, it will be easier to remove the tubing. Be careful not to damage the barbed fitting.)
Step 6: Install the new shiny tubing onto the ink connector and the check valve.
Step 7: Secure both ends of the new tubing using tie wraps.
Step 8: Place the new tubing inside the peristaltic pump, then close the front cover of the pump.

Replacing the Meniscus Vacuum Filter:

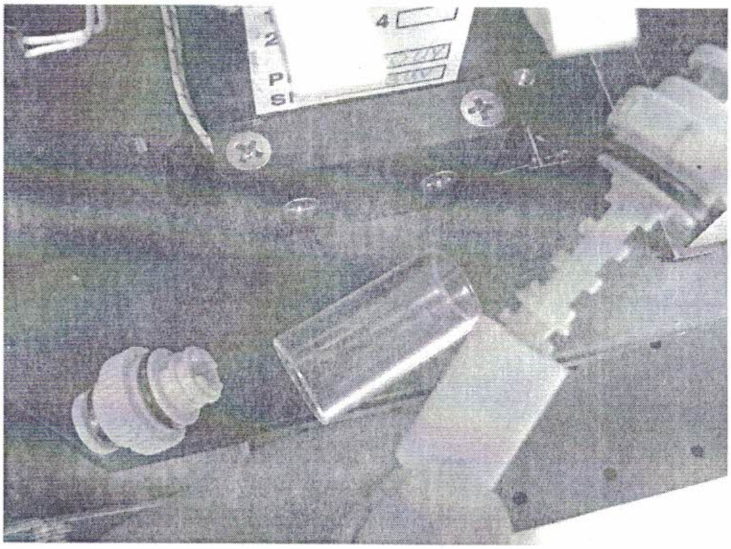
Note: when the meniscus vacuum filter is dirty, the meniscus vacuum will increase. If the meniscus value cannot be set to the appropriate setting by adjusting the meniscus needle valve, then this filter must be replaced.

Step 1: Unclip the filter assembly from its holder.

Step 2: Twist the bottom of the filter holder counter clockwise and then pull until it is removed, then slide the clear cover off.



Step 3: Pull the filter off of its holder and discard

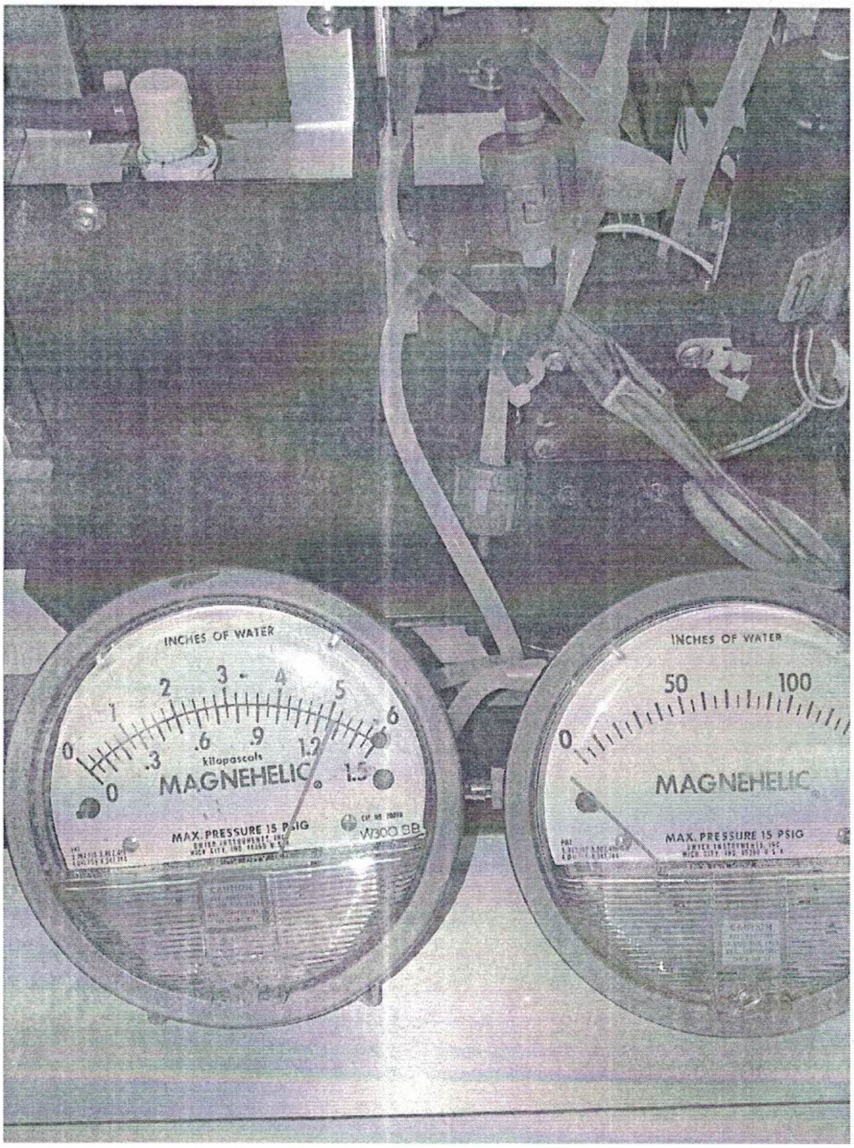


Step 4: Install new filter, then reassemble and insert back in its clip holder.

Setting Meniscus Vacuum and Purge Pressure:

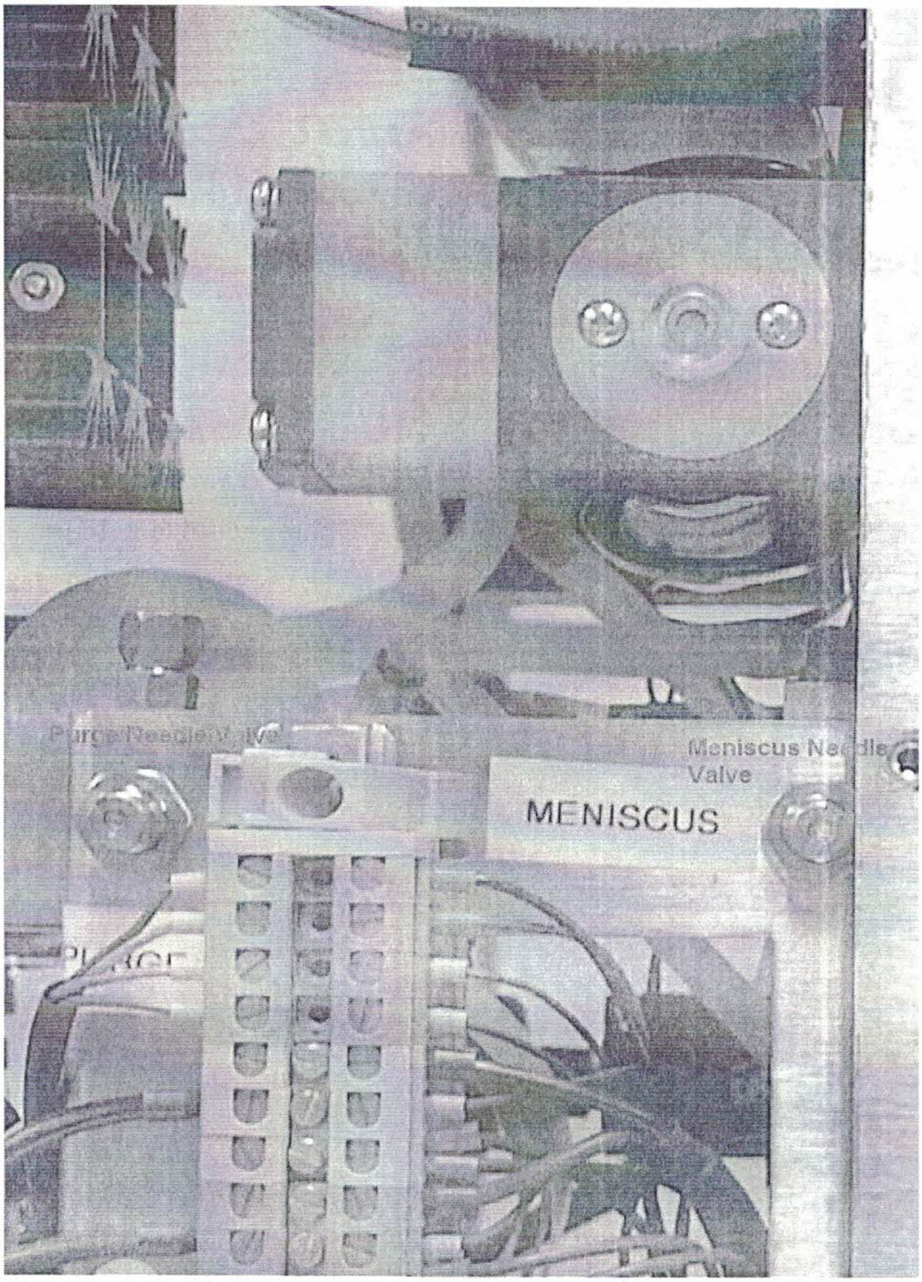
Printhead Model Number	Meniscus Vacuum Setting	Purge Pressure Setting
BK1025	3.0 –3.6 inches of water	50 inches of water
BK2520 or BK2530	4.0 – 4.7 inches of water	50 inches of water

Step 1: Connect a meniscus gauge and a purge gauge in line with the meniscus tubing between the solenoid (item 15) and the meniscus filter (item 16). Two t-fittings and some silicon tubing will be required for this.



Step 2: Using a pair of forceps, pinch off the tubing between the gauge connection t-fitting and the meniscus filter (see picture above). This is so that when setting your purge pressure, you do not waste ink.

Step 3: Read the meniscus value shown on the meniscus gauge. If the meniscus reading is not set based on the chart above, then adjust the meniscus needle valve (item 5) until the reading is set correctly.



4.6

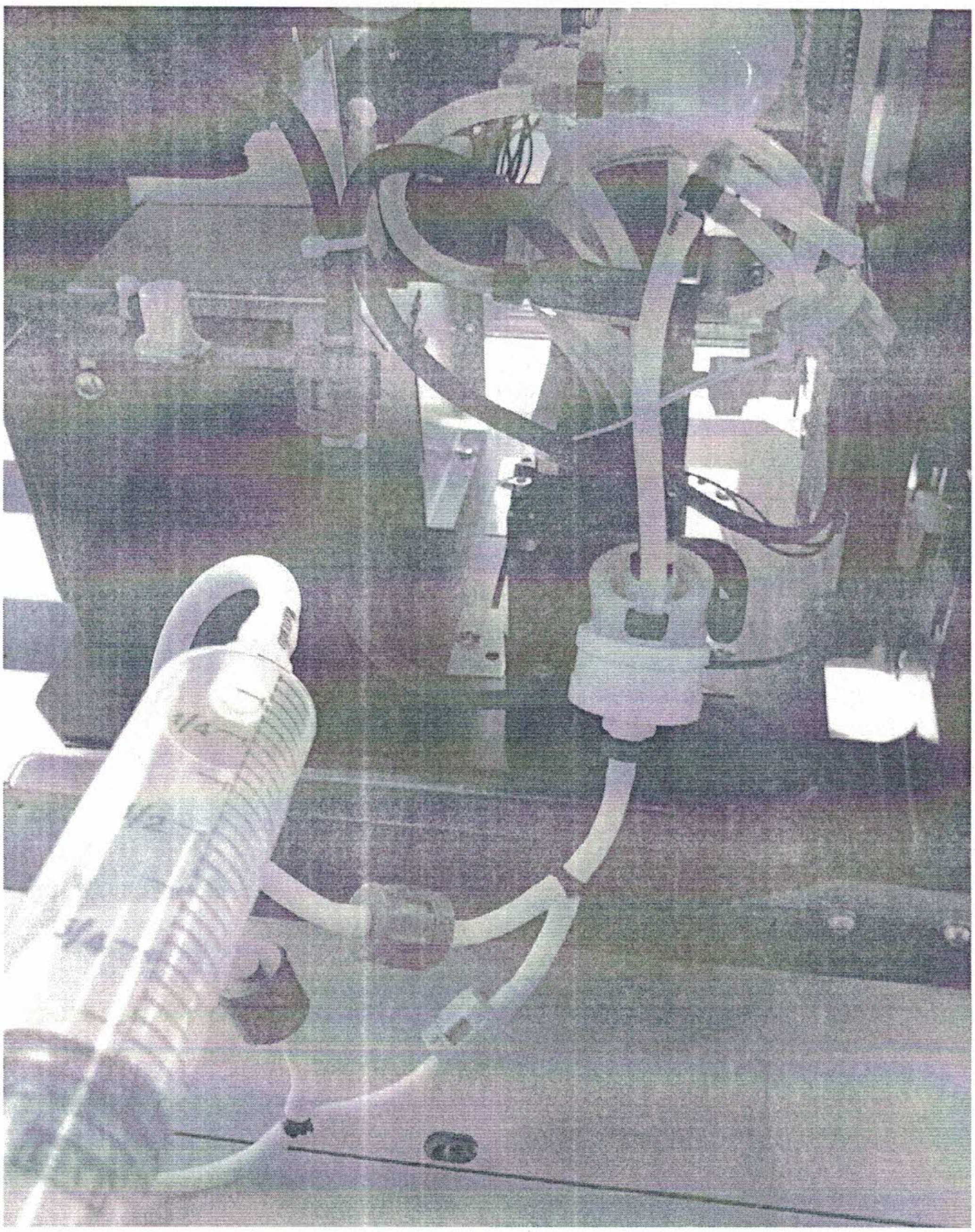
Step 4: Press and hold the purge button (item 28) and read the value on the purge gauge. If the purge reading is not set based on the chart above, then adjust the purge needle valve (item 4) until the reading is set correctly.

Step 5: Because the meniscus and the purge both share a pump, when adjusting the meniscus needle valve the purge value will change slightly, and when adjusting the purge needle valve, the meniscus value will change slightly. Because of this, steps 3 and 4 will have to be repeated until both values are set correctly.

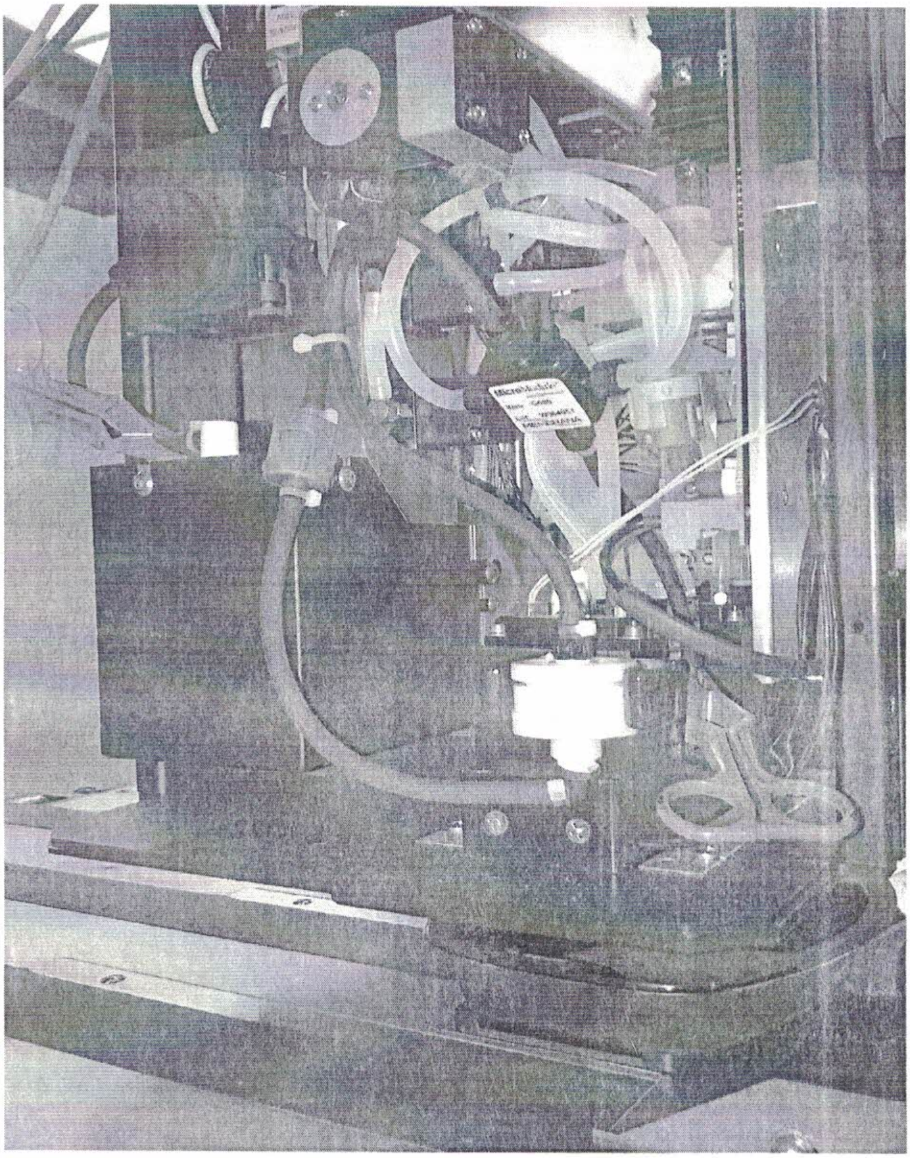
Replacing the Ink Line Assembly (including ink filter, check valves, lung degassing module):

Step 1: Turn power off to the printhead.

Step 2: Purge all ink from the printbar by connecting a syringe purge kit (PN PURGEKIT) to the meniscus line and push air through the printhead until all ink is expelled from the printbar. Note: Always purge air through a filter.



Step 3: Using a pair of forceps, pinch off the tubing at the ink connector (item 22) and using a second pair of forceps, pinch off the ink line tubing where the ink line connects to the printbar.



Step 4: Remove the entire ink line assembly from the printhead. The peristaltic pump will have to be opened as described on page 7.

Step 5: Install the new ink line assembly supplied with the PM kits.

Step 6: Install tie wraps on the two ends of this new ink line assembly.

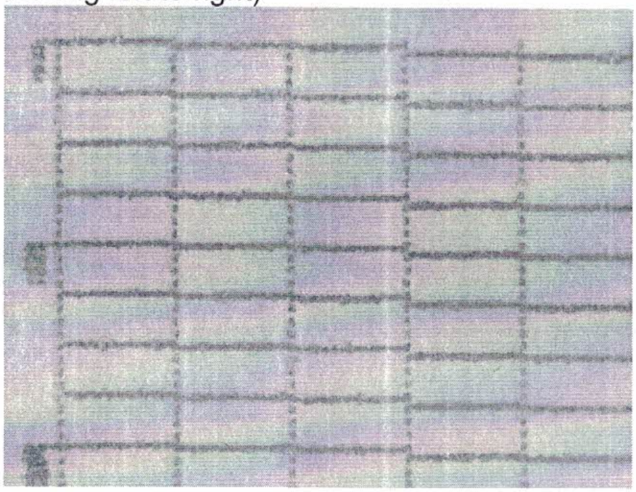
Step 7: Turn power on to the printhead and allow to fill up with ink.

Printhead Alignment:

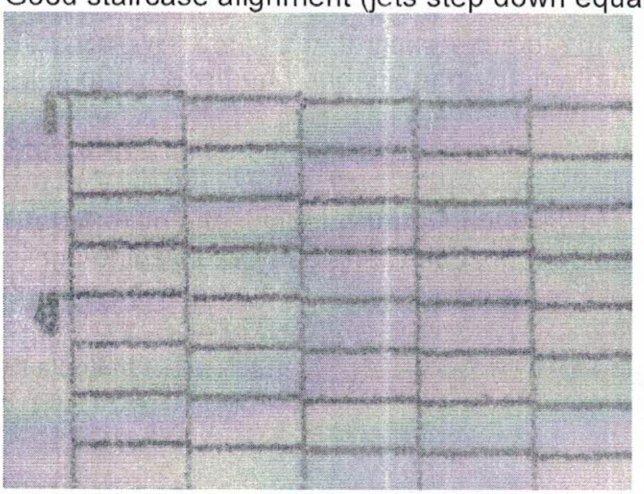
Vertical Staircase Alignment: If using a 2.5" Hybrid Atom printhead and the staircase alignment is not set, then the printhead is not square with the transport.

In order to adjust the staircase alignment, follow the steps below.

Poor staircase alignment (jets do not step down equally from one jet to the next when looking left to right)



Good staircase alignment (jets step down equally when looking left to right)



Step 1: Loosen the 4 screws that hold the bridge to the transport.

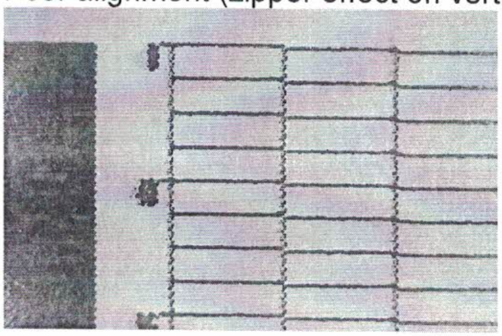
Step 2: Twist the bridge to square the printhead to the transport. You can use the edge of the printhead and the edge of the transport belts to line it up by eye.

Step 3: Re-tighten the 4 bridge screws.

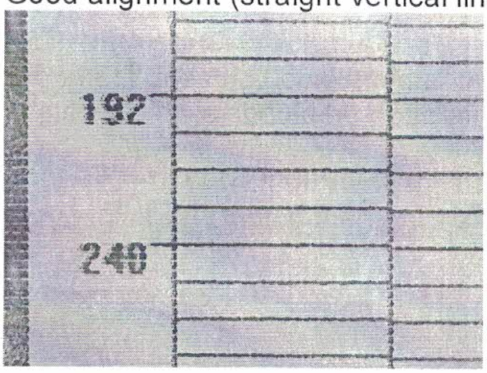
Step 4: Run a test label. If the print is still not aligned, repeat steps 1 – 4, when alignment is close you can just loosen 3 of the bridge screws and pivot the bridge for smaller adjustments.

Horizontal Timing Alignment: If using a 2.5" Hybrid Atom printhead and the timing alignment does not look straight, the timing between the jetting arrays needs to be adjusted. This should be done after the staircase alignment is complete.

Poor alignment (zipper effect on vertical lines)



Good alignment (straight vertical lines)



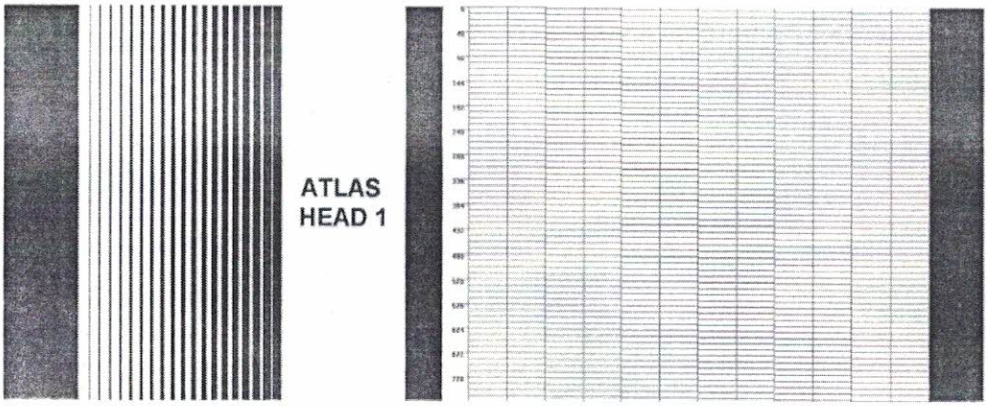
The following instructions describe how to set the horizontal print alignment for an Atom Hybrid 2530 printhead.

Required Tools:

Microscope or a Loupe with a minimum magnification of 10x.

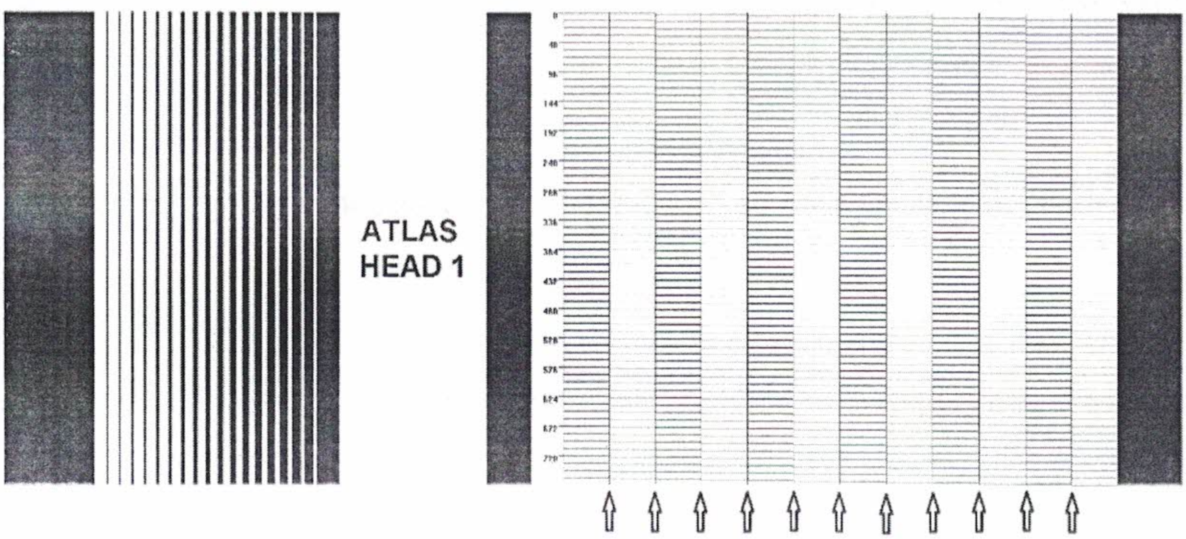
Step 1:

In order to determine whether your printhead timing alignment needs to be adjusted, start by printing a test label.



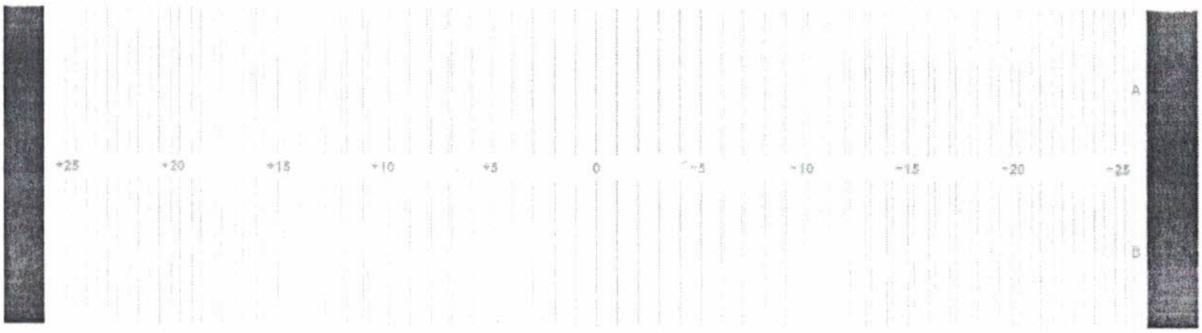
Step 2:

Using a microscope or a loupe, look at the thin vertical lines between the individual jets. If these are straight, with all jets aligned above one another, then no further alignment is required.   If the jets are jagged, then continue with this alignment guide.



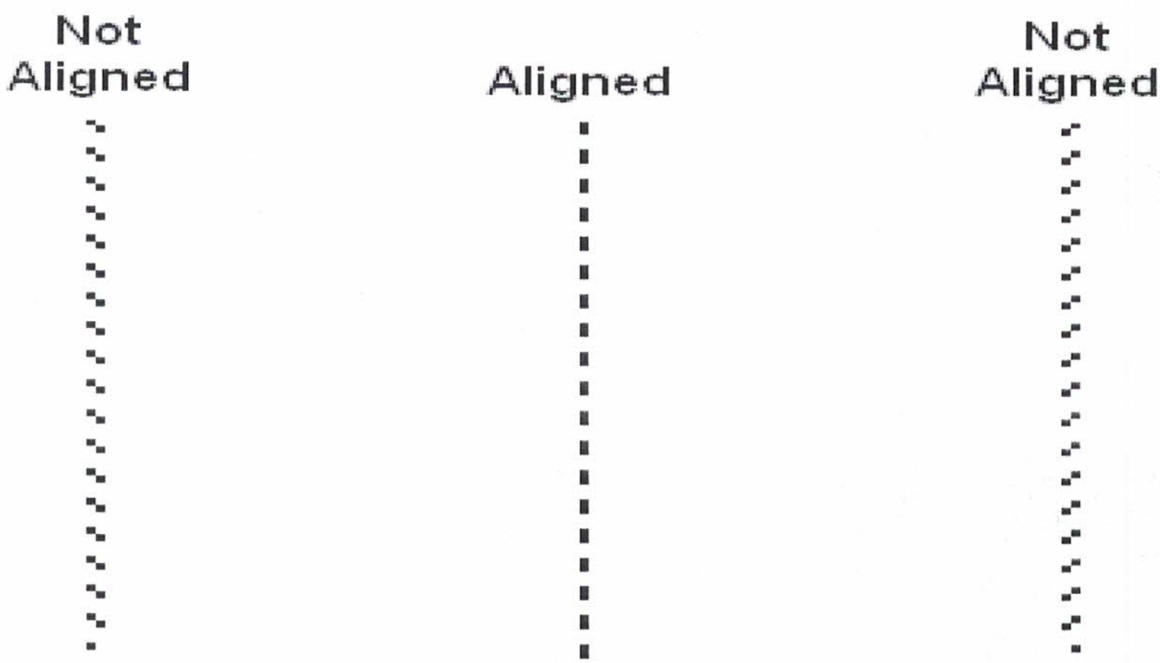
Step 3:

While in the Head Alignment screen, print on a piece. This will print a special alignment test pattern. A 2.5 inch Atom Hybrid printhead will show two rows (A & B)



Step 4:

Looking at the alignment test pattern, for each row, determine the number where the two lines converge to form a single line. This represents the alignment value that must be entered into Compose

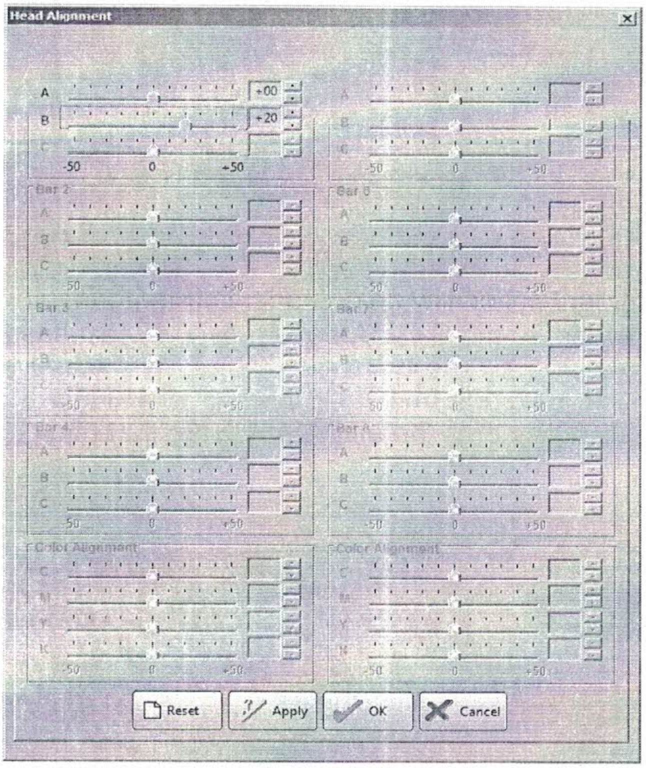


Step 5:

Once you have the alignment values for all arrays, open the Head Alignment screen and enter these values for each array. Then exit to the main screen of Compose and print another test label. If you look at the vertical lines again and you see straight aligned row of jets, your alignment is good. But if you lines are still jagged proceed to Step 6.

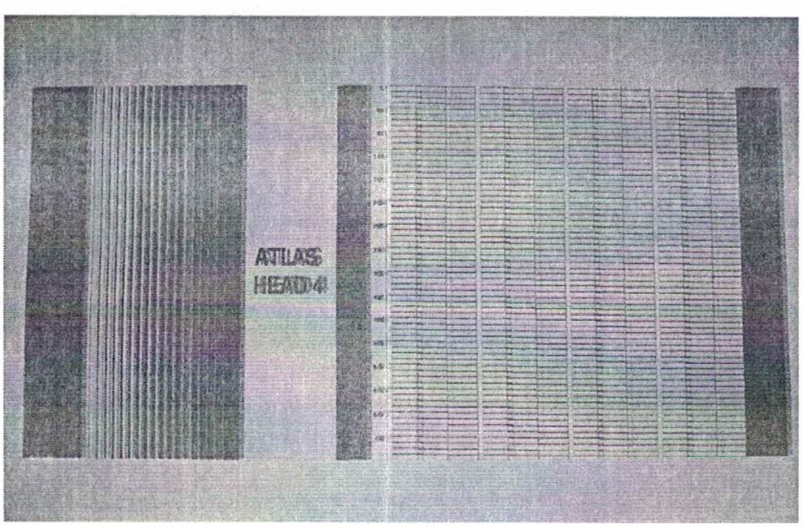
Step 6:

For the Atom Hybrid 2.5 inch printhead, you have 3 arrays (A, B, and C). Array C is static and cannot be adjusted. Arrays A and B are adjustable in order to align them to C. From the main screen of Compose, select Setup – Print Heads – Head Alignment. Change Array B to +20 while leaving Array A at 0. Press OK to exit the Head Alignment screen, and then press OK again to exit the Setup window.



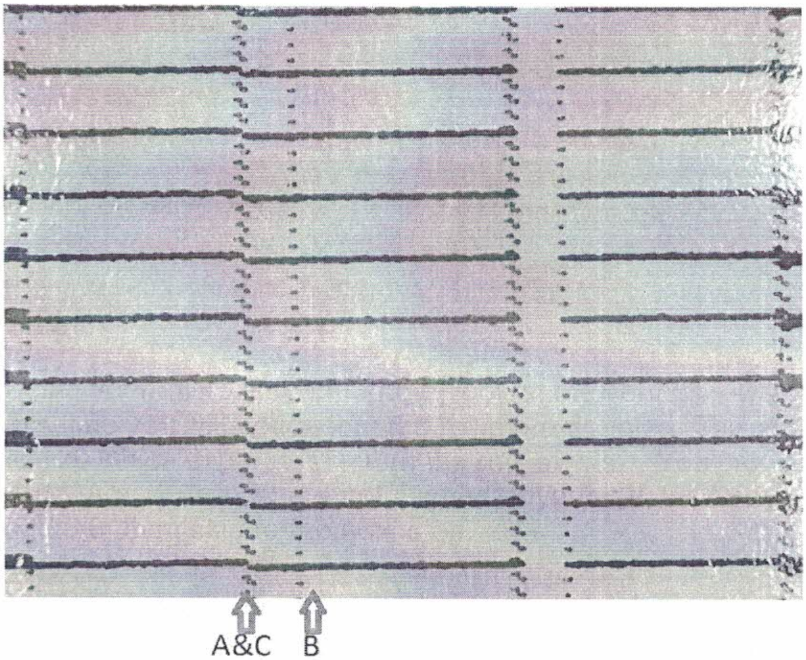
Step 7:

Print another test label. You will notice that the test label is now blurry. This is because we have moved Array B out of the way so that we can focus on Arrays A and C.



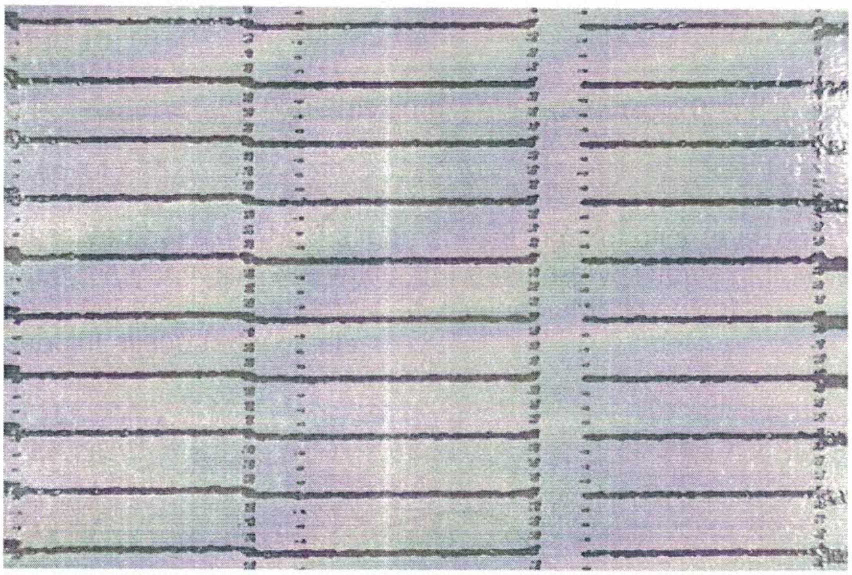
Step 8:

Using your microscope or loupe, look at the vertical rows of jets again as in step 2, but this time you will notice that the rows are doubled. This is because we have set Array B to +20 which separates it from the row of jets. You can see in the picture below that Array A and Array C are not aligned. If your jets for Arrays A and C are aligned when set to 0, then skip to the next step.



Step 9:

Re-open your printhead alignment screen as in step 6 and adjust the value of Array A To +1 and then print another test label. If the print gets better but not perfect, try adjusting this value one increment at a time until it is aligned. If the print gets worse when setting to +1, try setting it to –1 and then adjusting this value by one increment at a time until it is aligned. When you determine the best setting for Array A, write it down.

