

Atom Print System User's Guide

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Manual History

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1.0	General Information	1-0
1.1	Description	1-1
1.2	Ink Options.....	1-3
1.2.1	Monet Ink.....	1-3
1.2.2	Cezanne Ink	1-3
1.2.3	Renoir Ink	1-3
1.3	Printhead Drawings.....	1-4
1.3.1	Printhead Dimensions (M83 Mount)	1-4
1.3.2	Printhead Dimensions (230 Mount).....	1-5
2.0	Atom Setup and Use.....	2-0
2.1	Introduction	2-1
2.2	Software Setup	2-1
2.2.1	Computer Requirements	2-11
2.3	QPI Board	2-12
2.3.1	QPI LED Functions.....	2-12
2.3.2	QPI DIP Switch Settings.....	2-13
2.4	Compose IQ.....	2-14
2.4.1	Send PDL (Page Definition Language)	2-14
2.4.2	Firmware Updates.....	2-16
2.4.3	Diagnostics Screen.....	2-17
2.5	Factors that Affect Production Rates	2-18
2.6	Printhead Adjustments	2-19
2.7	Purging the Printhead	2-21
2.7.1	Wet Wiping	2-22
2.8	Air Management.....	2-23
2.8.1	Purge Pressure.....	2-23
2.8.2	Lung Vacuum.....	2-23
2.8.3	Meniscus Vacuum.....	2-23
2.9	Regular Maintenance	2-23
2.9.1	Daily Shut-down	2-23
2.9.2	Printhead Regular Maintenance.....	2-24
2.9.3	Regular Maintenance	2-24
3.0	Ink Options	3-0
3.1	Monet / Cezanne Ink	3-1
3.2	Renoir Ink	3-2
3.2.1	Stray UV Light.....	3-2
3.3	Ink Information, Safety, Handling, and Storage	3-2

4.0 Troubleshooting.....4-0

4.1 Troubleshooting Guide 4-1

4.1.1	When I insert text, it appears like a horizontal line	4-1
4.1.2	My Layout and/or setting changes did not take effect.....	4-2
4.1.3	The Send PDL command does nothing	4-2
4.1.4	I get blank pieces or my print is cut off	4-3
4.1.5	The end of my text or barcodes print consistently lighter	4-3
4.1.6	The Ink light is solid	4-3
4.1.7	The image appears compressed vertically	4-4
4.1.8	One array is continuously firing while the other two print normally	4-5
4.1.9	Print is stretched vertically and one array is continuously firing	4-6
4.1.10	Nothing is printing at all.....	4-7
4.1.11	Part of my layout is not printing.....	4-8
4.1.12	My Purge Button isn't working	4-8
4.1.13	Compose is not receiving feedback from the Atom	4-8
4.1.14	My Print shifts off the piece when I increase the transport speed.....	4-8

Appendix A – Assembly Drawings

Appendix B – Electrical Drawings

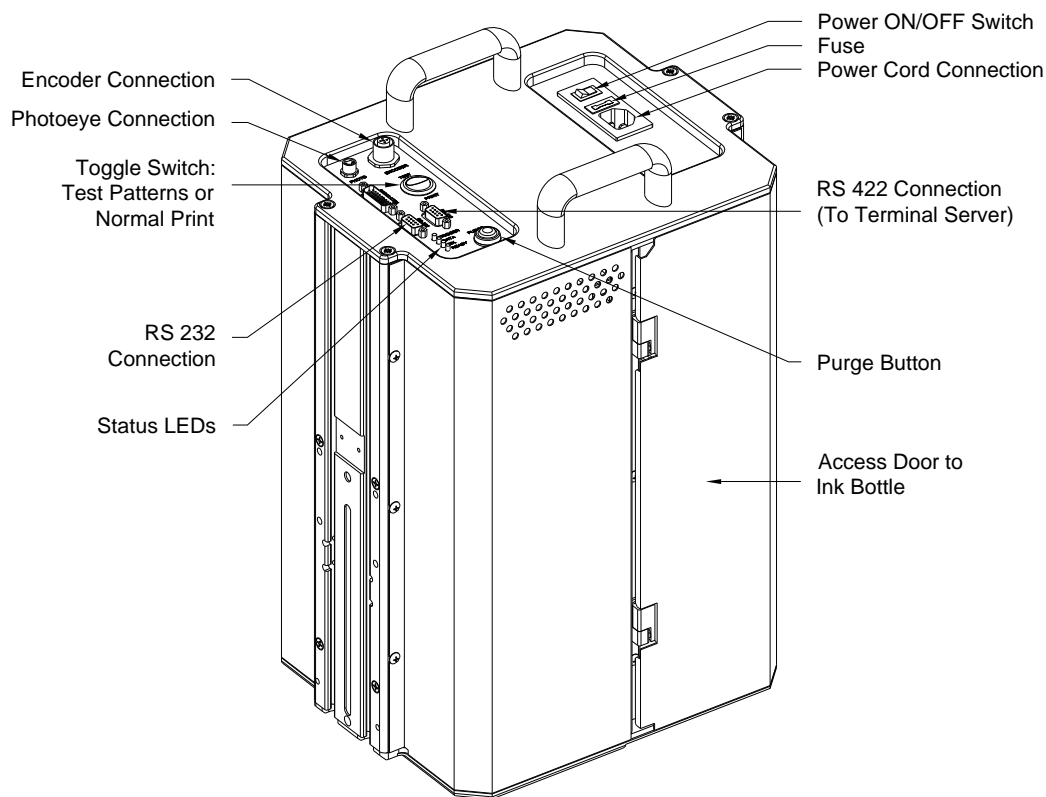
1.1 Description

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.

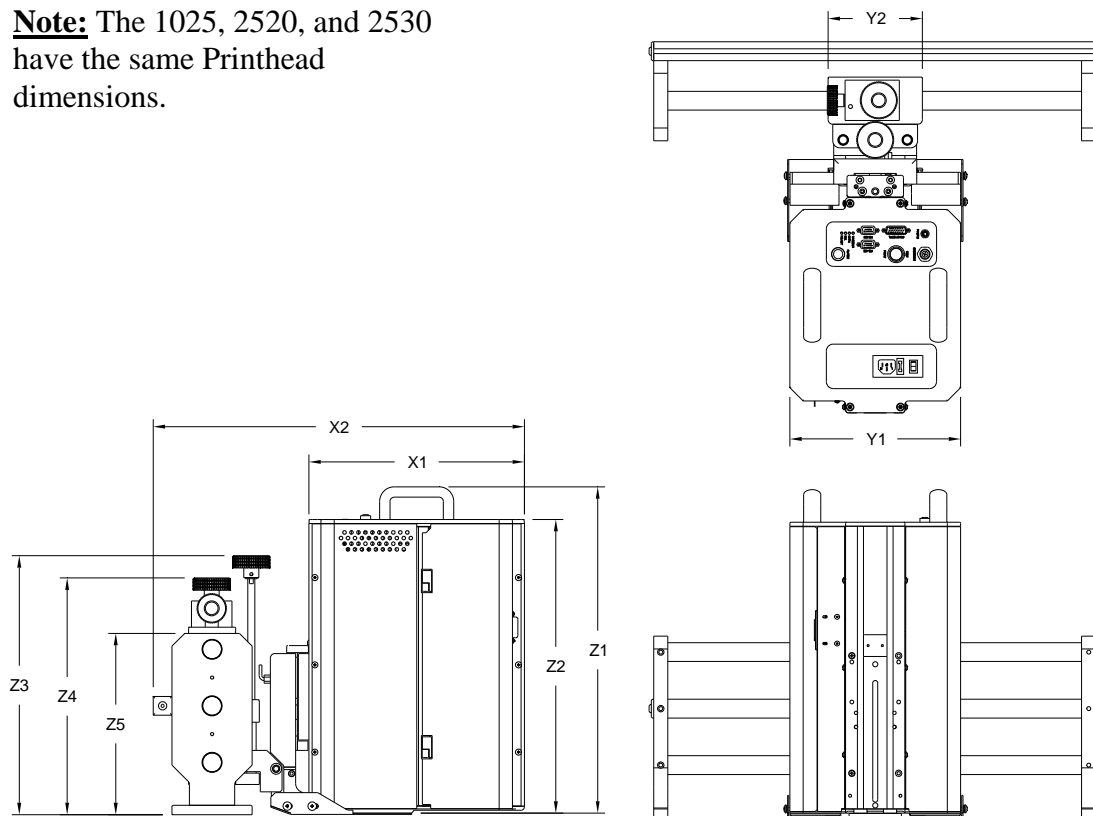


Table 1-1: Atom Printhead Dimensions on BK83Bridge

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.

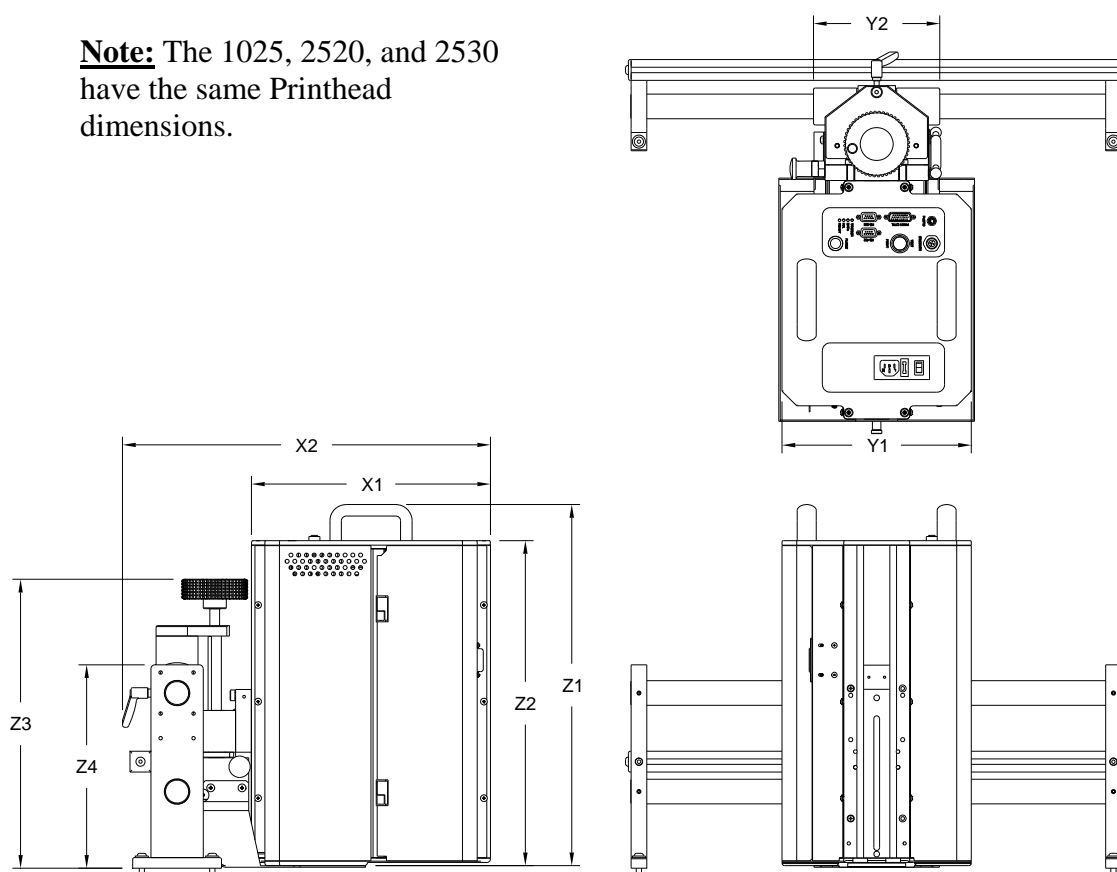


Table 1-2: Atom Printhead Dimensions on BK230 Bridge

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	

2.1 Introduction

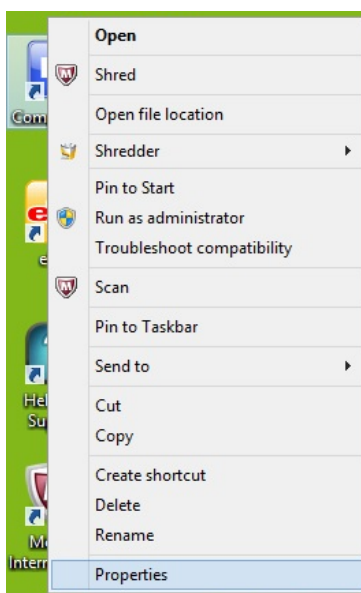
The Atom was designed to be controlled by a powerful Windows-based software package known as Compose IQ. Buskro's Compose IQ easily allows users to set up layouts with a variety of text, graphics, and barcodes. It is also capable of loading lists in standard formats such as List Files, Text Files, MS 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.

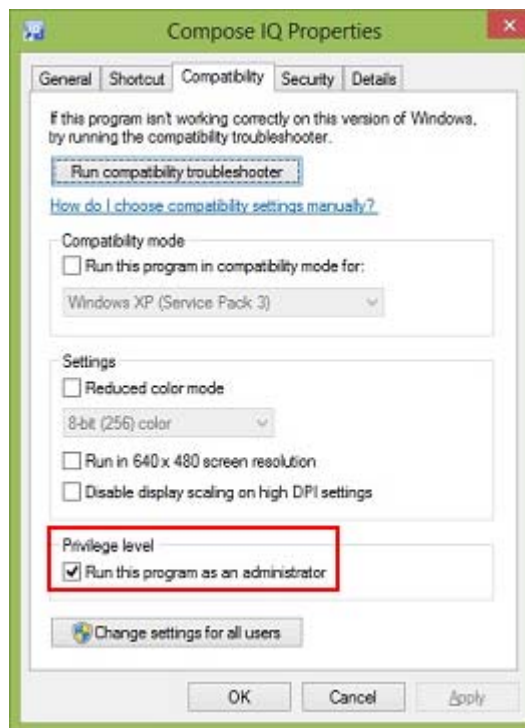
2.2 Software Setup

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.

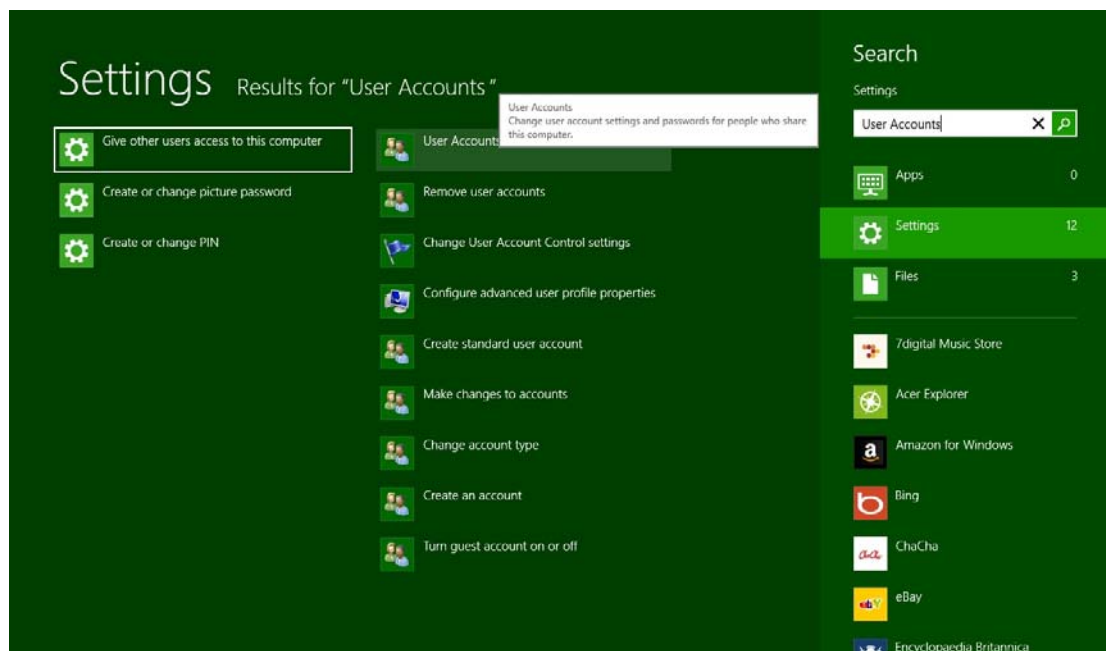
1. Insert the Compose Disc and follow the on-screen installation steps.
2. Once installed, right-click on the Compose icon and select **Properties**.



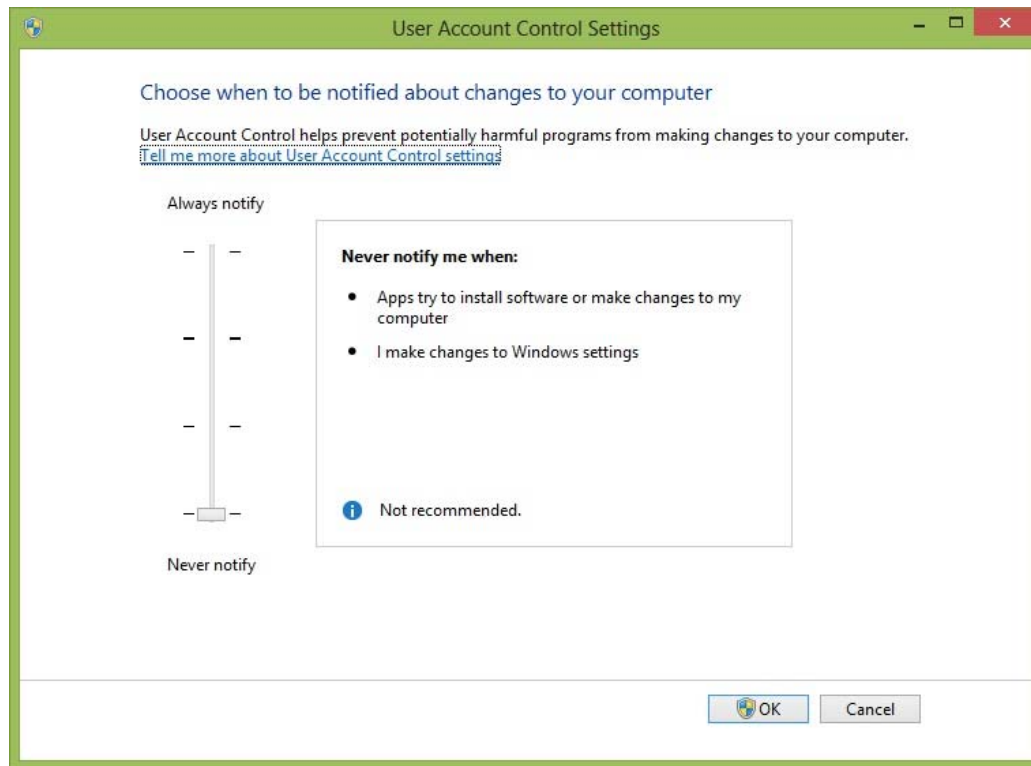
3. Select the **Compatibility** tab and ensure **Run this program as an administrator** under **Privilege level** is checked.



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.

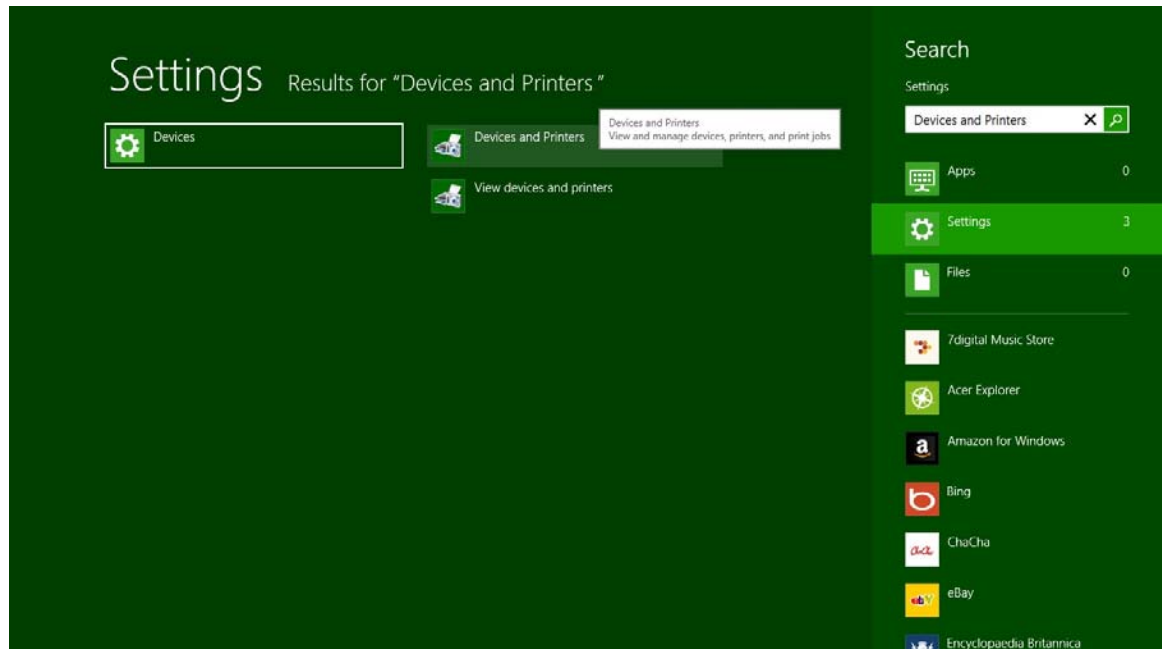


5. For Windows 8 select **User Accounts and Family Safety** and **Change User Account Control Settings**. In Windows 7 go to **Control Panel** and click **User Accounts and Family Safety** → **User Accounts** → **Change User Account Control Settings**.
6. Bring the **User Account Control Settings** bar 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**.

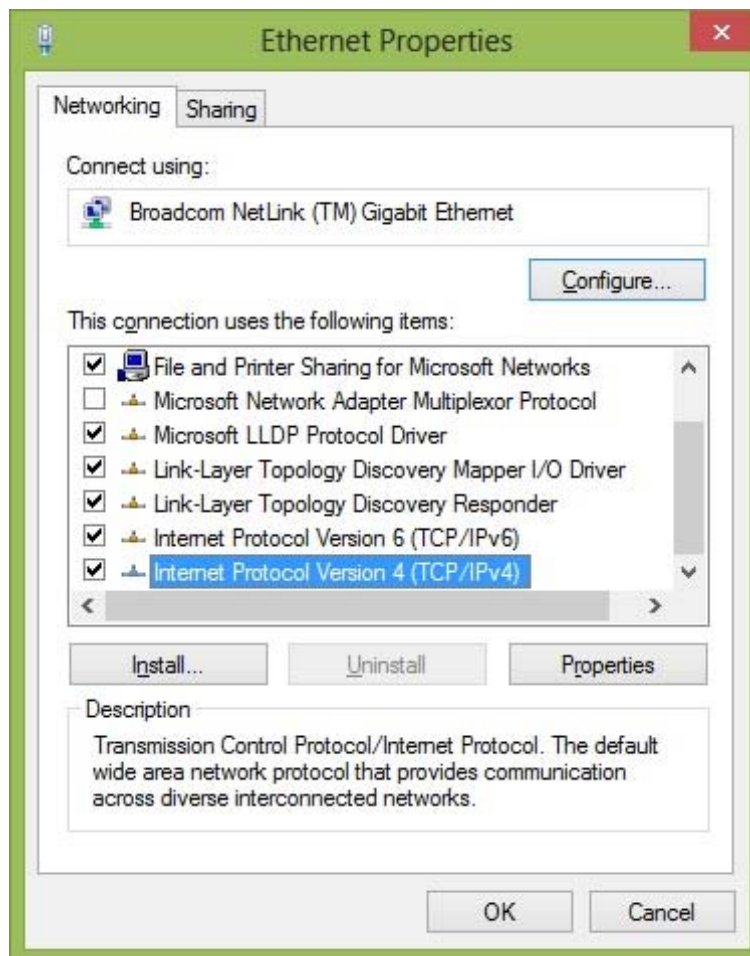
Click **Begin Install** and follow the instructions. Click on **Finish** when completed.

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.

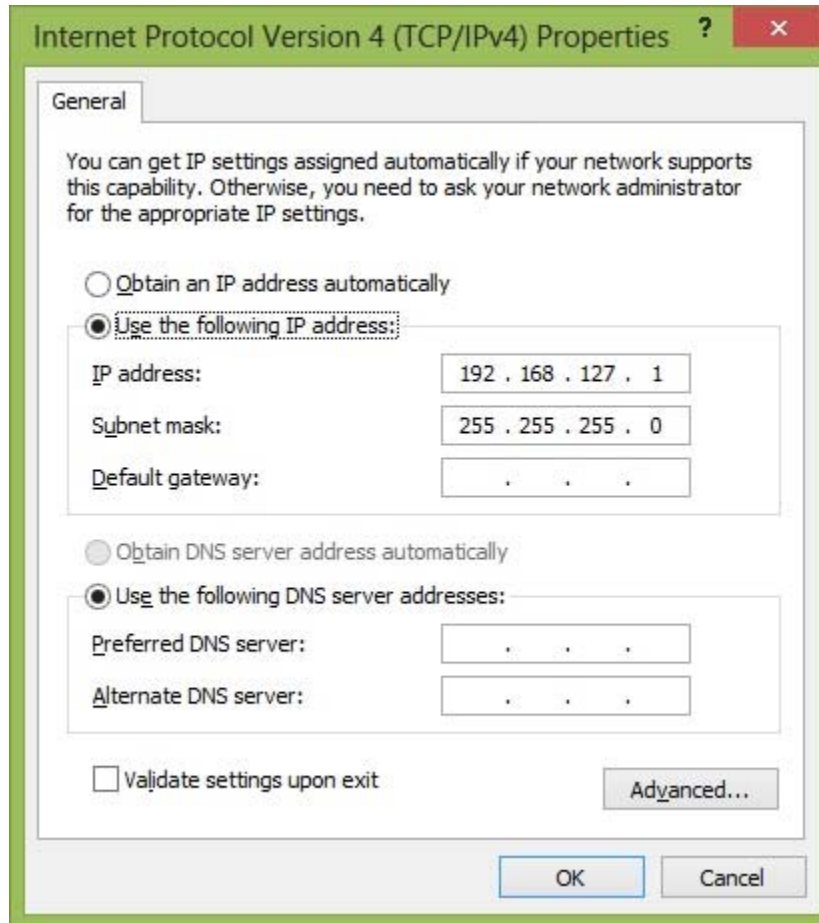


16. Set up the Ethernet Properties required to interface with the Atom Printhead. Go to the **Control Panel** (e.g. In the Windows 8 Start Menu, type **Control Panel** and select it). Select **Network and Internet**. Select **Network and Sharing Center**.

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.

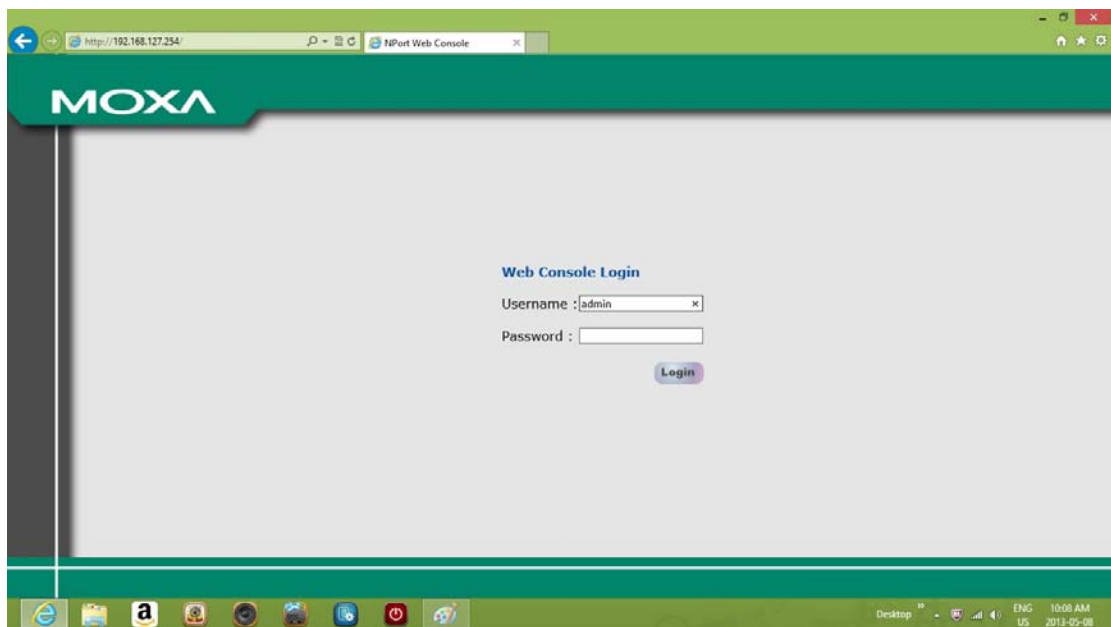


19. Connect a standard Ethernet cable from the computer to the Ethernet Terminal Server. The Terminal Server kit (P/N 9107931A) also includes the required Ethernet and Serial cables.

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.

Network Settings - Basic

IPv4 Configuration

IPv4 configuration: Static

IPv4 address: 192.168.127.254

Netmask: 255.255.255.0

Gateway:

IPv4 DNS server 1:

IPv4 DNS server 2:

PPPoE user account:

PPPoE password:

WINS function: ☒ Enable ☐ Disable

WINS server:

IPv6 Configuration

IPv6 configuration: Auto

IPv6 address:

Prefix: 64

IPv6 Gateway:

IPv6 DNS server 1:

IPv6 DNS server 2:

Connection priority: ☒ IPv6 first (RFC 3484) ☐ IPv4 first

Configuration

LAN speed: Auto

<http://192.168.127.254/network.htm>

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

Operation Modes

Port 1

Application: Socket

Mode: TCP Server

TCP alive check time: 7 (0 - 99 min)

Inactivity time: 0 (0 - 65535 ms)

Max connection: 1

Ignore jammed IP: ☐ Enable ☒ Disable

Allow driver control: ☐ Enable ☒ Disable

Secure: ☐ Enable ☒ Disable

TCP port: 6000

Cmd port: 966

Connection goes down: RTS ☐ always low ☒ always high
DTR ☐ always low ☒ always high

Command by command operation: ☐ Enable ☒ Disable

Response timeout: 0 (0 - 65535 ms)

Non-requested serial data: Discard

Data Packing

Packing length: 0 (0 - 1024)

Delimiter 1: 00 (Hex) ☐ Enable

Delimiter 2: 00 (Hex) ☐ Enable

Delimiter process: Do Nothing (Processed only when Packing length is 0)

Force transmit: 0 (0 - 65535 ms)

<http://192.168.127.254/opmode.htm?Port=1>

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

Communication Parameters

Port 1

Port alias

Serial Parameters

Baud rate [Hint]

Data bits

Stop bits

Parity

Flow control

FIFO ☒ Enable ☐ Disable

Interface

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.

Setup

Stacker/Diverter | Print Heads | **Options** | OCR | Master | Slave | Inserter | Tracking | Verify | Passwords

Language: Line Speed Units:

Base Options

Forms Out Delay: Number of cycles to feed before stopping the Base with a Forms Out Alarm.

Encoder 1 Resolution: Resolution (DPI) of the Transport Shaft Encoder.

Encoder 2 Resolution:

Stop on Clip Error: ☒ Checked if the base should stop on Clip Errors.

Prevent Duplicates: ☐ Checked if duplicate impressions are to be prevented.

Head Cap Timeout: Number of seconds before capping heads.

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.

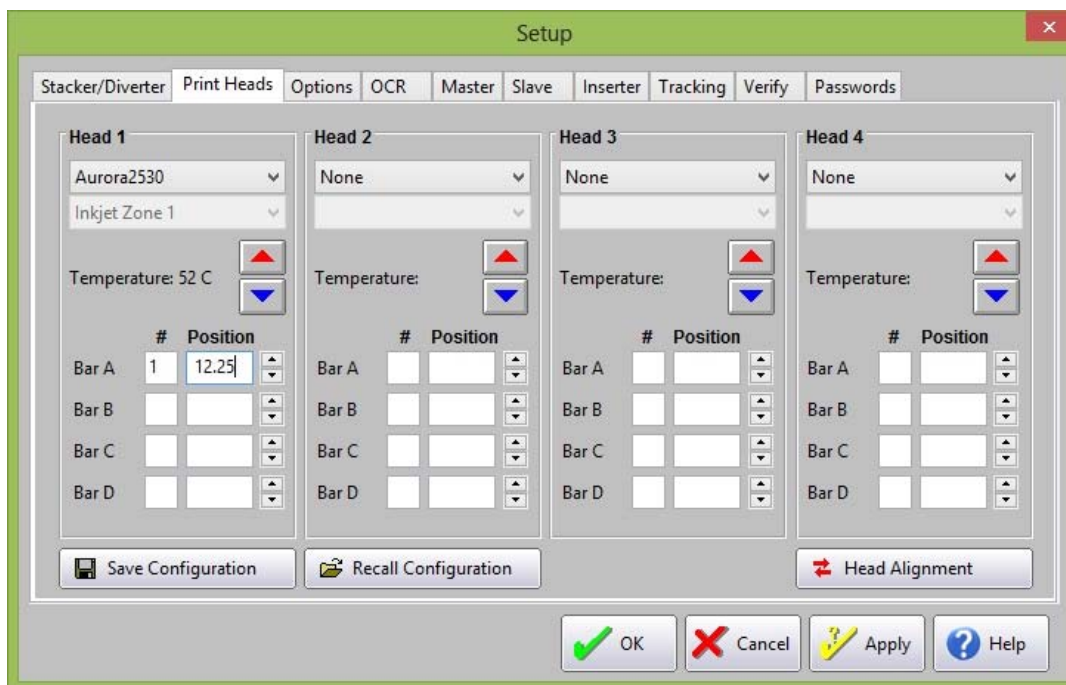


Table 2-1: Standard Printhead Drivers

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

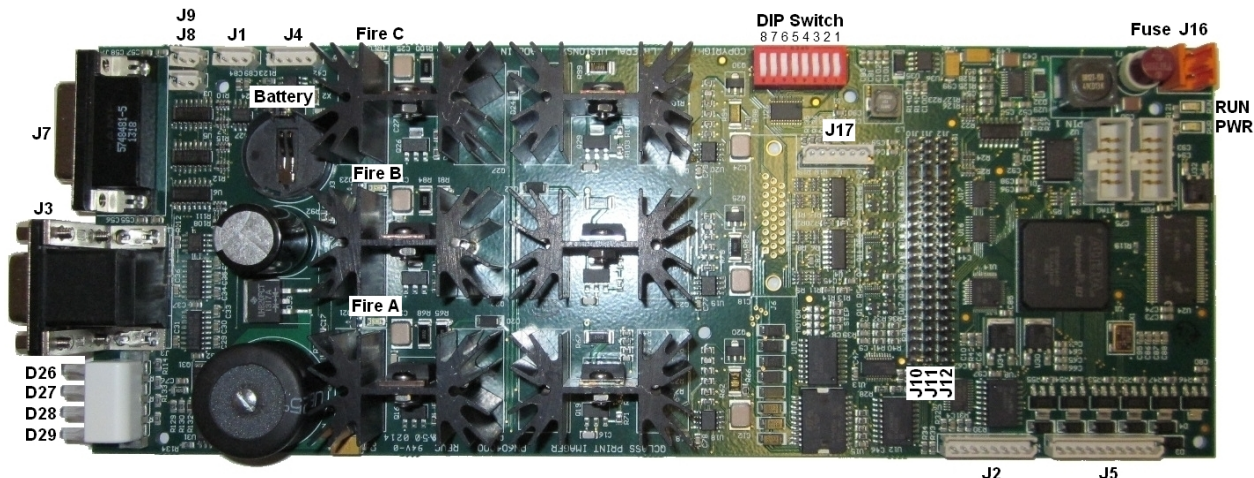


Table 2-2: QPI Service Replaceable Items

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:

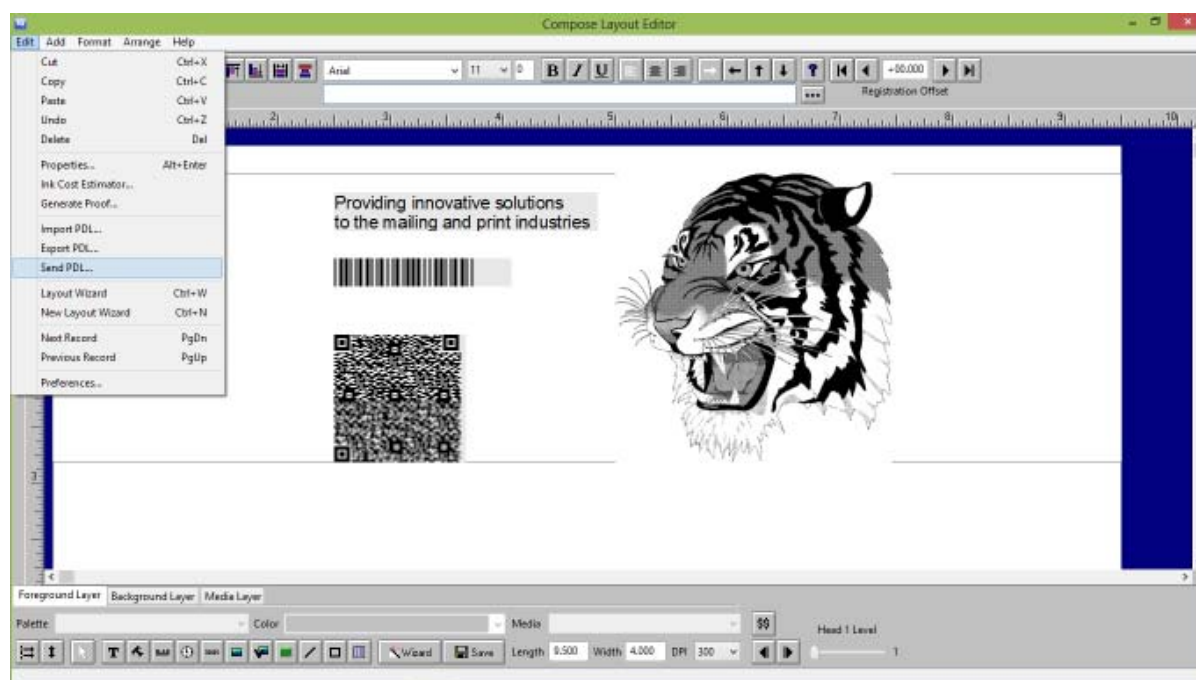
- **Change in the layout.** For example adding, removing, or repositioning text, graphics, or barcodes or changing the horizontal print resolution (DPI).
- **Change in settings.** For example changing the Printhead Driver, Photocue position, Ink Temperature, or Encoder Resolution.

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

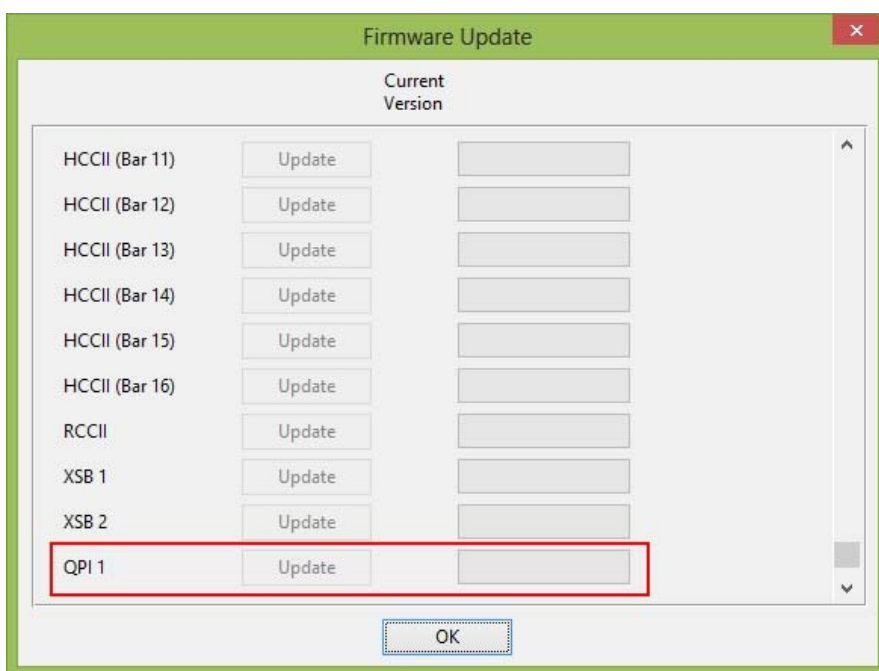


2.4.2 Firmware Updates

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 **and** 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 after the Data LED stops flashing.**

Figure 2-3: Atom / QPI Firmware Update



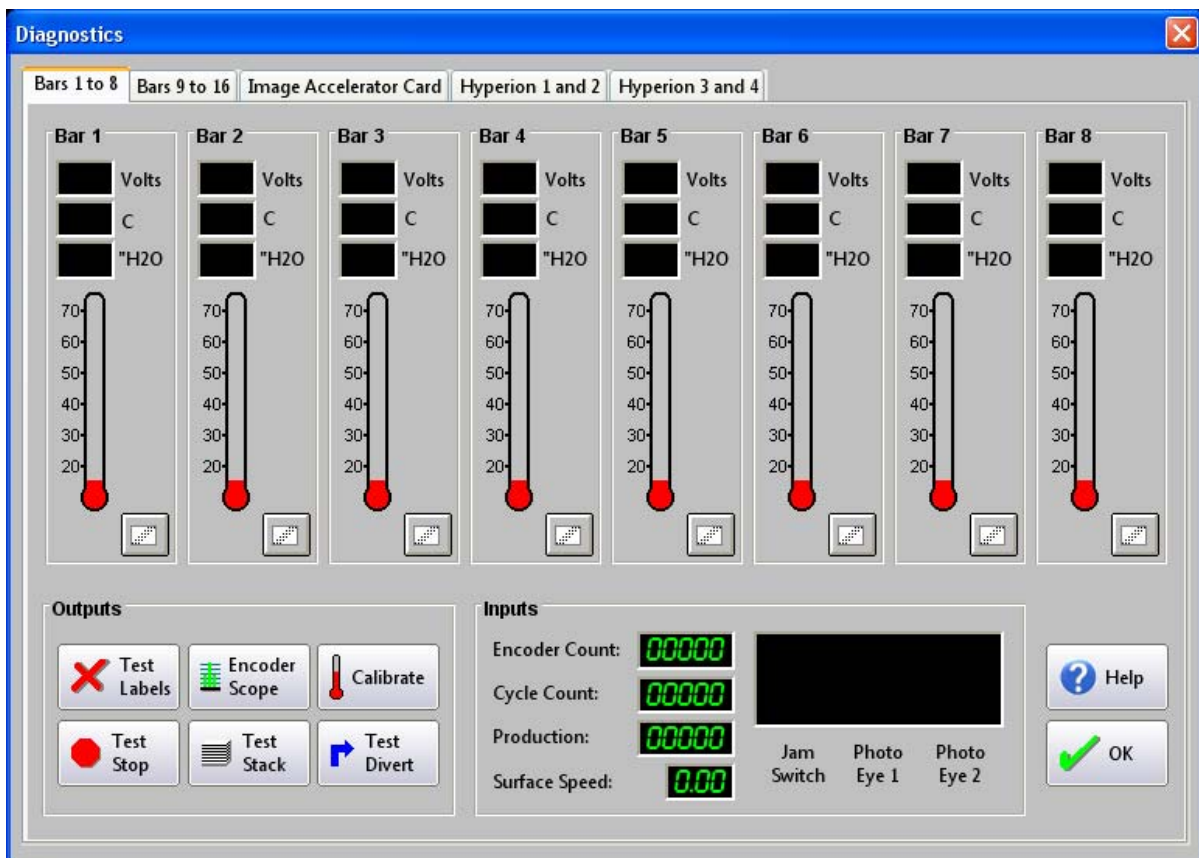
Note: Do not interrupt the update process and do not cycle power until Compose indicates the firmware update is successful **and** the Atom Data LED stops flashing (which typically takes an additional 30 seconds after the firmware update). If this is not followed, this can result in the QPI remaining 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

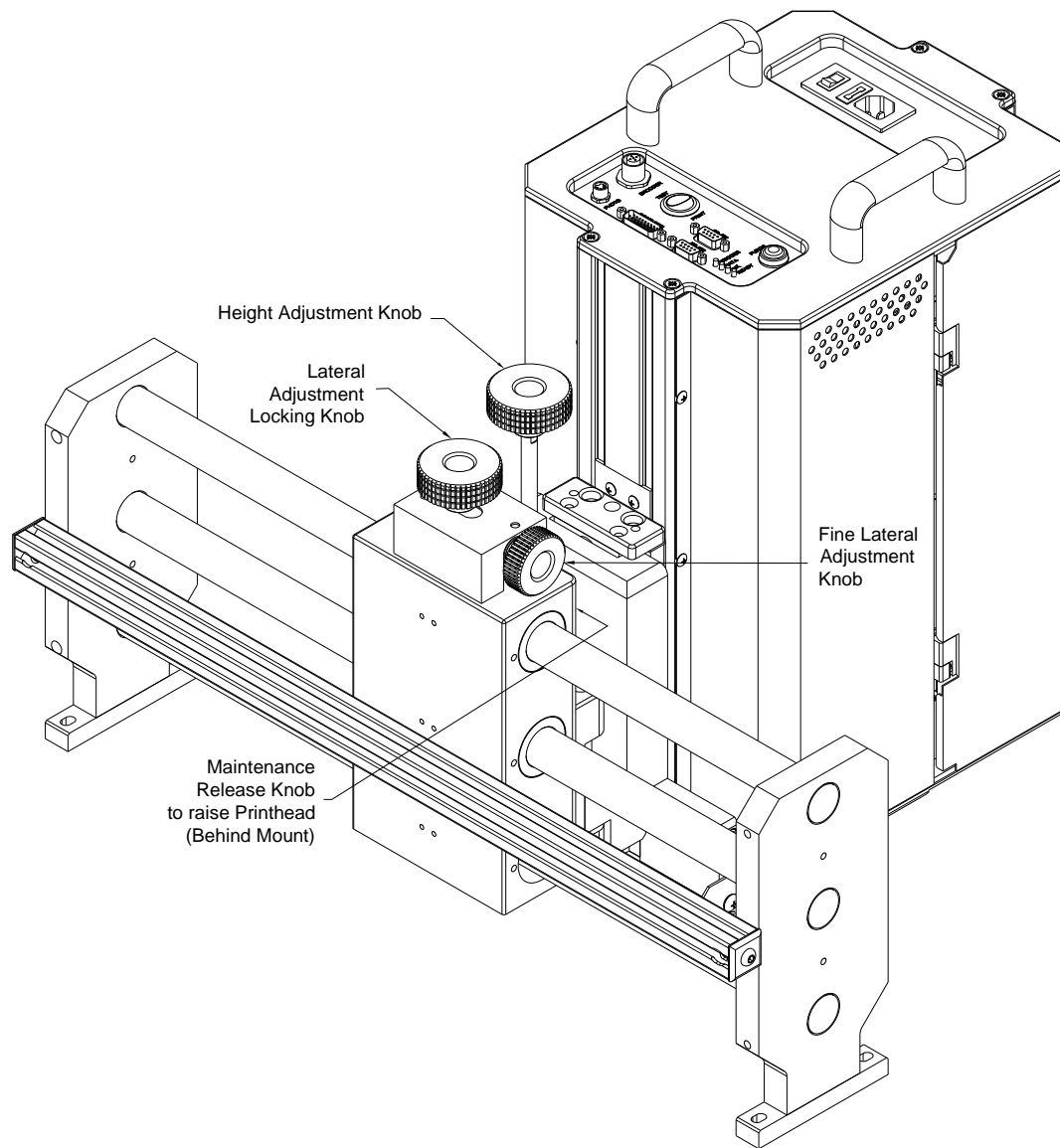
The Atom is designed for high speed, single-pass printing applications. However, there are factors that can affect its top Production Rate. Understanding these factors can help optimize the top production rate for a given application. For example:

- **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.

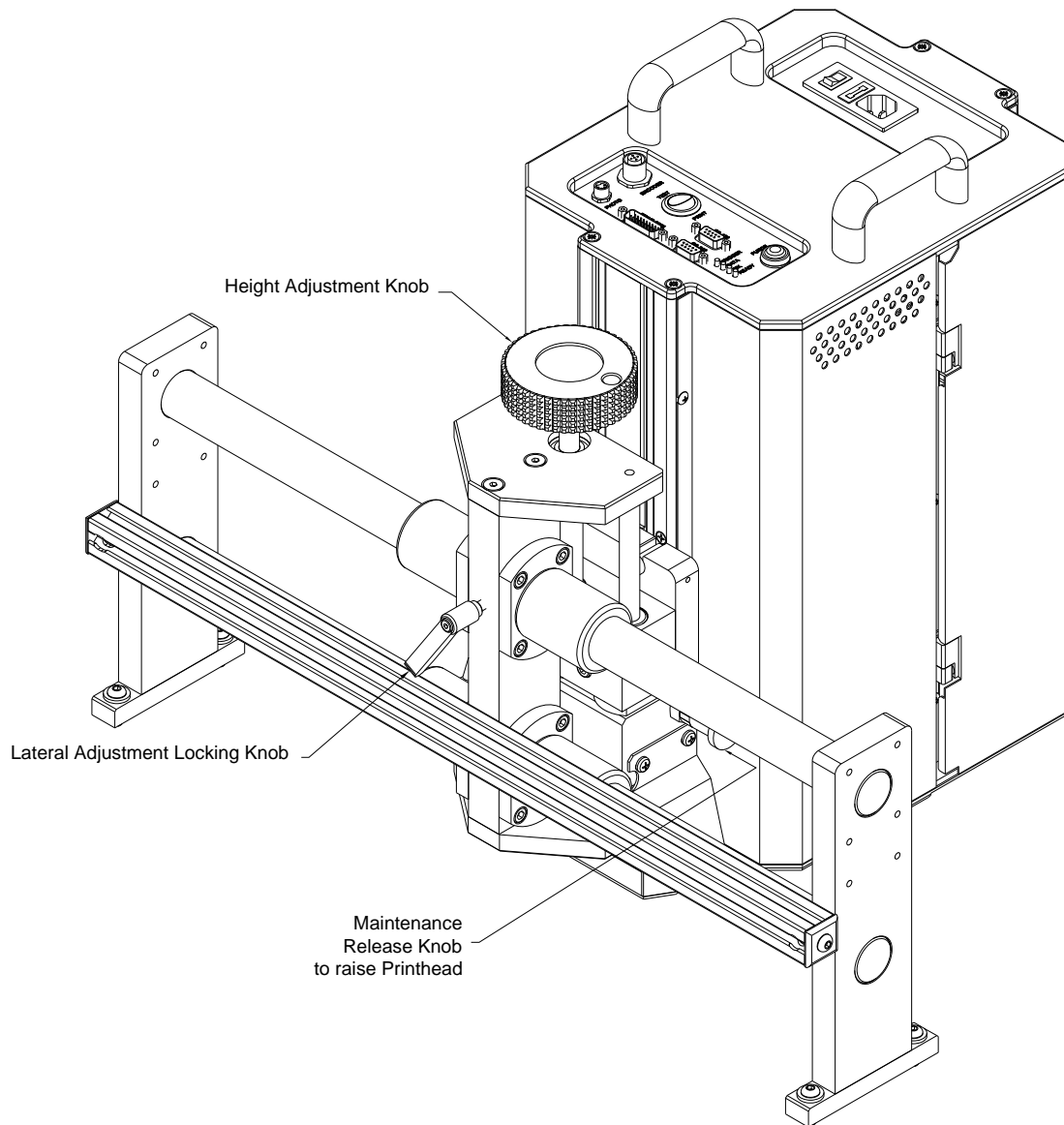
2.6 Printhead Adjustments

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.