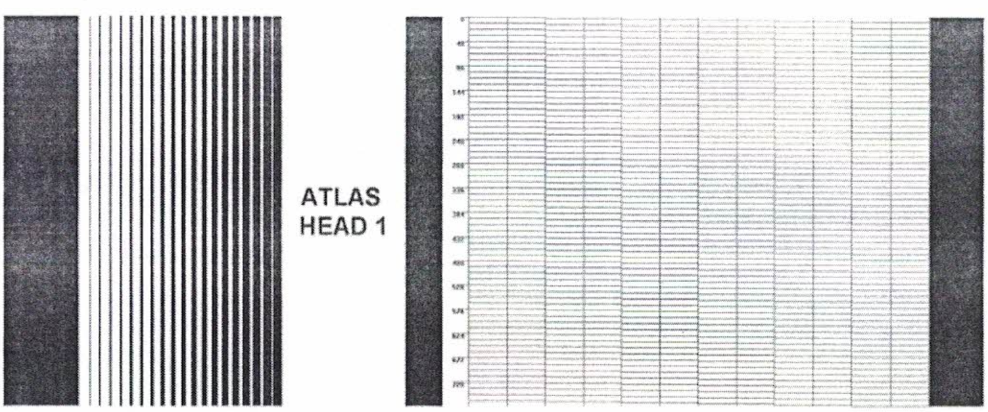


Step 10:

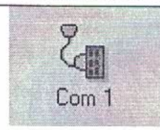
Repeat steps 6 to 9 but this time, set Array A to +20 and Array B to 0.

Step 11:

Once you have the best alignment settings for all arrays, open the Head Alignment screen and enter these values for each array. Then exit to the main screen of Compose and print another test label. If you look at the vertical lines again, you should see a straight aligned row of jets.



Troubleshooting

Problem	Reason	Action
COM error appears on the screen	 This happens when the print bar fails to communicate with the PCM.	• Verify DIP switch settings (Refer to Appendix A1) • Try a different hybrid cable. Ensure pins aren't bent in the connectors or any damaged wiring on the cable • Verify printhead number on compose printhead setup matches port number infront of PCM (Refer to Appendix A4). The printhead number should match the QPI DIP switch settings • Ensure Dongle license contains Atlas or Master license (Refer to Appendix 5) • Reflash QPI firmware by performing a firmware update(Refer to Appendix A2)
Ink light is blinking	This occurs when the ink bottle is empty or when ink is not getting to the print manifold.	• Replace ink bottle, turn off and on print head. • Check condition of the ink line and peristaltic pump. You might have to perform a preventative maintenance for the print head.
Purge button not working	Purge button won't work when the system is warming up or if the system is out of ink.	• Purge after printhead is ready • Purge when ink led is off • Replace Purge button if assembly is defective
Heater Failure (For 1 inch Hybrid Atom)	When the flex cable is plugged into the wrong slot, a heater failure alarm may appear on the screen. 	• Ensure flex cable from the array is plugged into the J12 slot of the QPI board and the QPI board is updated to the latest firmware.
Print head leaks	No or low meniscus pressure	• Replace meniscus filters if they are clogged with ink or dirt. • If you measure your meniscus and read 0 inH2O, check the 3 way solenoid (item #14), the meniscus and purge tubing may be reversed.

		• Connect the meniscus gauge to the meniscus line and adjust the reading to the suggested value using the valves in front of the print head.
Missing lines/streaks in print	Missing jets	• Refer to "Jet Recovery Documents" to recover jets • If Meniscus vacuum filters are dirty replace them
Printer drivers in Print Head setup don't appear (Atlas 2530, Aurora 2530…)	Encoder 1 resolution is not set right	• Verify Encoder 1 resolution is set to 660 or 652 DPI. The matching drivers to that resolution will appear on the printhead menu. (Refer to Appendix A3)

APPENDIX A

1. QPI DIP Switch Settings (Hybrid Atom)

Note that DIP switch settings must be done with the power off.

DIP 1 to 4 – Head Address

Each Printhead must have a unique Head Address that matches the Head # in the Compose Setup screen. For a 5.1" Atom, each separate QPI must have its own Head Address.

DIP	Head 1	Head 2	Head 3	Head 4
1	OFF	ON	OFF	ON
2	OFF	OFF	ON	ON
3	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	OFF

DIP 5 & 6 – Head Type

DIP	BK1025 (1")	200 DPI	300 DPI
5	OFF	OFF	ON
6	OFF	ON	ON

DIP 7 & 8 – Not Used

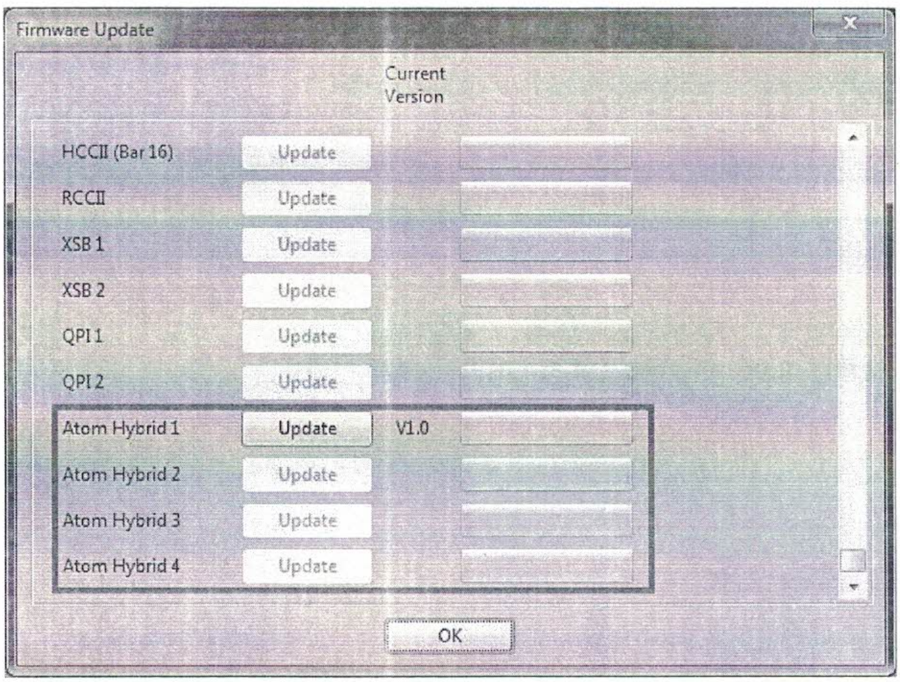
DIP 7 and 8 are not currently used and are set to OFF.

2. Firmware Updates (Hybrid Atom)

If a firmware update is provided for the Atom QPI, it can be transferred through Compose:

1. From the main Compose Pull-down menu, select **File** → Firmware Update...
2. Scroll down until **Atom Hybrid #** is displayed
3. Press the **Update** button for the QPI to be updated (Head 1 to 4).
4. Unlike the Standard Atom, the Hybrid Atom LEDs will not change and the process will take approximately 26 minutes.
5. Turn off the Atom printhead and wait ten seconds before turning it back on.

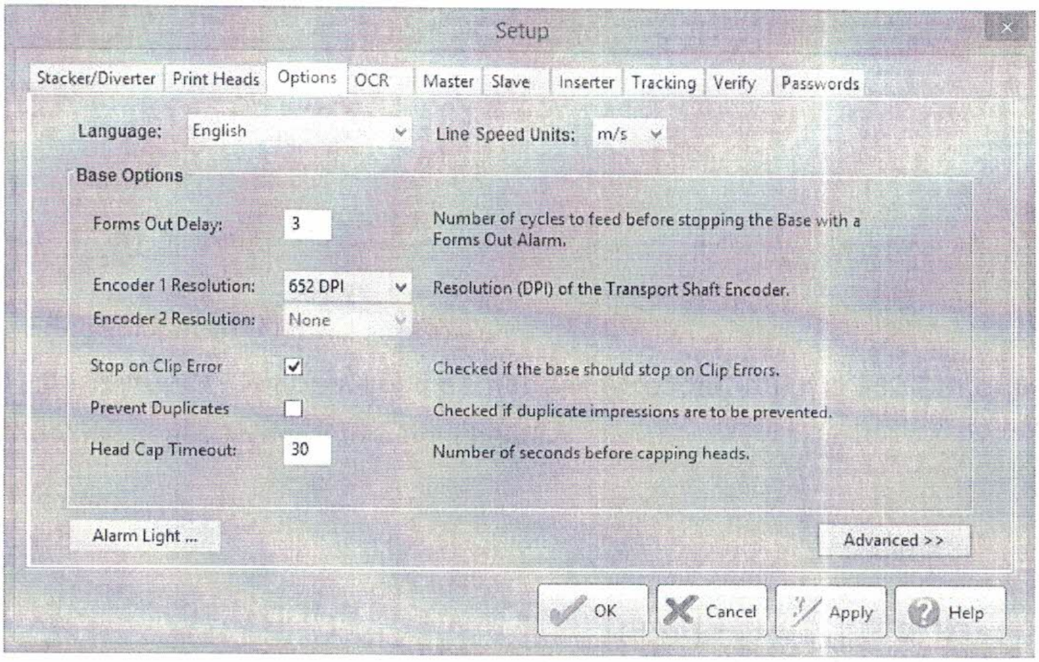
Hybrid Atom QPI Firmware Update



3. Encoder Setup (Hybrid Atom)

Under **Setup → Options**, set the **Encoder 1 Resolution**. It is **652 DPI or 660 DPI** for the 2500 series Hybrid Atom print head.

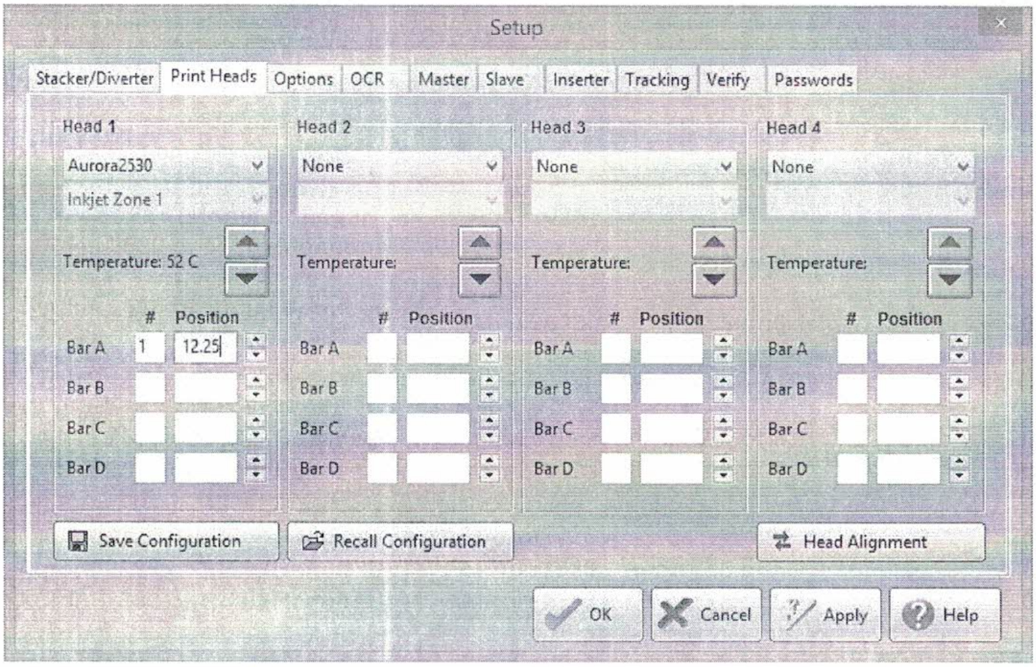
Encoder Setup



4. Print Head Setup (Hybrid Atom)

Under **Setup → Print Heads**, select the driver that matches the head type. Enter the Printhead number (1 if there is only 1 Printhead) and the Position which reflects the distance from the Photocue to the first jet.

Printhead Setup



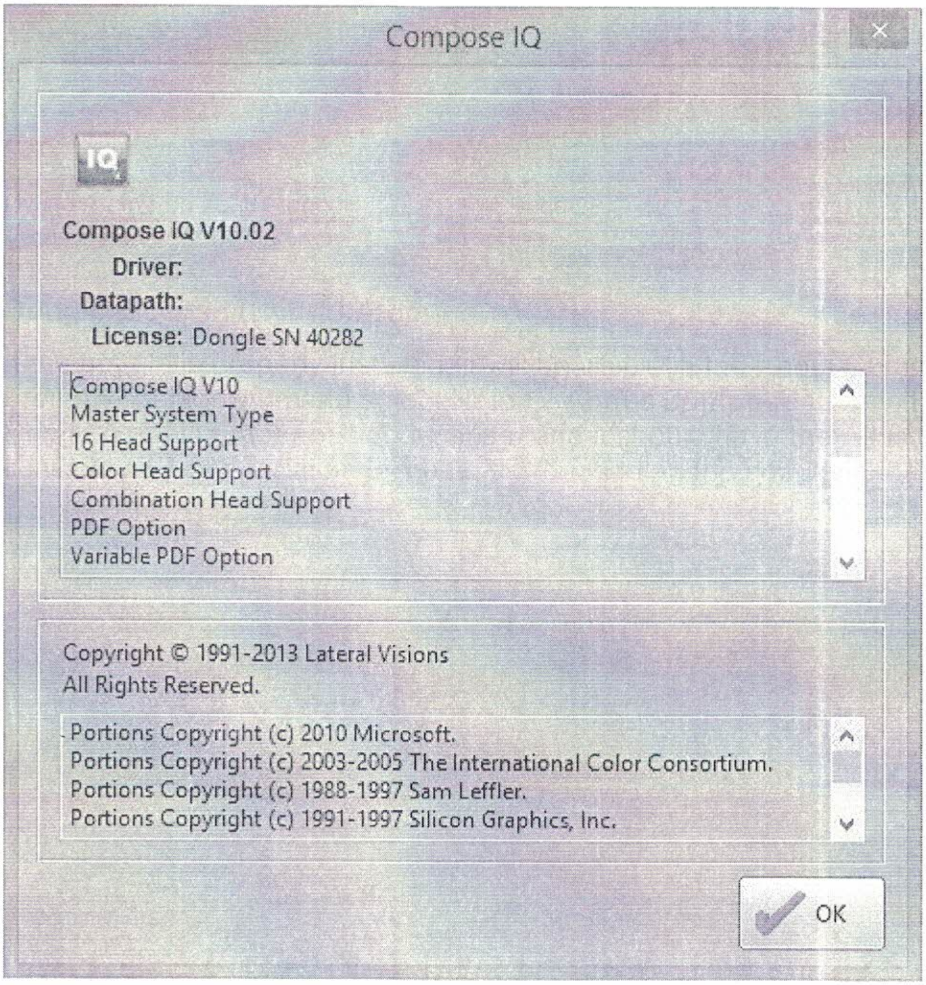
Standard Printhead Drivers

Print Type	Driver Name	Inches of Print	Vertical DPI
Atlas 1025 (Monet or Legar)	Atlas1025	1	256
Atlas 2520 or 5120 (Monet or Legar)	Atlas2520	2.5 or 5.1	200
Atlas 2530 or 5130 (Monet or Legar)	Atlas2530	2.5 or 5.1	300
Print Type	**Driver Name**	**Inches of Print**	**Vertical DPI**
Atlas 1025 (Cezanne)	Atlas1025cz	1	256
Atlas 2520 or 5120 (Cezanne)	Atlas2520cz	2.5 or 5.1	200
Atlas 2530 or 5130 (Cezanne)	Atlas2530cz	2.5 or 5.1	300
Print Type	**Driver Name**	**Inches of Print**	**Vertical DPI**
Aurora 1025 (Renoir, UV)	Aurora1025	1	256
Aurora 2520 or 5120 (Renoir, UV)	Aurora2520	2.5 or 5.1	200
Aurora 2530 or 5130 (Renoir, UV)	Aurora2530	2.5 or 5.1	300

5. Dongle License (Hybrid Atom)

If the dongle is properly installed, it will be visible in the About Compose IQ screen. From the pull-down menu select **Help** → About Compose IQ... It should display the Dongle Serial number beside License: and it should have the Atlas or Master license . If it indicates Demonstration License, try re-inserting the dongle in the USB port.

About Compose Screen



*For Further Troubleshooting Topics or atom printhead information, see the Atom manual PN 9108400

CCPRINT TRANSMITTER

User's Manual

April, 2014

Cleveland Controls, Inc.
P.O. Box 23912
Knoxville, TN 37933

GENERAL

CCPrint Transmitter is a PC Windows based program which will send messages to ink jet printers from a file that is specified by the user.

The normal configuration is to connect 1 Videojet EXCEL ink jet printers and one BUSKRO ink jet printer to a PC computer running a Windows operating system.

EQUIPMENT REQUIREMENTS

The inkjet printer is chosen from the speed capabilities, font and number of print lines, and available inks. Each application may vary from any other. Therefore, no specific requirements exist.

The PC should be a Pentium based with Microsoft 32 or 64 bit Window Operating system (i.e. Windows 7, 8 or 10). Disk storage should be capable of handling the data files to be printed.

If more that one printer is to be connected, a multiple port serial interface is required for the PC. This multiple port interface must have one port for each printer.

INSTALLATION

Install CCPrint Transmitter by inserting the installation disk (or other device) “SETUP.” Follow the instructions. After the successful installation, create program or icon entries as you see fit for easy access and program execution.

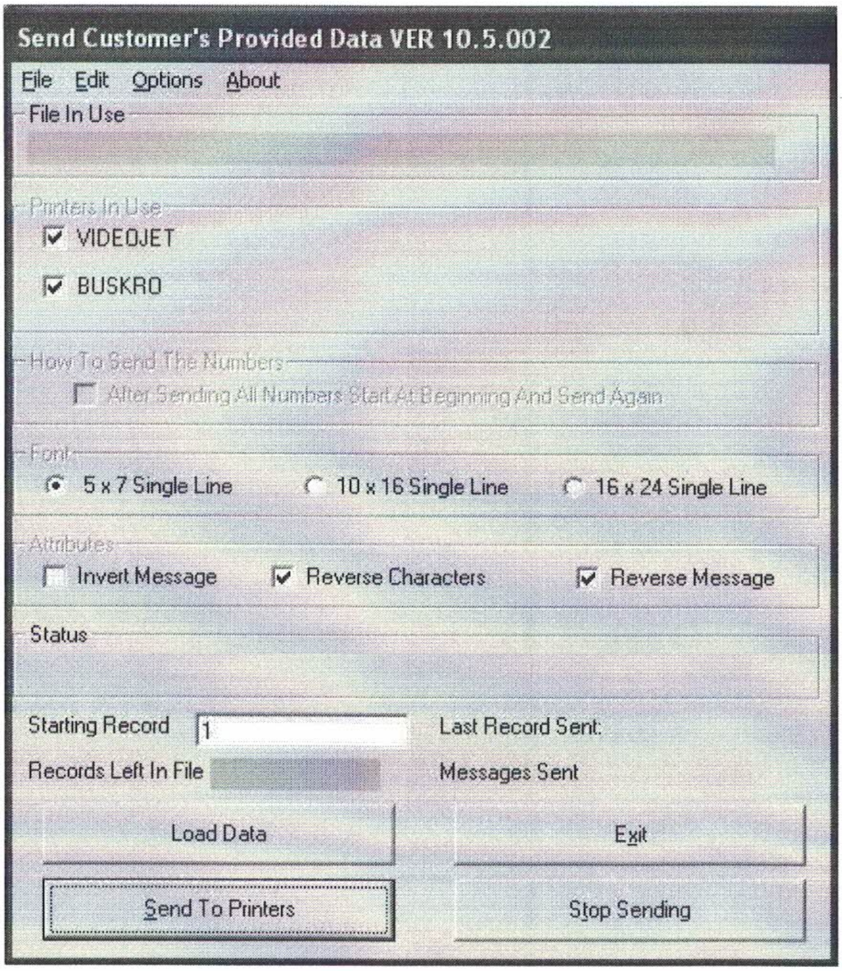
PRINTING FILES

A printing file is a text type file with each record (i.e. code) ending in a carriage return and line feed characters, or simply a carriage return character, or simply a line feed character.

This software program is made to only print one line of data.

PROGRAM

On executing the program the following screen will appear.



MENU ITEMS

The Menu bar has "File" with sub menus of Open, Close, and Exit. These functions allow the program to open and close the file to be printed or to exit the program.

The Options menu item allows the operator to select or de-select test messages to be sent to the printers. This feature allows the operator to make sure that the items are being properly printed.

The About menu item gives information about this program.

The Edit menu items are

Password – This allows the operator to change the password. The "Password" and "Comm Speed" are the only two menu items that are password protected.

Low Code Alarm – The menu item allows the operator to set the amount of codes remaining in the file, under which the backgrounds will turn red to warn the operator that the codes are about to be depleted.

Comm Speed – This allows the operator to set the speed of the serial ports. Both serial ports will be set to the same speed.

The Screen Items

Clicking on the "File Name" area allows the file to be selected and opened as if the menu File/Open were selected.

FONTS and ATTRIBUTES are fixed and can not be altered by the operator.

The "LOAD DATA" command button allows the operator to load a file from any device into the "Promotion Files" folder.

The "SEND" command button causes the messages to be sent to the printer.

The "STOP SENDING" command button stops the messages from being sent to the printer(s).

The "EXIT" command button causes the sending of the messages to exit from this program.

NORMAL PROGRAM EXECUTION

"LOAD DATA" to be printed.

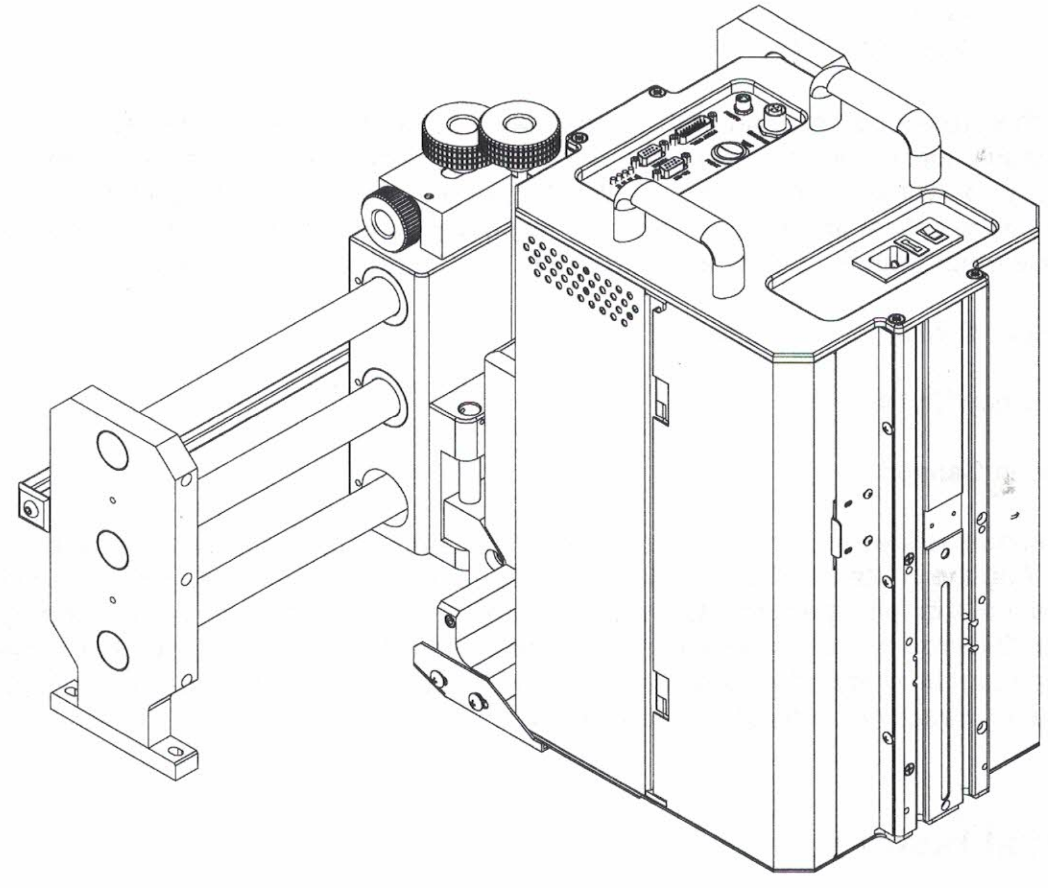
Select the message file to use by clicking on the "File Name" text area or by selecting the Menu "File/Open" item. An Open Command Dialog Box appears allowing the file to be selected.

Clicking the "SEND" command button starts the message transmission to the printers.

Click the "STOP" command button to stop sending messages.

BUSKRO
Built for today | Designed for tomorrow

Atom Print System



Part No. 9108400

User's Guide V1.0

Atom Print System User's Guide

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Manual History

Version	Date	Description	ECO No.
1.0	03-Jun-14	Manual Released.	N/A

Table Of Contents

General Information

Chapter 1

1.1 Description

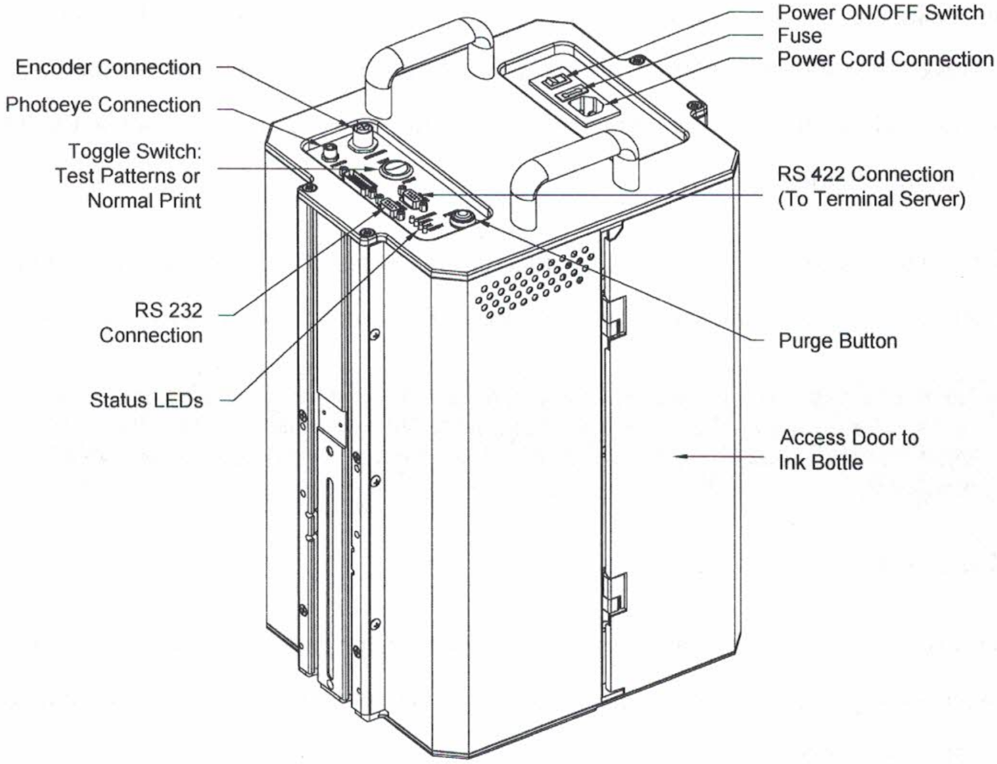
The Atom Print System (the "Atom") is a portable, stand alone printing device housed in an enclosure that includes the ink bottle, ink delivery and vacuum management system, electronics, and print engine. The print engine is available in both a 2.55" (65 mm) print height (200 or 300 DPI) or 1" (25 mm) print height (256 DPI). It employs Drop-On-Demand (DOD) print technology and supports a wide range of inks such as solvent and UV-curable making it suitable for a wide range of print media.

The Atom is a simple print system capable of a wide variety of traditional addressing and printing applications. Its economical price and small physical size compared with traditional print systems in addition to its many capabilities make it an ideal product for a large number of applications. For more complex or advanced applications, Buskro offers a full series of controllers that can handle more advanced functions such as:

- Full Process CMYK color printing
- Product tracking with coordinated printing such as read/print, duplex, and multi-zone printing
- Higher resolution printheads
- Support for up to eight printheads
- Automated Maintenance
- Variable Graphics
- Post print verification
- Fast Real-time layout changes and system parameter adjustments
- Sort, divert, and compensating stacker control

For more information, visit www.buskro.com and contact your Buskro representative.

Figure 1-1: Atom Printhead



The external features of the Atom Printhead as shown in Figure 1-1 include:

- Power ON/OFF switch.
- Photoeye and Encoder Connections
- RS232 and RS422 Serial Communications Connections
- Toggle switch between Test Patterns and Normal Print
- Status LEDs:
    - **Trigger** – Blinks when the product trigger is detected. This indicates proper operation of the encoder and photo sensor.
    - **Data** – Blinks when data is received or when programming.
    - **Ink** – ON when pumping ink, blinks when pump fails or out of ink. Cycle power to reset.
    - **Ready** – Blinks when warming up, and then ON when ready.
- Purge Button to push ink out of the nozzles to recover print quality.
- Access Door to Ink Bottle. Keep this door closed to minimize light exposure.

1.2 Ink Options

The Atom is capable of using a wide variety of ink types including solvent and UV curable. Although Buskro supplies a number of different ink options that can provide outstanding image quality, each ink has varying strengths. As a result, it is important to choose the ink that best suits the situation.

Although the Atom is capable of supporting different ink types, it is important not to mix inks or unapproved fluids in the same Atom printhead otherwise ***serious*** damage can occur.

> **Note:** Never mix inks or other fluids otherwise serious and permanent damage can occur to the system. This applies to both Buskro and non-Buskro fluids. For example, a mixture of Monet and Cezanne ink will cause permanent damage to a printhead.

1.2.1 Monet Ink

The Monet ink is a solvent-based ink formulation designed for general use and is known to dry on a wide variety of porous and coated materials. It is reliable, has low operational costs, and can print at high speeds.

1.2.2 Cezanne Ink

The Cezanne ink is a fast-drying solvent-based ink formulation that is recommended for applications where dry time and adhesion are the critical parameters. In general, where reliability and stability are more important, the traditional Monet ink should be used.

1.2.3 Renoir Ink

The Renoir ink is a UV-curable ink that can print on a large variety of materials including plastics and metal with no solvent emissions. It is a dark black ink but requires a UV Curing lamp to cure the ink.

1.3 Printhead Drawings

1.3.1 Printhead Dimensions (M83 Mount)

Note: The 1025, 2520, and 2530 have the same Printhead dimensions.

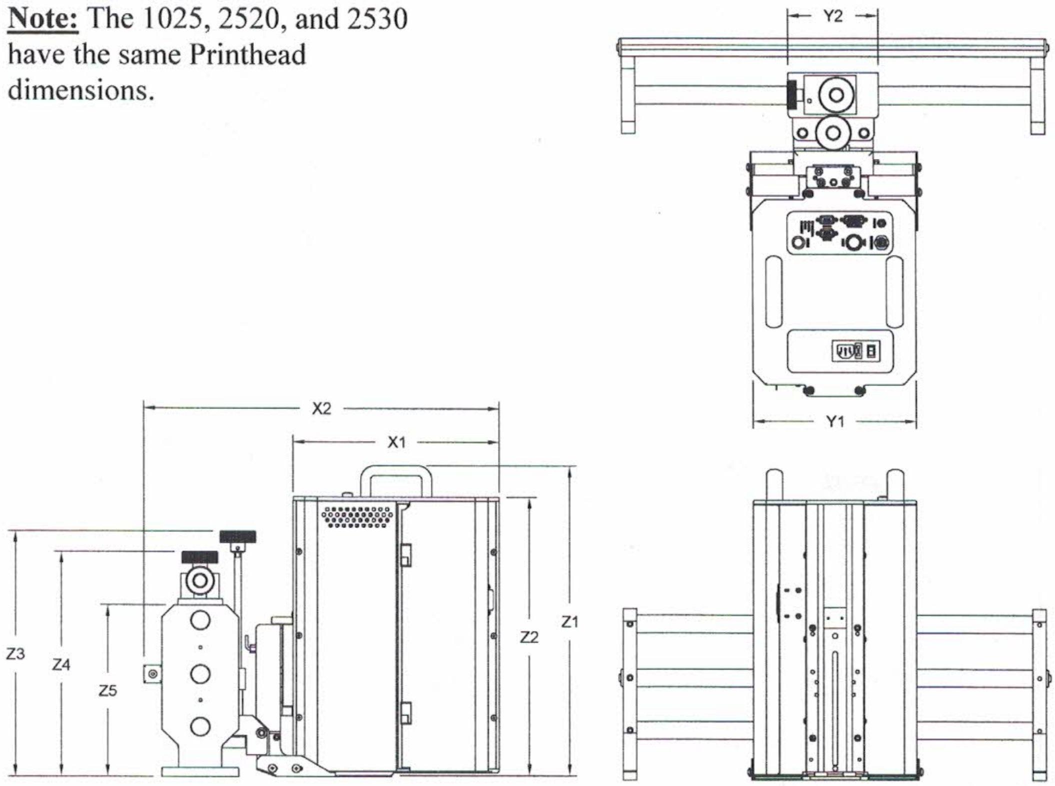
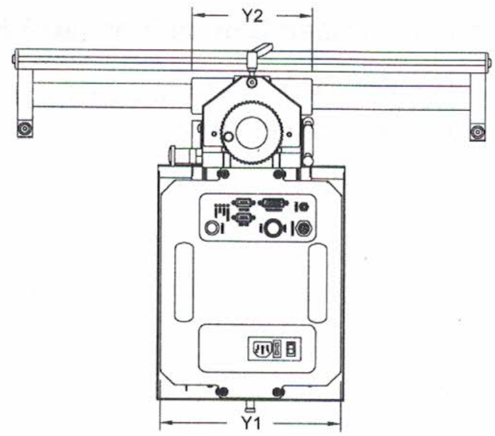


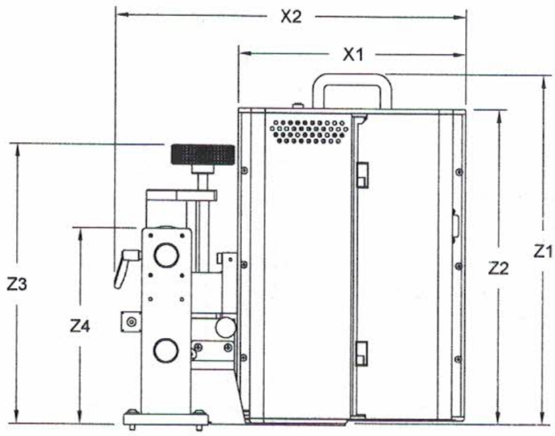
Table 1-1: Atom Printhead Dimensions on BK83Bridge

Symbol	Description	Dimensions	
X1	Printhead Length	290 mm	11.43"
X2	Overall Length	500 mm	19.69"
Y1	Printhead Width	230 mm	9.06"
Y2	Printhead Mount Width	127 mm	5.00"
Z1	Overall Height	440 mm	17.31"
Z2	Printhead Height	396 mm	15.58"
Z3	Height Adjustment Knob Height	349 mm	13.74"
Z4	Locking Mechanism Height	319 mm	12.56"
Z5	Bridge Rail Mount Height	244 mm	9.62"

1.3.2 Printhead Dimensions (230 Mount)

Note: The 1025, 2520, and 2530 have the same Printhead dimensions.





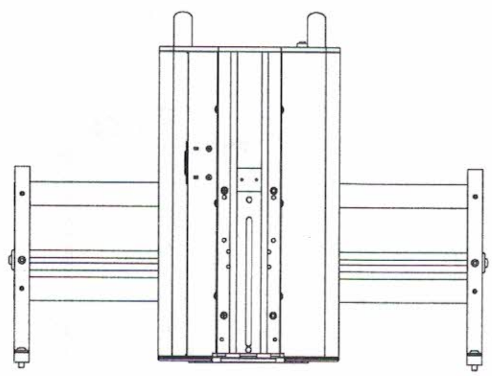


Table 1-2: Atom Printhead Dimensions on BK230 Bridge

Symbol	Description	Dimensions	
X1	Printhead Length	290 mm	11.43"
X2	Overall Length	447 mm	17.60"
Y1	Printhead Width	230 mm	9.06"
Y2	Printhead Mount Width	153 mm	6.04"
Z1	Overall Height	440 mm	17.31"
Z2	Printhead Height	396 mm	15.58"
Z3	Height Adjustment Knob Height	352 mm	13.85"
Z4	Bridge Rail Mount Height	248 mm	9.75"

Table 1-3: Atom Specifications

General		
Vertical Resolution	256 DPI (1025), 200 (2520), 300 (2530)	
Horizontal Resolution	108, 217, 326, 434, 652 DPI (1025) 100, 200, 300, 400, 600 DPI (2520 or 2530)	
Vertical Print Swath (1025)	25.4 mm	1.00"
Vertical Print Swath (2520 or 2530)	64.77 mm	2.55"
Power (North America)	120VAC, 1.3A	
Power (Outside North America)	230VAC, 0.65A	

Atom Setup and Use

Chapter 2

2.1 Introduction

The Atom was designed to be controlled by a powerful Windows-based software package known as Compose IQ. Buskro's Compose IQ easily allows users to set up layouts with a variety of text, graphics, and barcodes. It is also capable of loading lists in standard formats such as List Files, Text Files, MS Access Files, DBase/FoxPro Files, and Excel Files in order to send variable data to the Atom for printing. Compose IQ can also provide real-time feedback such as transport speed, estimated pieces per hour, as well as a variety of status and error alarms.

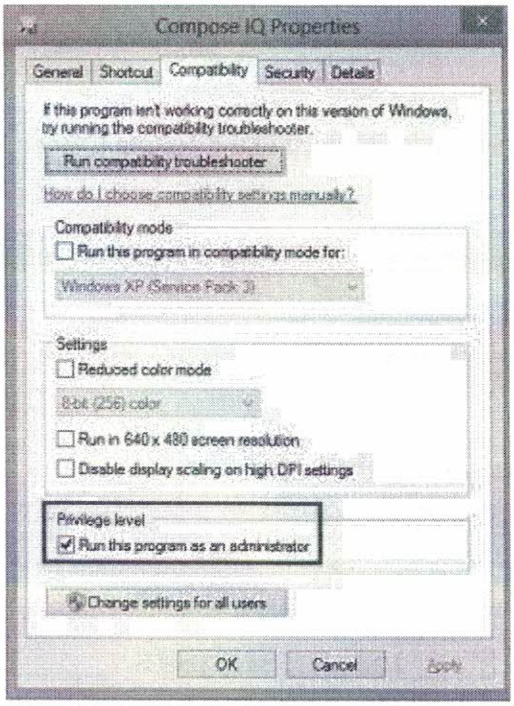
Although the Atom was designed to work specifically with Compose IQ, the Atom is also capable of working with 3rd party software packages. This allows qualified 3rd party companies to develop more customized software with their desired feature sets.

2.2 Software Setup

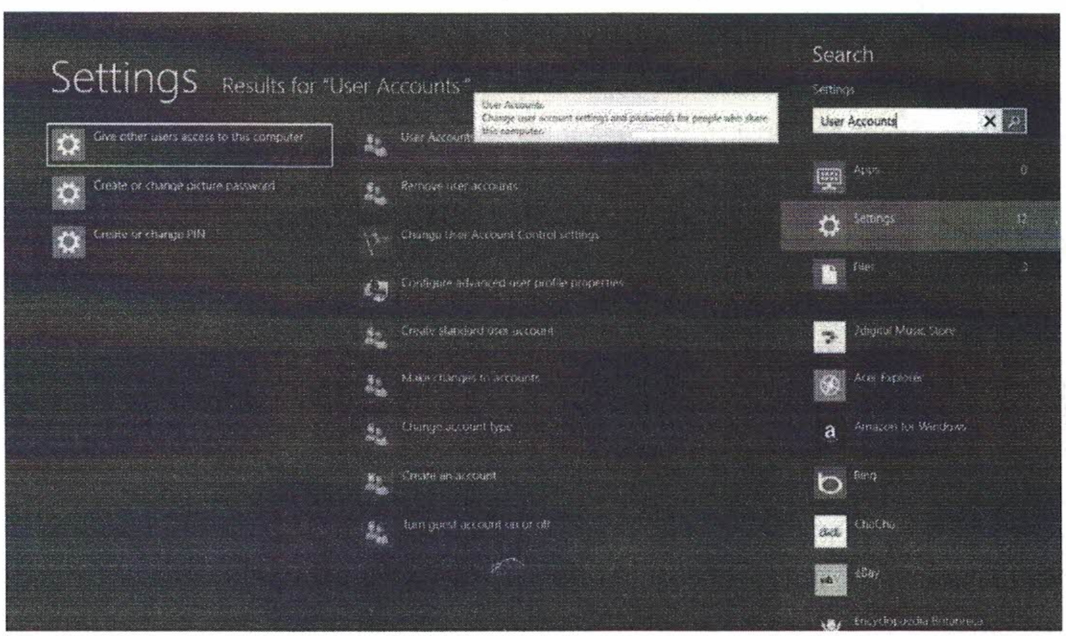
This section describes the Atom Software Setup for Windows and Compose IQ. Note that the figures in this section show the Windows 8 installation. The procedure may need to be slightly modified for different versions of Windows.

1. Insert the Compose Disc and follow the on-screen installation steps.
2. Once installed, right-click on the Compose icon and select **Properties**.

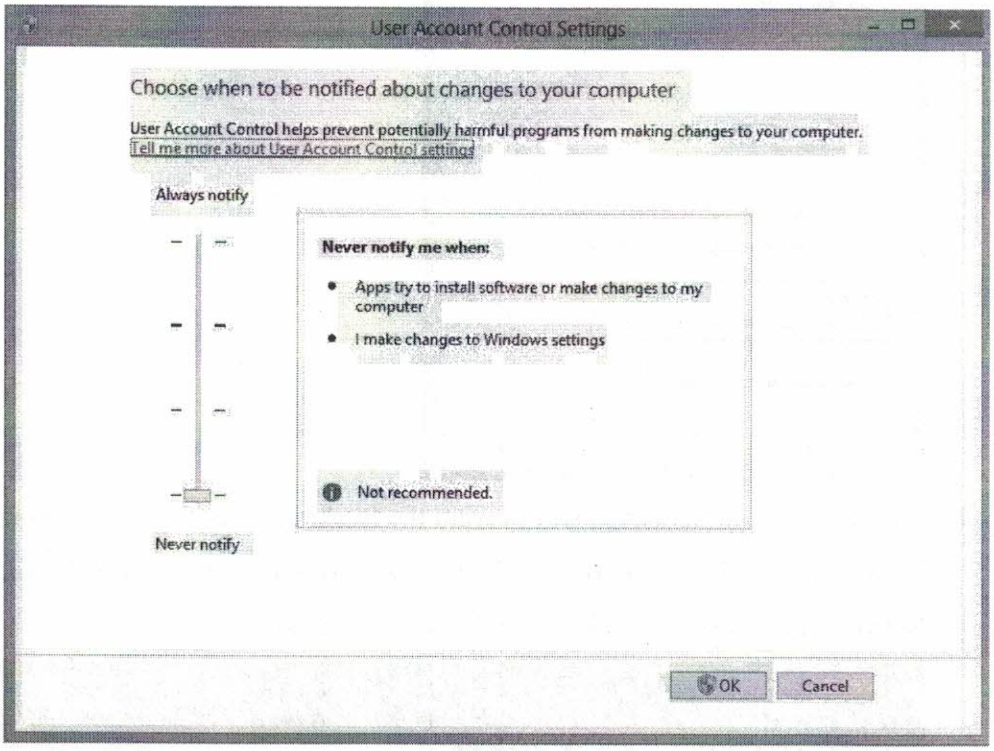
3. Select the **Compatibility** tab and ensure **Run this program as an administrator** under **Privilege level** is checked.



4. The Access Control (UAC) will prevent the Buskro RIP driver from operating. It must be set to Minimum. In the Windows 8 Start Screen, type **User Accounts** under **Settings** and select it. In Windows 7 skip to the next step.

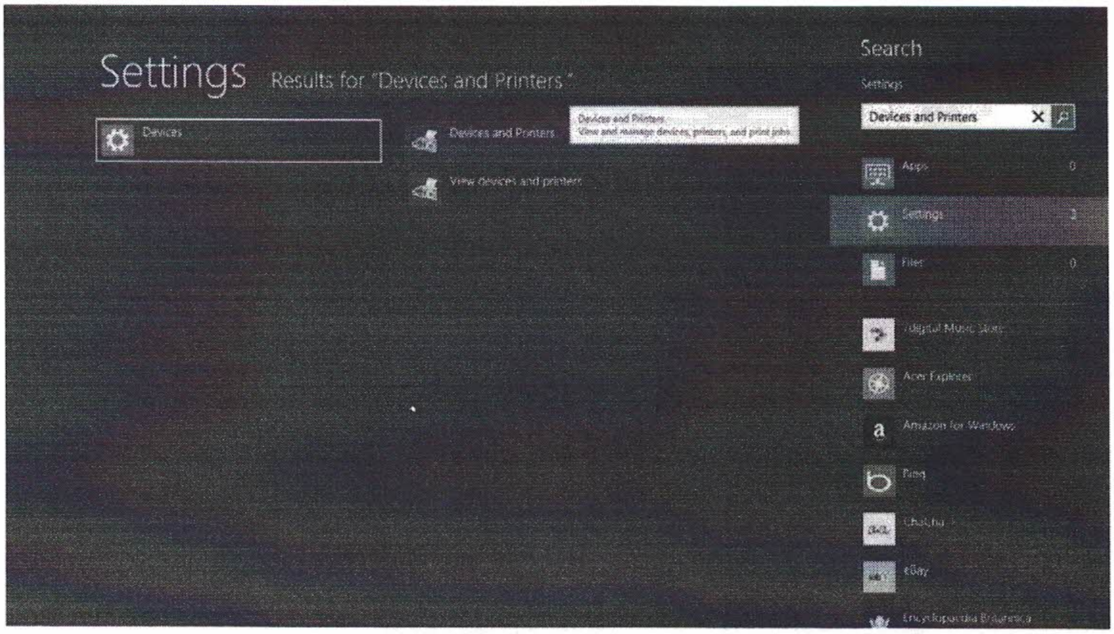


5. For Windows 8 select **User Accounts and Family Safety** and **Change User Account Control Settings**. In Windows 7 go to **Control Panel** and click **User Accounts and Family Safety → User Accounts → Change User Account Control Settings.**
6. Bring the **User Account Control Settings** bar down to the bottom (**Never Notify**). Click **OK.**



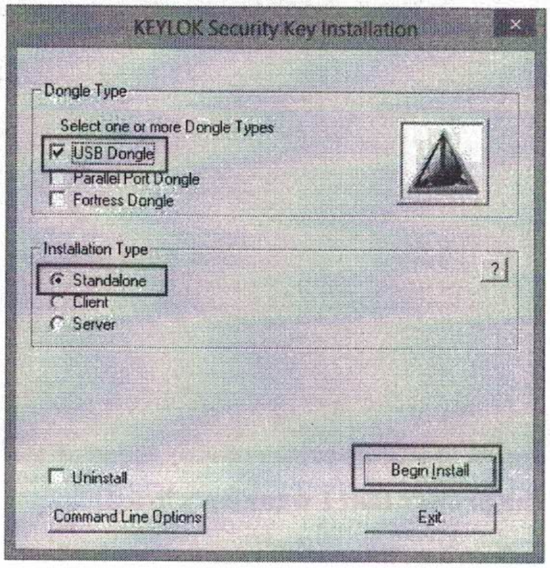
7. Set up the **Buskro RIP** driver normally by adding a local printer set to LPT1. For detailed instructions for installing in earlier versions of Windows, search for **RIP** in the Compose help file and select **Installing the Buskro RIP Printer Driver**. For Windows 8, follow steps 8-13.

8. For Windows 8, in the Start Menu type **Devices and Printers** under **Settings** and select it.



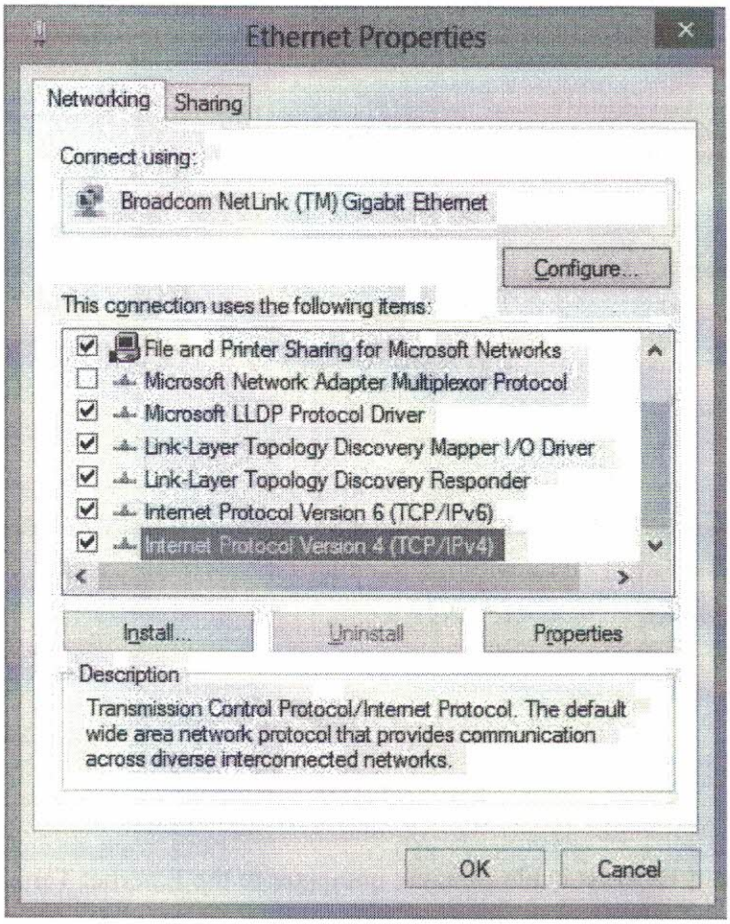
9. Select **Add a printer**. Select **The printer that I want isn't listed.**
10. Select **Add a local printer or network printer with manual settings** and press **Next**.
11. Select **Use an existing port:** and select **LPT1: (Printer Port)**. Press **Next**.
12. Select **Have Disk…** and select the drive with the Compose Disc and click **OK**.
13. Select **Buskro RIP** and click **Next**. Keep the default printer name and click **Next**. Select **Set as the default printer** and click **Finish**. The Buskro RIP driver is now installed.
14. Install the USB Security Dongle drivers. The security dongle is required to access features in Compose and is required to change the Atom print layout and to send record data to be printed. **Ensure that the USB dongle is not attached**. In **File Explorer**, go to the drive with the Compose Disc and go to the **Dongle** subdirectory (e.g. D:\Dongle). Double click on **Install.exe**.

15. Select **USB Dongle** under **Dongle Type** and **Standalone** under **Installation Type**. Click **Begin Install** and follow the instructions. Click on **Finish** when completed. The USB Security Dongle can now be inserted and recognized by Windows. Note that the proper license must be purchased for the USB Security Dongle (**Section 2.4**) and that it is specific to the serial number of the dongle.

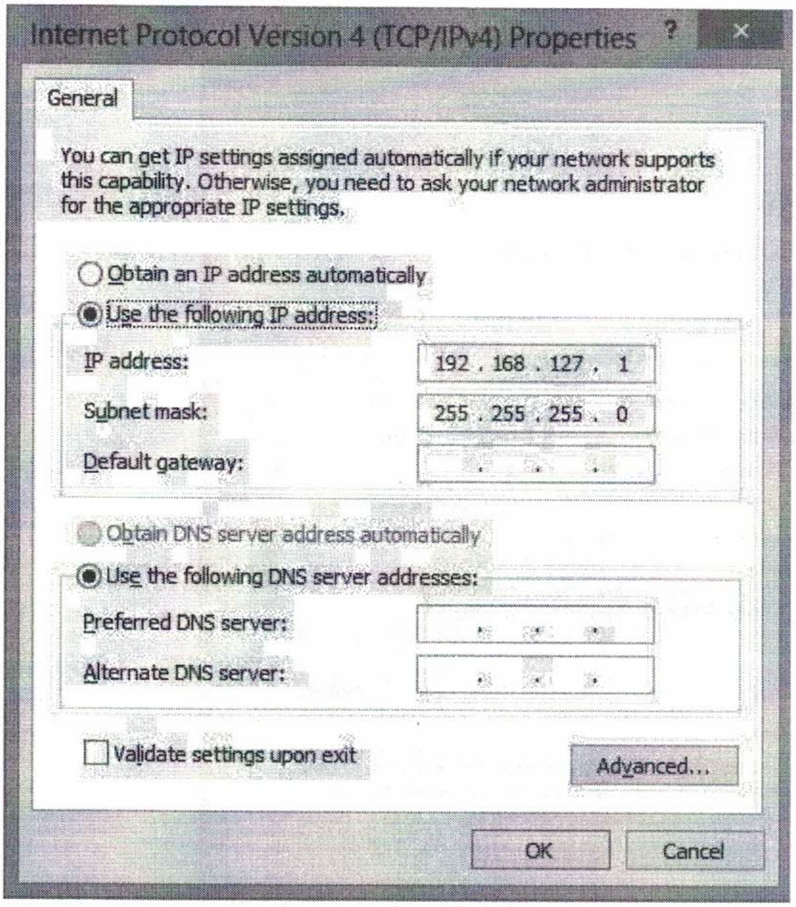


16. Set up the Ethernet Properties required to interface with the Atom Printhead. Go to the **Control Panel** (e.g. In the Windows 8 Start Menu, type **Control Panel** and select it). Select **Network and Internet**. Select **Network and Sharing Center**.

17. Select **Change Adapter Settings**. Double-click on the **Ethernet** adapter (Windows 8) or **Local Area Connection Properties** (Windows 7). Click on **Properties**. Under the **Ethernet Properties** (Windows 8) or **Local Area Connection Properties** (Windows 7), scroll down to **Internet Protocol Version 4 (TCP/IPv4)** and select it and click on **Properties**.

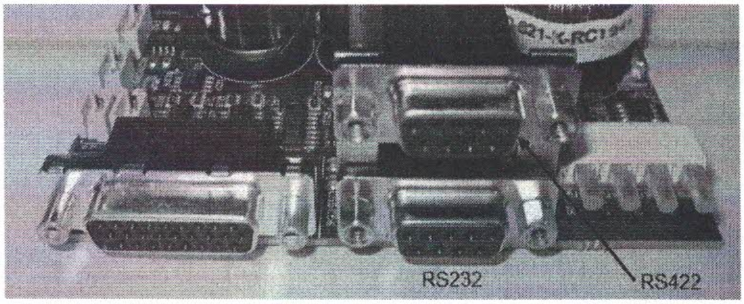


18. Select **Use the following IP address:** and change the **IP address** to **192.168.127.1** and the **Subnet mask** to **255.255.255.0**. Note that the first 3 sets of numbers in the IP address (in this case 192.168.127) must match the terminal server. These instructions assume that the default address for the terminal server is used.

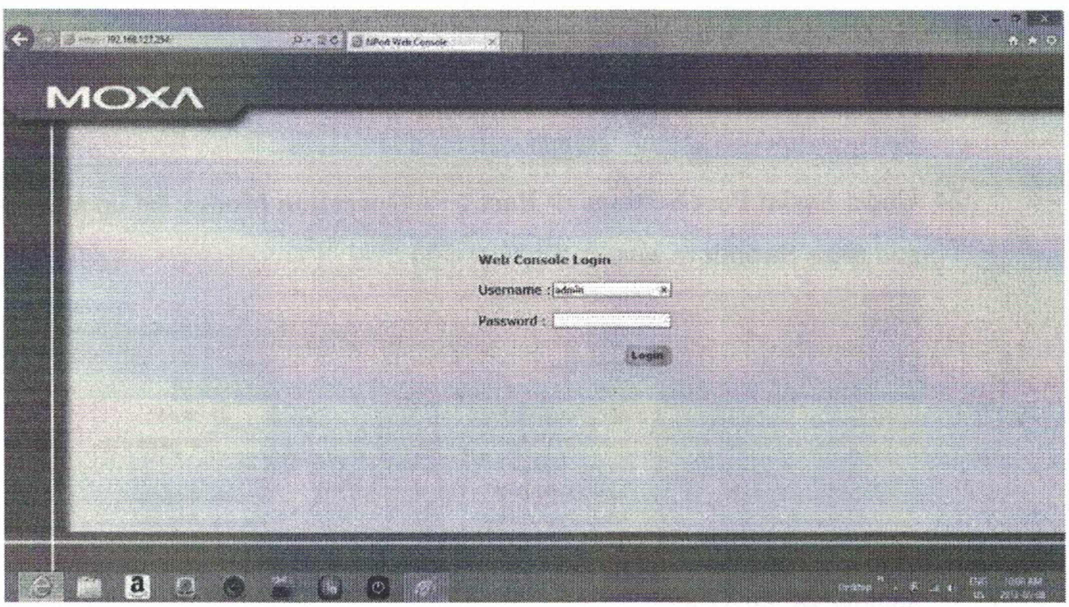


19. Connect a standard Ethernet cable from the computer to the Ethernet Terminal Server. The Terminal Server kit (P/N 9107931A) also includes the required Ethernet and Serial cables.

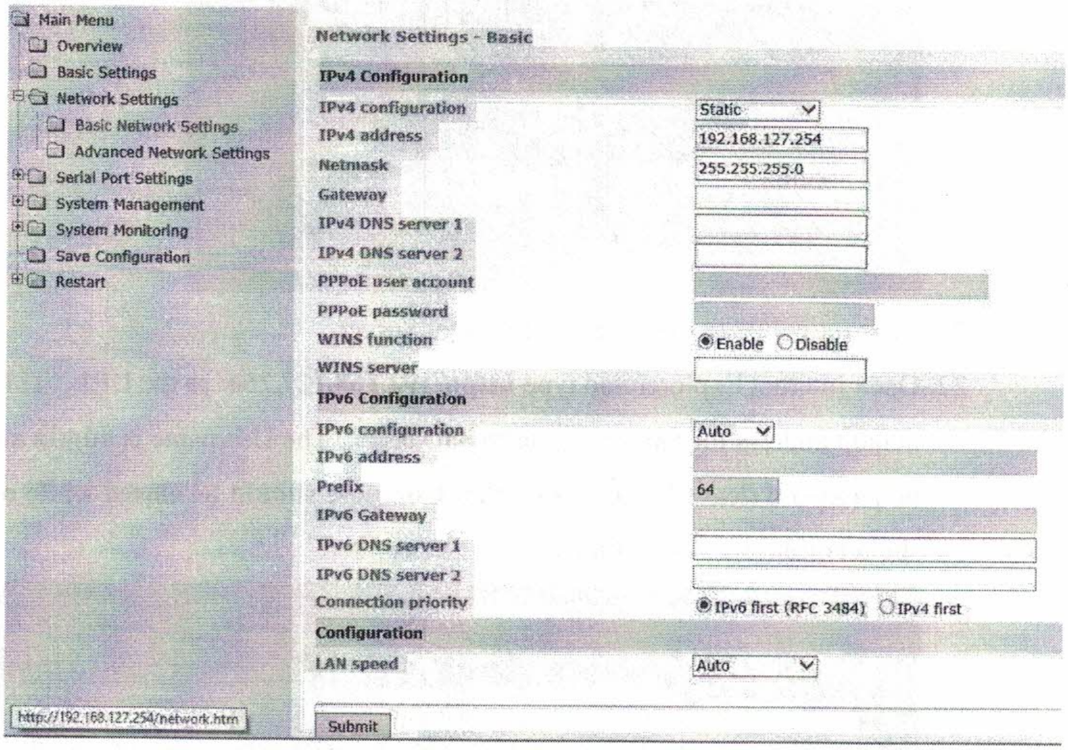
20. Connect the serial cable to the Ethernet Terminal Server and connect the other end of the cable to the RS422 9-Pin connector on the top of the Atom printhead.



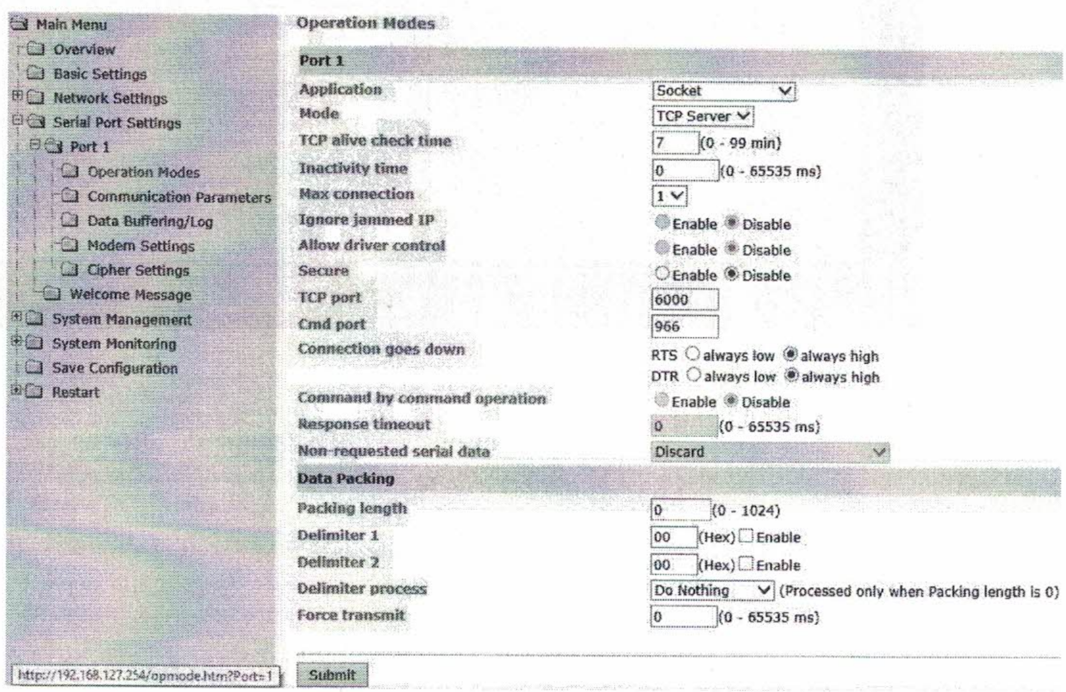
21. Connect power to the Ethernet Terminal Server.
22. Open Internet Explorer and type **http://192.168.127.254/** as the URL. This is the default address for the MOXA terminal server. The Username is **admin** and there is no password (leave blank). **Note that Compose should be closed while modifying the terminal server settings.**



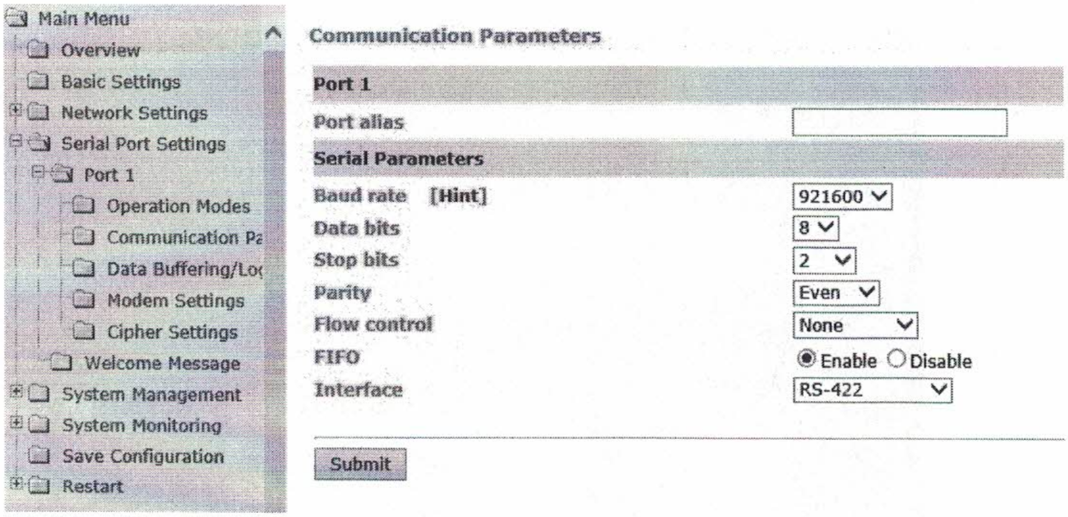
23. Under **Network Settings** and **Basic Network Settings**, set the **IPv4 configuration** to **Static.** Click on **Submit** to save the setting.



24. Under **Serial Port Settings → Port 1 → Operation Modes**, set up as shown below and press **Submit** to save.

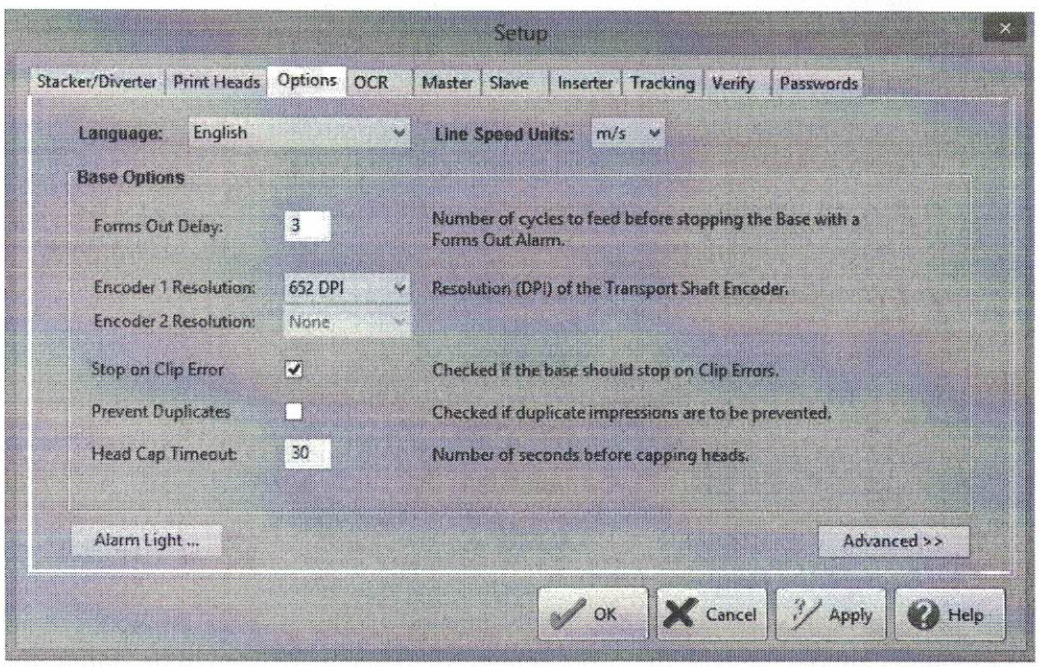


25. Under **Serial Port Settings → Port 1 → Communication Parameters**, set up as shown below and press **Submit** to save.



26. Exit Internet Explorer.

27. Open Compose. Under **Setup → Options**, set the **Encoder 1 Resolution**. It is **652 DPI** for the 1" printhead and **600 DPI** for the 2500 series Atom printhead.



28. Under **Setup → Print Heads**, select the driver that matches the head type (Table 2-1). Enter the Printhead number (1 if there is only 1 Printhead) and the Position which reflects the distance from the Photocue to the first jet.

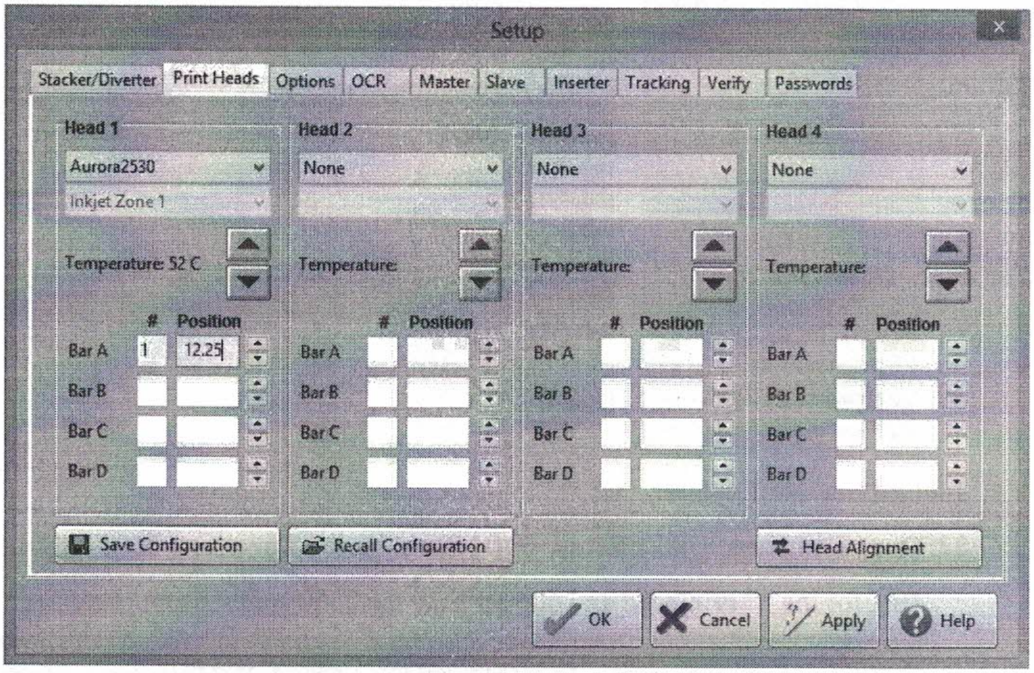


Table 2-1: Standard Printhead Drivers

Print Type	Driver Name	Inches of Print	Vertical DPI
Atlas 1025 (Monet)	Atlas1025	1	256
Atlas 2520 (Monet)	Atlas2520	2.5	200
Atlas 2530 (Monet)	Atlas2530	2.5	300
Print Type	Driver Name	Inches of Print	Vertical DPI
Atlas 1025 (Cezanne)	Atlas1025cz	1	256
Atlas 2520 (Cezanne)	Atlas2520cz	2.5	200
Atlas 2530 (Cezanne)	Atlas2530cz	2.5	300
Print Type	Driver Name	Inches of Print	Vertical DPI
Aurora 1025 (Renoir, UV)	Aurora1025	1	256
Aurora 2520 (Renoir, UV)	Aurora2520	2.5	200
Aurora 2530 (Renoir, UV)	Aurora2530	2.5	300

2.2.1 Computer Requirements

Computers interfacing with the Atom printhead are recommended to be equipped with Microsoft Windows 7 or higher, a wired Ethernet connection, and a monitor resolution of 1920 x 1080. A USB port for the USB Security Dongle must also be available. Compose V10.02 or higher is required.

2.3 QPI Board

The QPI Board is the main control board for the Atom printhead.

Figure 2-1: QPI Board

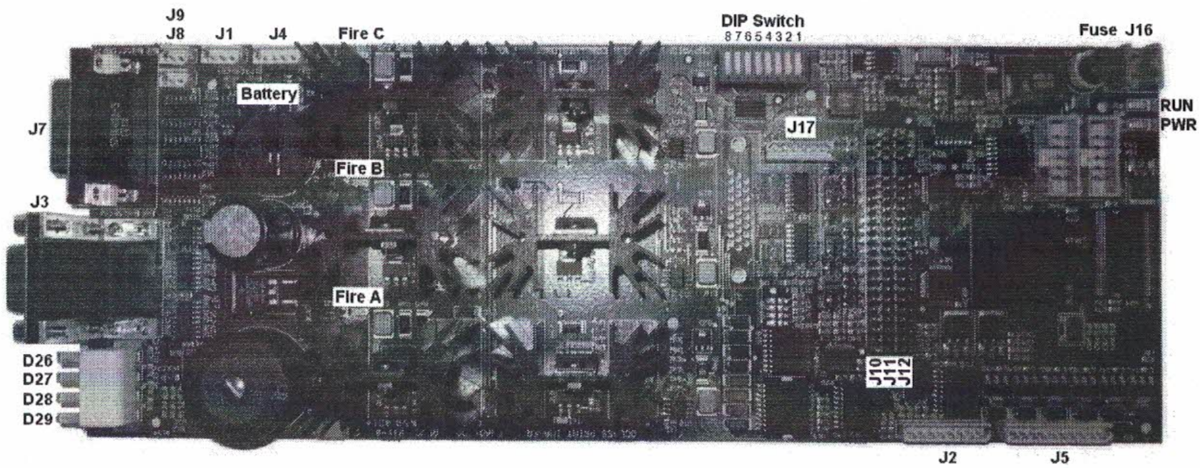


Table 2-2: QPI Service Replaceable Items

Part Number	Description
9104967	Battery, 3.0V, CR2032
9108460	Fuse, 8A, 250V, PCB, Fast Acting

2.3.1 QPI LED Functions

PWR		ON when onboard 5V switching supply is running
RUN		Flashes during boot, and periodically afterwards
D29	**READY**	Blinks when warming up, and then ON when ready.
D28	**INK**	ON when pumping ink, blinks when pump fails or out of ink. Cycle power to reset.
D27	**DATA**	Blinks when data is received or when programming the flash
D26	**TRIGGER**	Blinks when the product trigger is detected. This indicates proper operation of the encoder and photo sensor.
FIREA		Channel A High Voltage
FIREB		Channel B High Voltage
FIREC		Channel C High Voltage

2.3.2 QPI DIP Switch Settings

Note that DIP switch settings must be done with the power off.

DIP 1 & 2 – Head Type

DIP 1	DIP 2	Description
OFF	OFF	Downspit 1.00"
ON	OFF	Sidespit 1.00"
OFF	ON	200 DPI Atom
ON	ON	300 DPI Atom

DIP 3 & 4 – Not Used

DIP 3 and **4** are not currently used and are set to **OFF**.

DIP 5 – Status and Info Tweets

DIP 5 is **ON** for Status and Info Tweets. This is the default setting.

DIP 6 – Photo Eye Sense

DIP 6 selects inverted (DARK ON) photo eye sense when ON, or normal (LIGHT-ON) photo eye sense when OFF. The Buskro default is **DIP 6 = OFF**.

DIP 7 & 8 – Operating Modes

DIP 7	DIP 8	Mode	Description
OFF	OFF	Normal	Normal Print Setting
OFF	ON	Test Labels	Print Test Labels

2.4 Compose IQ

The Atom is designed to work with Buskro's Compose IQ. In order for the Atom to properly operate with Compose IQ, the USB security dongle must include the following licenses:

- **BKLI-ATOM** – This unlocks the ability to utilize the Send PDL command. This is needed to send the print layout and settings to the Atom printhead.
- **BKLI-OPT-DAT** – This unlocks the ability for Compose to send record data to the Atom printhead and receive feedback (e.g. Temperature, speed, etc). Note that this license will not work with a standard Buskro system equipped with an IA Card.