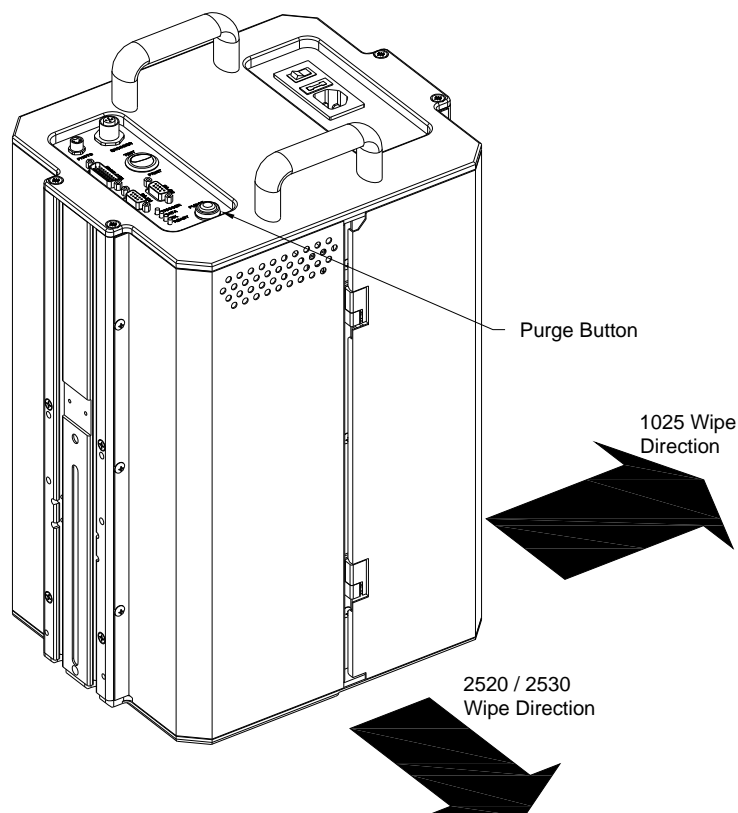
Note that in certain conditions, the purge button is disabled to prevent purging. This can happen if the Printhead is not in the Ready State (e.g. if it is still warming to the operating temperature), or if the system is out of ink.

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 H₂O**.

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 H₂O**. 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.

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.

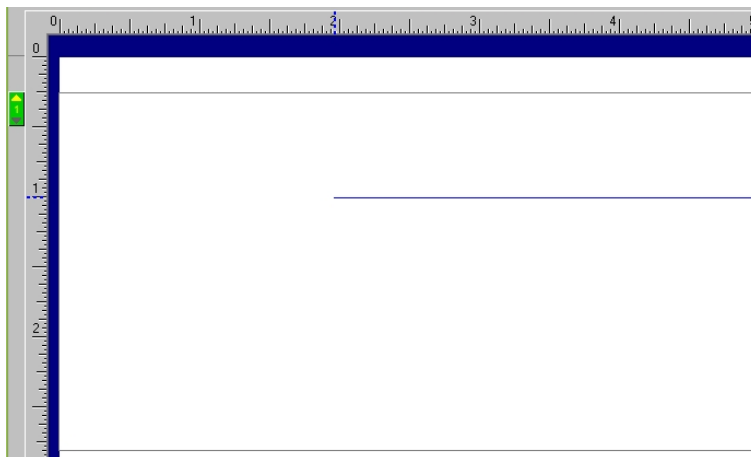
3.3 Ink Information, Safety, Handling, and Storage

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.

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



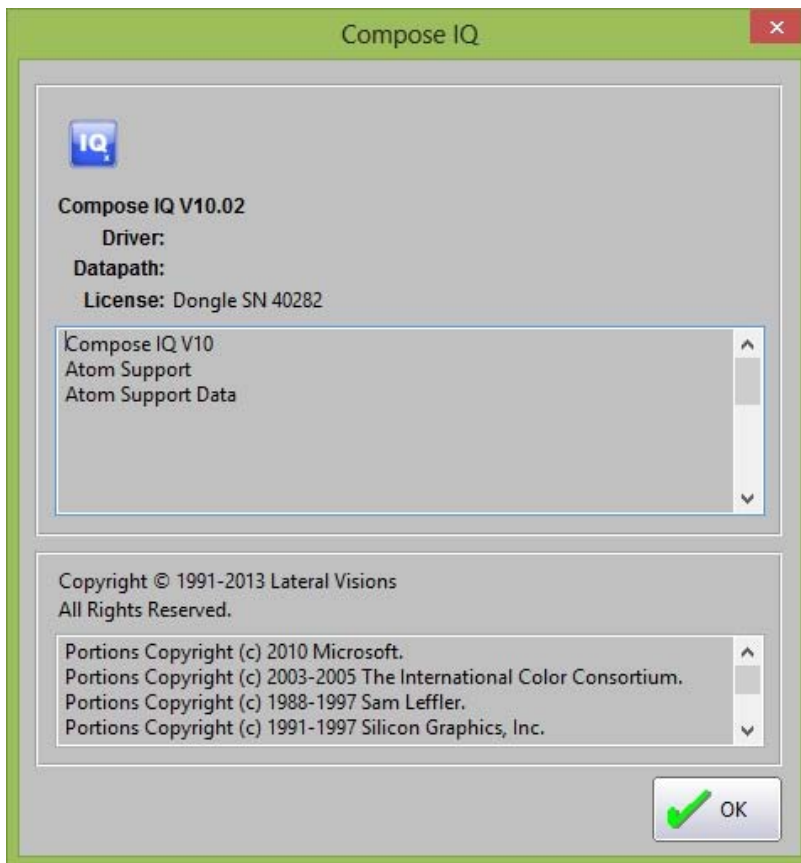
4.1.2 My Layout and/or setting changes did not take effect

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



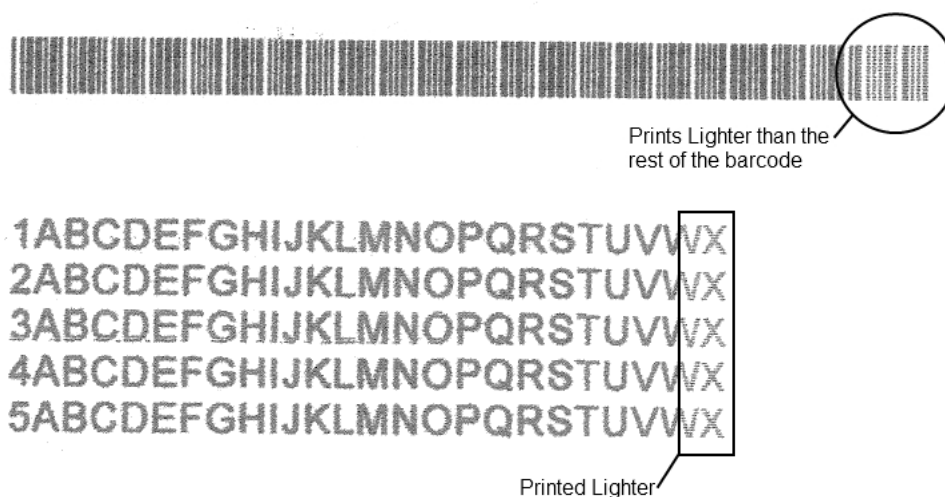
4.1.4 I get blank pieces or my print is cut off

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

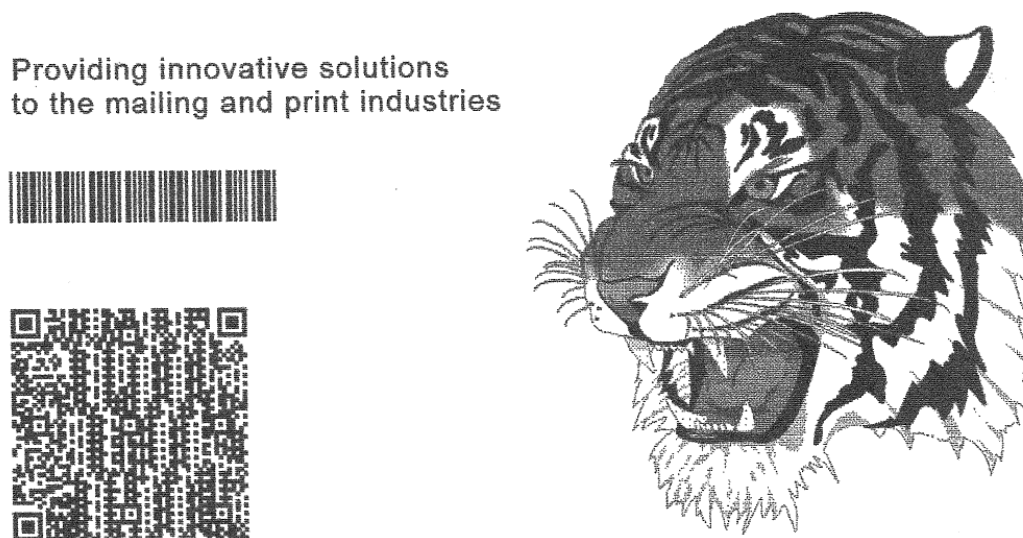
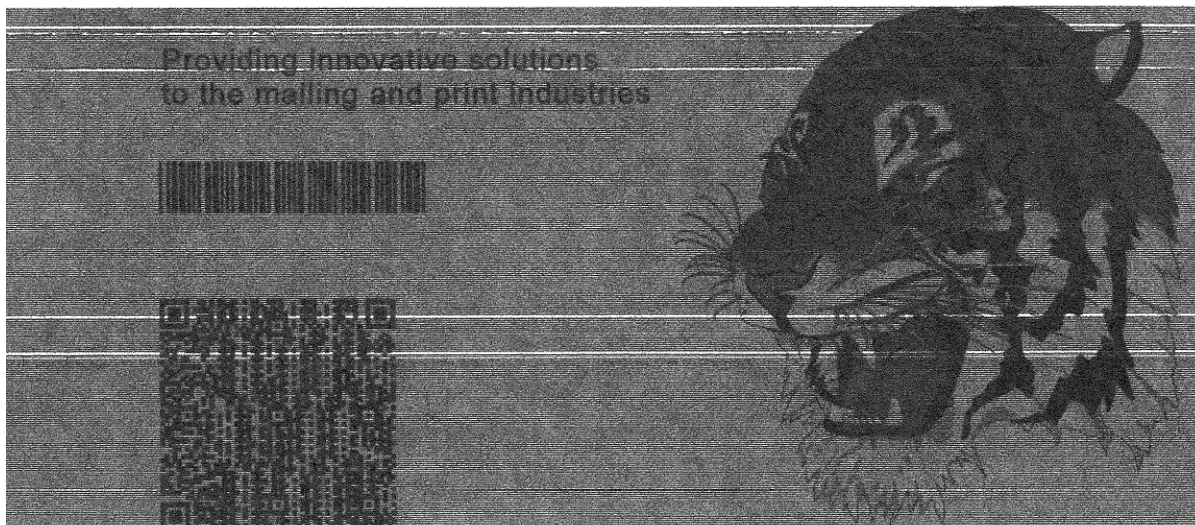
Figure 4-5: Compressed Image (Top) vs Normal Print (Bottom)



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

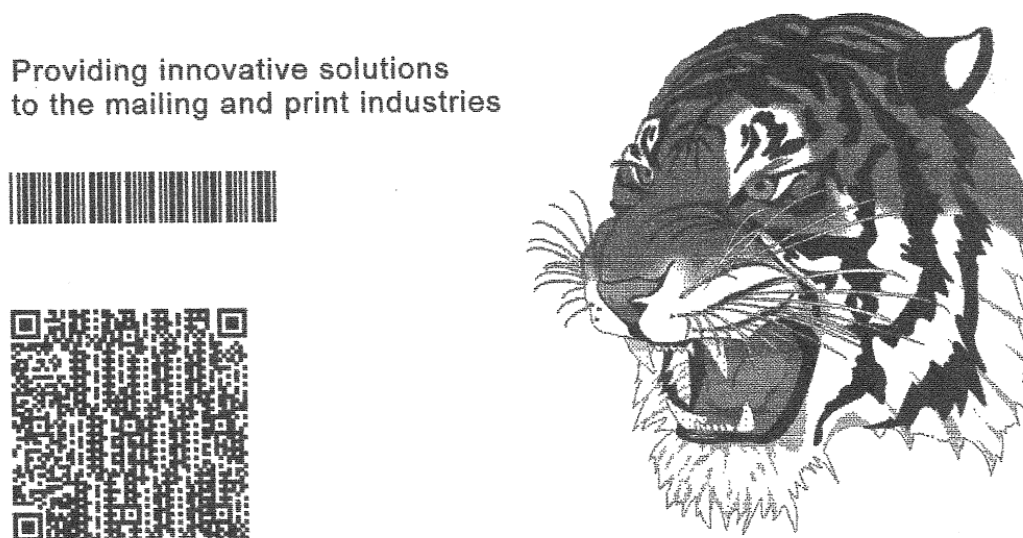
Figure 4-6: Continuous Firing (Top) vs Normal Print (Bottom)



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:

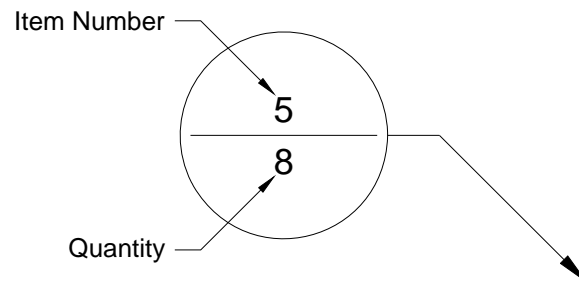
DPI	Speed (m/s)
300	2.67
400	2.00
600	1.33

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

List of Tables

Table A-1: BK2530?-AT-M83 - Printhead, Atom, BK2530, 300 DPI, M83	A-1
Table A-2: BK2530?-AT-230 - Printhead, Atom, BK2530, 300 DPI, M230	A-2
Table A-3: BK2530A-AT – Printhead, Atom, Atlas, BK2530.....	A-3
Table A-4: BK2530C-AT – Printhead, Atom, Cezanne, BK2530	A-4
Table A-5: BK2530U-AT – Printhead, Atom, Aurora, BK2530.....	A-5
Table A-6: BK2500-AT – Atom Head Assembly, BK2500.....	A-6
Table A-7: BK83M-4 – Mount, BK83 Bridge	A-8
Table A-8: BK230M – Mount, BK230 Bridge.....	A-9
Table A-9: 9100120A – Fuse/Relay Base Assembly, Atom	A-11
Table A-10: 9101580A – Terminal Block Assembly, Atom.....	A-12
Table A-11: 9105072A – Shield Assembly, Atom 2500, BK230	A-13
Table A-12: 9107437A – Bottom Plate Assembly, Atom 2500	A-14
Table A-13: 9107438A – Manifold Assembly, Atom 2500	A-15
Table A-14: 9107439A – QPI Support Assembly, Atom.....	A-17
Table A-15: 9107441A – Bottom Plate Assembly, Atom 1025	A-18
Table A-16: 9107445A – Top Plate Assembly, Atom.....	A-19
Table A-17: 9107447A – Bracket Assembly, QPI Inputs, Atom	A-20
Table A-18: 9107718A - Manifold/Reservoir Assembly, Atom 1025	A-21
Table A-19: 9107911A – Solenoid Valve Assembly, 3-way, Air	A-22
Table A-20: 9107912A – Solenoid Valve Assembly, 2-way, Air	A-23
Table A-21: 9107921A – Bracket Assembly, Atom Input Power.....	A-24
Table A-22: 9107922A – Subbracket Assembly, Ink Tray	A-25
Table A-23: 9107924A – Separator Assembly, Atom.....	A-26
Table A-24: 9107925A – Air/Ink Pump/Power Mount Assembly	A-27
Table A-25: 9107926A – Ink Pump Bracket Assembly, Atom.....	A-29
Table A-26: 9107927A – Shoe Assembly, Atom 2500	A-30
Table A-27: 9107930A – Door Assembly, Atom.....	A-31
Table A-28: 9107935A – Connector Assembly, Encoder	A-32
Table A-29: 9107938A – Right Bracket Assembly, Atom.....	A-33
Table A-30: 9107943A – Air Pump Assembly, Atom	A-34
Table A-31: 9107945A – Cable Assembly, Encoder.....	A-35
Table A-32: 9108204A – Connector Assembly, Photoeye.....	A-36
Table A-33: 9108206A – Cable Assembly, Photoeye	A-37
Table A-34: 9108208A – Cap Assembly, 2500 Atom.....	A-38

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.