The Atom uses the same full version of Compose IQ as other Buskro print systems. However, some features are available only by purchasing the required licenses for the USB security dongle, while other features are only available with Buskro's more advanced print controllers.

For more information on how to use Compose IQ, refer to the help file included with the software. This can be accessed by pressing **F1** in the main Compose screen or by pressing the **Help** button at the top of the screen.

2.4.1 Send PDL (Page Definition Language)

Although the use of common features in Compose IQ are nearly identical between the Atom and Buskro's more advanced controllers, there are some differences. One of the main operational differences is the need to use the **Send PDL** function with the Atom printhead in order for changes to take effect. Some examples of changes that require the Send PDL command are:

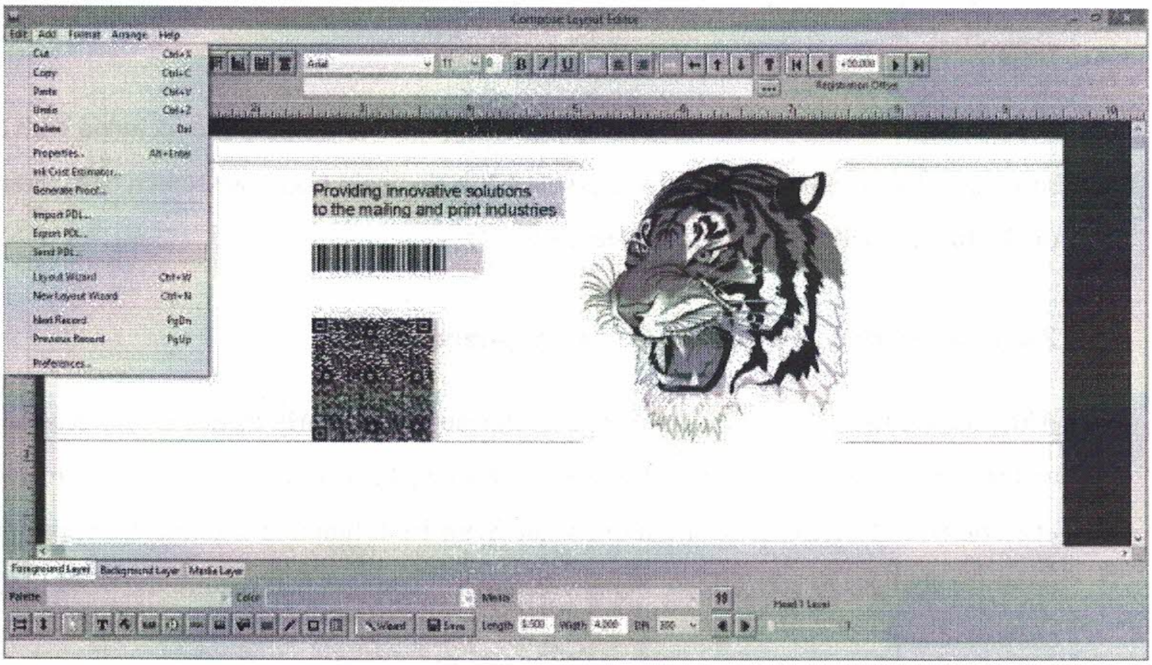
- **Change in the layout**. For example adding, removing, or repositioning text, graphics, or barcodes or changing the horizontal print resolution (DPI).
- **Change in settings**. For example changing the Printhead Driver, Photocue position, Ink Temperature, or Encoder Resolution.

The Send PDL function sends and saves the layout and setting information to the Atom printhead and is only required to be sent once per configuration. The time required to send the PDL depends on the complexity of the layout. For Buskro's more advanced controllers, these types of changes take effect immediately after the settings are saved.

In order to use the Send PDL command:

1. Go to the Compose **Layout Editor (F5)**.
2. Select **Edit** and then **Send PDL…**
3. Type in a file name for the PDL file or select an existing PDL file. Press Save. This will create a PDL file and send it to the printhead. A **Sending Layout…** status bar will appear. Once this is completed, the Data light on the top of the printhead will blink. Once it stops blinking, the printhead is ready to print.

Figure 2-2: The Send PDL command

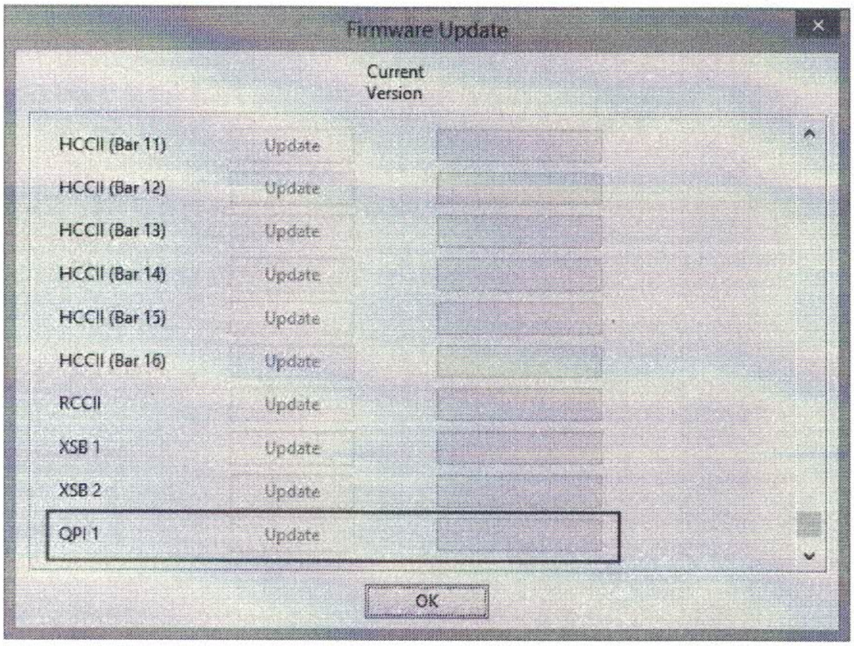


2.4.2 Firmware Updates

If a firmware update is provided for the Atom QPI, it can be transferred through Compose:

1. From the main Compose Pull-down menu, select **File → Firmware Update...**
2. Scroll down until **QPI 1** is displayed (Figure 2-3).
3. Press the **Update** button for the QPI to be updated.
4. Wait until Compose finishes updating the Atom **<u>and</u>** the Atom Data LED stops flashing. This may take a few minutes.
5. Turn off the Atom printhead and wait ten seconds before turning it back on. **Only do this <u>after</u> the Data LED stops flashing.**

Figure 2-3: Atom / QPI Firmware Update

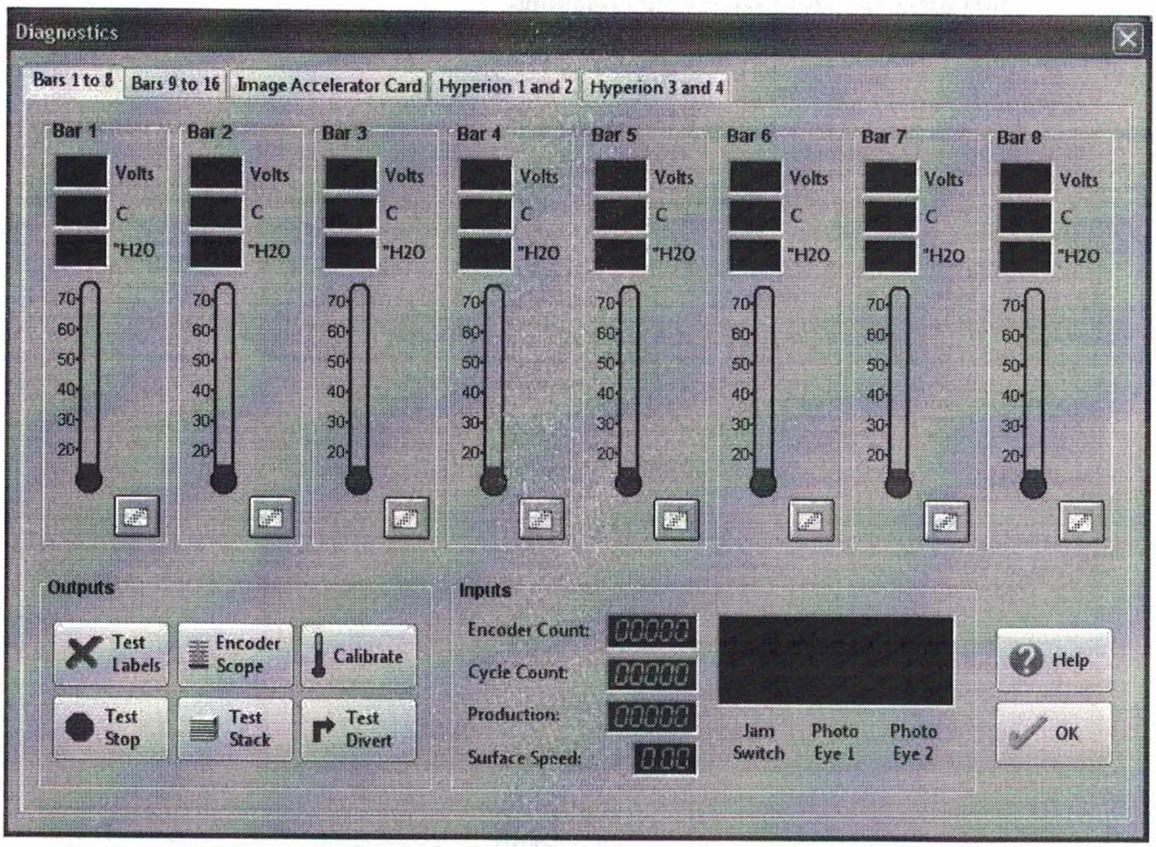


> **Note:** Do not interrupt the update process and do not cycle power until Compose indicates the firmware update is successful **<u>and</u>** the Atom Data LED stops flashing (which typically takes an additional 30 seconds after the firmware update). If this is not followed, this can result in the QPI remaining in a locked inoperable state.
>
> If a new firmware file is manually provided (e.g. not included with the Compose Disc), place this file in C:\Compose IQ\Bin and ensure it is the only QPI Hex file in this directory (e.g. QPI_#_#_#.hex where # refers to the firmware version). It is recommended to back up the previous hex file before installing the new version.

2.4.3 Diagnostics Screen

The Compose diagnostic screen displays the voltage and temperature readings for each printbar (Figure 2-4). The voltage value can be different for each jetting array. As a result, it is either preset before shipment (if a computer is included in the order from the factory), or set by the technician installing the equipment. The normal voltage range is 80-100 volts. The temperature reading depends on the ink technology used (40°C for Monet, 25-30°C for Cezanne, 45°C for Onyx, and 52°C for Renoir).

Figure 2-4: Compose Diagnostics Window



Note: Only trained technicians should make adjustments to the Voltage as it can affect print performance. In the case of Cezanne ink, it is not recommended to exceed the rated voltage otherwise more frequent jetouts will occur during printing.

2.5 Factors that Affect Production Rates

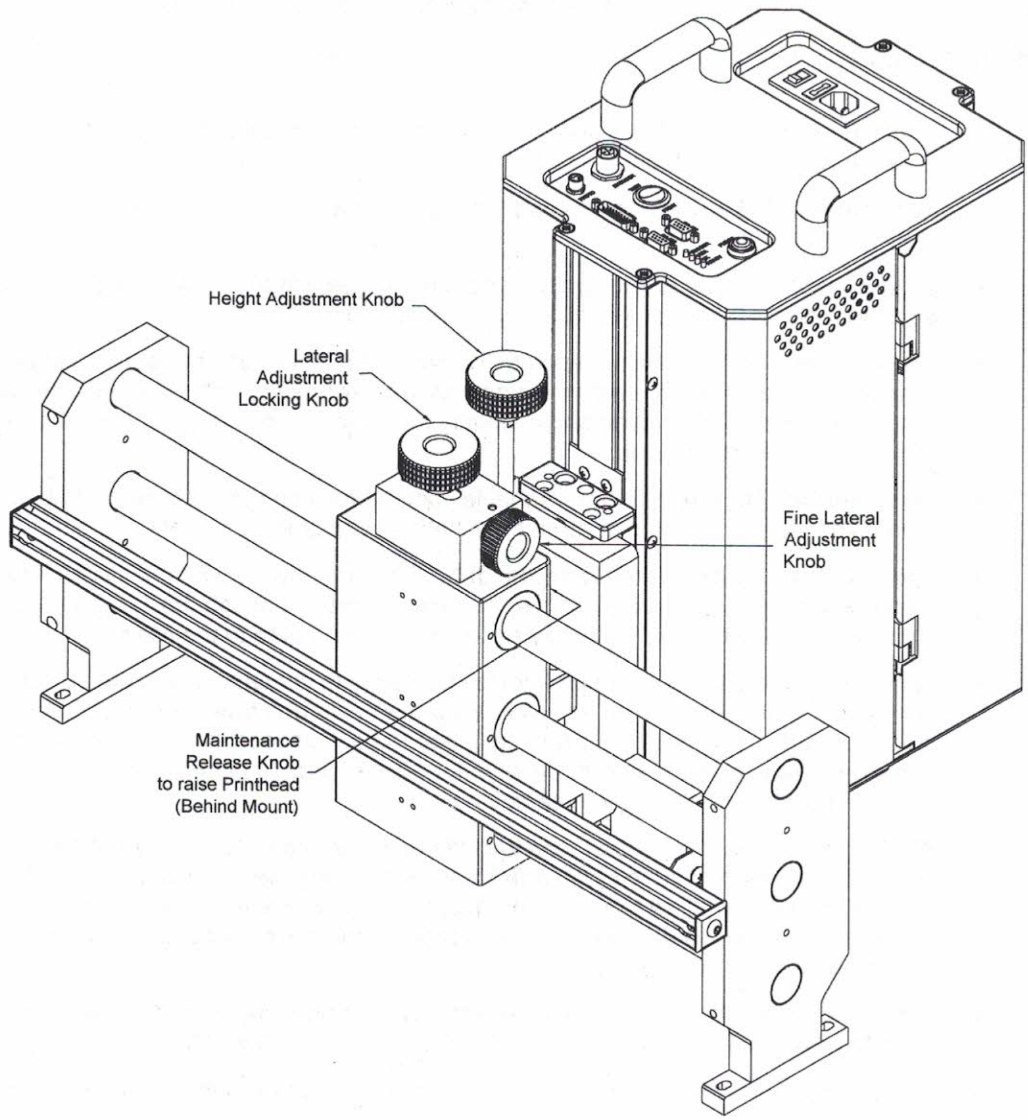
The Atom is designed for high speed, single-pass printing applications. However, there are factors that can affect its top Production Rate. Understanding these factors can help optimize the top production rate for a given application. For example:

- **Content in the layout.** More text, barcodes, and graphics as well as larger fonts in a single layout may reduce the top Production Rate.
- **Horizontal DPI.** Lower DPIs can achieve higher Production Rates. This is set at the bottom of the Layout Editor.
- **Layout position.** The layout can be optimized by keeping the content (e.g. text, barcodes, and graphics) as far left as possible in the Layout Editor.
- **Frame Length.** Longer frame lengths (the border for text or barcodes) take longer to format. Optimize the frame length so that it is only as long as needed. This can be done by double-clicking on the text or barcode and changing the length, or by dragging the left or right border of the text or barcode frame.
- **Static versus variable content.** Variable content that changes from piece-to-piece can reduce the top production rate more than static or unchanging content.
- **Speed of the equipment sending the data.** The time required for the system to send a record when requested can affect the Production Rate. Although optimized with Compose IQ, this can change if a 3rd party system is used to send data to the Atom.
- **Pitch.** This refers to the distance from leading edge to leading edge between consecutive printed pieces in a production run. Reducing this value at a given speed can maximize the production rate. However, the pitch may need to be increased to provide sufficient time to format and transfer the layout in real-time for each record. If blanks appear or print is cut off, increase the gap by slowing the feeder.
- **Photocue distance.** If a piece travels to the printhead before it can format and transfer the layout, it may result in cut-off print or a blank. Increasing the distance between the photocue and the first jet may allow for higher production rates. However, keep the photocue as close to the printhead as reasonably possible in order to minimize impact on print registration (print position accuracy on the piece).
- **Printhead type.** Printheads with fewer jets have the potential to achieve higher production rates for identical layouts (e.g. the 1025 can be faster than the 2530).
- **Avoid actively running other software** on the computer used to send print records.

Note that depending on what is being printed, these factors may not result in any noticeable difference (e.g. the desired production rate may be achievable without optimizing any of the above factors). However, if print appears cut-off or blanks with no print are appearing, these factors can be considered to optimize the Production Rate.

2.6 Printhead Adjustments

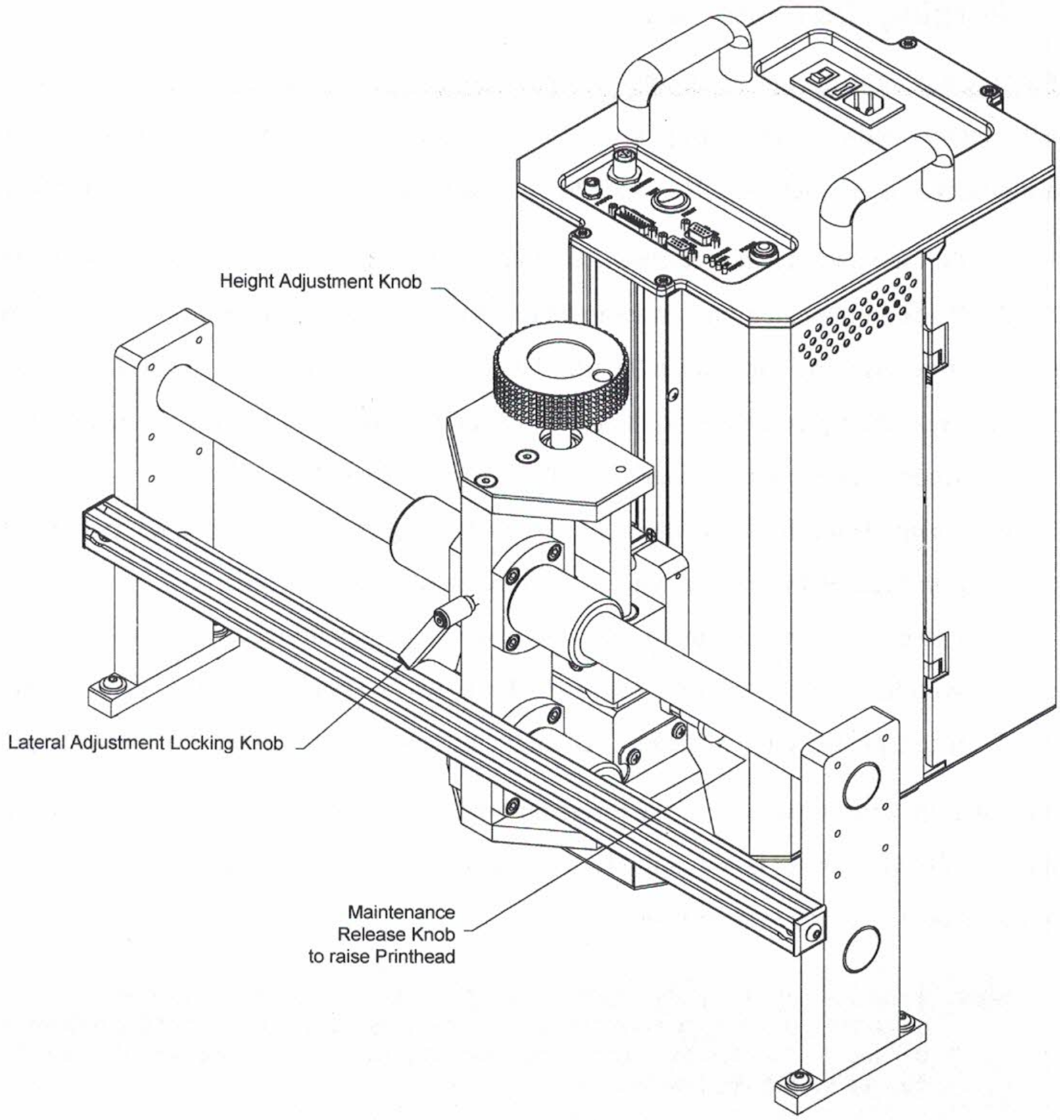
Figure 2-5: Printhead Adjustments (BK83 Mount)



The Atom Printhead adjustments with the BK83 mount include:

1. **Height Adjustment Knob** – Adjust the Printhead distance from the table.
2. **Lateral Adjustment Locking Knob** – Lock Printhead in place laterally.
3. **Fine Lateral Adjustment Knob** – For small lateral adjustments.
4. **Maintenance Release Knob** – To raise Printhead in order to wipe and clean the arrays.

Figure 2-6: Printhead Adjustments (BK230 Mount)



The Atom Printhead adjustments with the BK230 mount include:

1. **Height Adjustment Knob** – Adjust the Printhead distance from the table.
2. **Lateral Adjustment Locking Knob** – Lock Printhead in place laterally.
3. **Maintenance Release Knob** – To raise Printhead in order to wipe and clean the arrays.

2.7 Purging the Printhead

Purging a printhead consists of applying pressure to eject ink through the print nozzles. This is typically conducted at start-up, after a long idle period, and when lines or voids in the print are observed due to jet loss. It is done to optimize print quality. To purge the printhead:

1. Pull the maintenance release knob to raise the printhead (Figure 2-5 and Figure 2-6).
2. Place an ink catch tray underneath the printhead. Alternatively, hold an approved fibreless wipe underneath the printhead (recommend wearing nitrile gloves).
3. Press the purge button on the top of the printhead. Hold for approximately 3-4 seconds to allow ink to drip out of the printhead and then release.
4. Using clean, fibreless wipes (P/N 9104195), lightly press against the bottom of the printhead and move the wipe in the direction shown in Figure 2-7.
5. Lower the printhead and print a test pattern. Test patterns can be printed by switching the Test Pattern switch to **Test**. Switch back to **Print** to print the layout.
6. If one purge is not sufficient, repeat the process. Wait ten seconds between purges.

Note that in certain conditions, the purge button is disabled to prevent purging. This can happen if the Printhead is not in the Ready State (e.g. if it is still warming to the operating temperature), or if the system is out of ink.

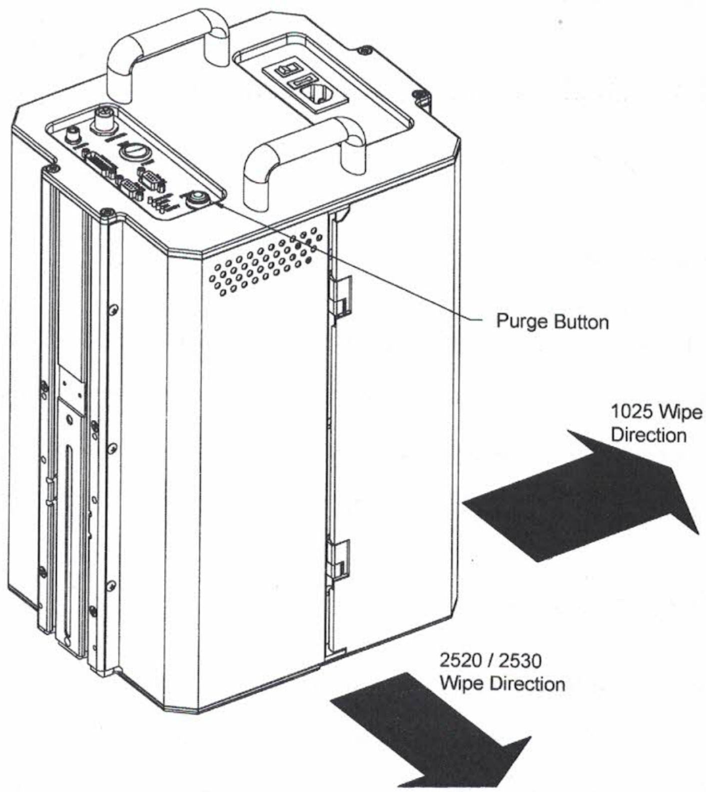
Note: If jets are lost shortly after purging during a production run (i.e. after a few minutes), there may be air bubbles in the ink. Repeat the purge process and wait at least two minutes before printing. This will provide time for the lung vacuum to remove air bubbles from the ink.

Only Buskro approved fibreless wipes (P/N 9104195) should be used otherwise the printhead can be damaged or fibres from the wipe may cause blockages and voids in the print. Do NOT apply unapproved materials to the orifice plate.

Do not use unapproved chemicals to assist in cleaning the printhead. Only use the Maintenance Spray or Flush specifically designed for the ink.

In order to keep the wipes clean, it is recommended that they be stored in a sealed bag. This is to minimize contamination from the environment (such as dust and debris) which can be transferred to the printhead.

Figure 2-7: Wipe Direction



2.7.1 Wet Wiping

Wet wiping is recommended to assist in cleaning the orifice plate (bottom of the printhead where the jets are fired from) and can be done if voids in the print (loss of jets) are observed. This process assists in removing dust, debris, and dried ink from the orifice plate. To wipe the printhead:

1. Pull the maintenance release knob to raise the printhead.
2. Apply Maintenance Spray or Flush (P/N BKSPR-MON125 for Monet, BKSPR-CEZ125 for Cezanne, and BKFSH-REN1000 for Renoir) to the approved fibreless wipe (P/N 9104195). The wipe should be new (clean and free of dust and particles) and wet (saturated with maintenance spray or flush but not dripping wet).
3. Using the specified wipes, lightly press against the bottom of the printhead and move the wipe in the direction shown in Figure 2-7. Repeat until the orifice plate is clean.

2.8 Air Management

2.8.1 Purge Pressure

For the Atom Printhead, the purge pressure used to recover jets is typically set to **50 in H_2O**.

2.8.2 Lung Vacuum

The lung vacuum is designed to de-aerate the ink to prevent loss of jets due to air bubbles. If a large volume of ink is consumed (i.e. purging), wait a couple of minutes to allow the lung to remove the air bubbles. Otherwise, jets may be lost within a few minutes of printing. The lung vacuum is typically **–16 in Hg** or greater.

2.8.3 Meniscus Vacuum

The meniscus vacuum holds ink in the print manifold. For the Atom Printhead, it is typically set for **-4.6 in H_2O**. If the meniscus vacuum is too low, ink may leak from the printhead. Conversely, if the meniscus vacuum is too high, air may be drawn into the nozzles. Both cases can result in a loss of jets during printing.

2.9 Regular Maintenance

2.9.1 Daily Shut-down

To shut-down the printhead overnight:

1. Follow the purging procedure outlined in **Section 2.7**. Use nitrile gloves (P/N 9101176).
2. Print test patterns and ensure all jets are firing.
3. Shut off the power to the system.

2.9.2 Printhead Regular Maintenance

The key to proper printhead maintenance is to exercise the printhead jets and to regularly refresh the ink in the printhead. This is normally done by running the system during a print job and following the purging procedure in **Section 2.7.** It is recommended to follow the daily shutdown procedure found in **Section 2.9.1**.

For printheads that are unused for more than 3-days, it is recommended to turn the Printhead on and follow the shutdown procedure found in **Section 2.9.1**. This will help to avoid jet blockages in the printhead by cycling ink. This is especially important for printheads utilizing the Renoir ink. A full test pattern should be printed to ensure all jets are firing.

For Renoir inks, it is recommended that the printhead be shut down when not used and kept at a temperature below 35C. Avoid exposing Renoir ink to light by keeping the printhead covers on and the door to the ink bottle closed.

Note: If regular maintenance is not properly followed, this can make it more difficult to recover jets or even result in permanent jet loss with some inks.

Do not exceed 15 days of inactivity for any printhead utilizing Renoir ink otherwise permanent missing jets can occur. Follow the proper maintenance procedures.

2.9.3 Regular Maintenance

It is recommended to replace the ink line in the ink pump at least every 6 months and to replace the remainder of the ink line including filters, fittings, and the lung module every year. More details can be found in the Atom Service Manual.

Ink Options

Chapter 3

3.1 Monet / Cezanne Ink

The Cezanne ink is a fast-drying solvent-based ink formulation that is recommended for applications where dry time and adhesion are the critical parameters. However, in order to obtain faster-dry times, the ink is more volatile. As a result, some operating stability is sacrificed. In general, where reliability and stability are more important, the traditional Monet ink (a non-volatile solvent-based ink with moderate drying characteristics) should be used. Some important facts about Cezanne:

- **Recommended ink temperature is 25-30°C.** It is recommended to keep the system in an environment that does not exceed this temperature otherwise it may result in more frequent wiping or purging due to lines in the print.
- **Due to the fast drying properties of the ink, the printhead itself can dry out quickly.** This is an area where the Monet ink is superior. During periods of inactivity (between prints), the printhead can dry out resulting in a fuzzy leading edge or even missing jets. This can normally be recovered by printing, but it may also require purging (**Section 2.7**).
- **Use in a well-ventilated area.**
- **Cezanne ink is darker than Monet.** Based on tests on standard materials, Cezanne was found to be consistently darker than Monet (the magnitude of difference varies with substrate and DPI).
- **Cezanne ink dries faster than Monet.** Based on tests on standard materials with and without the use of a heater, Cezanne consistently matched or exceeded Monet in terms of reduced dry times. While dry times were equal on porous materials (nearly instantaneous), a significant improvement was seen on glossier materials

3.2 Renoir Ink

The Renoir ink is a UV curable ink. The main advantage of the Renoir ink is its ability to adhere to a wide variety of materials including high gloss materials, plastic, and even metal. Although the Monet and Cezanne inks are able to dry on a wide variety of materials, Renoir ink is even stronger in this category. In addition, although Monet, Cezanne, and Renoir inks are all capable of the same resolutions, the Renoir ink typically produces a darker, shinier image.

3.2.1 Stray UV Light

It is important that any ink related components avoid unnecessary exposure to UV light (i.e. sunlight or a UV lamp) or excessive heat (greater than 55°C). This may cause premature curing of the ink. As a result, all covers must be attached and the Printhead door to the ink bottle should always be closed. All ink must also be stored away from light.

3.3 Ink Information, Safety, Handling, and Storage

It is recommended to review the Material Safety Data Sheet (MSDS) for each ink prior to use. When servicing the equipment, it is recommended to wear splash-proof goggles, protective gloves made of Nitrile, and to ensure that the area is well ventilated.

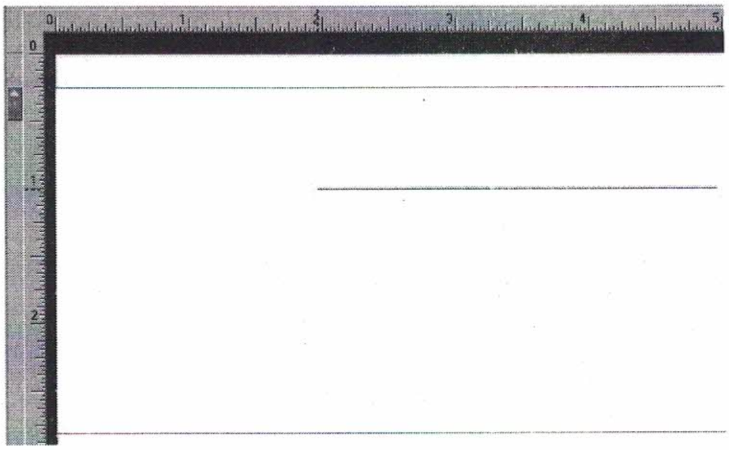
Troubleshooting

Chapter 4

4.1 Troubleshooting Guide

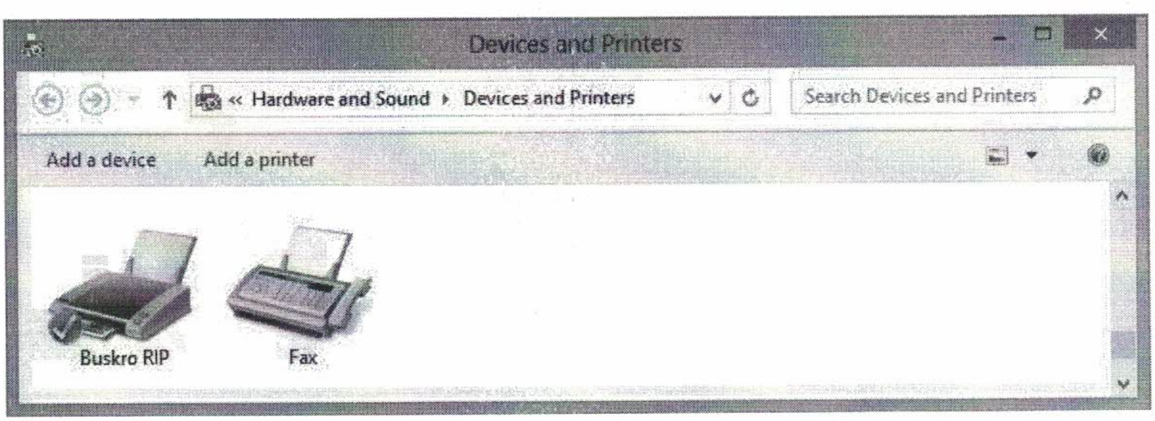
4.1.1 When I insert text, it appears like a horizontal line

Figure 4-1: Horizontal Line instead of Text



Confirm that the Buskro RIP driver has been properly set up. This is the required Printer Driver. Also confirm that Compose is set to be run as an Administrator and that the User Access Control (UAC) is set to minimum, otherwise the Buskro RIP will not operate properly. This is described in **Section 2.2**.

Figure 4-2: Buskro RIP Driver



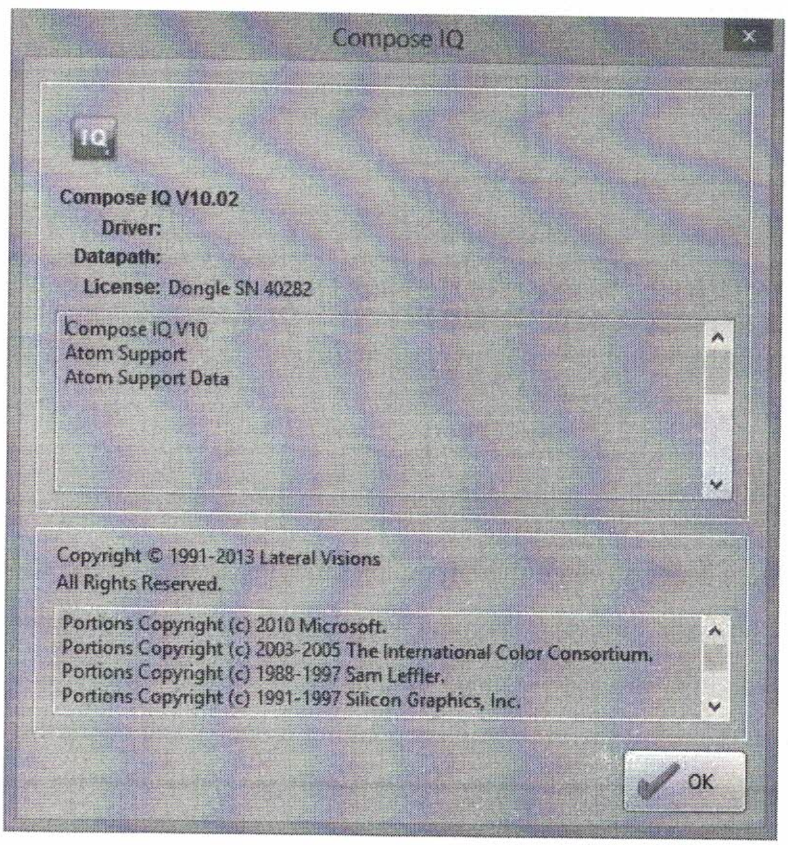
4.1.2 My Layout and/or setting changes did not take effect

Any time the layout or settings are changed, use the **Send PDL** command to update the Atom printhead otherwise the changes will not take effect. See **Section 2.4.1**.

4.1.3 The Send PDL command does nothing

Check that the USB security dongle is properly installed as described in **Section 2.2**. If the dongle is properly installed, it will be visible in the About Compose IQ screen. From the pull-down menu select **Help → About Compose IQ…** It should display the Dongle Serial number beside **License:** and it should have the **Atom Support** license as shown in Figure 4-3. The required licenses are described in **Section 2.4**. If it indicates **Demonstration License**, try re-inserting the dongle in the USB port.

Figure 4-3: About Compose Screen



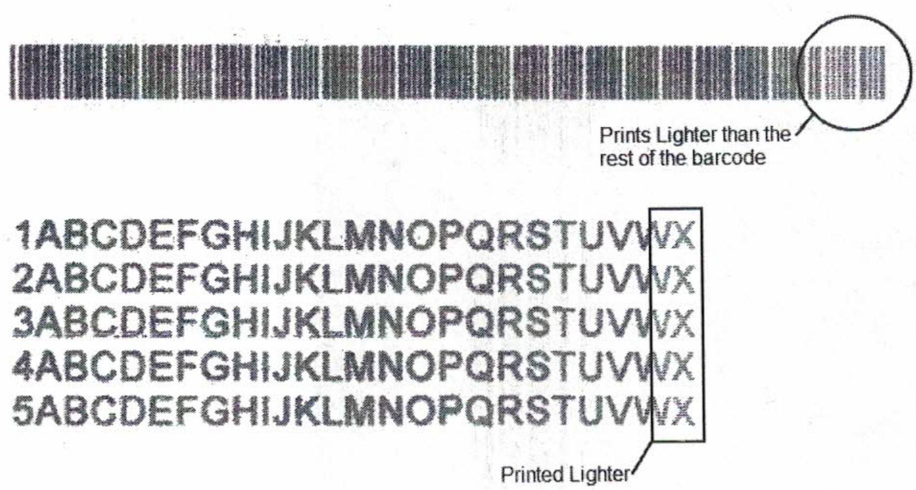
4.1.4 I get blank pieces or my print is cut off

Check for material feed issues (e.g. double feeds or no gap) and that the material is not dragging at any point during travel. It is also possible that you have exceeded the maximum production rate for your current setup. Refer to **Section 2.5** for tips on optimizing the setup.

4.1.5 The end of my text or barcodes print consistently lighter

The frame size (or border) for the text or barcode may be smaller than required. Increase the frame length by double-clicking on the text or barcode in the Layout Editor and increase the length. Alternatively, drag the left or right border of the text or barcode frame to the desired size.

Figure 4-4: Lighter Print in text or barcodes due to insufficient frame size

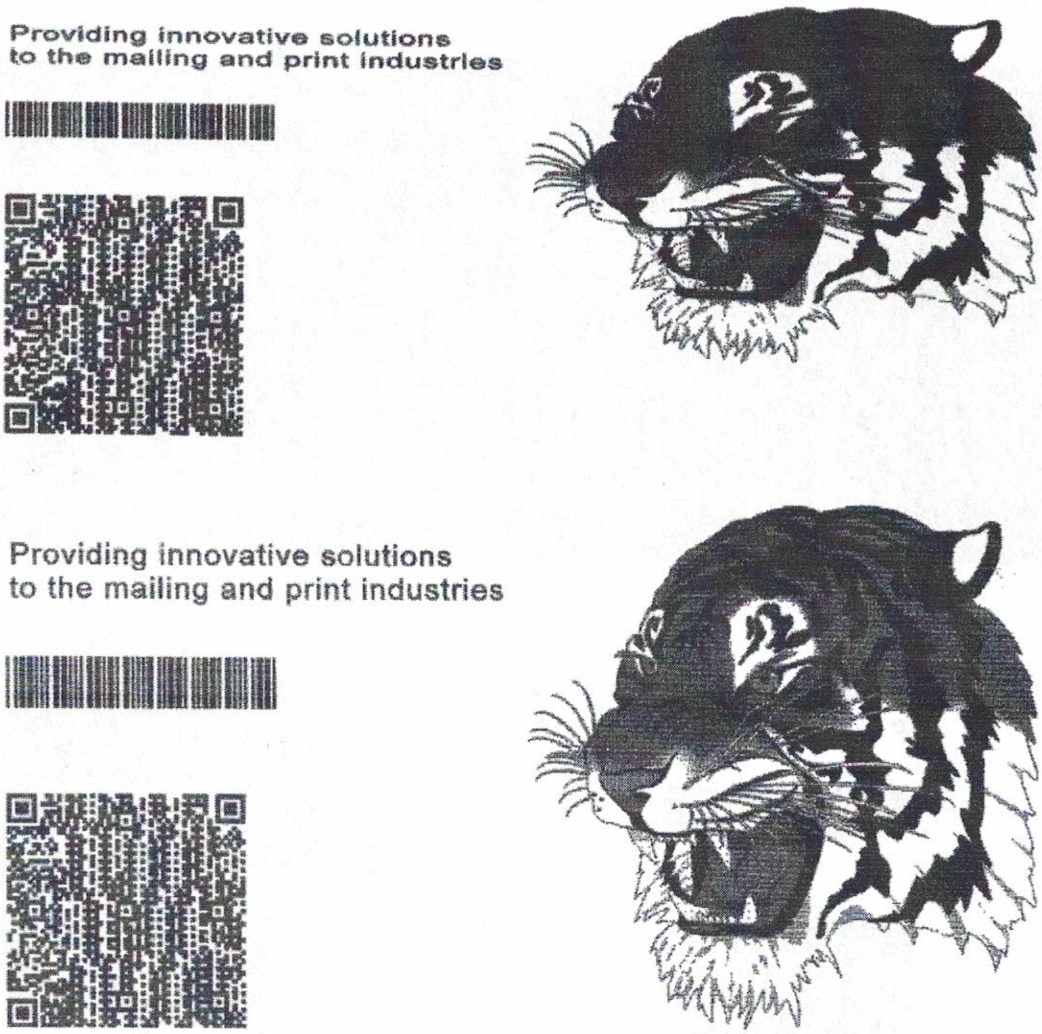


4.1.6 The Ink light is solid

This identifies either the Atom is out of ink or there is an ink pumping failure. If the Atom is out of ink, replace the ink bottle and turn off and on the Atom printhead. If this does not resolve the problem and the light eventually becomes solid again, it is likely that ink is not getting to the print manifold. Check if the ink pump is operating properly and check the condition of the ink line, especially in the ink pump. More details are provided in the Atom Service Manual.

4.1.7 The image appears compressed vertically

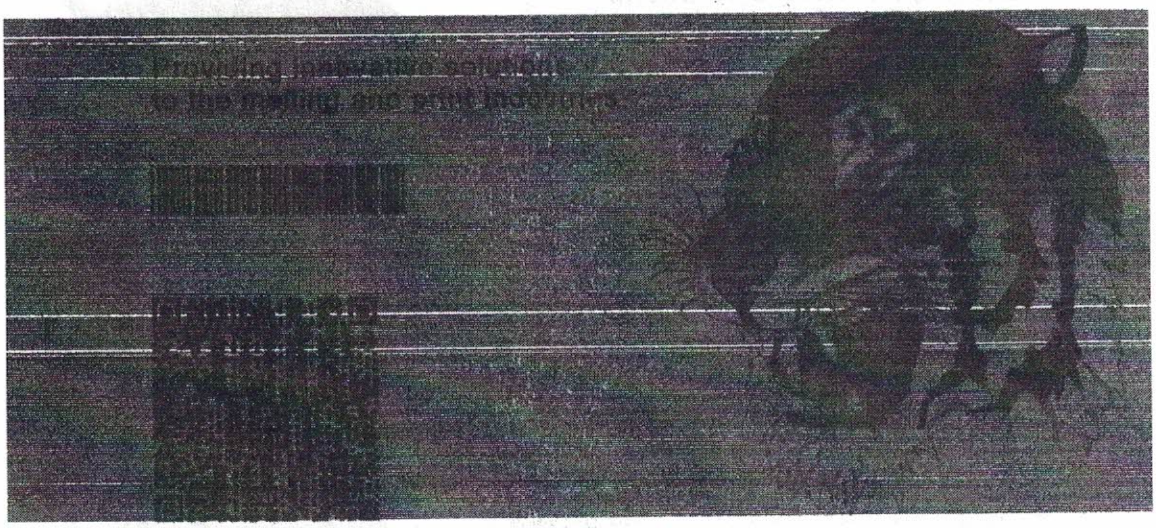
Figure 4-5: Compressed Image (Top) vs Normal Print (Bottom)

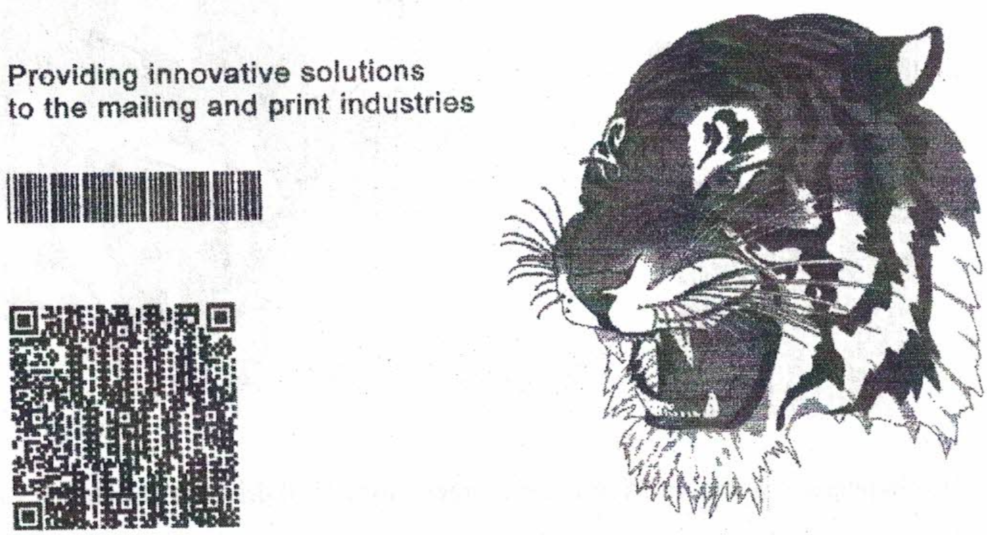


This happens in an Atom 2520 if the correct Atom 2520 driver is selected in Compose but the QPI is incorrectly set to 300 DPI. Check the DIP switch settings on the QPI (**Section 2.3.2**) and set it to the 200 DPI Atom (DIP 1 = OFF, DIP 2 = ON). In general, the physical printhead, the Compose Driver, and the QPI DIP switch settings must match.

4.1.8 One array is continuously firing while the other two print normally

Figure 4-6: Continuous Firing (Top) vs Normal Print (Bottom)

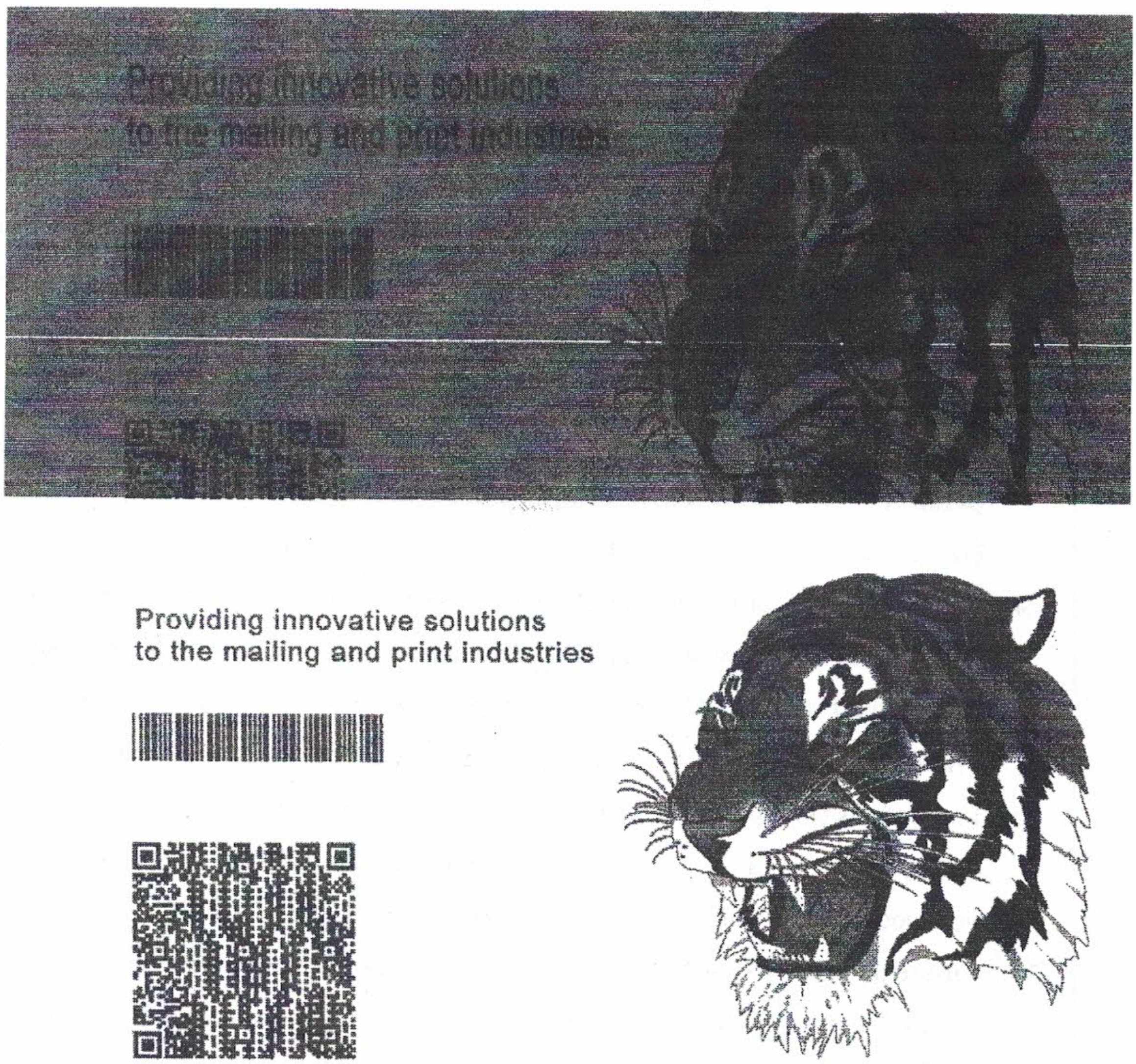




This happens if an Atom 2530 printhead incorrectly uses the Atom 2520 driver in Compose and the QPI is incorrectly set to 200 DPI. Change the driver in Compose to the proper driver as described in Table 2-1 at the end of **Section 2.2** and check the DIP switch settings on the QPI (**Section 2.3.2**) and set it to the 300 DPI Atom (DIP 1 & 2 = ON).

4.1.9 Print is stretched vertically and one array is continuously firing

Figure 4-7: Continuous Firing & Stretched Print (Top) vs Normal Print (Bottom)



This happens in an Atom 2530 if the correct Atom 2530 driver is selected in Compose but the QPI is incorrectly set to 200 DPI. Check the DIP switch settings on the QPI (**Section 2.3.2**) and set it to the 300 DPI Atom (DIP 1 & 2 = ON).

4.1.10 Nothing is printing at all

Check the following (this assumes the BKLI-OPT-DAT license is used):

1. Ensure that **Disable Printing** is not checked at the bottom of the main screen. It should be set to **Enable Printing** in order to print the layout.
2. Check all cable connections between the Computer, Terminal Server, and Atom. Ensure all three are powered, and Compose is open. If this is a problem, Compose will likely display a temperature of 14C in the **Test (F6)** Diagnostics screen and there will be no feedback from the Photocue or Encoder. Note that if one of these cables are disconnected, you may need to restart Compose after reconnecting the cable.
3. It is possible that it is printing off the piece. Check that the Photocue distance is set properly and that the material is not dragging on the transport. This is set under **Setup (F7) → Print Heads** as described in **Section 2.2**. Also check that the proper material size is set up at the bottom of the Layout Editor **(F5)**.
4. Check that the Photoeye and Encoder are properly working. Go into the Compose **Diagnostics** screen by selecting **Test (F6)**. Manually block the photocue sensor. The **Photo Eye 1** icon should appear if it is working properly. Run the transport base. The **Encoder Count** should increase if the Encoder is working properly.
5. For systems equipped with the BKLI-OPT-DAT license for sending records to the Atom, ensure that a list is loaded and it is not at the end of the list. Select the record you would like to print and press the **Position (F9)** button.
6. Ensure that the USB Security dongle is properly installed. See **Section 4.1.3**.
7. Check the DIP switch settings on the QPI (**Section 2.3.2**) and ensure it is set for **Normal Mode** (DIP 7 & 8 = OFF).
8. Turn off the Atom printhead, wait ten seconds, and turn it back on.

Note that systems without the BKLI-OPT-DAT license will not display feedback such as Temperature, Photocue, or Encoder signals.

4.1.11 Part of my layout is not printing

For example, the static content in the layout does not print but the variable information does. This can happen if the DIP switch settings are set incorrectly. Check the DIP switch settings on the QPI (**Section 2.3.2**) and ensure it is set for **Normal Mode** (DIP 7 & 8 = OFF).

4.1.12 My Purge Button isn't working

The Purge button is disabled if the system is out of ink or if the Atom is warming up to the operating temperature.

4.1.13 Compose is not receiving feedback from the Atom

If the Atom is not receiving feedback such as the printhead temperature, print speed, or from the photocue and encoder sensors:

1. Check that your USB security dongle is properly installed and that you have the Atom Data license (refer to Section 4.1.3). It is identified as **Atom Support Data** in the About Compose IQ screen.
2. Check the Terminal Server settings as per **Section 2.2**.
3. Check that DIP 5 = ON on the QPI (**Section 2.3.2**).

Note that the Atom Data License (BKLI-OPT-DAT) is required for Compose IQ to display feedback from the Atom printhead.

4.1.14 My Print shifts off the piece when I increase the transport speed

If the top speed of the Atom printhead is exceeded, the print can shift out of position. To resolve this, turn the Atom OFF and ON. This typically occurs at approximately:

DPI	Speed (m/s)
300	2.67
400	2.00
600	1.33

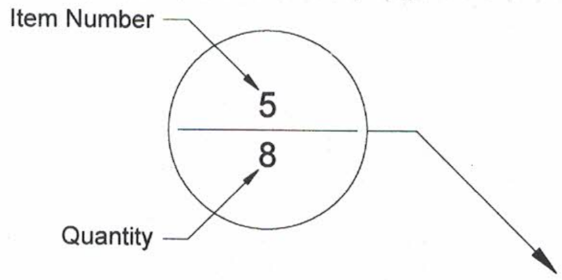
DPI	Speed (m/s)
326	2.50
434	1.83
652	1.33

Assembly Drawings

Appendix **A**

List of Tables

Balloon Annotation and Parts Listing



Item	Part Number	Quantity	Description	Reference
1				
2				

The following is a description of how to interpret the information in this section:

Item:

This column indicates the item number used for each unique part in an assembly drawing. It is matched with the top number in the balloon pointing at the associated part.

Part Number:

This column represents the Buskro part number.

Quantity:

This represents the total number of a given part in an assembly. It is matched with the bottom number in the balloon pointing at the associated part.

Description:

This column contains a brief description of the part.

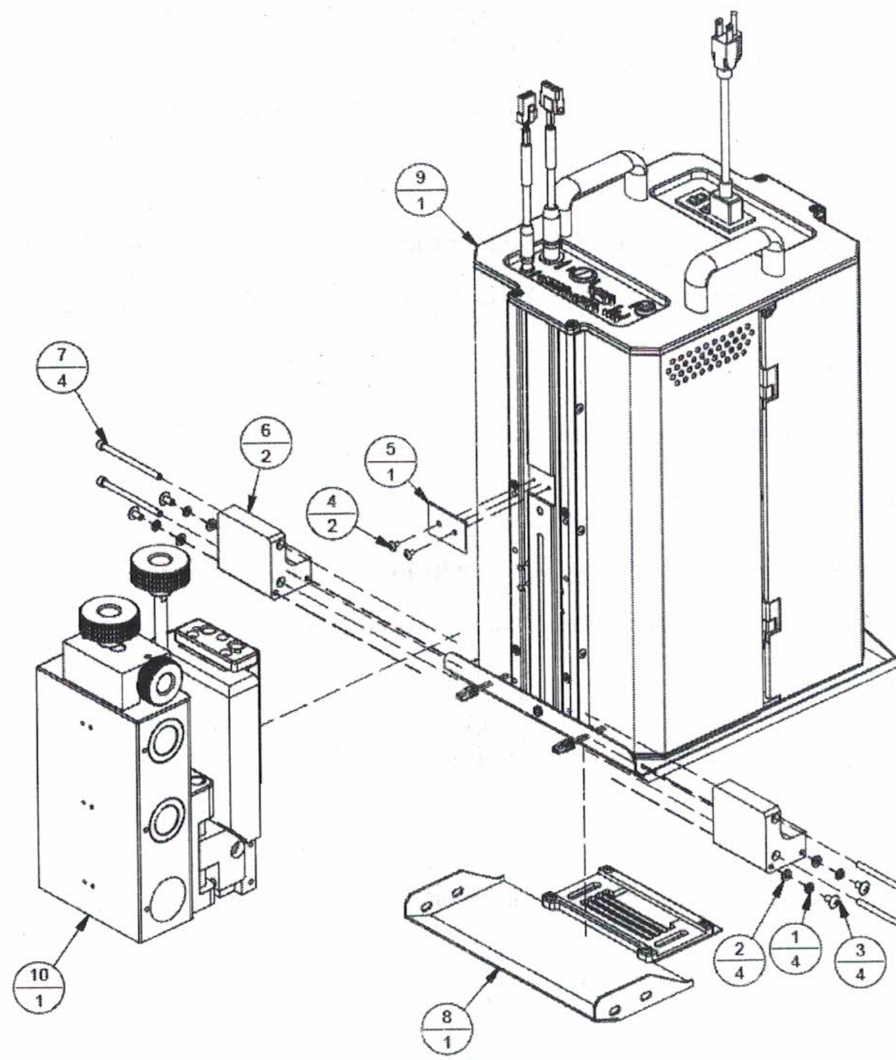
Reference:

This column indicates the page location for sub-assemblies.

Table A-1: BK2530?-AT-M83 - Printhead, Atom, BK2530, 300 DPI, M83

Item	Part Number	Quantity	Description	Reference
1	439009	4	Lockwasher, #10 SS	
2	440008SS	4	Washer, #10, SS	
3	9104501	4	Screw, SS, Truss, 10-32 UNF x ½"	
4	9105725	2	Screw, PHMS, 6-32 x ¼, SS, Truss	
5	9105771	1	Stopper Bracket, Side Profile	
6	9105954	2	Support Block, 5" Shield	
7	9105955	4	Screw, SHCS, 10-32 UNF x 2-3/4"	
8	9107927A	1	Shoe Assembly, Atom 2500	Page A-30
9	BK2530?-AT	1	Printhead, Atom, BK2530 (? = A, C, or U)	Page A-3
10	BK83M-4	1	Mount, BK83 Bridge	Page A-8

Figure A-1: BK2530?-AT-M83 - Printhead, Atom, BK2530, 300 DPI, M83

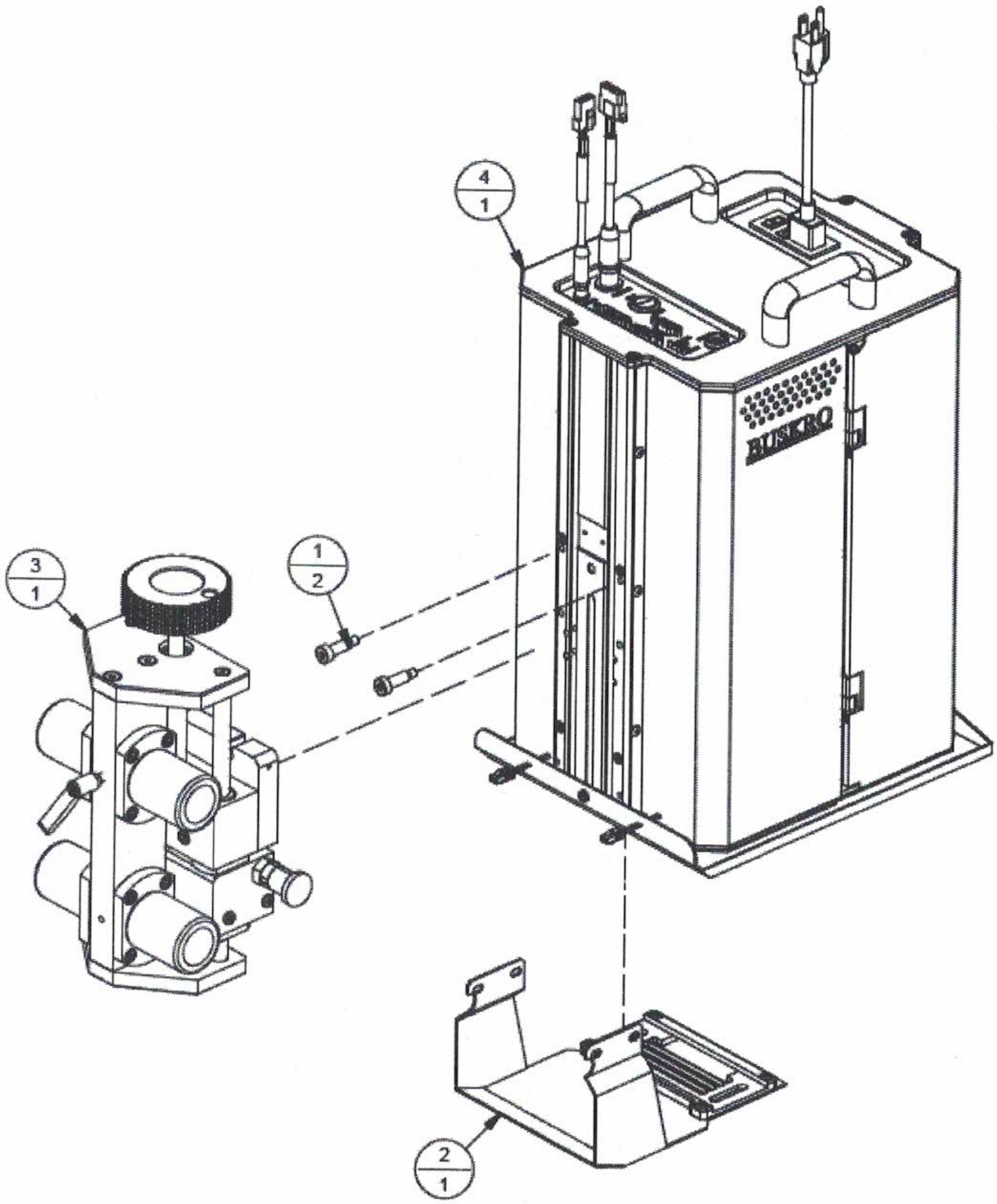


Note: In BK2530?-AT-M83 and BK2530?-AT, **?** = A = Atlas, C = Cezanne, U = UV

Table A-2: BK2530?-AT-230 - Printhead, Atom, BK2530, 300 DPI, M230

Item	Part Number	Quantity	Description	Reference
1	9105070	2	Shoulder Bolt, M6, 20 mm Lg., SS	
2	9105072A	1	Shield Assembly, Atom 300	Page A-13
3	BK230M	1	Bridge Mount Assembly, BK230M	Page A-9
4	BK2530?-AT	1	Printhead, Atom, BK2530 (? = A, C, or U)	Page A-3

Figure A-2: BK2530?-AT-M83 - Printhead, Atom, BK2530, 300 DPI, M83



Note: BK2530**?**-AT-230 and BK2530**?**-AT where **?** = A = Atlas, C = Cezanne, U = UV

Table A-3: BK2530A-AT – Printhead, Atom, Atlas, BK2530

Item	Part Number	Quantity	Description	Reference
1	9100472	2 x 1.35"	Tubing, Silicone, ¼" OD x 1/8" ID	
2	9101290	1	Fitting, Tee, 1/8" ID.	
3	9102090A	1	Filter Assembly, Solvent	
4	9105081	1	Check Valve, 0.32 PSI, #302, PE (Blue-Red)	
5	9105590A	3	Jetting Array Assembly, Atom	
6	9106737	2	Bracket, Common, JA	
7	9106747	3	Shim, 0.007", Long	
8	9107443	1	Insert, 300, Brass	
9	BK2500-AT	1	Atom Head Assembly, BK2500	Page A-6

Figure A-3: BK2530A-AT – Printhead, Atom, Atlas, BK2530

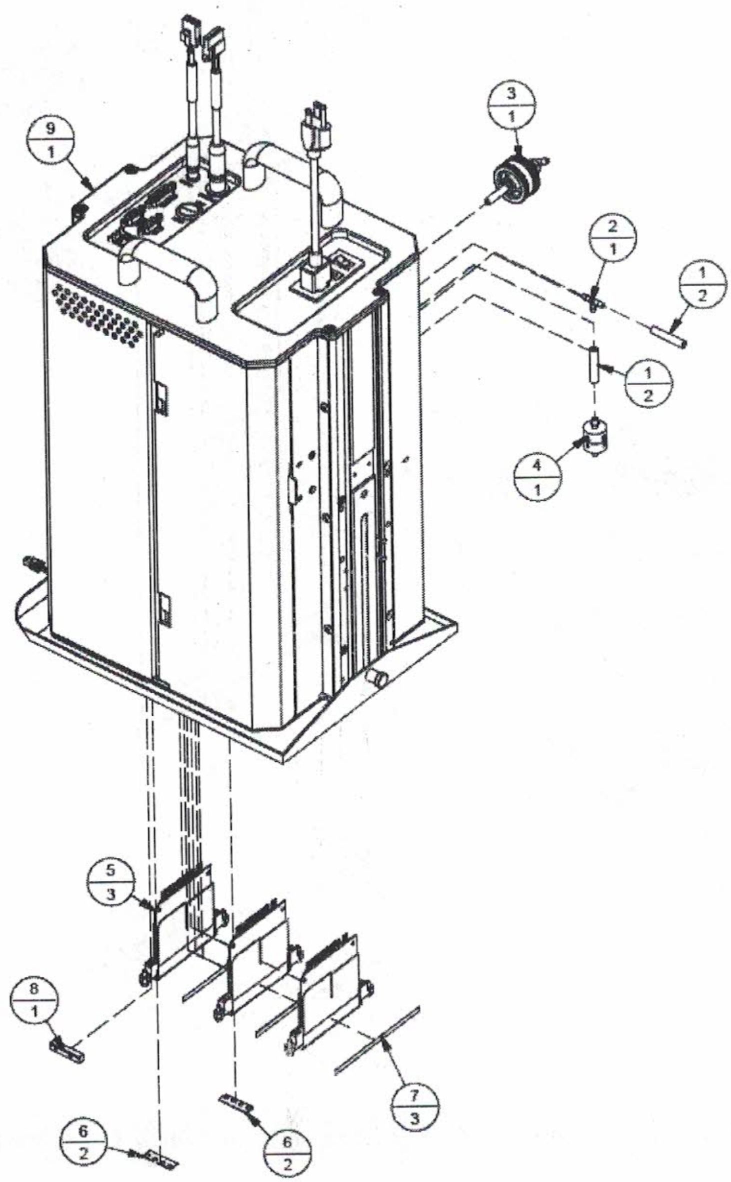


Table A-4: BK2530C-AT – Printhead, Atom, Cezanne, BK2530

Item	Part Number	Quantity	Description	Reference
1	9102090A	1	Filter Assembly, Solvent	
2	9105590A	3	Jetting Array Assembly, Atom	
3	9106737	2	Bracket, Common, JA	
4	9106747	3	Shim, 0.007"	
5	9107443	1	Insert, 300, Brass	
6	BK2500-AT	1	Atom Head Assembly, BK2500	Page A-6

Figure A-4: BK2530C-AT – Printhead, Atom, Cezanne, BK2530

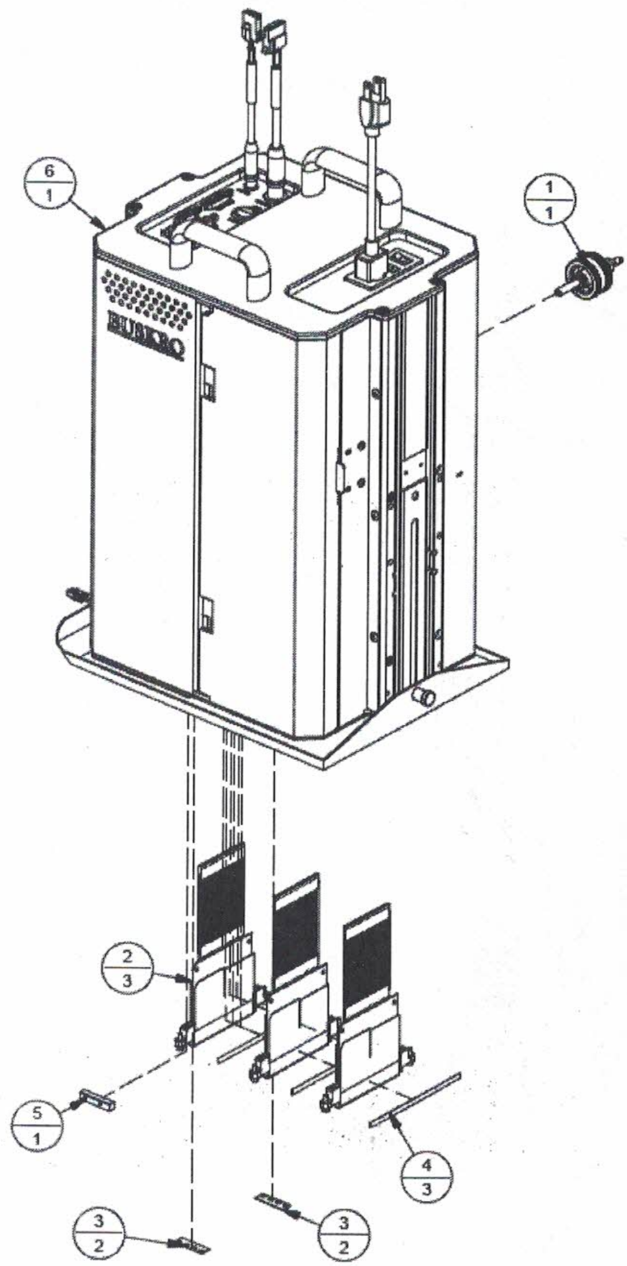


Table A-5: BK2530U-AT – Printhead, Atom, Aurora, BK2530

Item	Part Number	Quantity	Description	Reference
1	9100472	2 x 1.35"	Tubing, Silicone, ¼" OD x 1/8" ID	
2	9101290	1	Fitting, Tee, 1/8" ID	
3	9103390A	1	Filter, Assembly, 10 µm, UV	
4	9105081	1	Check Valve, 0.32 PSI, #302, PE (Blue-Red)	
5	9105590A	3	Jetting Array Assembly, Atom	
6	9106737	2	Bracket, Common, JA	
7	9106747	3	Shim, 0.007"	
8	9107443	1	Insert, 300, Brass	
9	9108116	1	Tubing, Ink, ¼ OD x 1/8 ID, 3"	
10	BK2500-AT	1	Atom Head Assembly, BK2500	Page A-6

Figure A-5: BK2530U-AT – Printhead, Atom, Aurora, BK2530

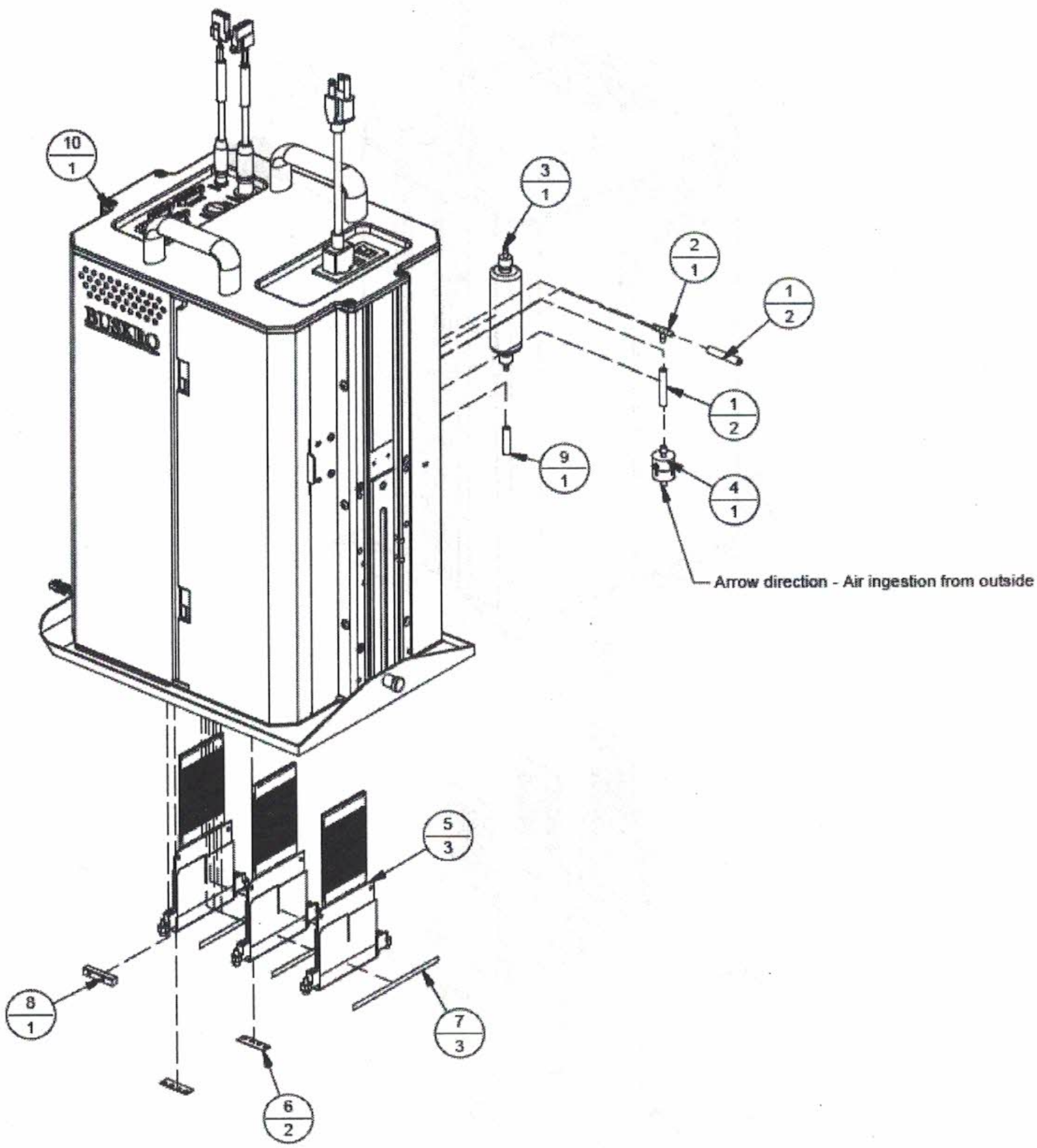


Table A-6: BK2500-AT – Atom Head Assembly, BK2500

Item	Part Number	Quantity	Description	Reference
1	403005006	3	Screw, PHMS, M5 x 0.8, 6 mm Lg.	
2	404040SS	8	Screw, FHCS, 10-32 UNF x 5/8" SS	
3	404510SS	2	Screw, BHCS, 10-32 UNF x ¼" SS	
4	606322	1	Cordset, 10A/125 VAC, 90", Harmonized IEC	
5	9100472	2 x 4"	Tubing, Silicone, ¼" OD x 1/8" ID, 4"	
6	9101290	1	Fitting, Tee, 1/8" ID	
7	9103109	2	Screw, PHMS, Truss, 8-32 UNC x ¼"	
8	9103200A	1	Cable, LOIS/Heat Support	
10	9105725	15	Screw, PHMS, 6-32 x ¼", SS, Truss	
11	9105795A	1	Cable, Ink Pump/Purge Support	
12	9106159	1	Side Profile, Long	
13	9106249	2	Screw, FPHMS, 8-32 UNC, ¾", SS	
14	9107437A	1	Bottom Plate Assembly, 2500 Atom	Page A-14
15	9107439A	1	QPI Support Assembly	Page A-17
16	9107445A	1	Top Plate Assembly, Atom	Page A-19
17	9107922A	1	Subbracket Assembly, Ink Tray	Page A-25
18	9107924A	1	Separator Assembly, Atom	Page A-26
19	9107925A	1	Air/Ink Pump/Power Mount Assembly	Page A-27
20	9107928	1	Cover, Atom Front	
21	9107929	1	Cover, Atom Back	
22	9107930A	1	Door Assembly, Atom	Page A-31
23	9107938A	1	Right Bracket Assembly, Atom	Page A-33
24	9107945A	1	Cable Assembly, Atom Encoder	Page A-35
25	9108206A	1	Cable Assembly, Atom Photoeye	Page A-37
26	9108208A	1	Cap Assembly, 2500 Atom	Page A-38