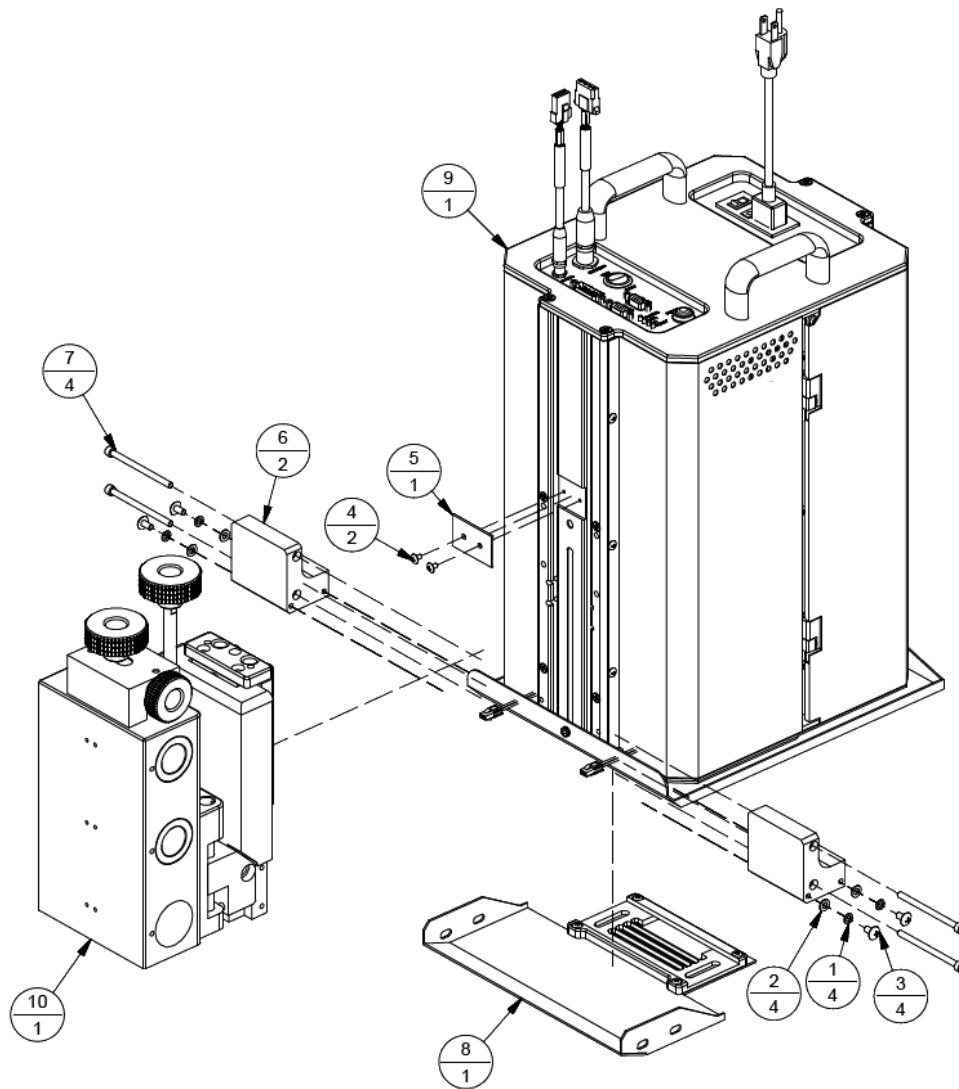
Reference:

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 1/2"	
4	9105725	2	Screw, PHMS, 6-32 x 1/4, 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

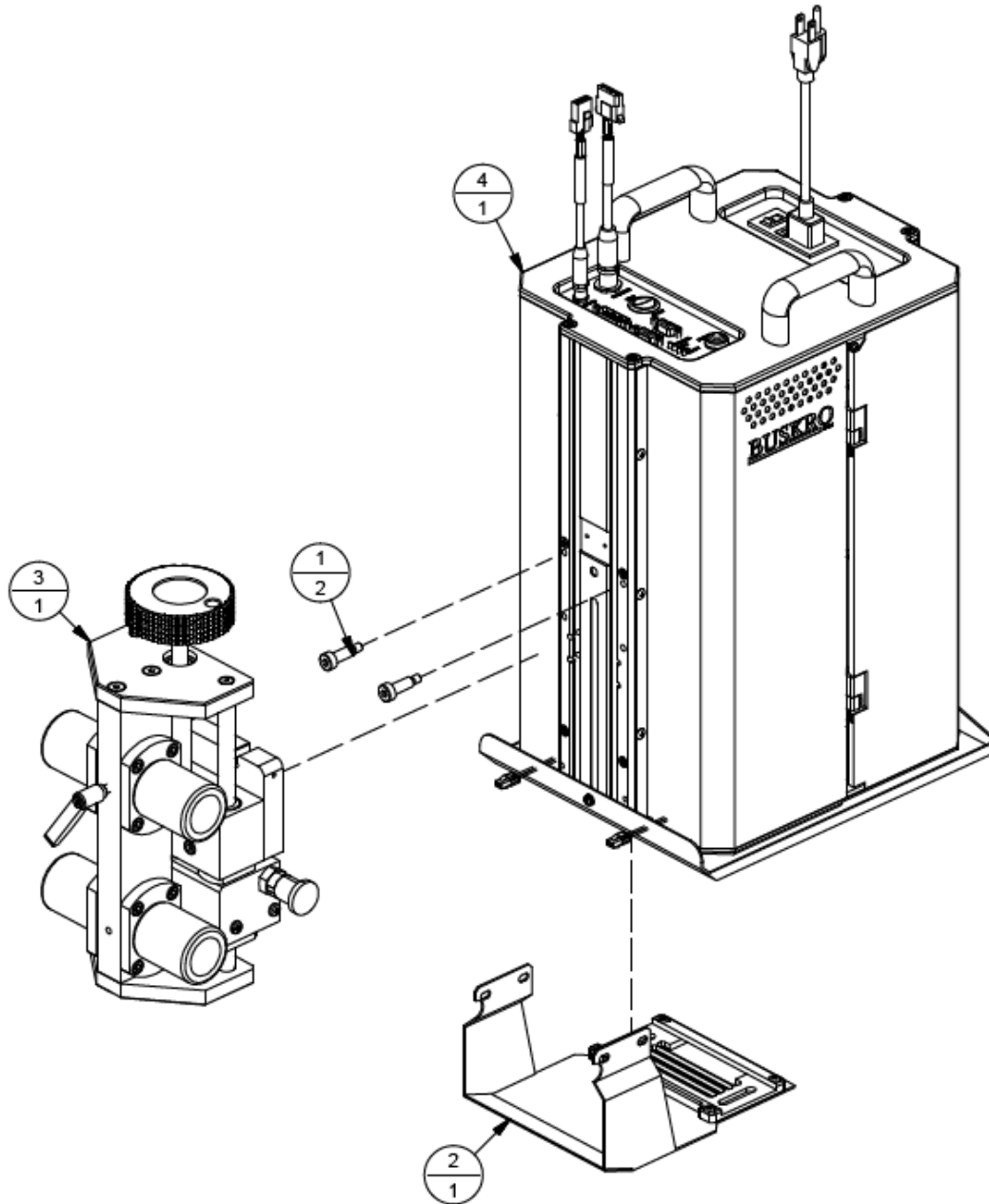


Note: In BK2530?-AT-M83 and BK2530?-AT, ? = A = Atlas, C = Cezanne, U = UV

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, 1/4" 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

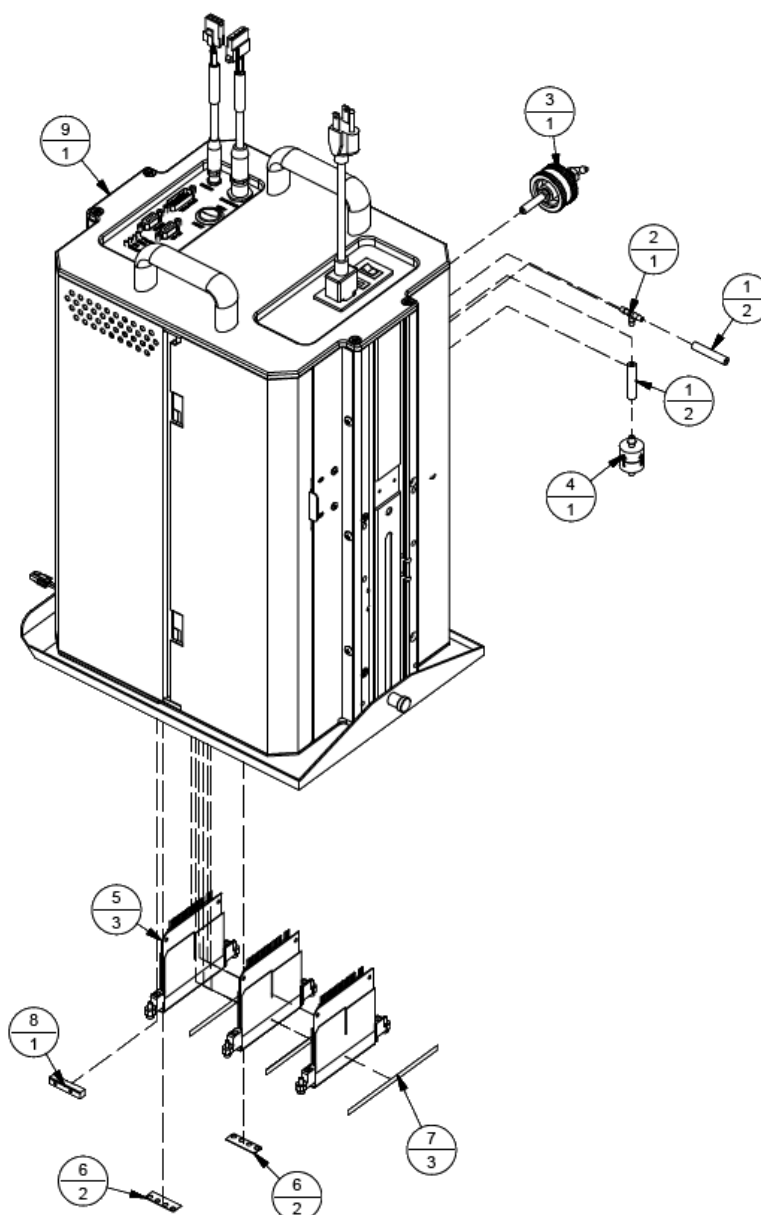


Table A-4: BK2530C-AT – Printhead, Atom, Cezanne, BK2530

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

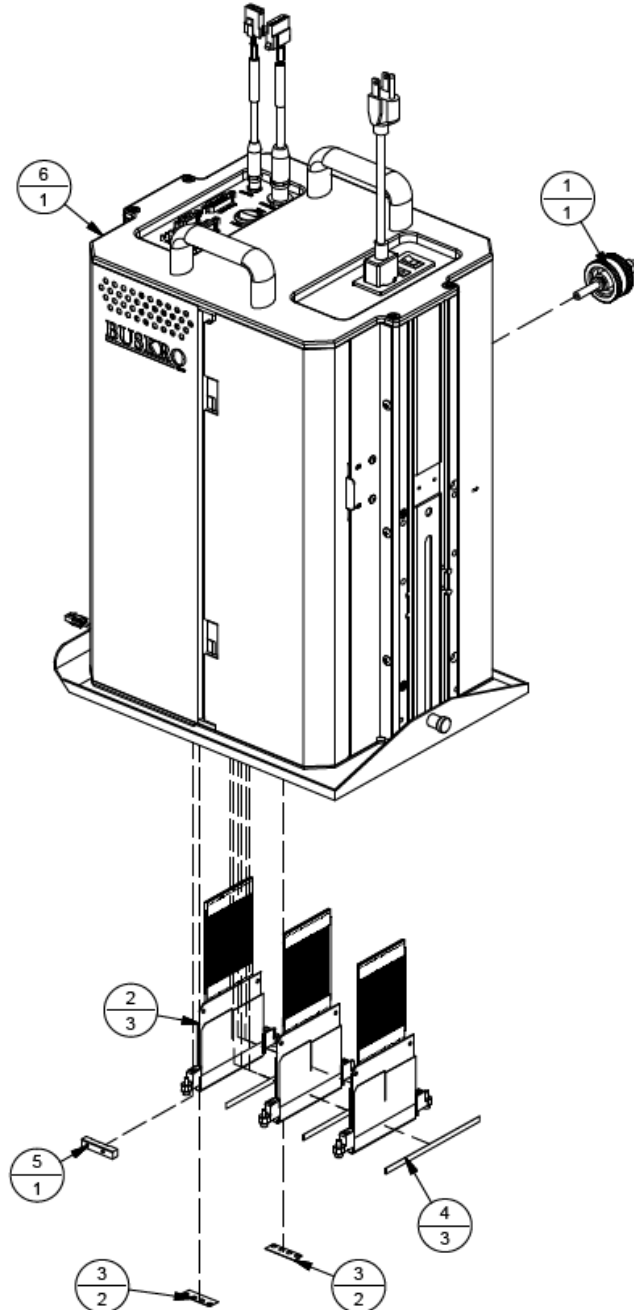
Figure A-4: BK2530C-AT – Printhead, Atom, Cezanne, BK2530

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

Item	Part Number	Quantity	Description	Reference
1	9100472	2 x 1.35"	Tubing, Silicone, 1/4" 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, 1/4 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

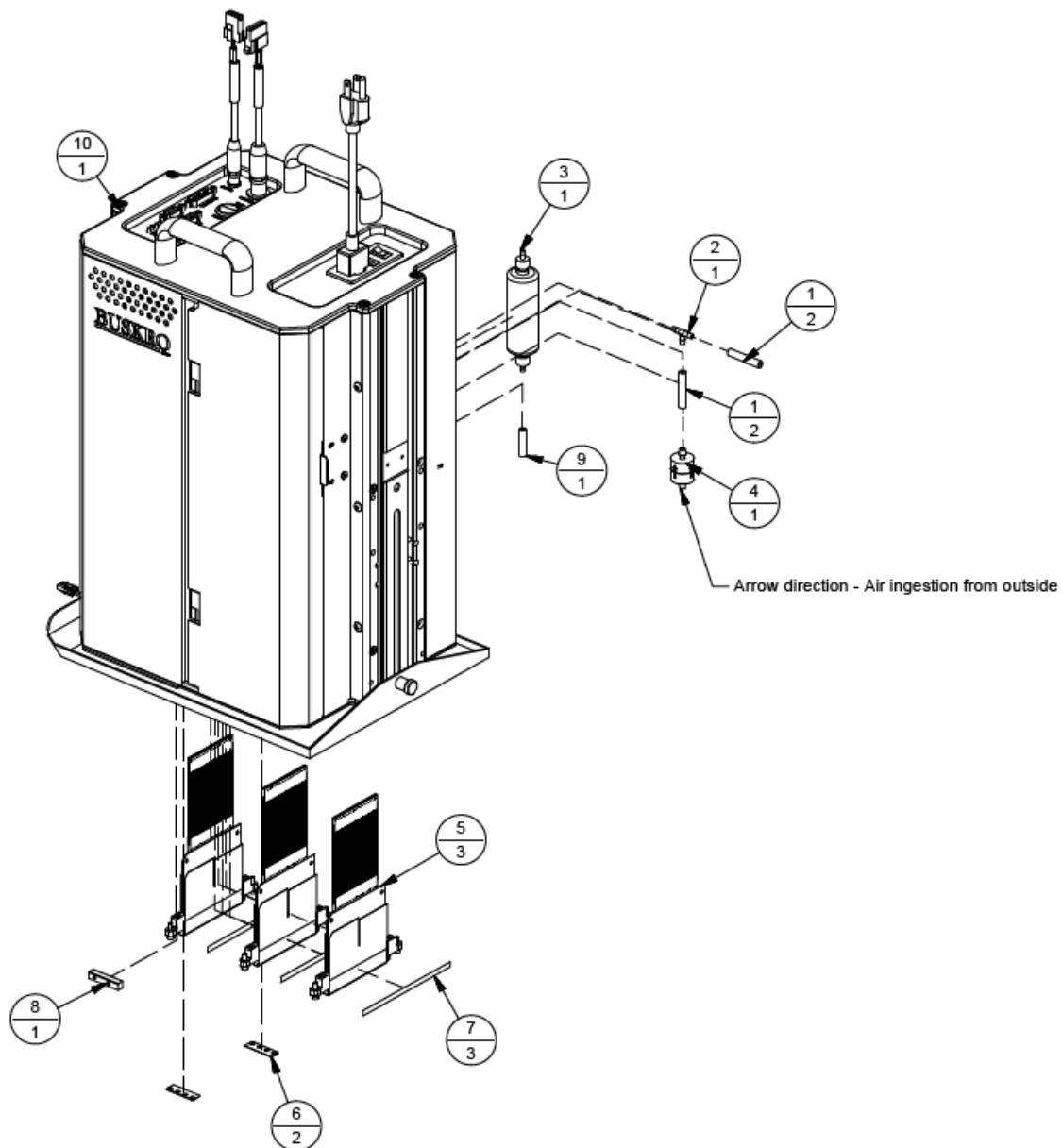


Table A-6: BK2500-AT – Atom Head Assembly, BK2500

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 1/4" SS	
4	606322	1	Cordset, 10A/125 VAC, 90", Harmonized IEC	
5	9100472	2 x 4"	Tubing, Silicone, 1/4" OD x 1/8" ID, 4"	
6	9101290	1	Fitting, Tee, 1/8" ID	
7	9103109	2	Screw, PHMS, Truss, 8-32 UNC x 1/4"	
8	9103200A	1	Cable, LOIS/Heat Support	
10	9105725	15	Screw, PHMS, 6-32 x 1/4", SS, Truss	
11	9105795A	1	Cable, Ink Pump/Purge Support	
12	9106159	1	Side Profile, Long	
13	9106249	2	Screw, FPHMS, 8-32 UNC, 3/4", 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