Figure A-6: BK2500-AT – Atom Head Assembly, BK2500

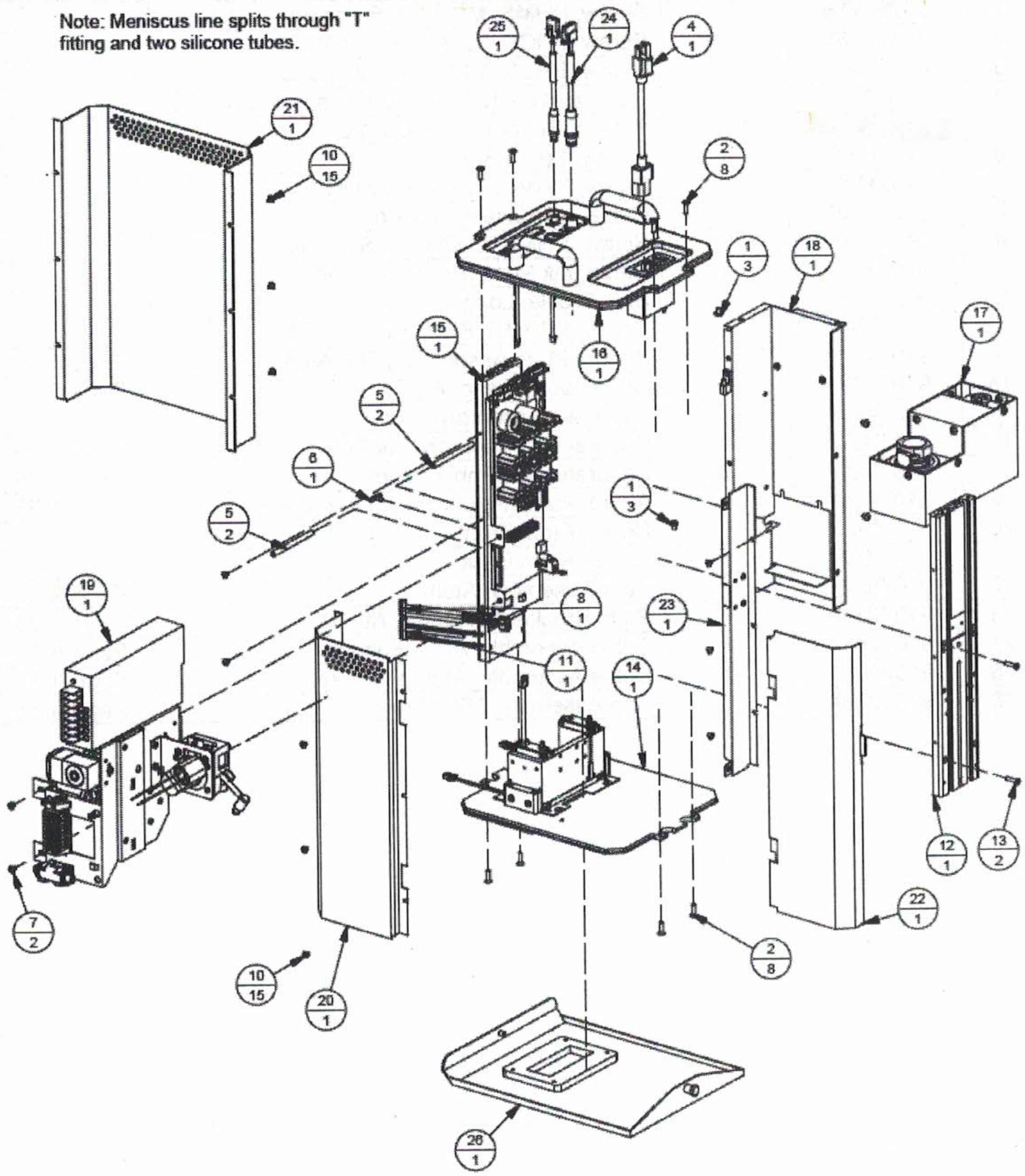


Table A-7: BK83M-4 – Mount, BK83 Bridge

Item	Part Number	Quantity	Description	Reference
1	9104276A	1	Printhead Support Assembly	
2	9104413A	1	Bridge Mount Assembly, Triple	

Figure A-7: BK83M-4 – Mount, BK83 Bridge

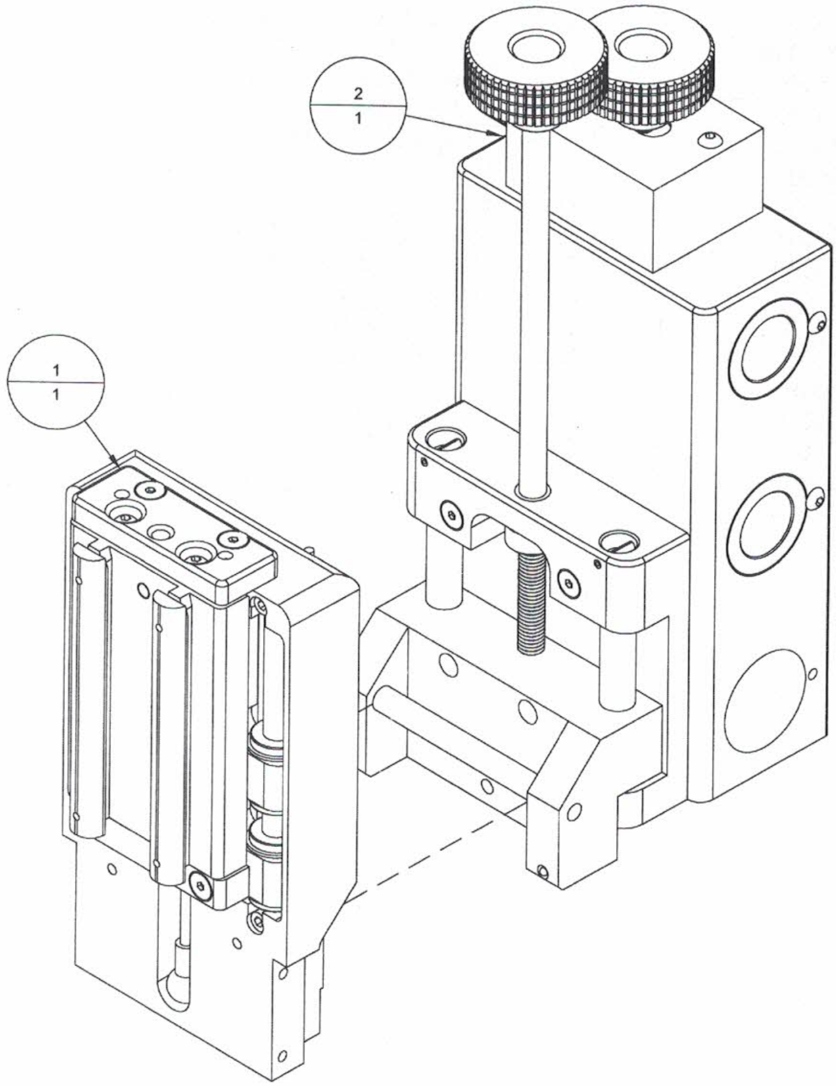


Table A-8: BK230M – Mount, BK230 Bridge

Item	Part Number	Quantity	Description	Reference
1	400005016	4	Screw, FHCS, M5 x 0.8 x 16 mm Lg.	
2	400006020	4	Screw, FHCS, M6 x 1 x 20 mm Lg.	
3	400006035	2	Screw, FHCS, M6 x 1 mm x 35 mm Lg.	
4	402004010	8	Screw, SHCS, M4 x 0.7 x 10 mm Lg.	
5	402006016	18	Screw, SHCS, M6 x 1 x 16 mm Lg.	
6	402006070	2	Screw, SHCS, M6 x 1 x 70 mm Lg.	
7	403005006	4	Screw, PHMS, M5 x 0.8 x 6 mm Lg.	
8	9105046	1	Lead Screw, 16 mm, 294 mm Lg.	
9	9105048	1	Handwheel, Knurled 80 mm	
10	9105056	1	Lever, Clamp with Pad, M6	
11	9105063	1	Mount Post, HD	
12	9105064	2	Plate, Shaft Support	
13	9105065	2	Shaft, Linear, 12 mm, M5 Both Ends	
14	9105066	4	Bearing, Linear, Flanged, 30 mm	
15	9105067	1	Bracket, Height Adjustment	
16	9105068	1	Bracket, Shuttle Block	
17	9105069	1	Bracket, Head Support	
18	9105995	1	Gas Spring, 140 N	
19	9106620	1	Plunger, Indexing, M16	
20	9107879	2	Bearing, Angular Contact	
21	9107880	4	Linear Bearing, 12 mm, Flanged	
22	9107884	1	Nut, Lead Screw, M16	

Figure A-8: BK230M – Mount, BK230 Bridge

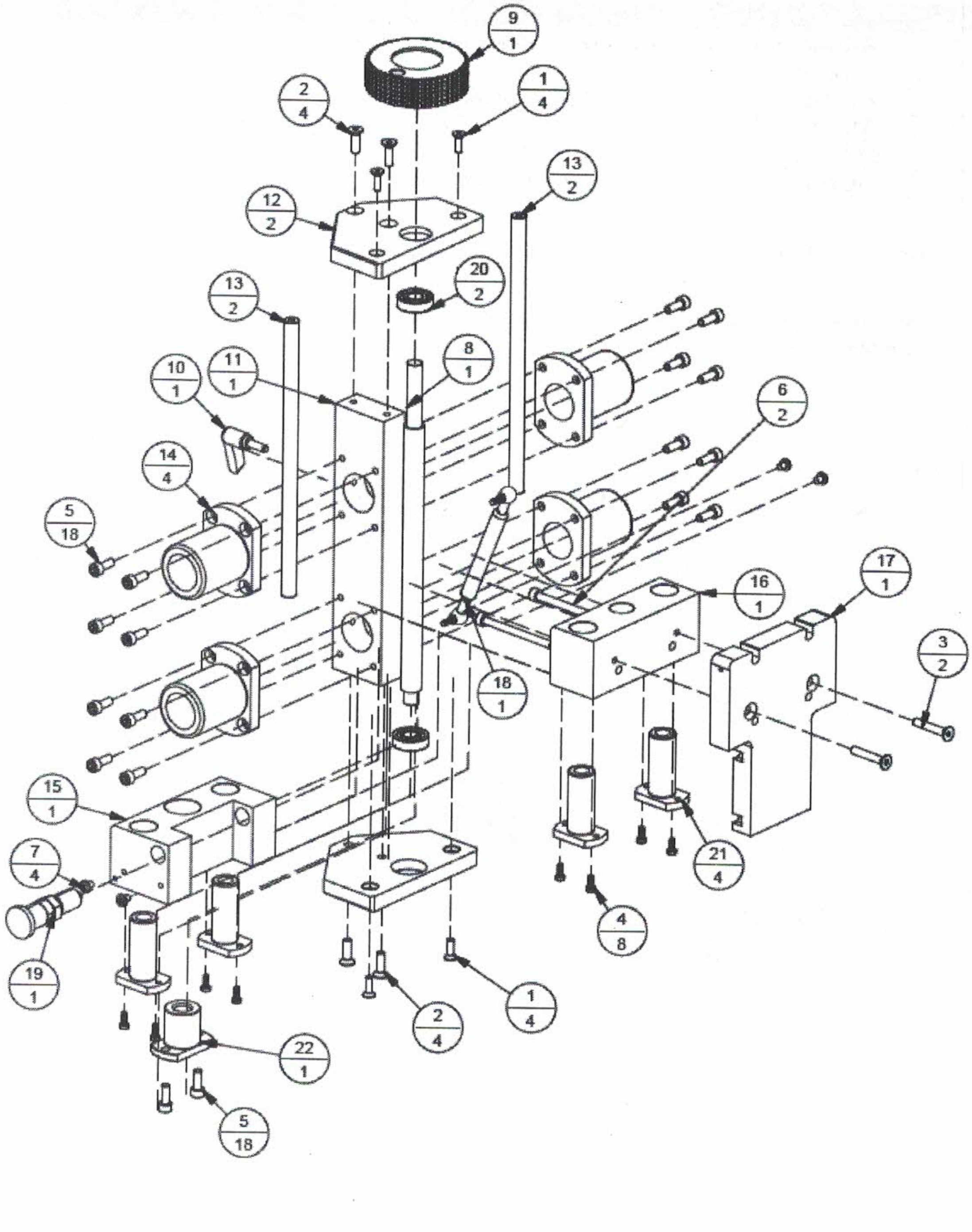


Table A-9: 9100120A – Fuse/Relay Base Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	610100	1	Relay, 120 VAC	
2	615004	1	Relay Base	
3	615016	1	End Stop, BAM, 9.1 mm	
4	615021	1 x 3.5"	T-Rail, DIN	
5	9100298	1	Relay, 240 VAC	
6	9103435	4	Ferrule, #16 AWG, Red	

Figure A-9: 9100120A – Fuse/Relay Base Assembly, Atom

Note: Depending on environment, install 120VAC or 240VAC relay.
(see wiring diagram)

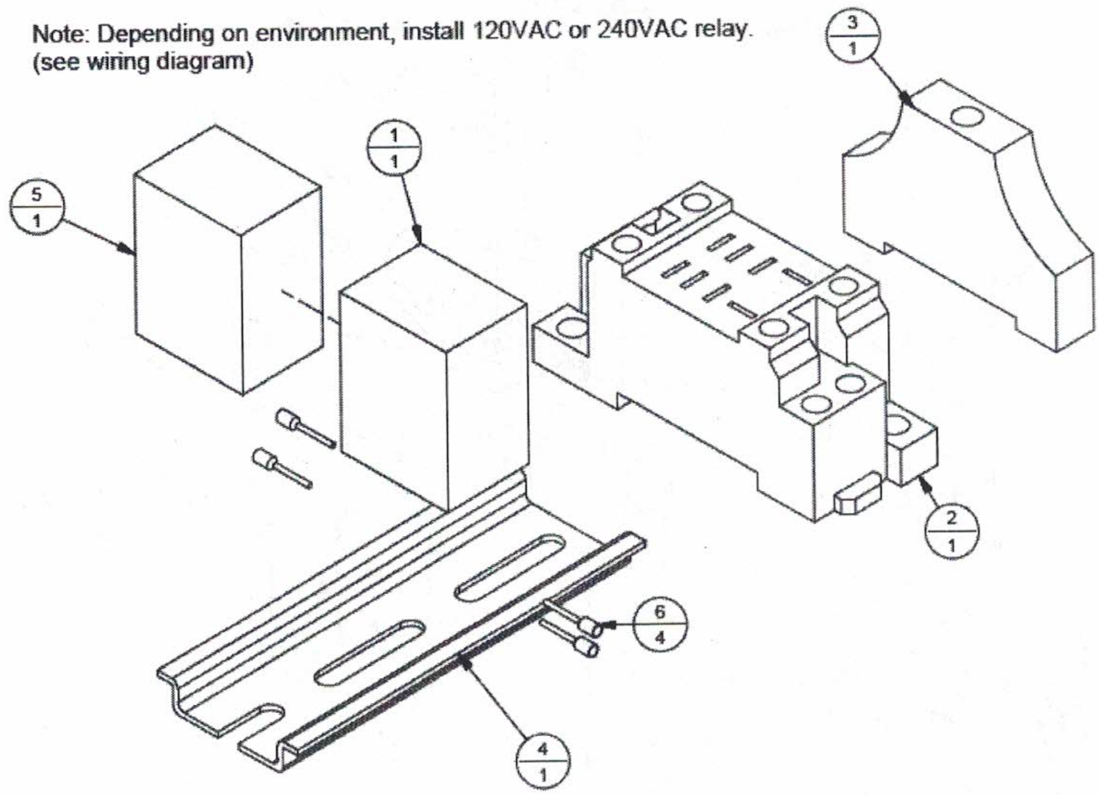


Table A-10: 9101580A – Terminal Block Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	9101570	1 x 3"	Rail, Terminal Block, TS 15	
2	9101573	2	End Stop, Terminal Block, EW 15	
3	9101574	1	End Plate, Terminal Block, AKZ 2.5	
4	9101575	3	Terminal Block, AKZ 2.5	
5	9101580	2	Jumper, AKZ 1.5/AKZ 2.5, Q3	
6	9101662	1	Terminal Block Label, DEK 5	
7	9101688	7	Terminal Block, AKZ 2.5, Blue	

Figure A-10: 9101580A – Terminal Block Assembly, Atom

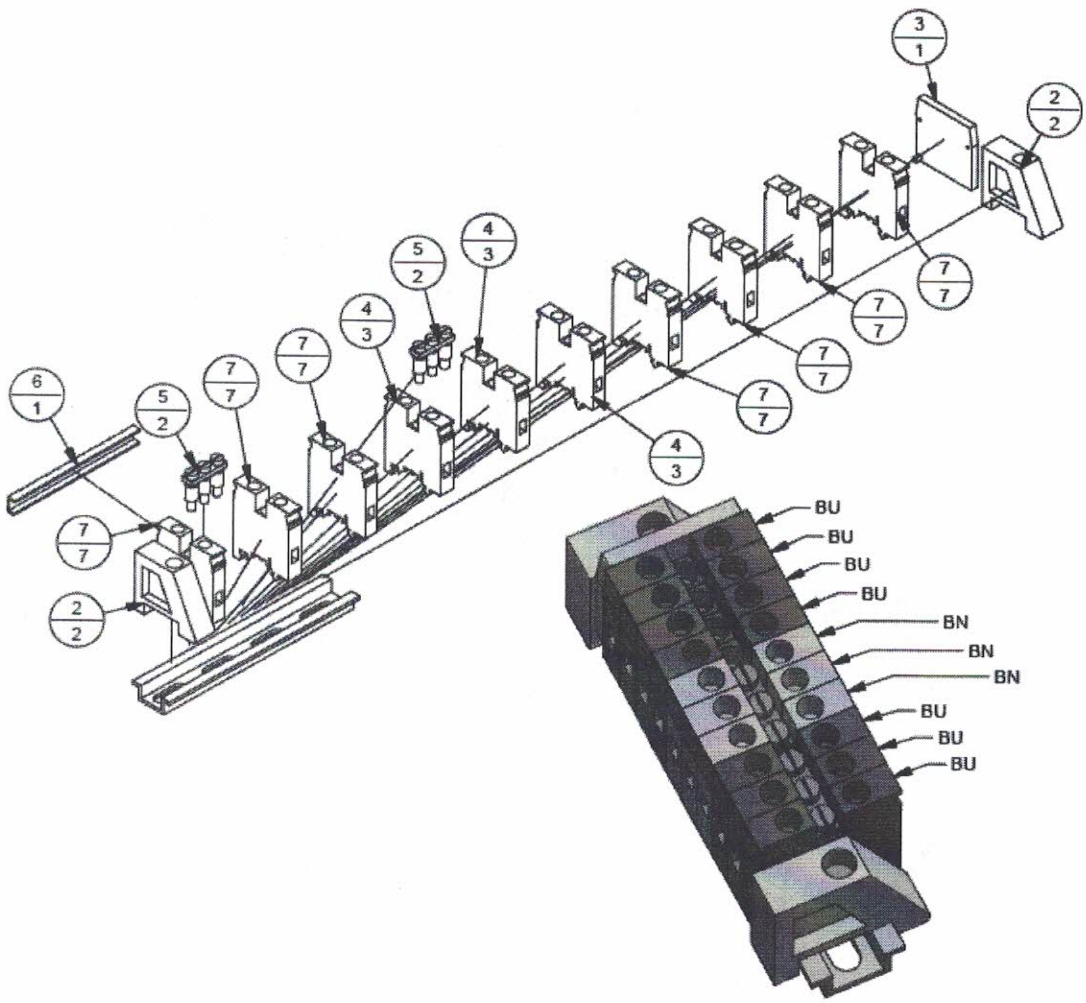


Table A-11: 9105072A – Shield Assembly, Atom 2500, BK230

Item	Part Number	Quantity	Description	Reference
1	9105072	1	Shield, Atom 2500, BK230	
2	9105725	4	Screw, PHMS, 6-32 x ¼", SS, Truss	
3	9106303	1	Subbracket, 2500 Shield	

Figure A-11: 9105072A – Shield Assembly, Atom 2500, BK230

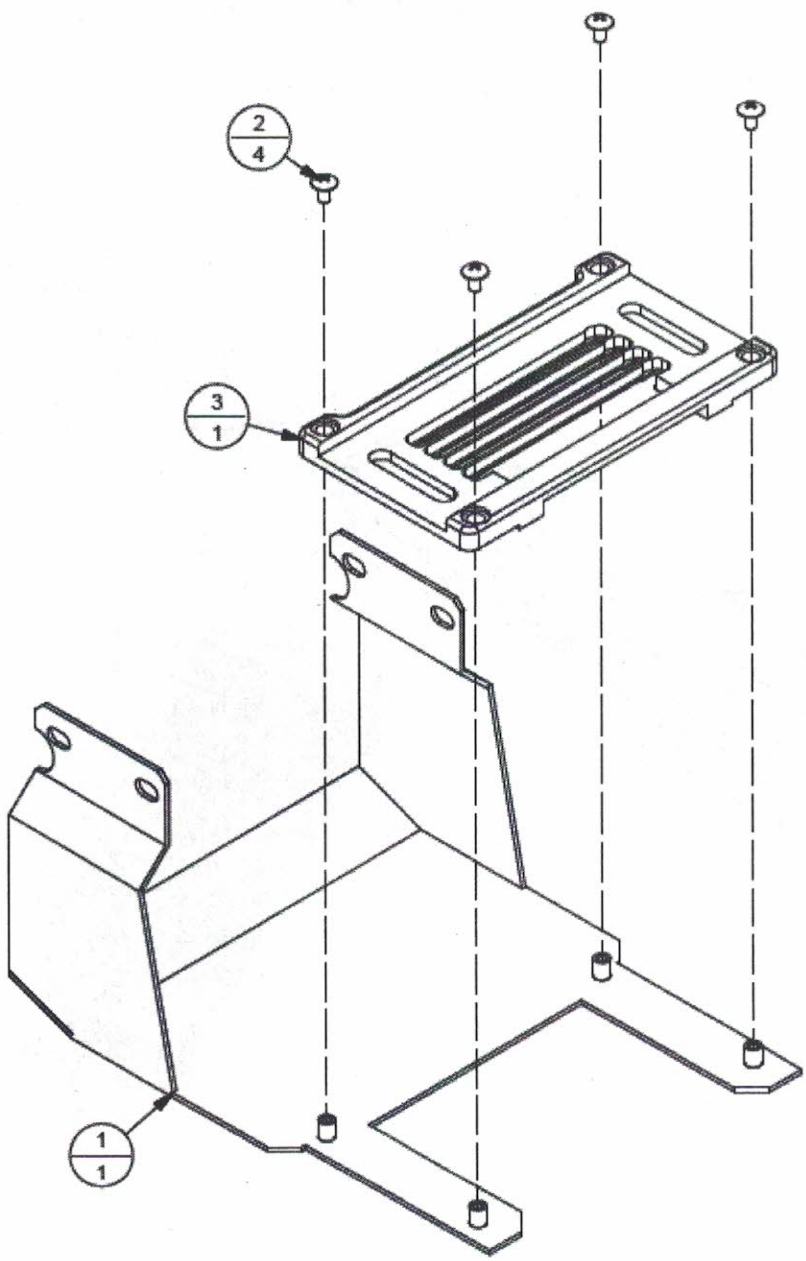


Table A-12: 9107437A – Bottom Plate Assembly, Atom 2500

Item	Part Number	Quantity	Description	Reference
1	403310	4	Screw, PHMS, 8-32 UNC x ¼"	
2	9105778	4	Screw, FPHMS, 8-32 UNC, 1-1/4", SS	
3	9106249	4	Screw, FPHMS, 8-32 UNC, ¾", SS	
4	9106305	2	Cover, Safety	
5	9107437	1	Plate, Bottom Atom 2500	
6	9107438	2	Manifold Support, Atom 2500	
7	9107438A	1	Manifold Assembly, Atom 2500	Page A-15

Figure A-12: 9107437A – Bottom Plate Assembly, Atom 2500

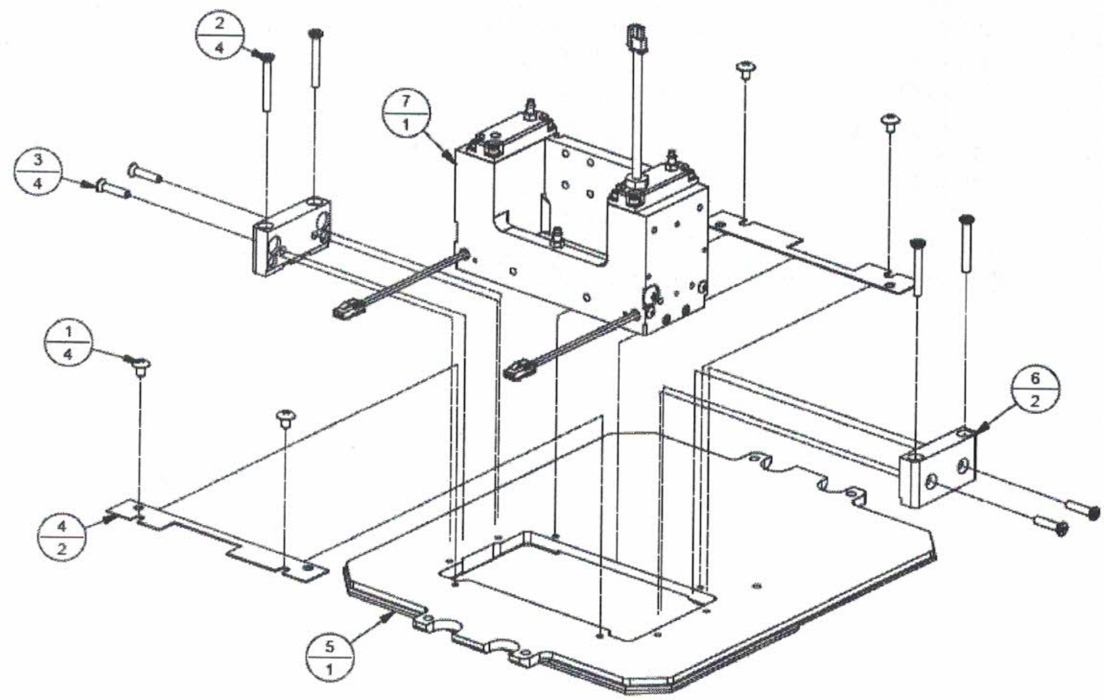


Table A-13: 9107438A – Manifold Assembly, Atom 2500

Item	Part Number	Quantity	Description	Reference
1	9100130A	1	LOIS Assembly, Atom	
2	9102973	3	Fitting, 10-32 UNF x 1/8" ID, Nickel Plated	
3	9103170	2	O-Ring, PC EPDM, 11/32" x 7/32" x 1/16"	
4	9104501	2	Screw, SS, Truss, 10-32 UNF x ½"	
5	9104839	1	O-Ring, PC EPDM, 3/8" x ¼" x 1/16"	
6	9105726	8	Screw, SHCS, M3 x 12 mm, SS	
7	9105748	8	Washer, Flat, SS, M3 Screw	
8	9105749	8	Lockwasher, Disc Spring, #4	
9	9105776	8	Screw, SS, Truss, 4-40 UNC x ¼"	
10	9105827A	1	Blind Cap Block Assembly, Jetting Array	
11	9105829	2	Cover, Integrated Reservoir	
12	9105831	2	O-Ring, PC EPDM, 1-1/4" x 1-3/8" x 1/16"	
13	9105890	1	Screw, HSCS, ¼-20 UNC x 3/8" SS	
14	9106573	1	Bracket, Spring Support, Long	
15	9106574	1	Bracket, Spring Support, Short	
16	9106735	2	Screw, FHCS, 4-40 UNC, ¼" SS, Phillips	
17	9106736	6	Spring, Compression, 0.18" OD	
18	9107150	1	Manifold, Spring Loaded JA	
19	9107826A	2	Heater Cartridge Assembly, Atom	

Figure A-13: 9107438A – Manifold Assembly, Atom 2500

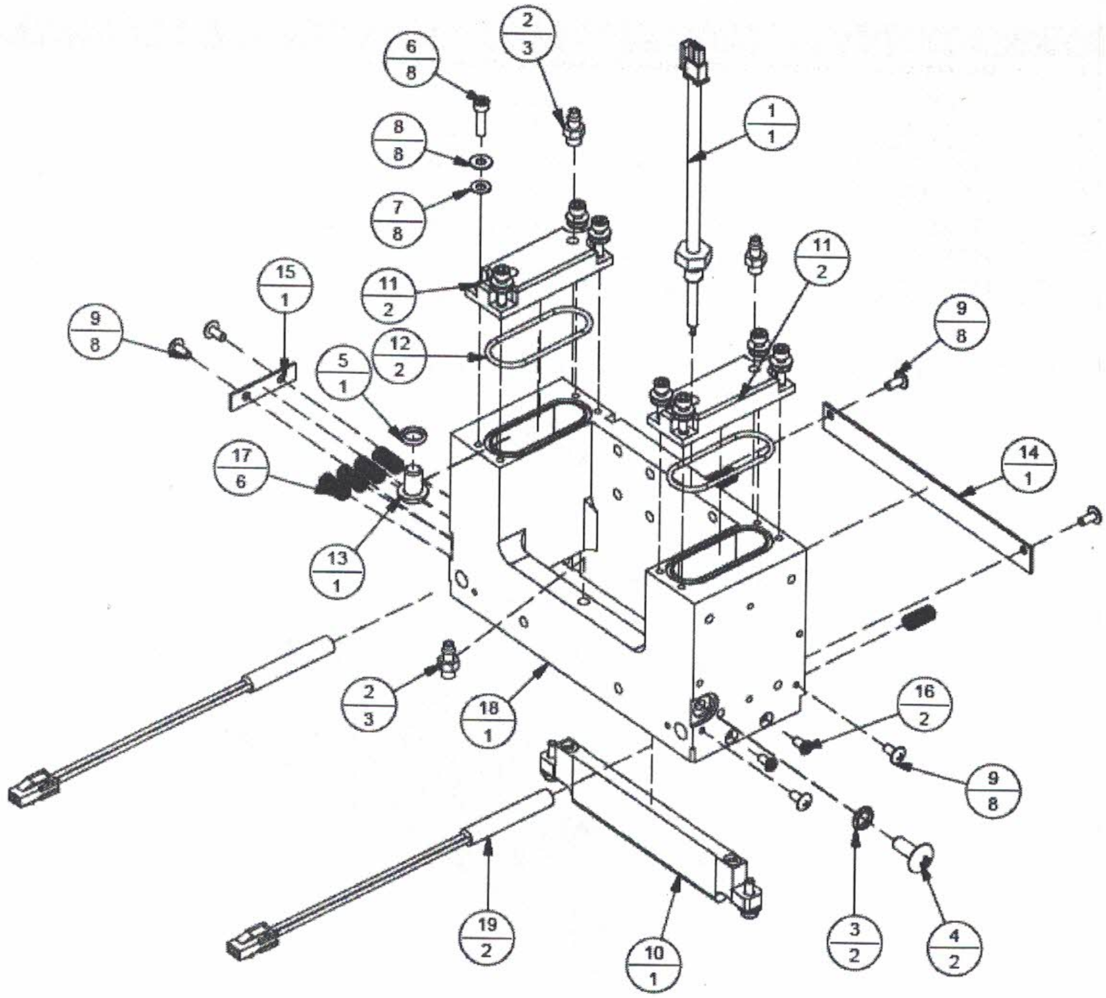


Table A-14: 9107439A – QPI Support Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	401310	6	Screw, PHMS, 4-40 UNC x ¼"	
2	615062	1	Connector, Female, 2-Pin, BLA2	
3	9103435	2	Ferrule, #16 AWG, Red	
4	9105974	6	Washer, #4, Retaining, Nylon	
5	9106159	1	Side Profile, Long	
6	9106249	4	Screw, FPHMS, 8-32 UNC x ¾", SS	
7	9107439	1	Bracket, QPI	
8	9107717	1	Board, QPI	

Figure A-14: 9107439A – QPI Support Assembly, Atom

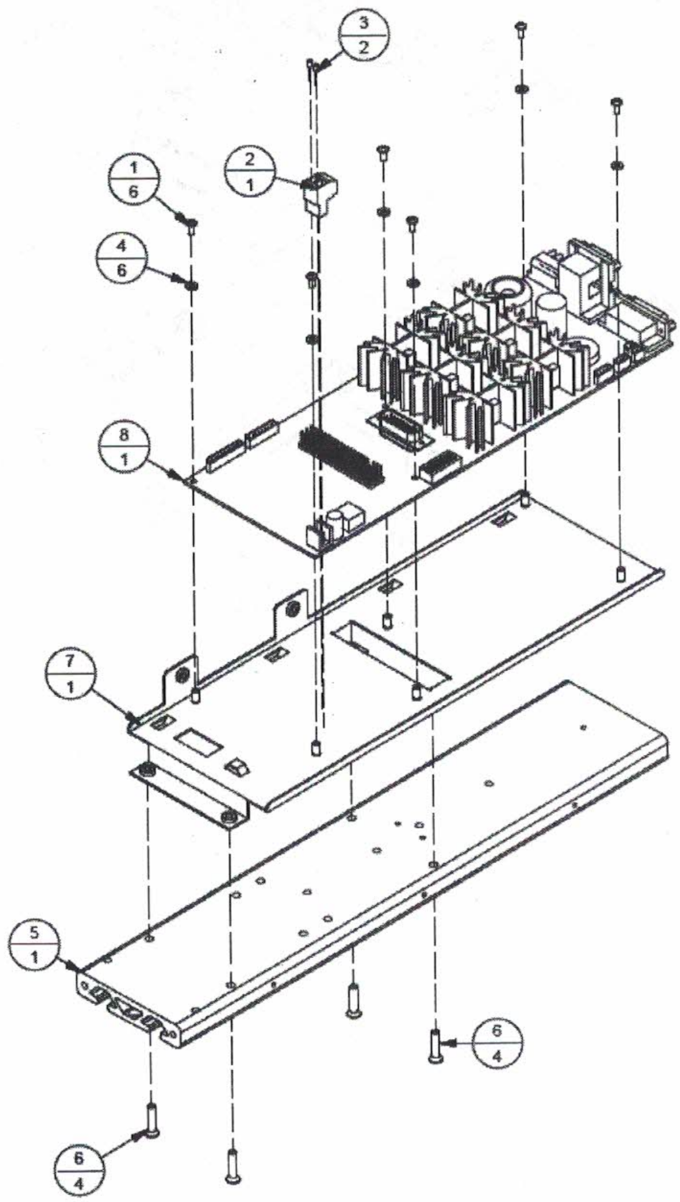


Table A-15: 9107441A – Bottom Plate Assembly, Atom 1025

Item	Part Number	Quantity	Description	Reference
1	9105018	4	Screw, FHMS, 8-32 UNC x 1" Lg, SS	
2	9106249	4	Screw, FPHMS, 8-32 UNC x ¾", SS	
3	9107441	1	Plate, Bottom Atom 1025	
4	9107449	2	Manifold Support, Atom 1025	
5	9107718A	1	Manifold/Reservoir Assembly, Atom 1025	Page A-21

Figure A-15: 9107441A – Bottom Plate Assembly, Atom 1025

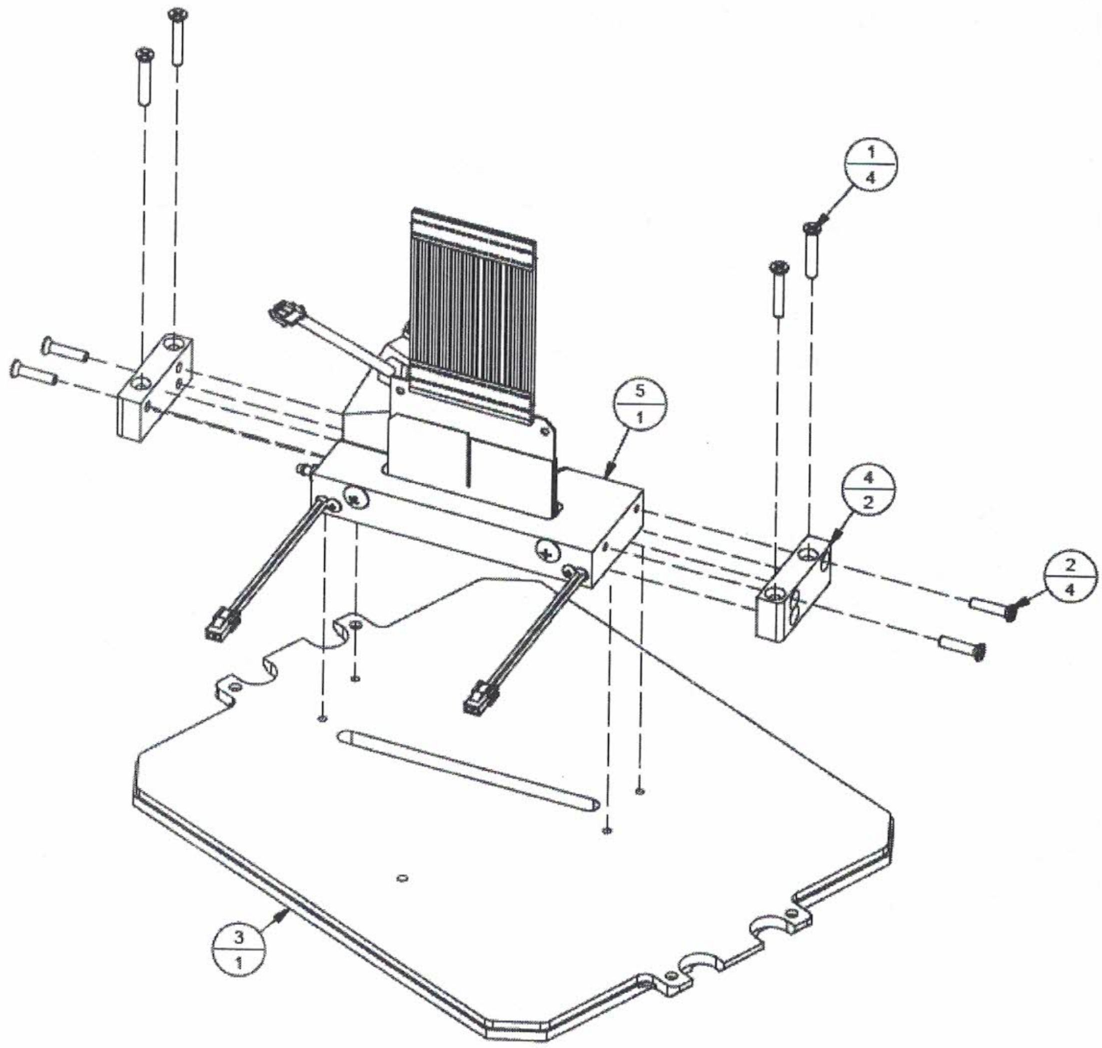


Table A-16: 9107445A – Top Plate Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	403005006	4	Screw, PHMS, M5 x 0.8, 6 mm Lg.	
2	405230	4	Screw, SHCS, ¼-20 UNC x ½"	
3	9102846	2	Handle, Pull, ¼-20	
4	9107445	1	Top Plate, Atom	
5	9107447A	1	Bracket Assembly, QPI Inputs	Page A-20
6	9107921A	1	Bracket Assembly, Atom Input Power	Page A-24

Figure A-16: 9107445A – Top Plate Assembly, Atom

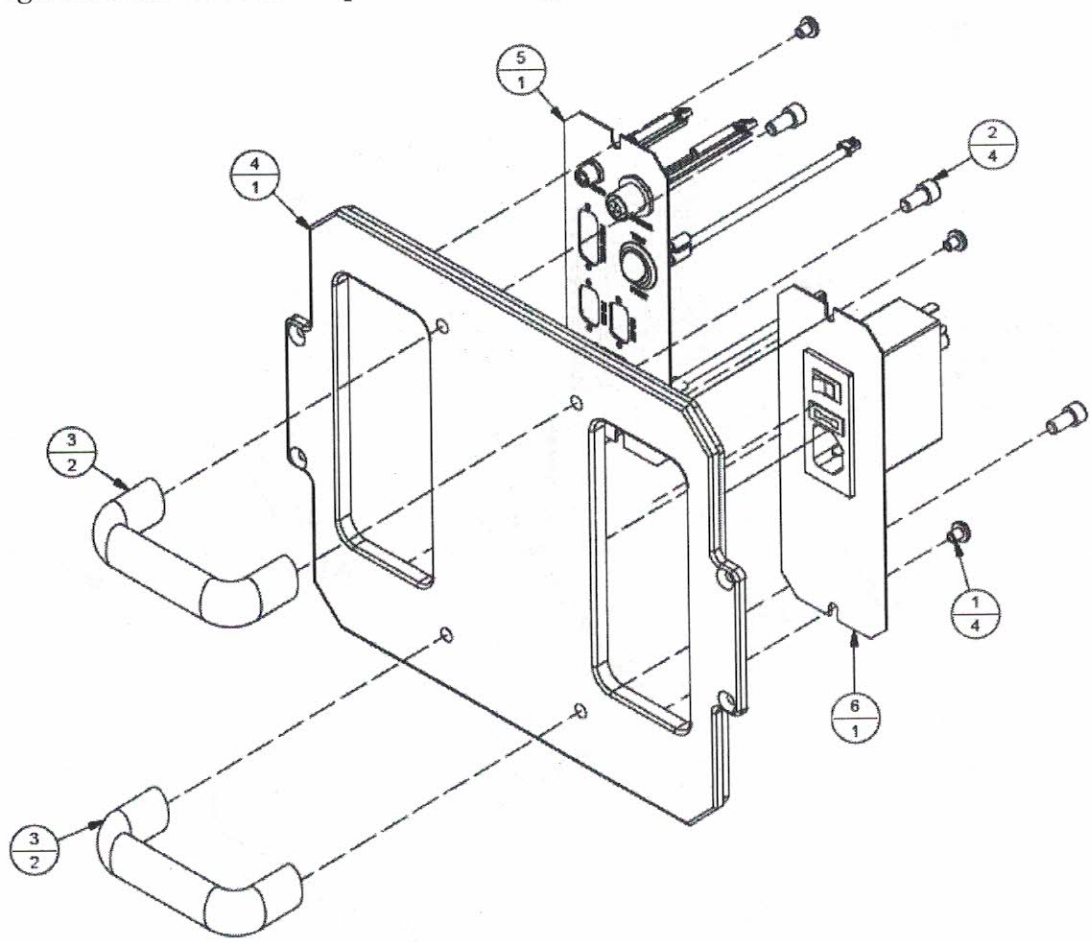


Table A-17: 9107447A – Bracket Assembly, QPI Inputs, Atom

Item	Part Number	Quantity	Description	Reference
1	9105021A	1	Test/Print Switch Cable Assembly	
2	9105837A	1	Switch Assembly, Momentary, Sealed	
3	9107447	1	Bracket, QPI Face Mount	
4	9107935A	1	Connector Assembly, Encoder	Page A-32
5	9108204A	1	Connector Assembly, Photoeye	Page A-36

Figure A-17: 9107447A – Bracket Assembly, QPI Inputs, Atom

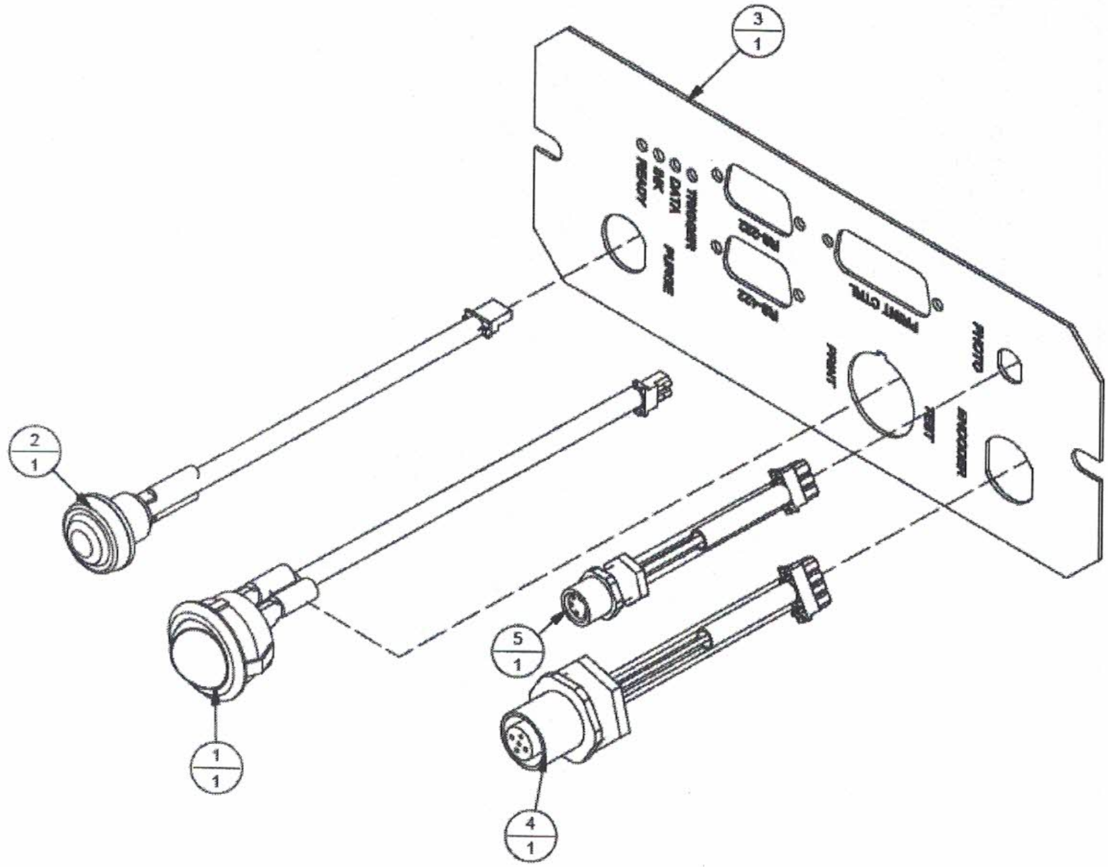


Table A-18: 9107718A - Manifold/Reservoir Assembly, Atom 1025

Item	Part Number	Quantity	Description	Reference
1	9100130A	1	LOIS Assembly, Atom	
2	9102973	4	Fitting, 10-32 UNF x 1/8" ID	
3	9103170	2	O-Ring, PC EPDM, 11/32" x 7/32"	
4	9104839	1	O-Ring, PC EPDM, 3/8" x ¼"	
5	9105019	1	Plug, Threaded, Tapered 10-32, Black Nylon	
6	9105020	2	Screw, PHMS, Truss, 10-32 UNF x ¼"	
7	9105599A	1	Jetting Array Assembly, Atom	
8	9105726	6	Screw, SHCS, M3 x 12 mm, SS	
9	9105748	4	Washer, Flat, SS, M3 Screw	
10	9105749	4	Lockwasher, Disc Spring, #4, Spring Steel	
11	9105776	2	Screw, Truss, 4-40 UNC x ¼", SS	
12	9105829	1	Cover, Integrated Reservoir	
13	9105831	1	O-Ring, PC EPDM, 1-1/4 x 1-3/8"	
14	9105890	1	Screw, HSCS, ¼-20 UNC x 3/8", SS	
15	9107718	1	Block, 1025 Support	
16	9107719	1	Reservoir, 1025	
17	9107826A	2	Heater Cartridge Assembly, 24 VDC	

Figure A-18: 9107718A - Manifold/Reservoir Assembly, Atom 1025

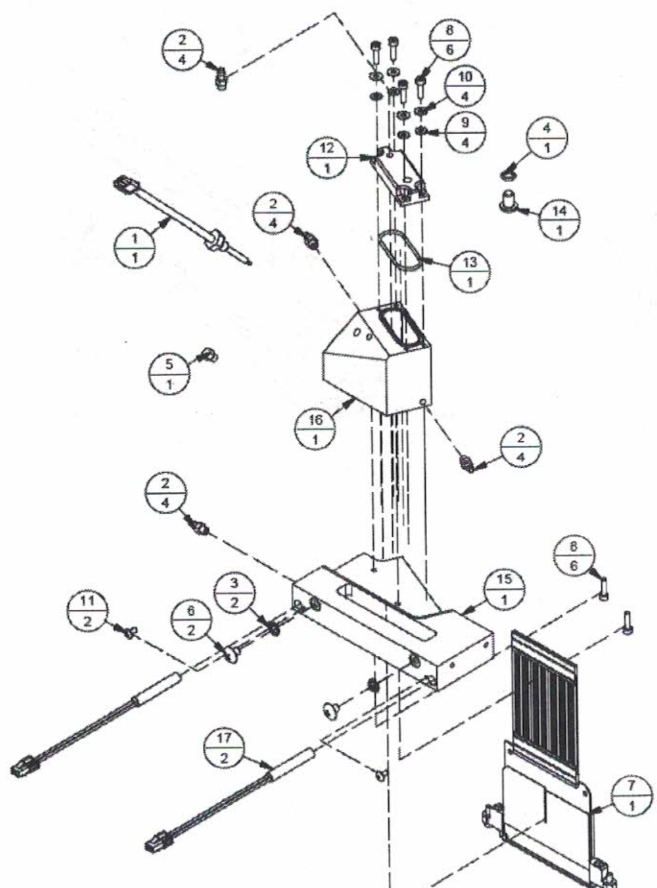
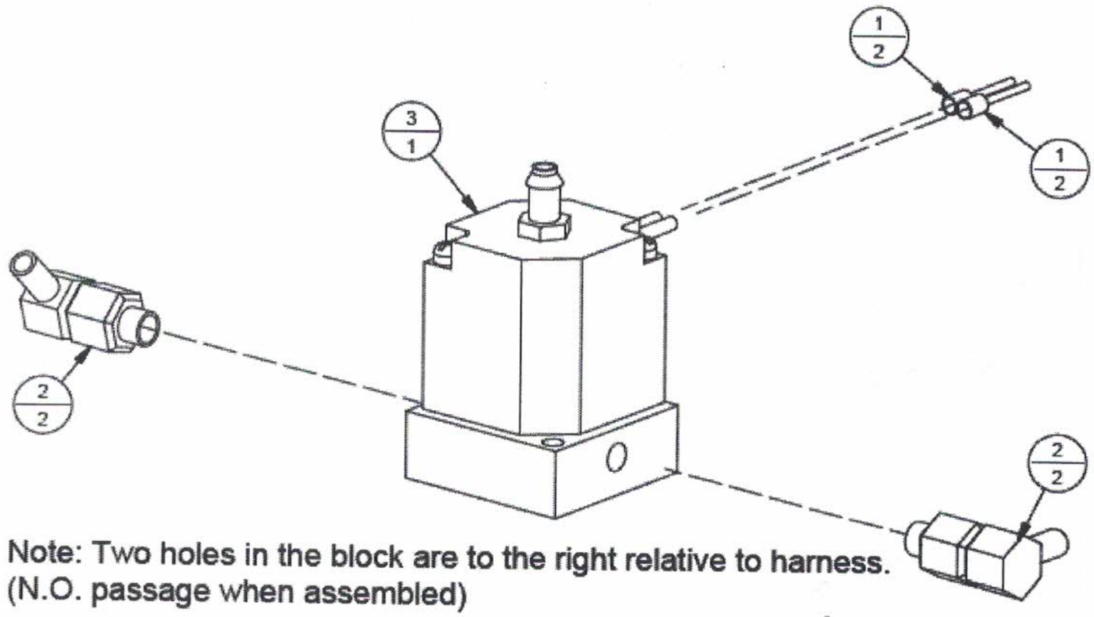


Table A-19: 9107911A – Solenoid Valve Assembly, 3-way, Air

Item	Part Number	Quantity	Description	Reference
1	9103540	2	Ferrule, #24 AWG, Light Blue	
2	9107591	2	Fitting, Ink Elbow Swivel, 10-32 UNF	
3	9107911	1	Solenoid Valve, 3-way, 24 VDC	

Figure A-19: 9107911A – Solenoid Valve Assembly, 3-way, Air



Note: Two holes in the block are to the right relative to harness. (N.O. passage when assembled)

Table A-20: 9107912A – Solenoid Valve Assembly, 2-way, Air

Item	Part Number	Quantity	Description	Reference
1	9103540	2	Ferrule, #24 AWG, Light Blue	
2	9107591	2	Fitting, Ink Elbow Swivel, 10-32 UNF	
3	9107912	1	Solenoid Valve, 2-way, 24 VDC	

Figure A-20: 9107912A – Solenoid Valve Assembly, 2-way, Air

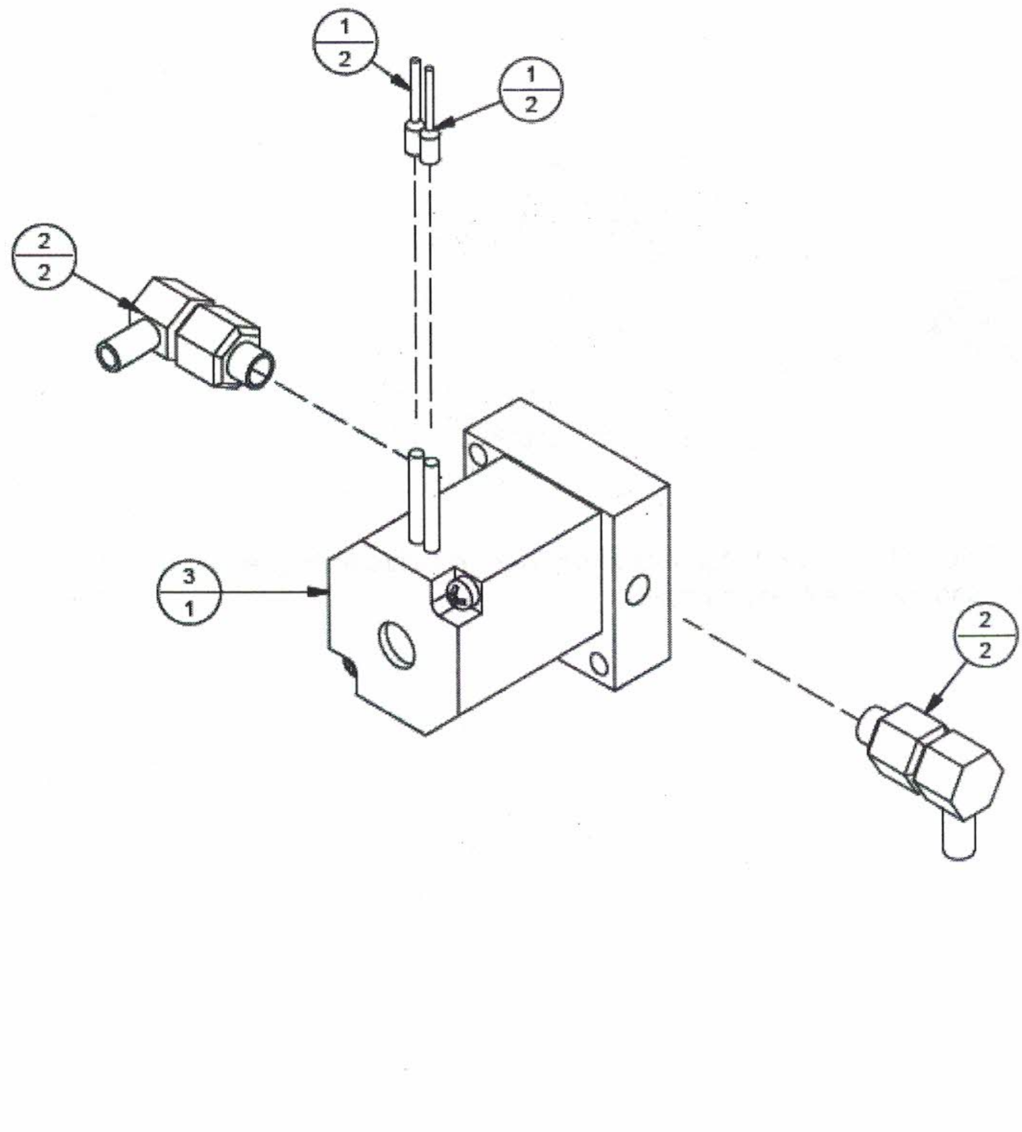


Table A-21: 9107921A – Bracket Assembly, Atom Input Power

Item	Part Number	Quantity	Description	Reference
1	646000	1	Fuse, 3A, 250V, 5 x 20 mm, Slo-Blo	
2	9107921	1	Bracket, Power	
3	9108173	1	Ferrite, Clamp-On, 9.91 mm	
4	9108177	1	EMI Filter	

Figure A-21: 9107921A – Bracket Assembly, Atom Input Power

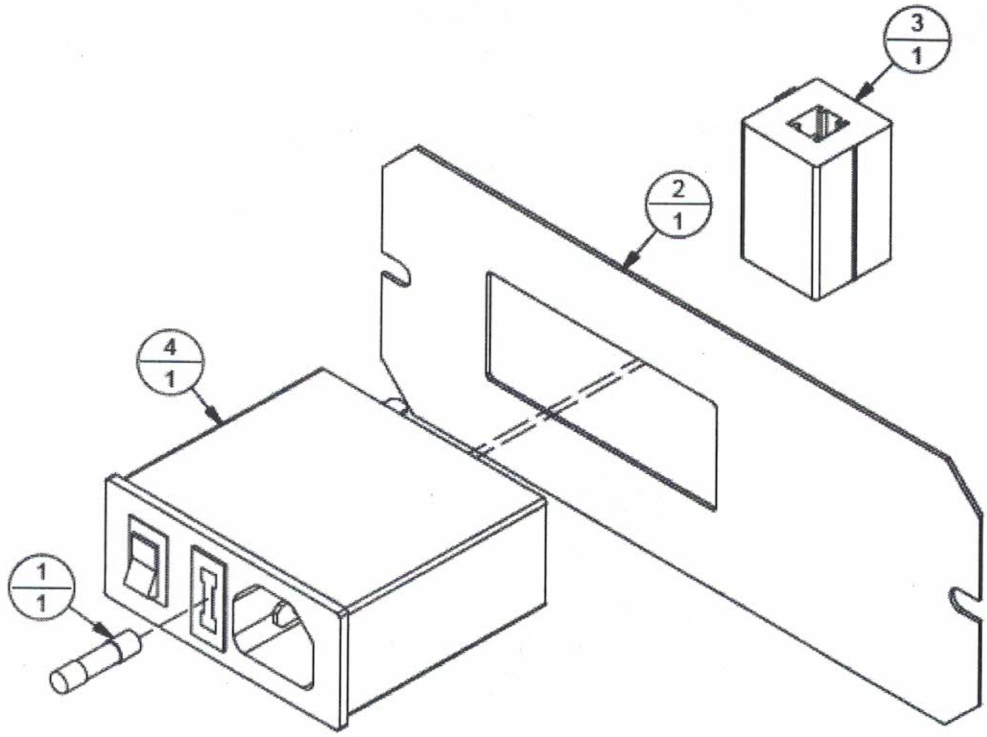


Table A-22: 9107922A – Subbracket Assembly, Ink Tray

Item	Part Number	Quantity	Description	Reference
1	404510SS	9	Screw, BHCS, 10-32 UNF x ¼" SS	
2	9103909	1	Coupling, 3/8" ID, Elbow	
3	9104497	1	Coupling Body, ¼" ID, Panel Mount	
4	9107406	1	Adapter, Coupling Panel Mount	
5	9107922	1	Tray, Ink, Atom	
6	9107923	1	Bracket, Pump Support	
7	9107942	1	Fitting, Elbow Reduction, 3/8" x ¼" ID	
8	9108117	1 x 4.8"	Tubing, Ink, 3/8" OD x ¼" ID, Black	
9	9108118	1 x 1.75"	Tubing, Ink, ½" OD x 3/8" ID, Black	

Figure A-22: 9107922A – Subbracket Assembly, Ink Tray

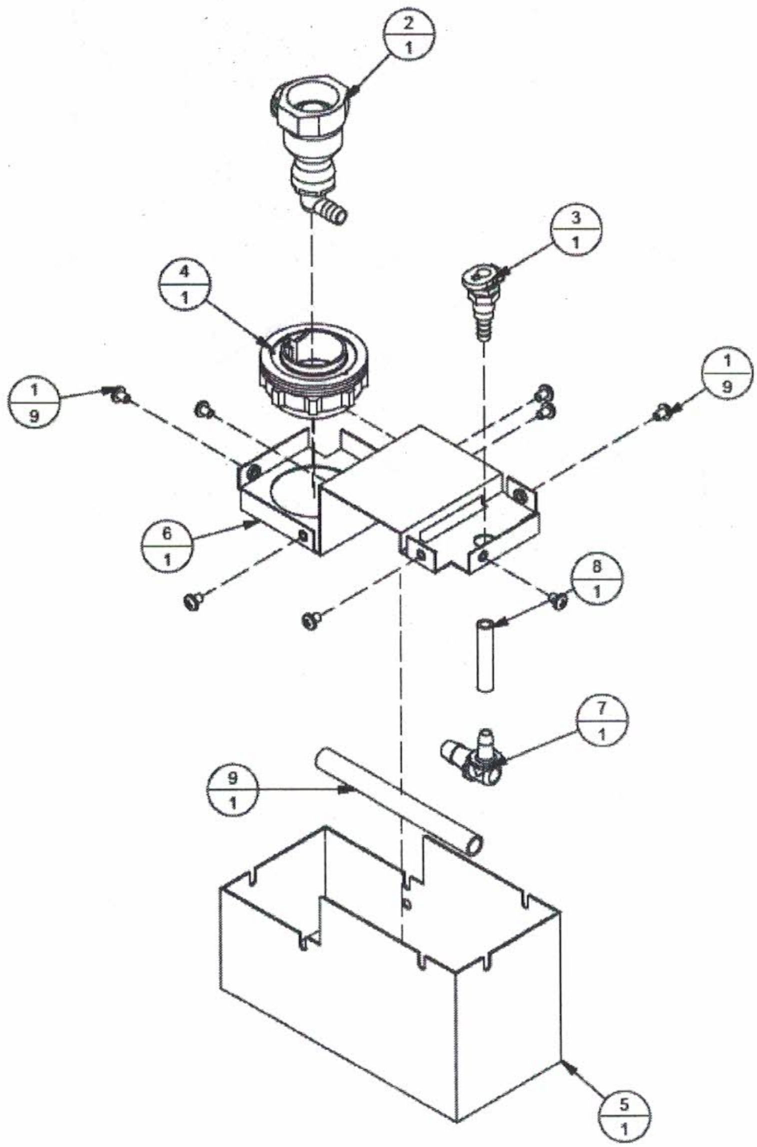


Table A-23: 9107924A – Separator Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	402020	2	Screw, FHCS, 6-32 UNC x 3/8"	
2	402510	2	Screw, BHCS, 6-32 UNC x ¼"	
3	9100120A	1	Fuse/Relay Base Assembly, Atom	Page A-11
4	9101110	2	Hinge, Mini Lift-Off, In-line	
5	9103109	2	Screw, PHMS, Truss, 8-32 UNC x ¼"	
6	9107924	1	Bracket, Separation	

Figure A-23: 9107924A – Separator Assembly, Atom

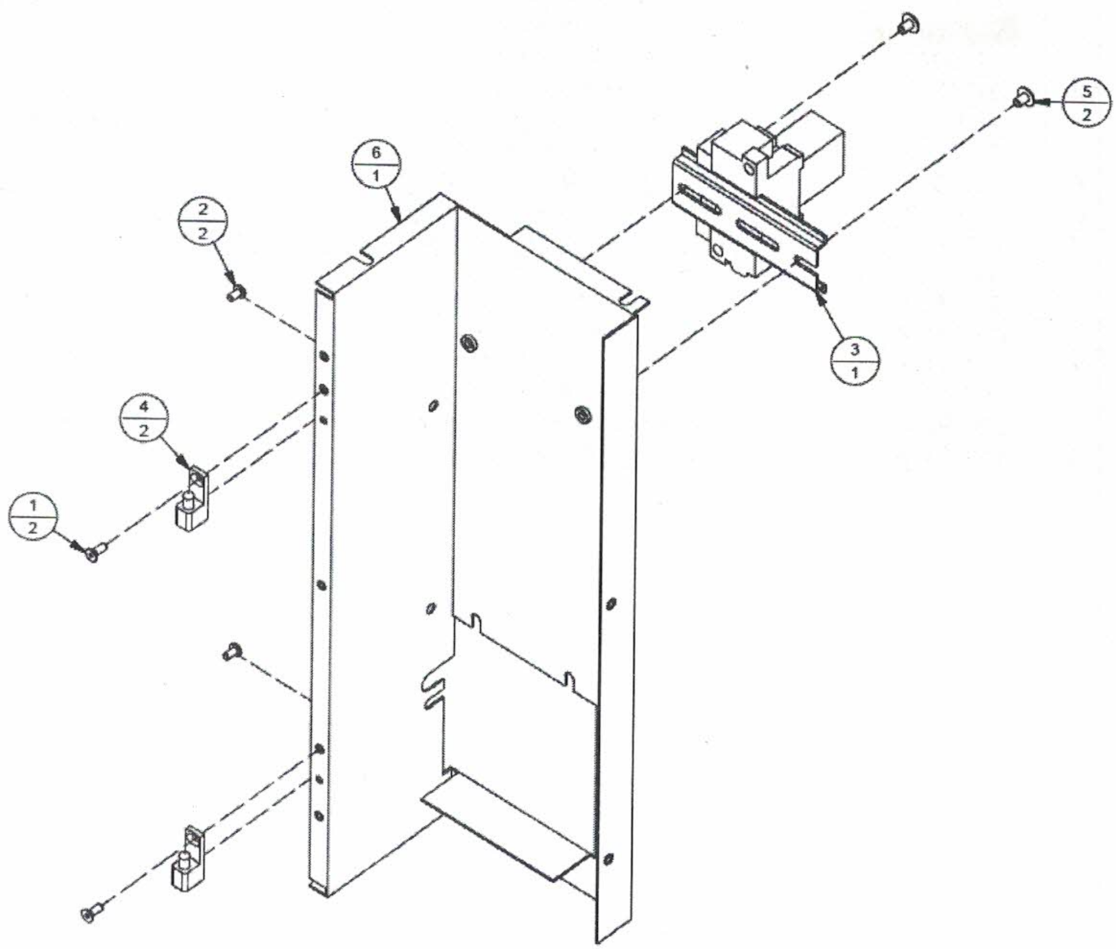


Table A-24: 9107925A – Air/Ink Pump/Power Mount Assembly

Item	Part Number	Quantity	Description	Reference
1	403004006	12	Screw, PHMS, M4 x 0.7 x 6 mm Lg.	
2	403025012	4	Screw, PHMS, M2.5 x 0.45, 12 mm Lg.	
3	609116	5	Terminal, Ring, #10, 22-18 AWG, Red	
4	9100472	1 x 5"	Tubing, Silicone, ¼" OD x 1/8" ID	
5	9100472	1 x 1.35"	Tubing, Silicone, ¼" OD x 1/8" ID	
6	9100472	1 x 2.65"	Tubing, Silicone, ¼" OD x 1/8" ID	
7	9100472	4 x 2.35"	Tubing, Silicone, ¼" OD x 1/8" ID	
8	9100472	1 x 3.25"	Tubing, Silicone, ¼" OD x 1/8" ID	
9	9100472	2 x 3"	Tubing, Silicone, ¼" OD x 1/8" ID	
10	9100965	1	Filter, Air, Meniscus, 0.2 µm	
11	9100971	2	Gripper Clip, Large	
12	9101290	1	Fitting, Tee, 1/8" ID	
13	9101580A	1	Terminal Block Assembly, Atom	Page A-12
14	9102960	2	Valve, Flow Control, 10-32 UNF	
15	9102973	1	Fitting, 10-32 UNF x 1/8" ID	
16	9103712	1	Fitting, Y, 1/8" ID, Black Nylon	
17	9107446	1	Power Supply, 100-240 VAC, 24 VDC Out	
18	9107477	1	Vacuum Filter Body (6 mm)	
19	9107591	2	Fitting, Ink Elbow Swivel, 10-32 UNF	
20	9107911A	1	Solenoid Valve Assembly, 3-Way, Air	Page A-22
21	9107912A	1	Solenoid Valve Assembly, 2-Way, Air	Page A-23
22	9107925	1	Bracket, Air Management	
23	9107926A	1	Ink Pump Bracket Assembly, Atom	Page A-29
24	9107943A	1	Air Pump Assembly, Atom	Page A-34

Figure A-24: 9107925A – Air/Ink Pump/Power Mount Assembly

Note: Meniscus line after filter 9100965 is split for any BK2500 head.

Two 4" silicone tubes and "T" are added at BK2500-AT level.