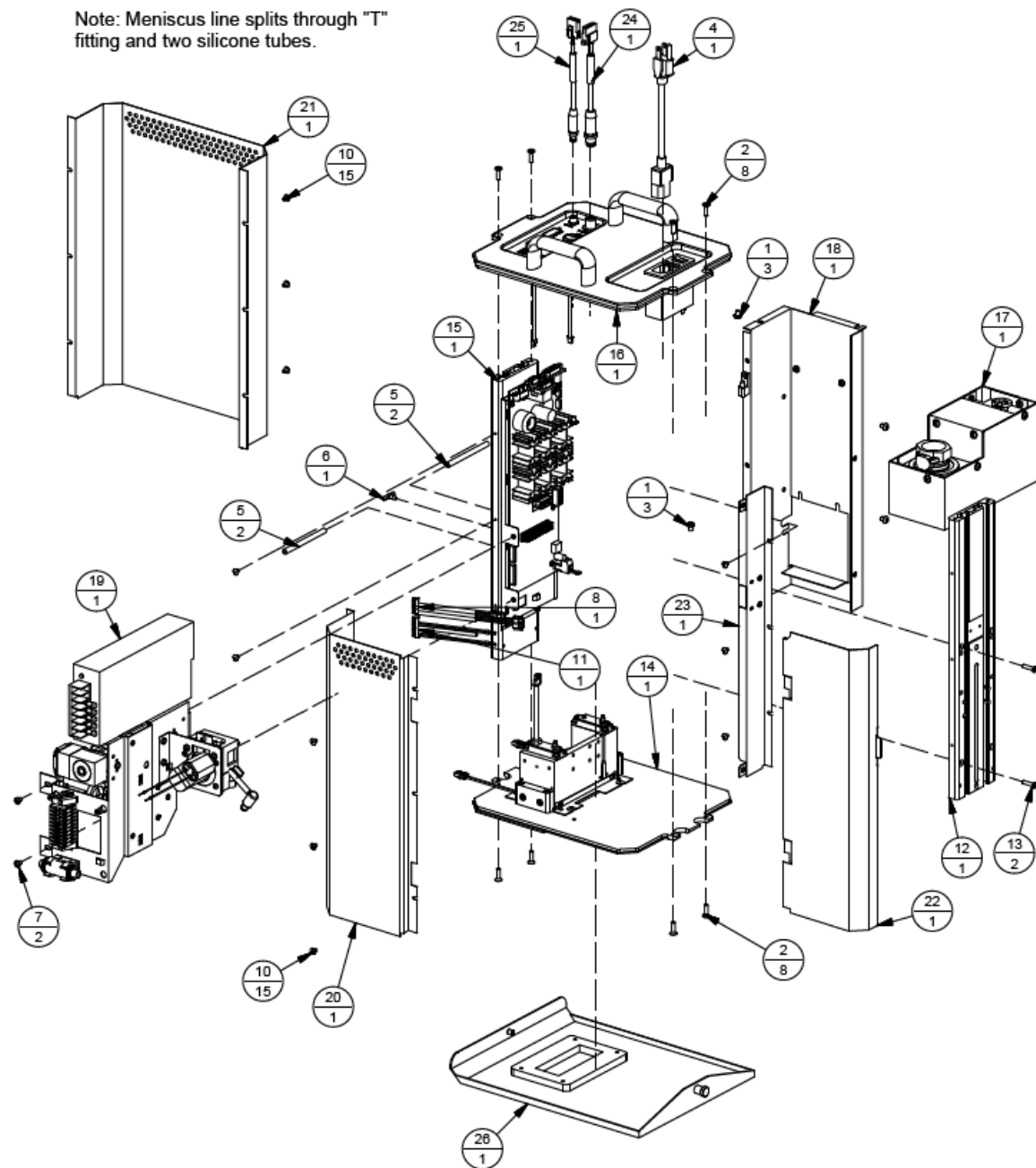
Figure A-6: BK2500-AT – Atom Head Assembly, BK2500

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	

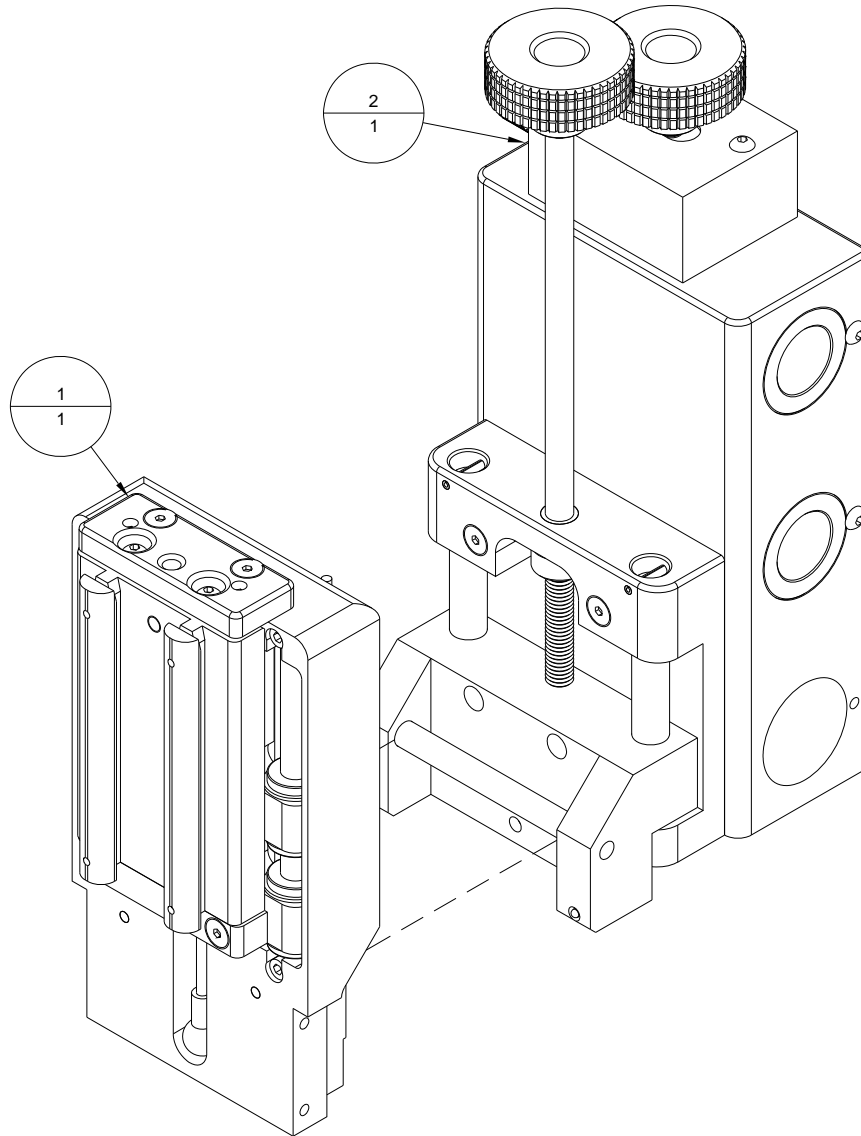
Figure A-7: BK83M-4 – Mount, BK83 Bridge

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	

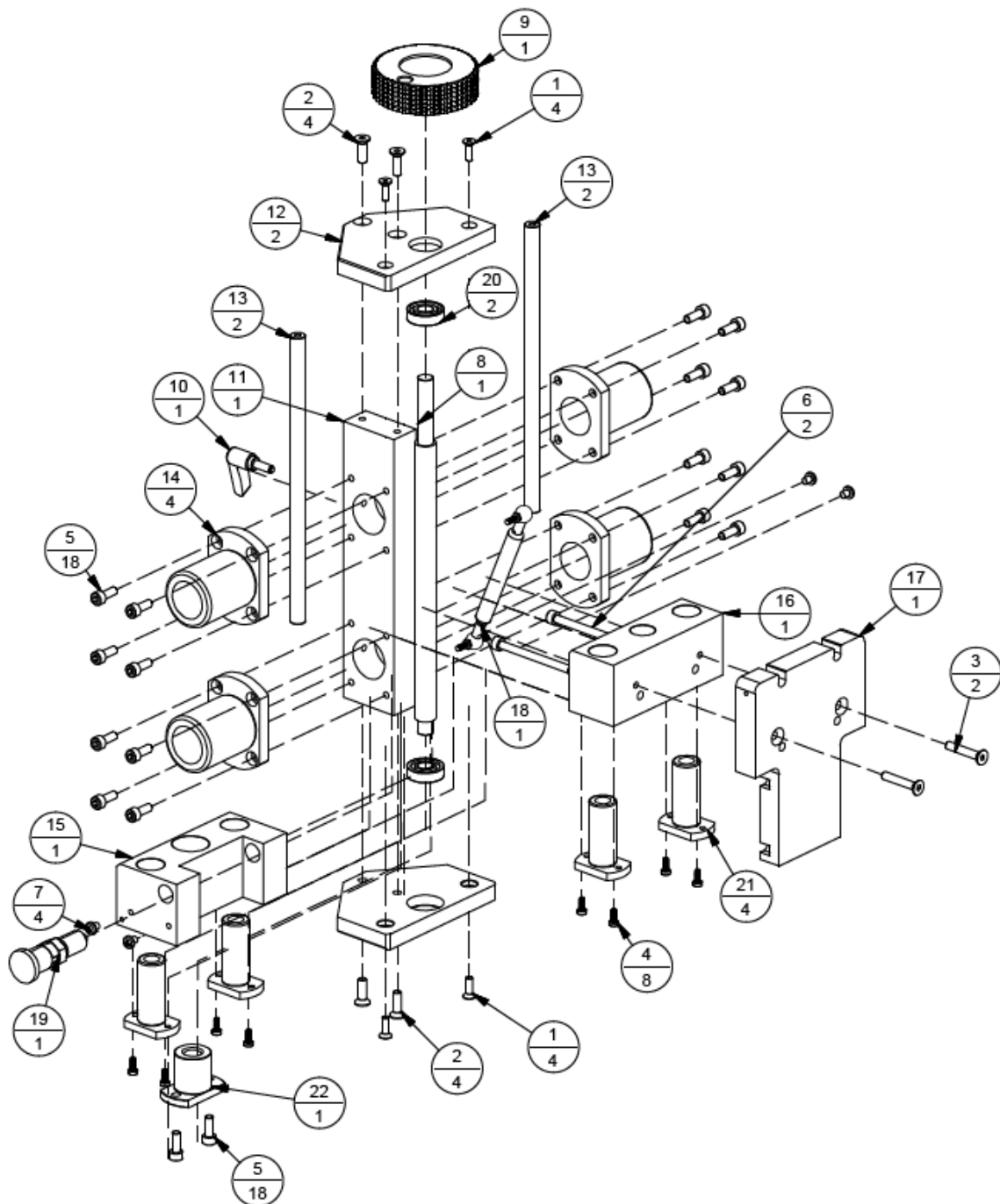
Figure A-8: BK230M – Mount, BK230 Bridge

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)

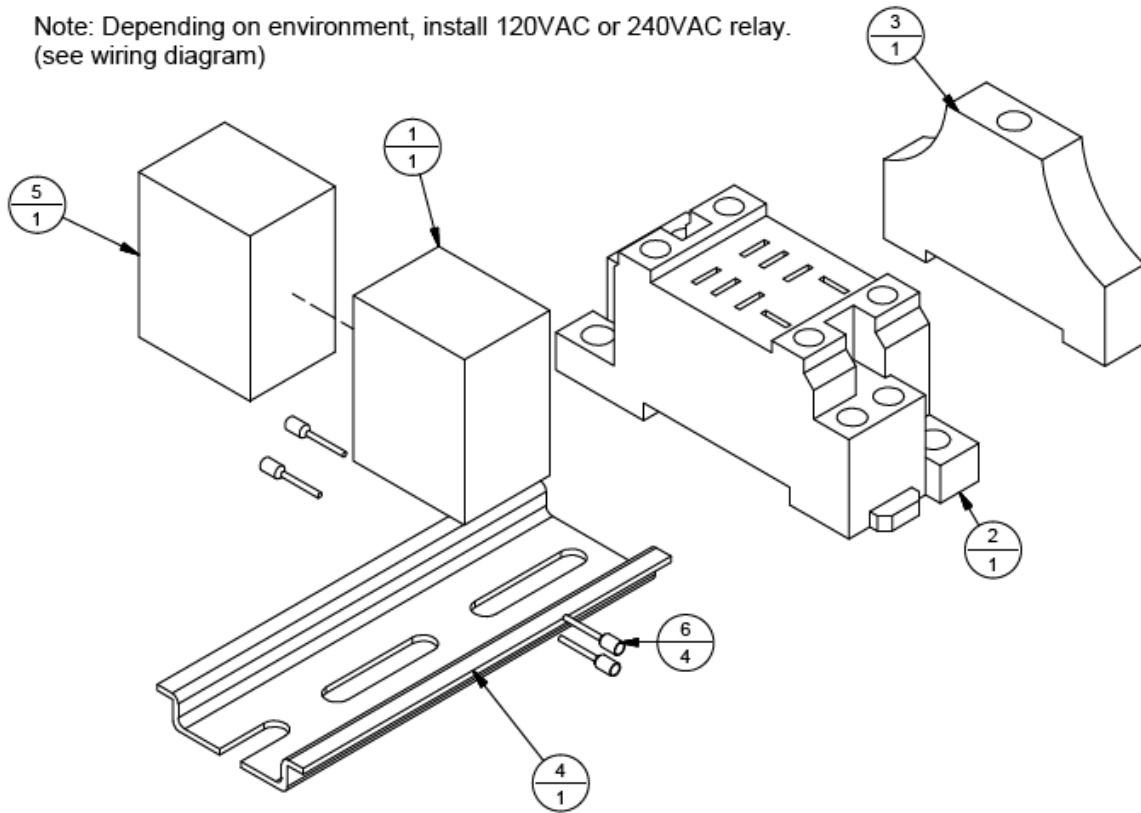


Table A-10: 9101580A – Terminal Block Assembly, Atom

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

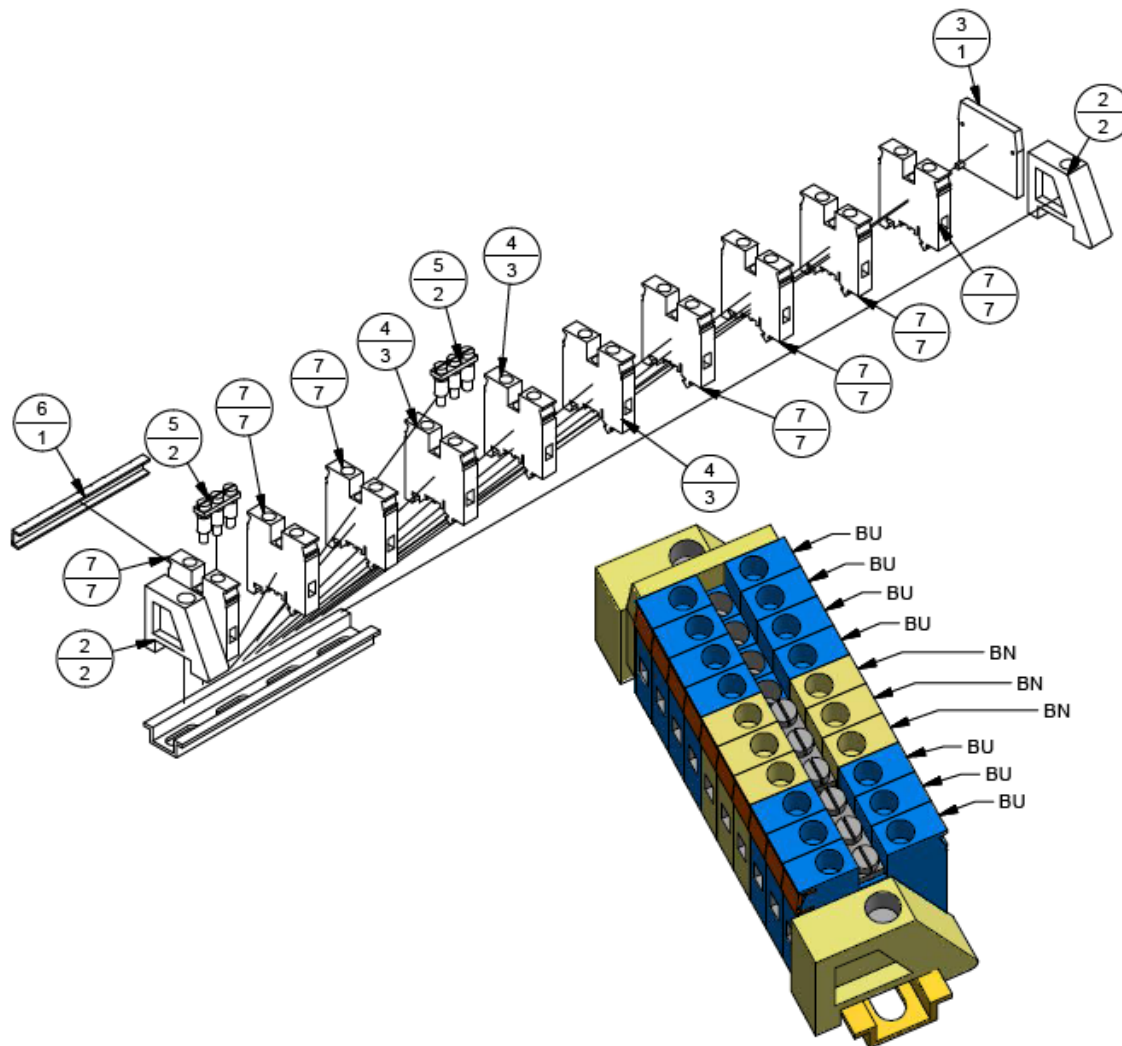


Table A-11: 9105072A – Shield Assembly, Atom 2500, BK230

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	

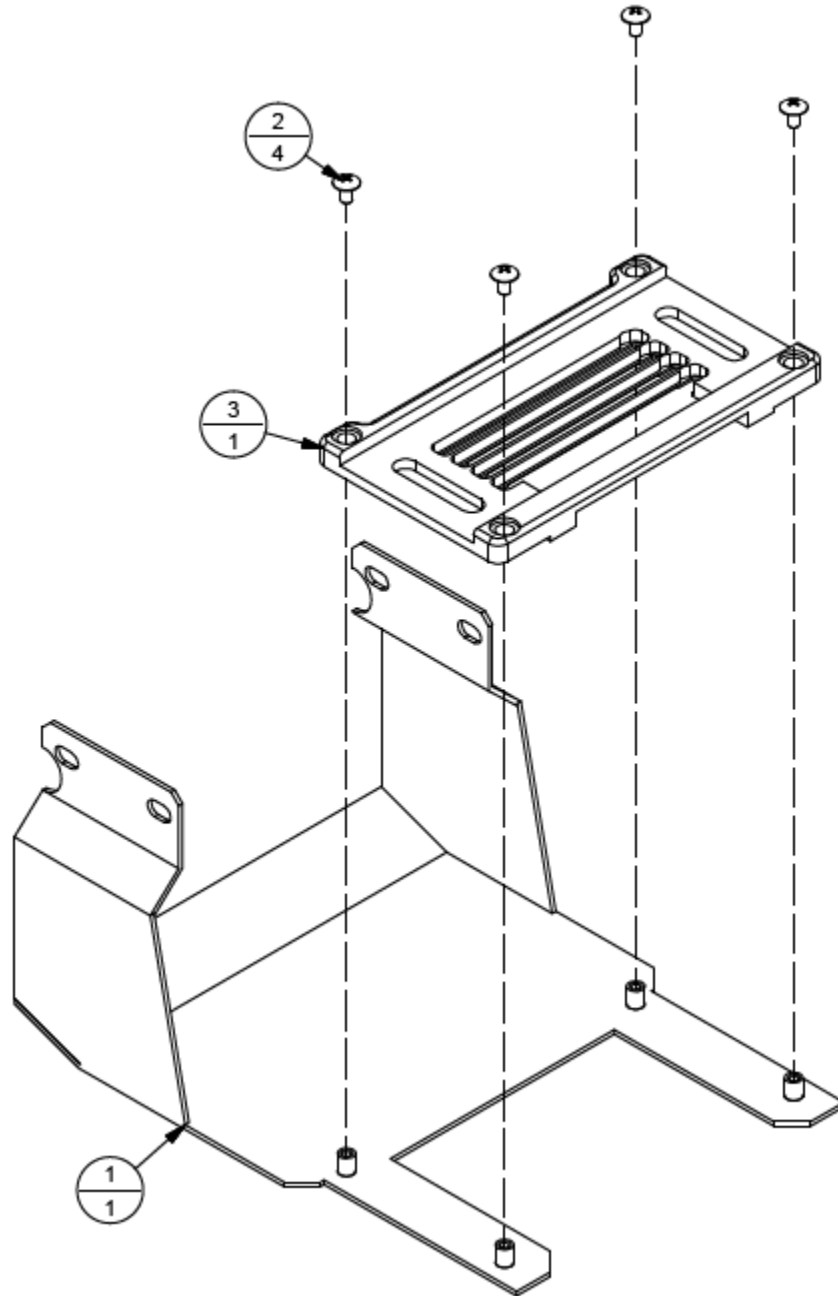
Figure A-11: 9105072A – Shield Assembly, Atom 2500, BK230

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

Item	Part Number	Quantity	Description	Reference
1	403310	4	Screw, PHMS, 8-32 UNC x 1/4"	
2	9105778	4	Screw, FPHMS, 8-32 UNC, 1-1/4", SS	
3	9106249	4	Screw, FPHMS, 8-32 UNC, 3/4", 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

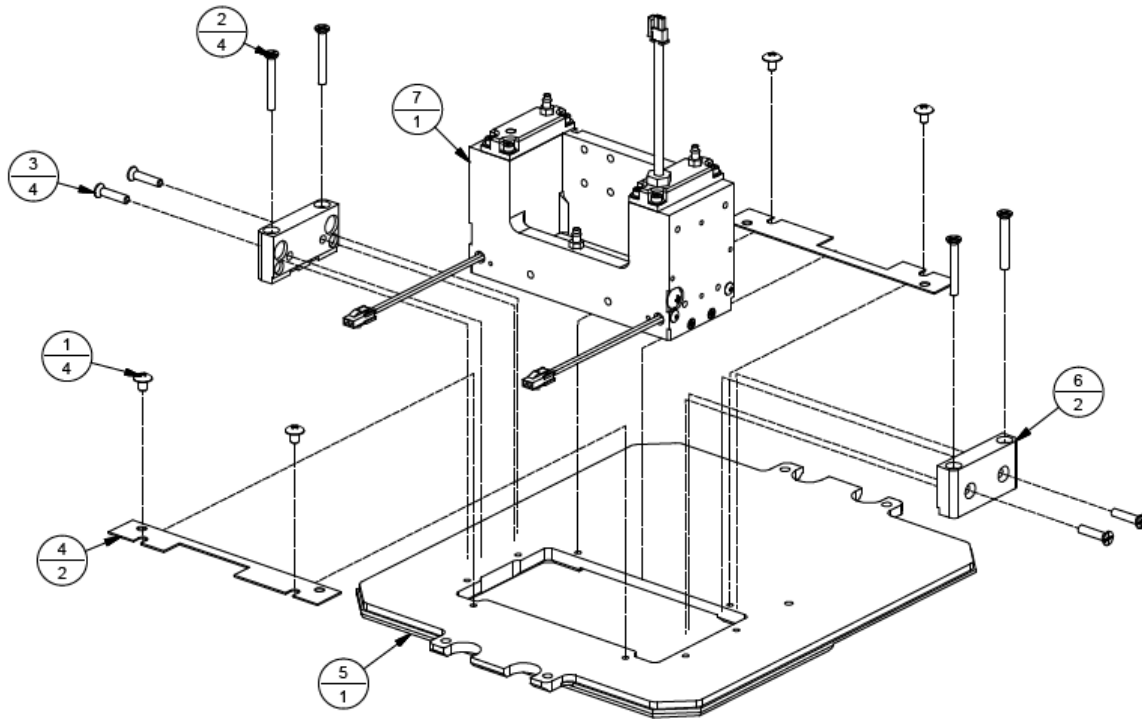
Figure A-12: 9107437A – Bottom Plate Assembly, Atom 2500

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 1/2"	
5	9104839	1	O-Ring, PC EPDM, 3/8" x 1/4" 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 1/4"	
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, 1/4-20 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, 1/4" SS, Phillips	
17	9106736	6	Spring, Compression, 0.18" OD	
18	9107150	1	Manifold, Spring Loaded JA	
19	9107826A	2	Heater Cartridge Assembly, Atom	

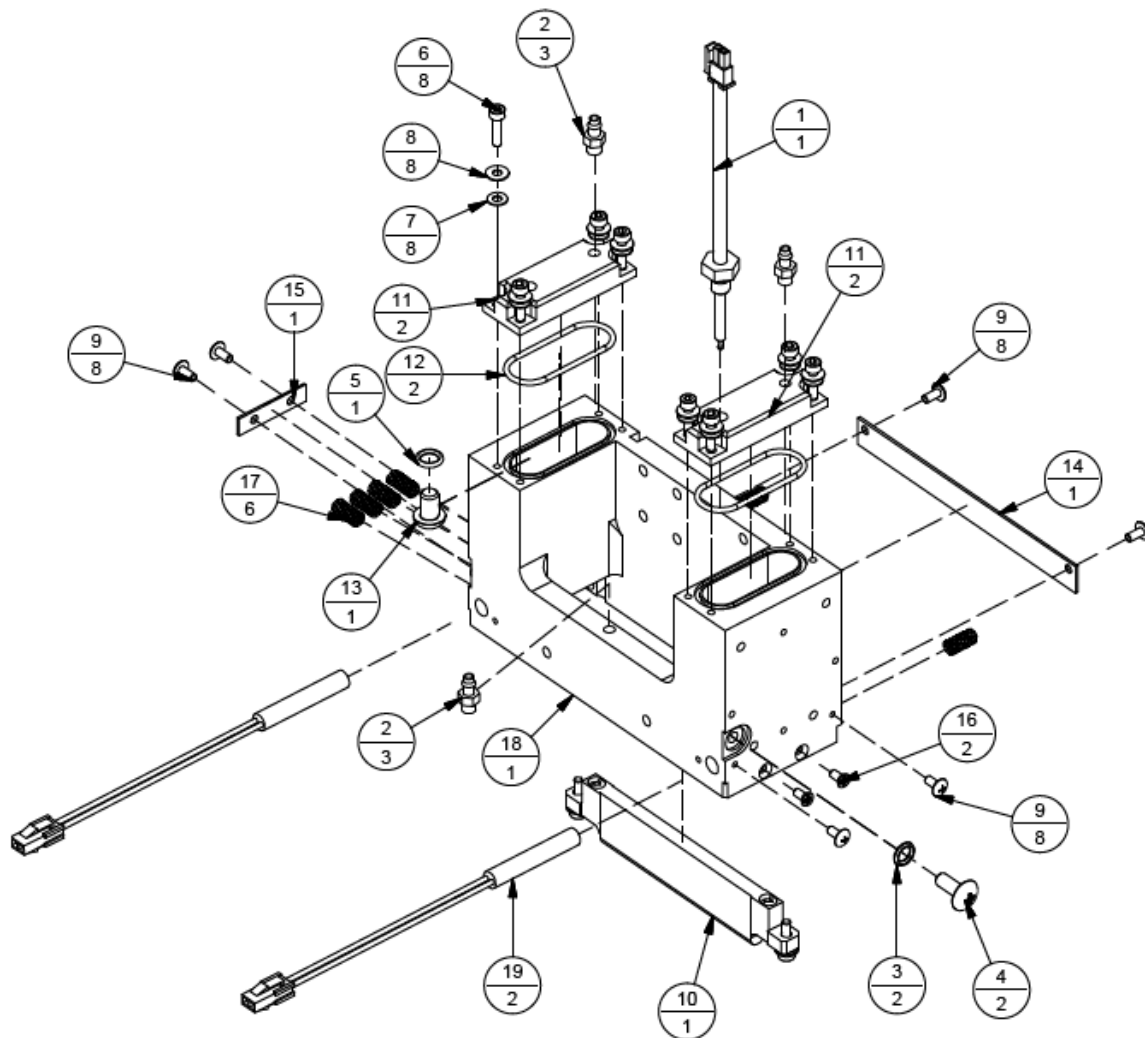
Figure A-13: 9107438A – Manifold Assembly, Atom 2500

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

Item	Part Number	Quantity	Description	Reference
1	401310	6	Screw, PHMS, 4-40 UNC x 1/4"	
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 3/4", SS	
7	9107439	1	Bracket, QPI	
8	9107717	1	Board, QPI	

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

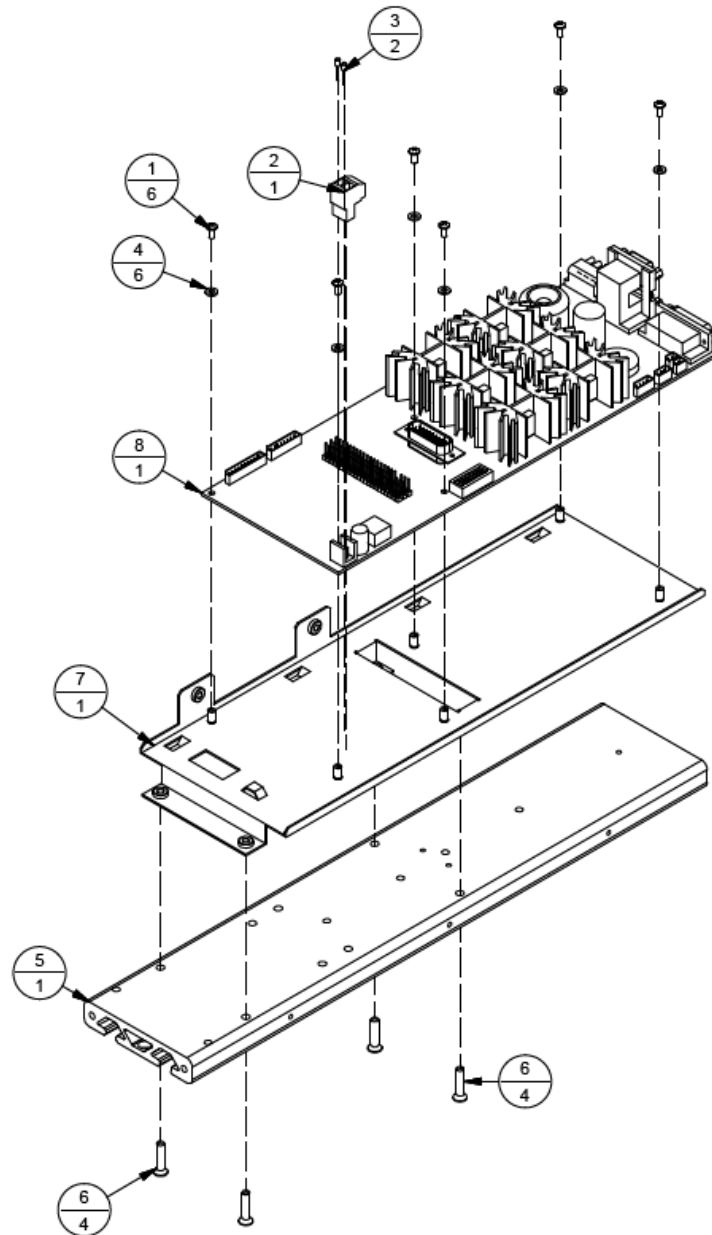


Table A-15: 9107441A – Bottom Plate Assembly, Atom 1025

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

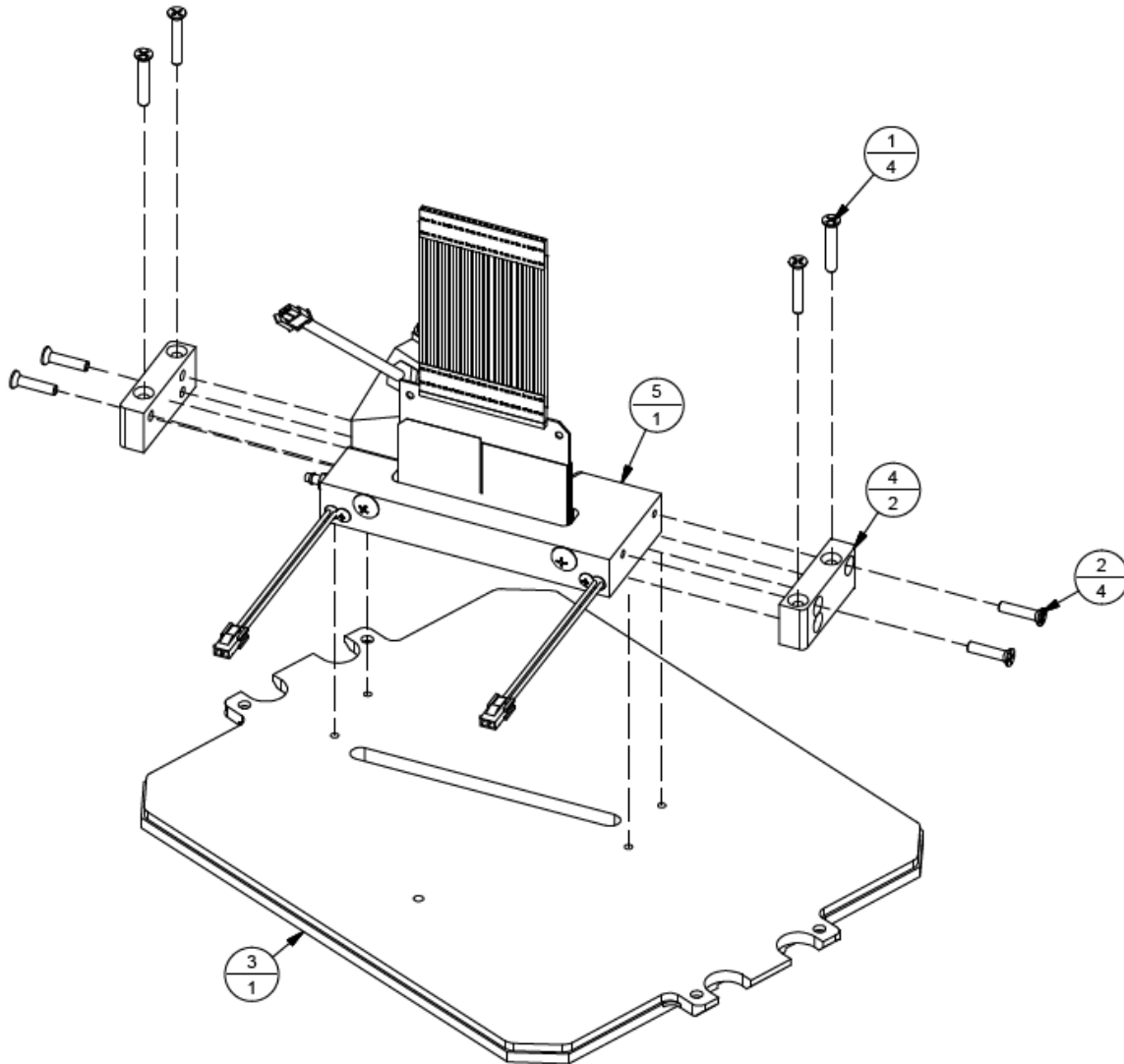
Figure A-15: 9107441A – Bottom Plate Assembly, Atom 1025