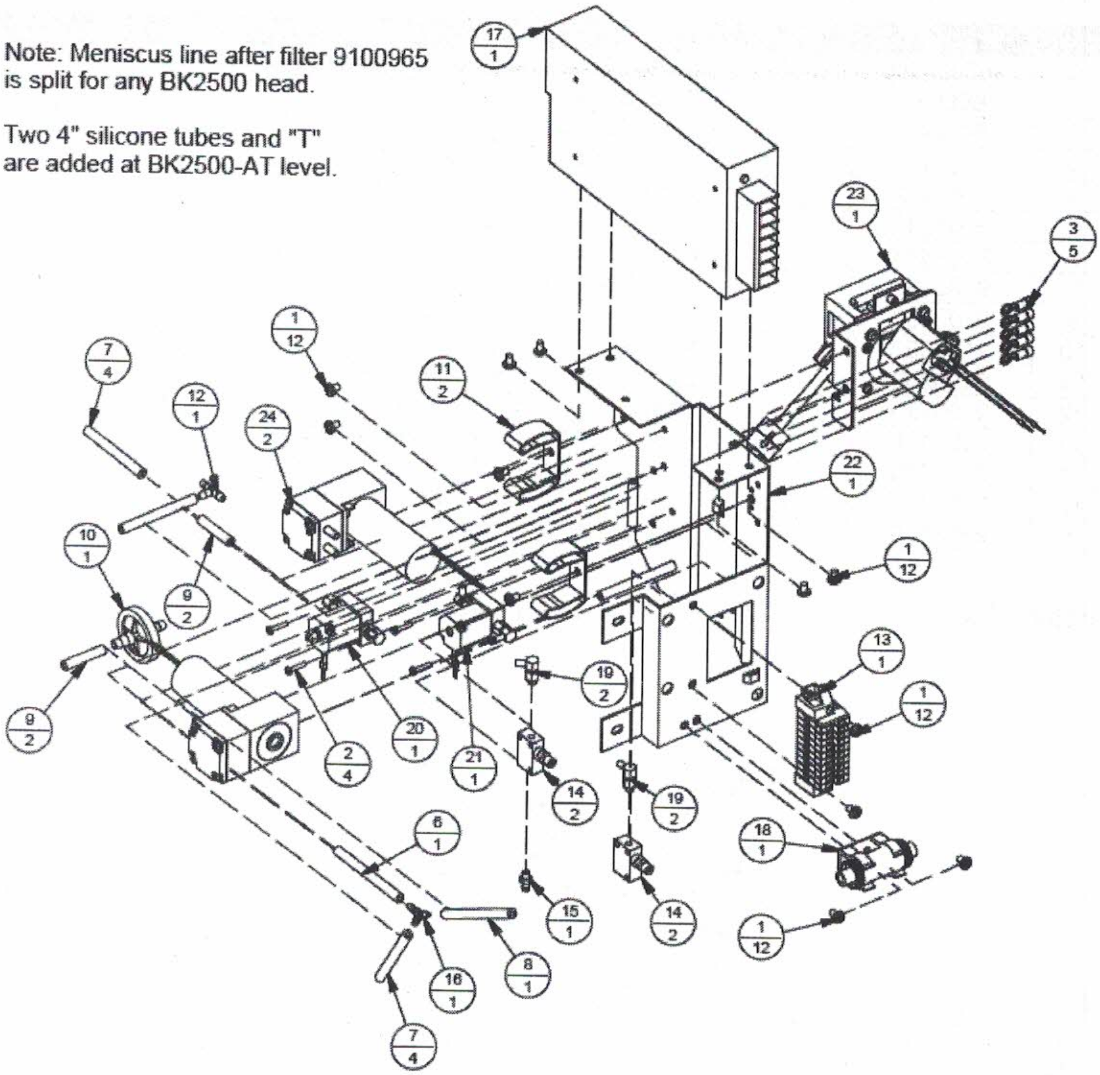
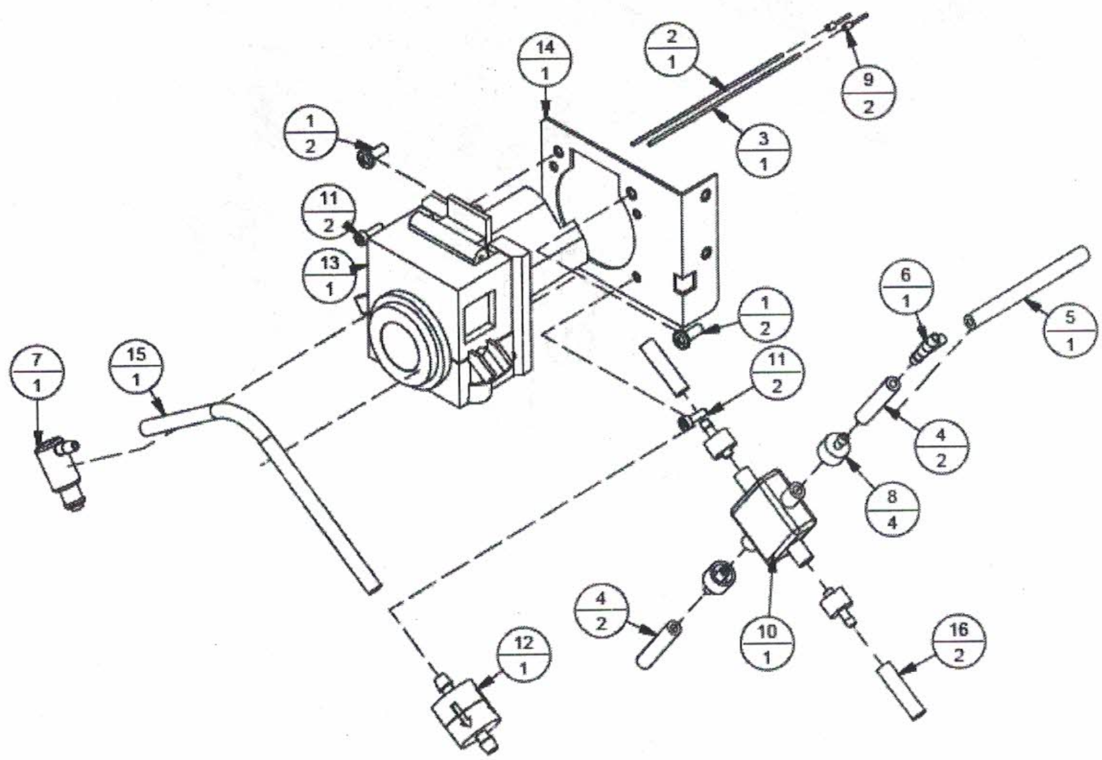


Table A-25: 9107926A – Ink Pump Bracket Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	403004006	2	Screw, PHMS, M4 x 0.7 x 6 mm Lg.	
2	606037	1 x 16"	Wire, Black, #22	
3	606044	1 x 16"	Wire, Red, #22	
4	9100472	2 x 4"	Tubing, Silicone, ¼" OD x 1/8" ID	
5	9100472	1 x 5"	Tubing, Silicone, ¼" OD x 1/8" ID	
6	9101290	1	Fitting, Tee, 1/8" ID	
7	9102626	1	Coupling Insert, Elbow, 1/8" ID, Straight Thru	
8	9103257	4	Luer, Male, 1/8" ID Tubing, Black	
9	9103468	2	Ferrule, #22 AWG, Turquoise	
10	9105992	1	Module, Degassing	
11	9106250	2	Screw, HSCS, M3 x 10 mm, SS	
12	9106790	1	Check Valve, 1/8" ID, Barbed, Red, 1 PSI	
13	9107418	1	Peristaltic Pump, Integrated, 24 VDC	
14	9107926	1	Bracket, Peristaltic Pump Support, Atom	
15	9108116	1 x 9"	Tubing, Ink, ¼" OD x 1/8" ID	
16	9108116	2 x 5"	Tubing, Ink, ¼" OD x 1/8" ID	

Figure A-25: 9107926A – PP Bracket Assembly, Atom



Note: Solder red wire to "+", black to "-".
Wires end on terminal block assembly 9101580A
for proper (clockwise) turning direction.
Red wire to "+24" on QPI, black wire to "UMB A" on QPI.
(see wiring diagram)

Table A-26: 9107927A – Shoe Assembly, Atom 2500

Item	Part Number	Quantity	Description	Reference
1	9105725	4	Screw, PHMS, 6-32 UNC x ¼", SS, Truss	
2	9106303	1	Subbracket, 2500 Shield	
3	9107927	1	Shield, 2500	

Figure A-26: 9107927A – Shoe Assembly, Atom 2500

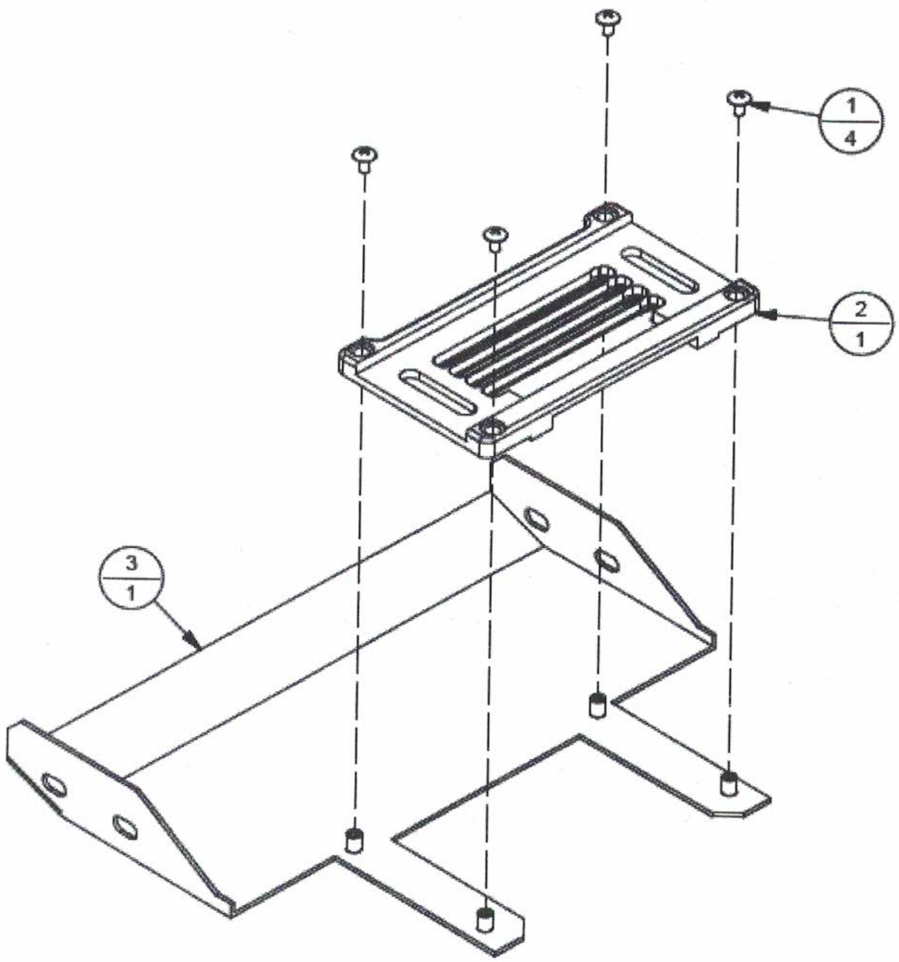


Table A-27: 9107930A – Door Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	9101110	2	Hinge, Mini Lift-Off (Other half in 9107924A)	
2	9107938	1	Magnetic Catch (In 9107938A)	
3	402020	2	Screw, FHCS, 6-32 UNC x 3/8"	
4	402510	2	Screw, BHCS, 6-32 UNC x ¼"	
5	9106735	2	Screw, FHCS, 4-40 UNC, ¼", SS	
6	9107930	1	Door, Atom	

Figure A-27: 9107930A – Door Assembly, Atom

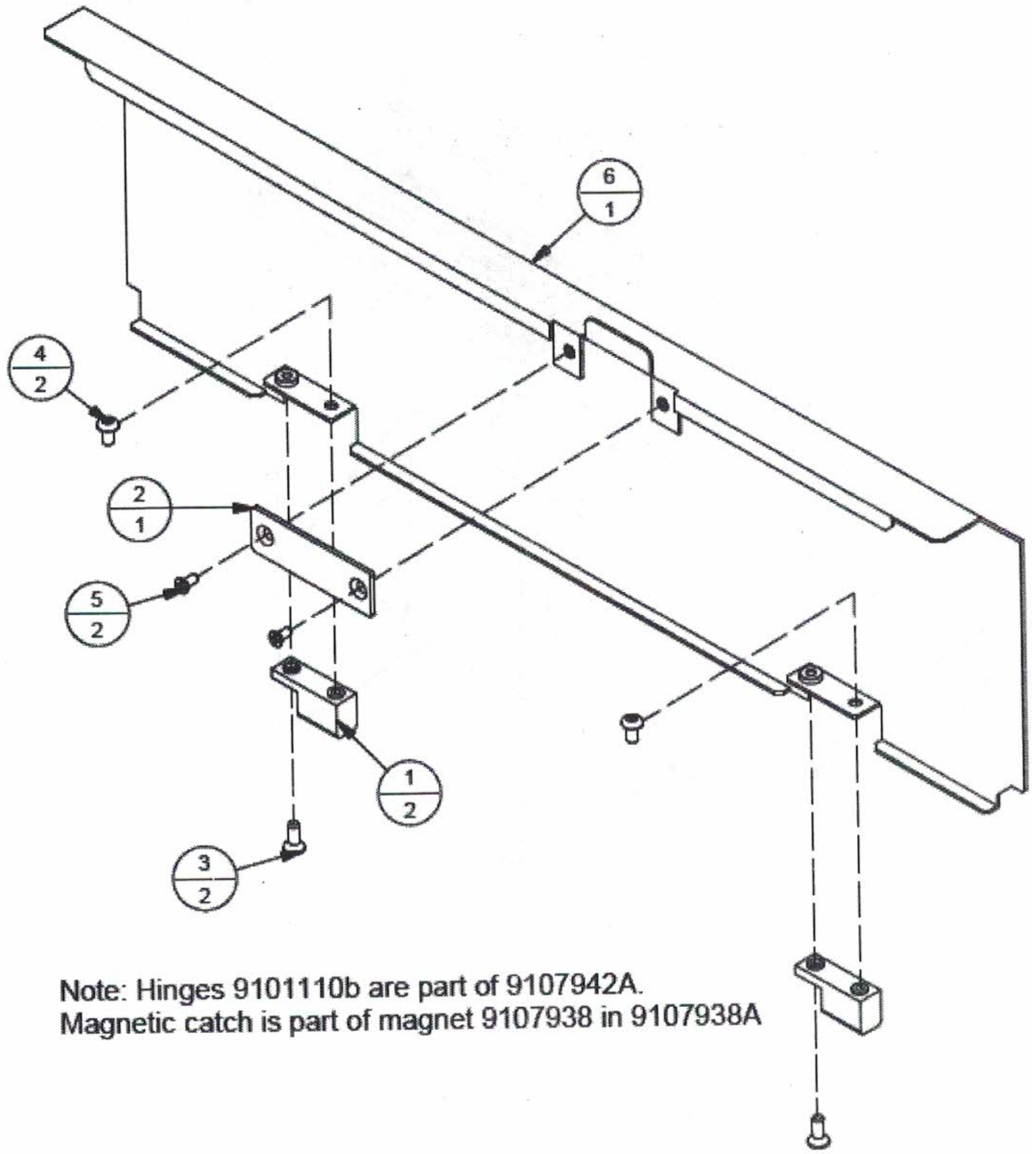


Table A-28: 9107935A – Connector Assembly, Encoder

Item	Part Number	Quantity	Description	Reference
1	609000	200 mm	Shrink Wrap, 3/16" ID	
2	9102565	4	Contact, Female, 28-22 AWG, SPOX	
3	9103190	1	Connector, Female, 4-Pin, Series 5264	
4	9107935	1	Connector, M12 Flange, Female, 5-Pole	
5	9107936	1	Nut, M12	

Figure A-28: 9107935A – Connector Assembly, Encoder

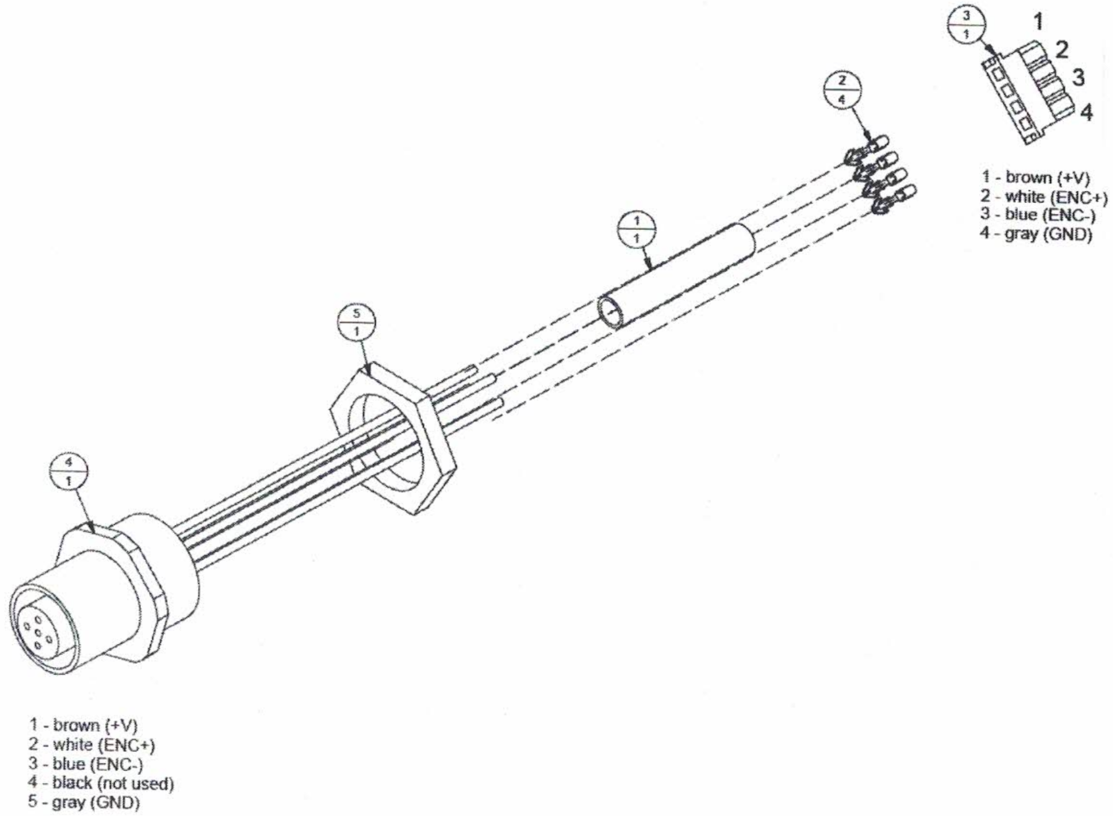


Table A-29: 9107938A – Right Bracket Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	9105776	4	Screw, SS, Truss, 4-40 UNC x ¼"	
2	9105974	4	Washer, #4, Retaining, Nylon	
3	9106388	1	Bracket, Door Mount, Long Right	
4	9107938	1	Magnetic Catch, Low Force	
5	9107939	1	Bracket, Adjustable Magnetic Catch	

Figure A-29: 9107938A – Right Bracket Assembly, Atom

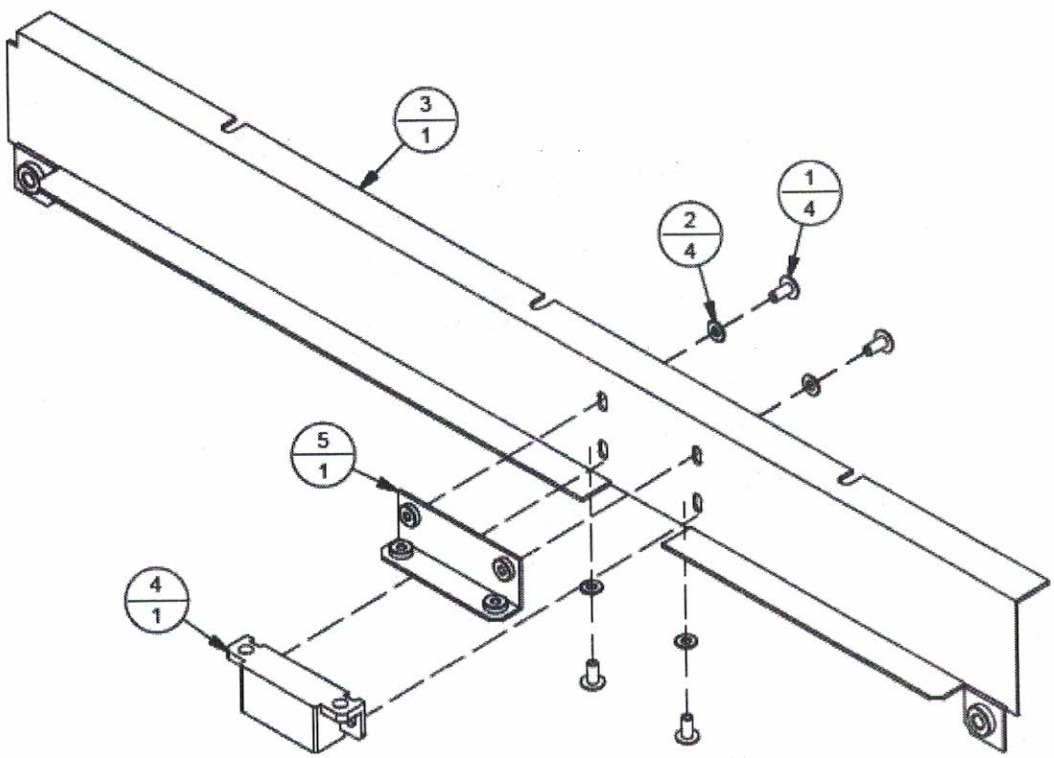


Table A-30: 9107943A – Air Pump Assembly, Atom

Item	Part Number	Quantity	Description	Reference
1	9103468	2	Ferrule, #22 AWG, Turquoise	
2	9107943	1	Pump, Air, 24VDC, Brushless	

Figure A-30: 9107943A – Air Pump Assembly, Atom

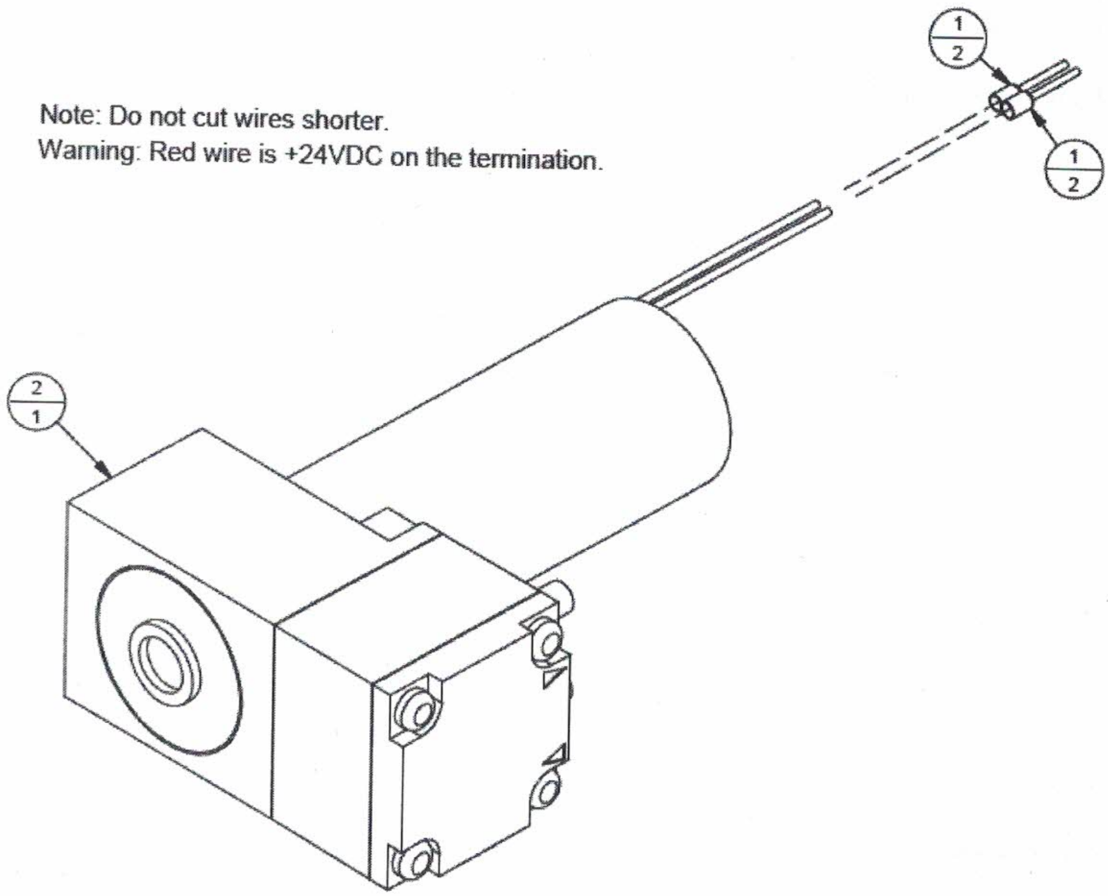


Table A-31: 9107945A – Cable Assembly, Encoder

Item	Part Number	Quantity	Description	Reference
1	609003	1 x 2.5"	Shrink Wrap, 3/8" ID	
2	609004	4 x 0.5"	Shrink Wrap, 1/8" ID	
3	614006	4	Contact, Female, 24-18 AWG, Mate-n-lok	
4	614007	1	Connector, 4-Pin, Socket Housing, Mate-n-lok	
5	9103468	4	Ferrule, #22 AWG, Turquoise	
6	9107945	1	Cordset, M12, Male, Straight, 5-Pole	

Figure A-31: 9107945A – Cable Assembly, Encoder

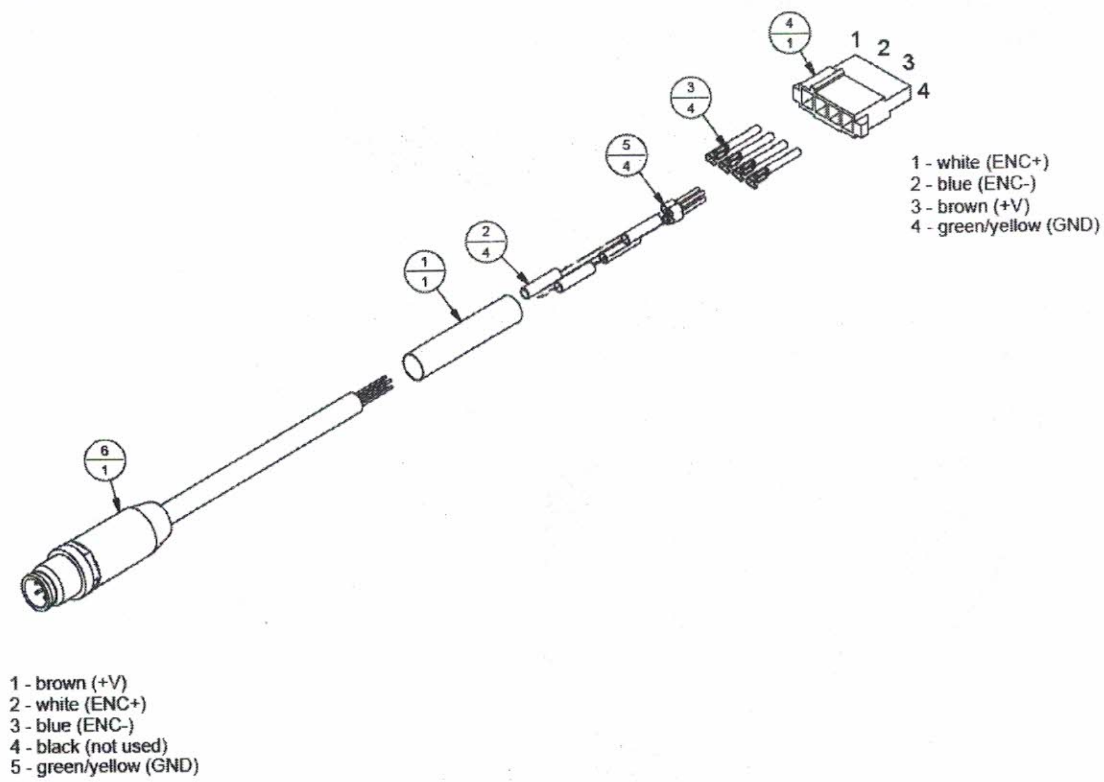


Table A-32: 9108204A – Connector Assembly, Photoeye

Item	Part Number	Quantity	Description	Reference
1	609000	200 mm	Shrink Wrap, 3/16" ID	
2	9102565	3	Contact, Female, 28-22 AWG, SPOX	
3	9105210	1	Connector, Female, 3-Pin, Series 5264	
4	9108204	1	Connector, M8 Flange, Female, 4-Pole	
5	9108205	1	Nut, M8	

Figure A-32: 9108204A – Connector Assembly, Photoeye

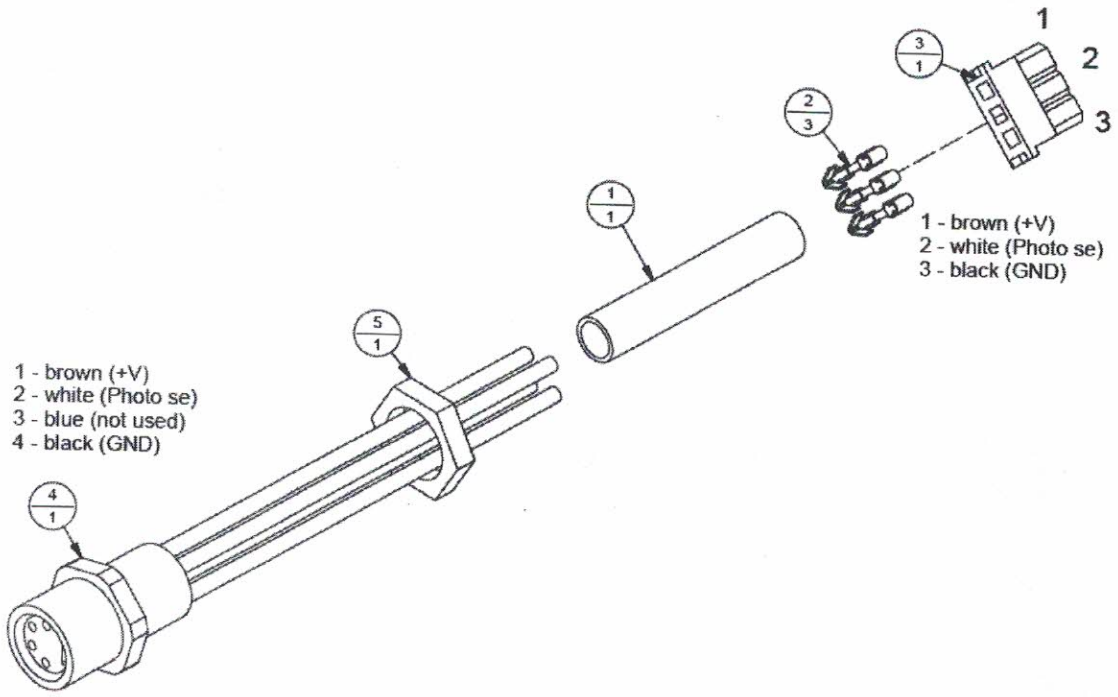


Table A-33: 9108206A – Cable Assembly, Photoeye

Item	Part Number	Quantity	Description	Reference
1	609003	1 x 2.5"	Shrink Wrap, 3/8" ID	
2	609004	3 x 0.5"	Shrink Wrap, 1/8" ID	
3	614002	3	Female Contact, Socket	
4	614003	1	Cap Receptacle	
5	9103468	3	Ferrule, #22 AWG, Turquoise	
6	9108206	1	Cordset, M8, Male, Straight, Shielded, 4-Pole	

Figure A-33: 9108206A – Cable Assembly, Photoeye

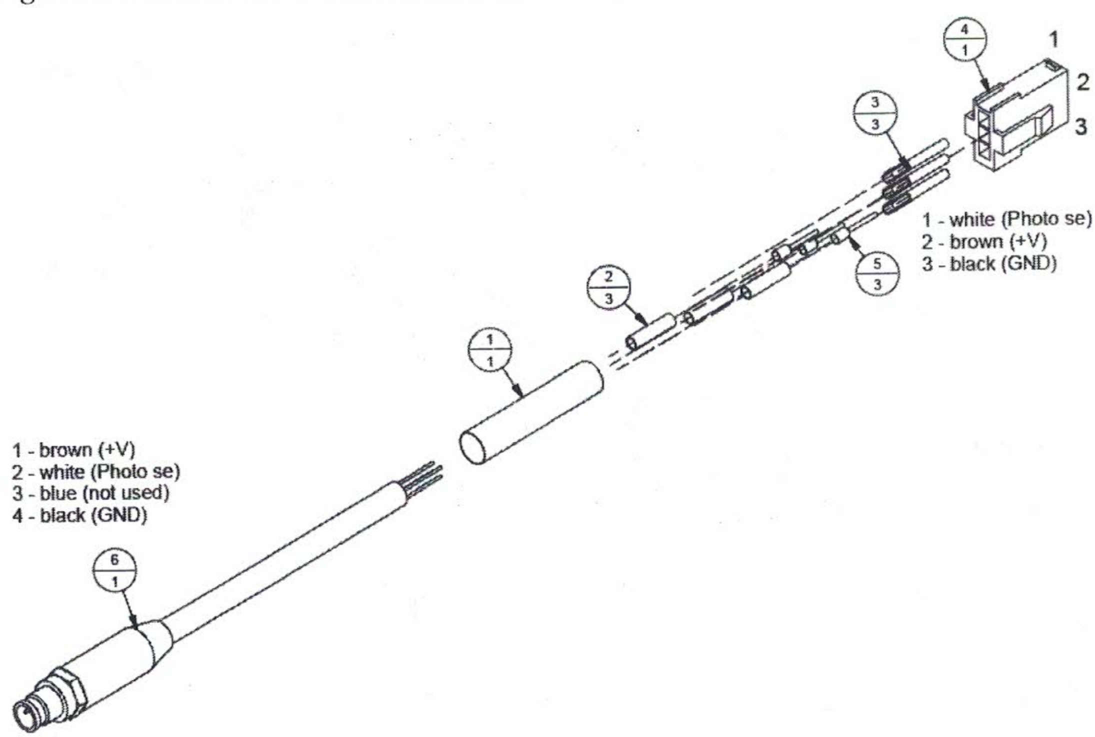
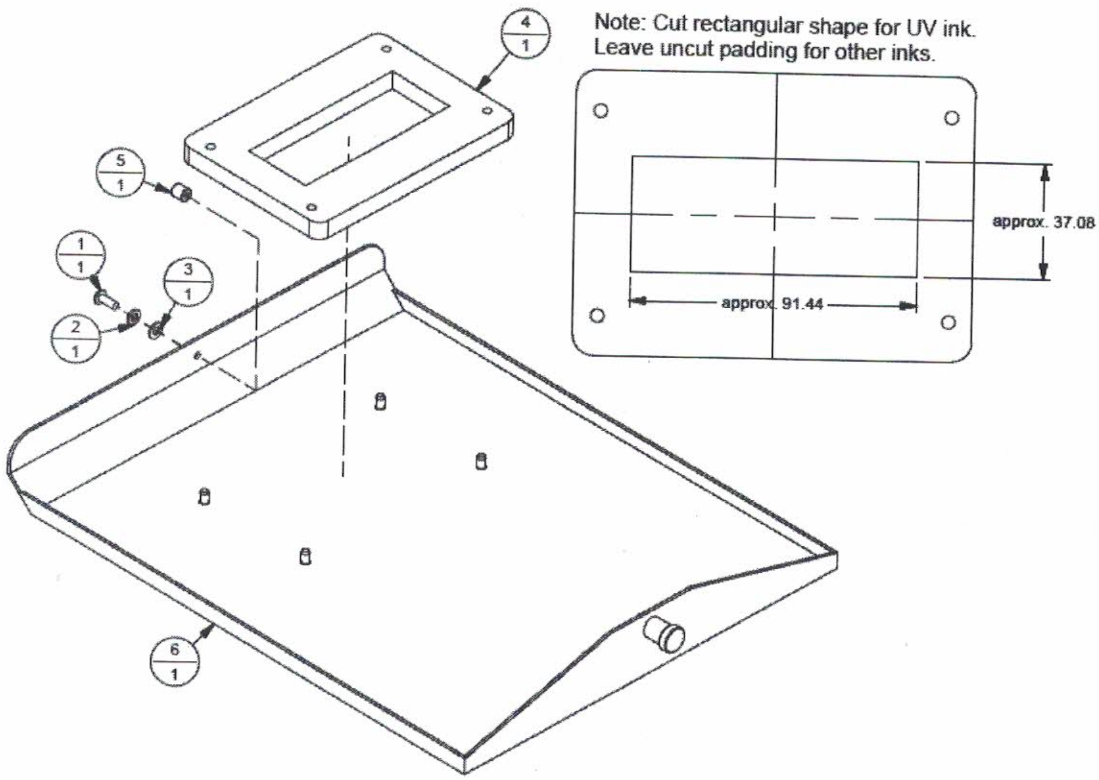


Table A-34: 9108208A – Cap Assembly, 2500 Atom

Item	Part Number	Quantity	Description	Reference
1	402320	1	Screw, PHMS, 6-32 UNC x 3/8"	
2	439006	1	Lockwasher, #6	
3	440005	1	Washer, #6	
4	9104593	1	Padding, EPDM Foam, 3/8" +/- 0.8 mm	
5	9105979	1	Spacer, Round, Aluminum, 6-32 UNC	
6	9108208	1	Cap, Parking, 2500 Atom	

Figure A-34: 9108208A – Cap Assembly, 2500 Atom

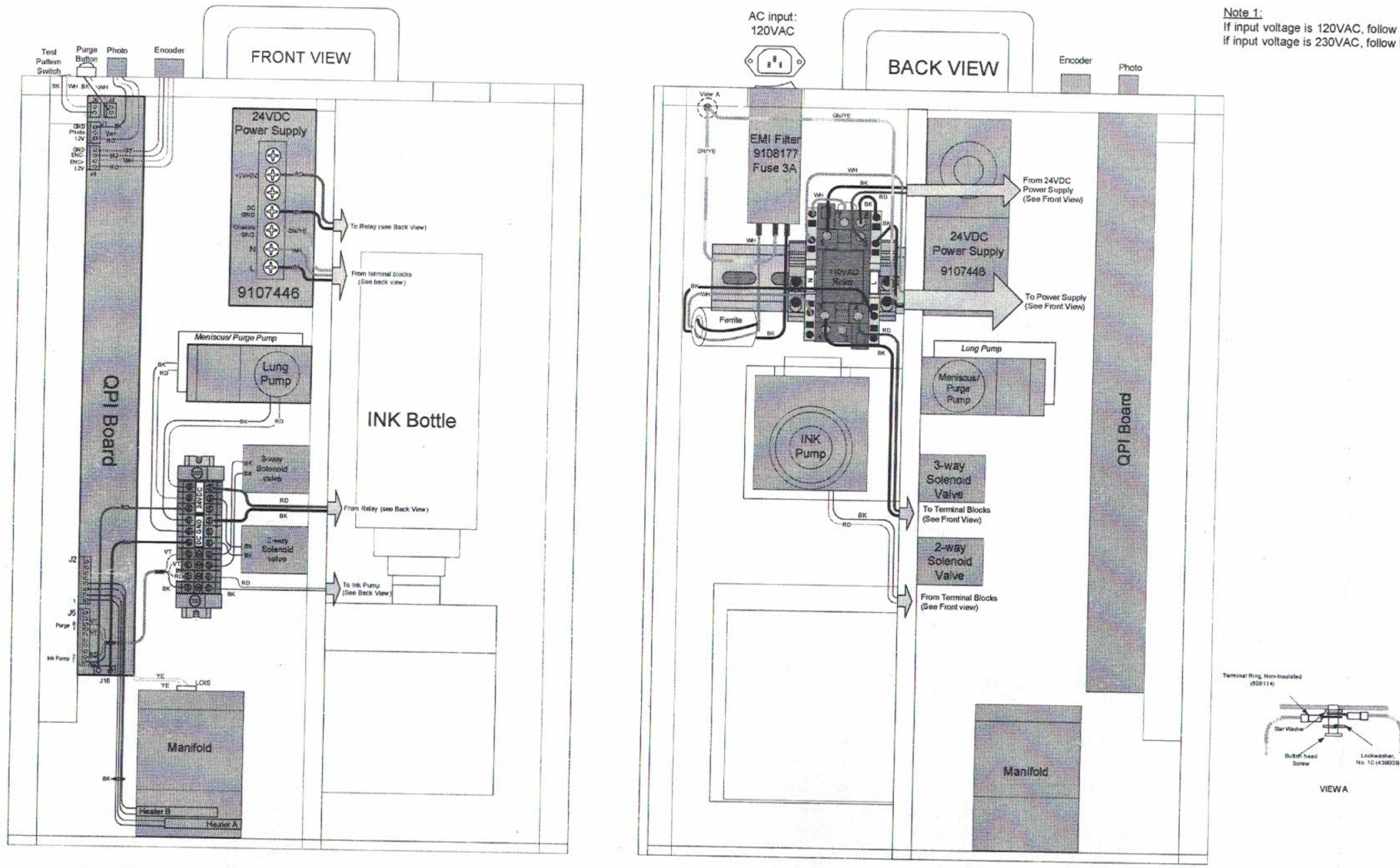


Electrical Drawings

Appendix B

List of Schematics

Figure B-1: 9107439AC – Atom Wiring Diagram, 120VAC



Note 1:
If input voltage is 120VAC, follow Page 1.
If input voltage is 230VAC, follow Page 2.

Figure B-2: 9107439AC – Atom Wiring Diagram, 230VAC

Note 1:
If input voltage is 120VAC, follow Page 1.
If input voltage is 230VAC, follow Page 2.