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

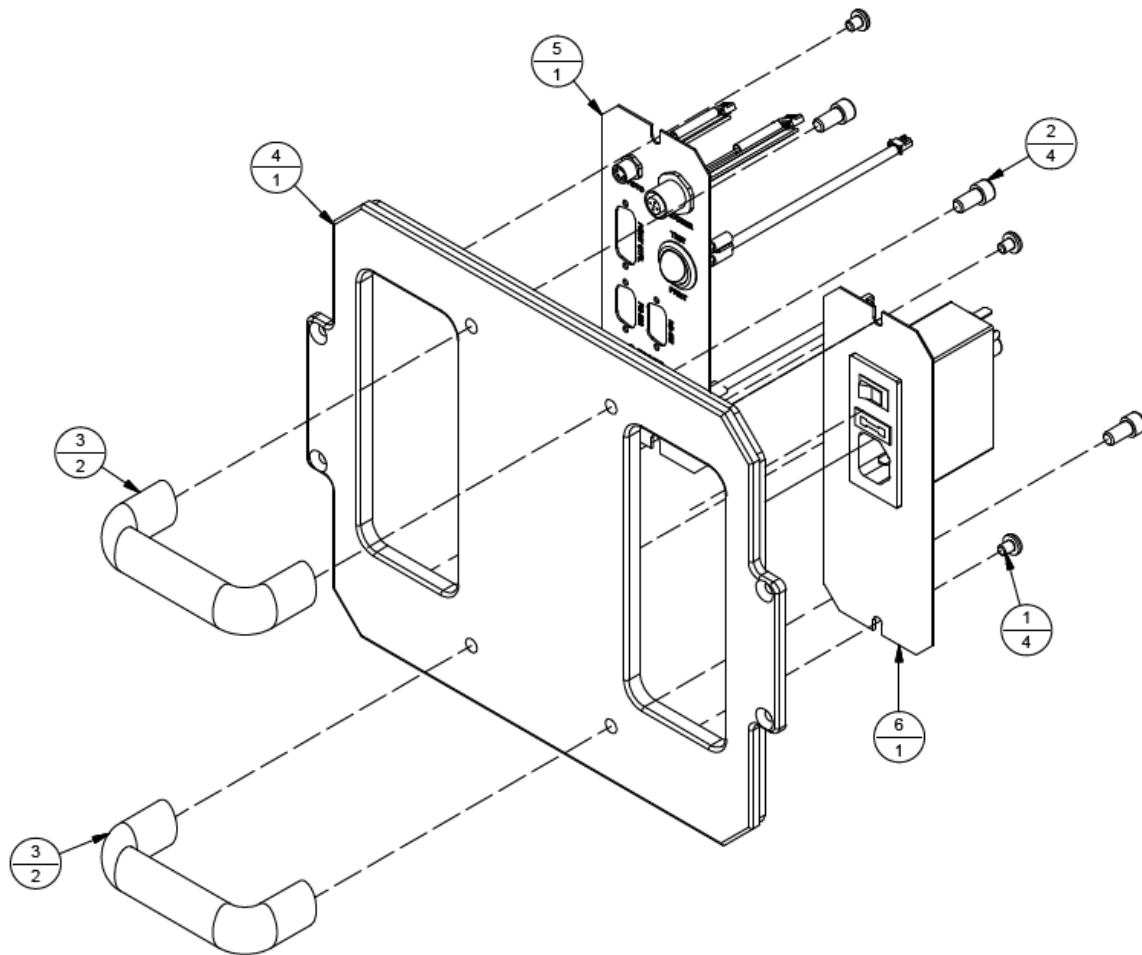


Table A-17: 9107447A – Bracket Assembly, QPI Inputs, Atom

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

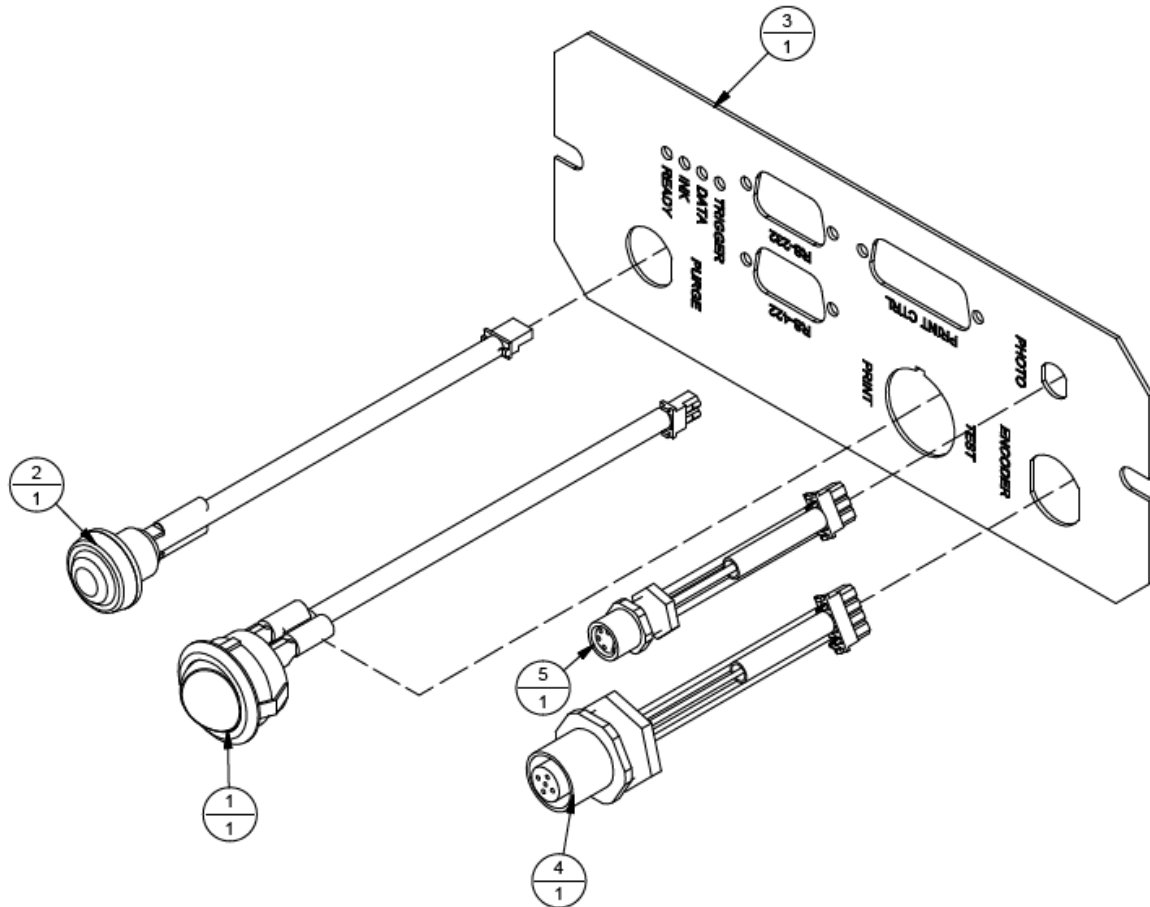


Table A-18: 9107718A - Manifold/Reservoir Assembly, Atom 1025

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 1/4"	
5	9105019	1	Plug, Threaded, Tapered 10-32, Black Nylon	
6	9105020	2	Screw, PHMS, Truss, 10-32 UNF x 1/4"	
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 1/4", 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, 1/4-20 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

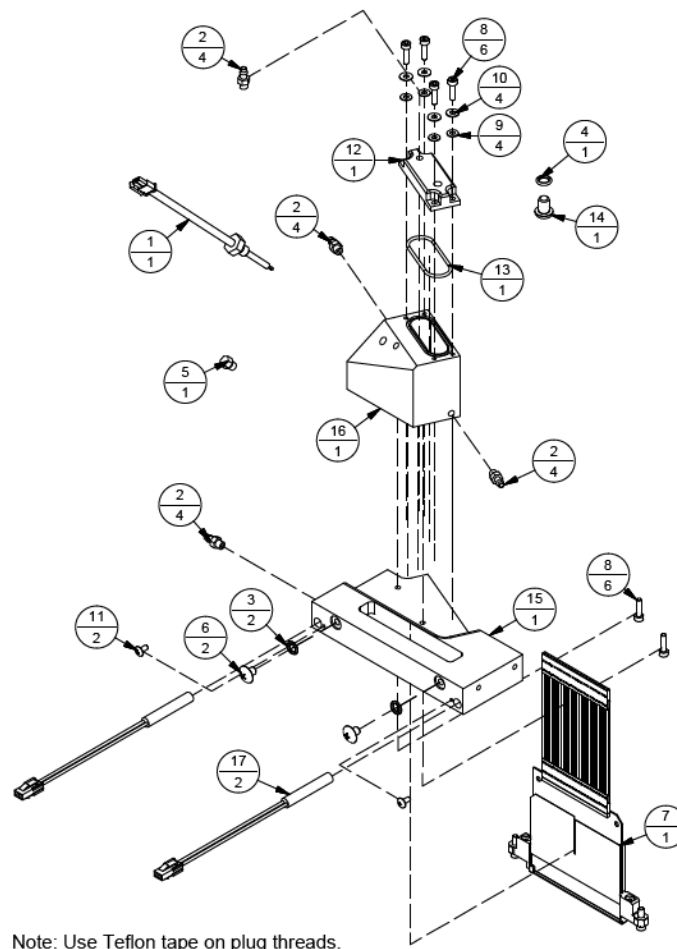


Table A-19: 9107911A – Solenoid Valve Assembly, 3-way, Air

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	

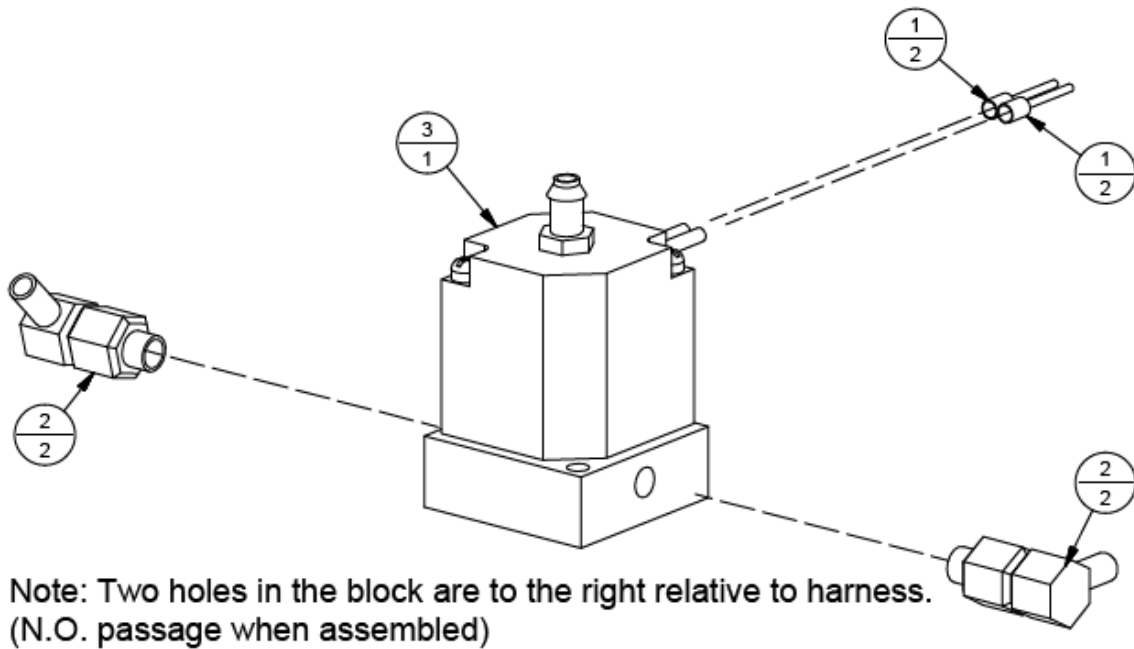
Figure A-19: 9107911A – Solenoid Valve Assembly, 3-way, Air

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	

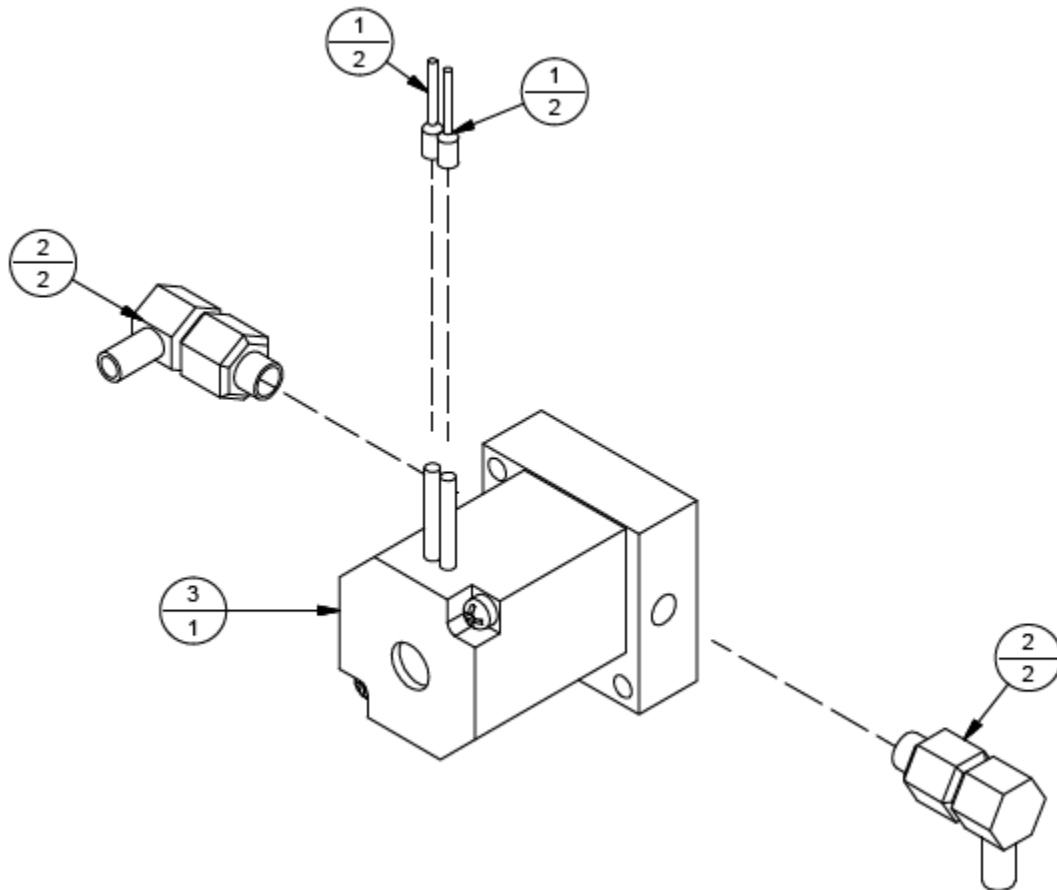
Figure A-20: 9107912A – Solenoid Valve Assembly, 2-way, Air

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	

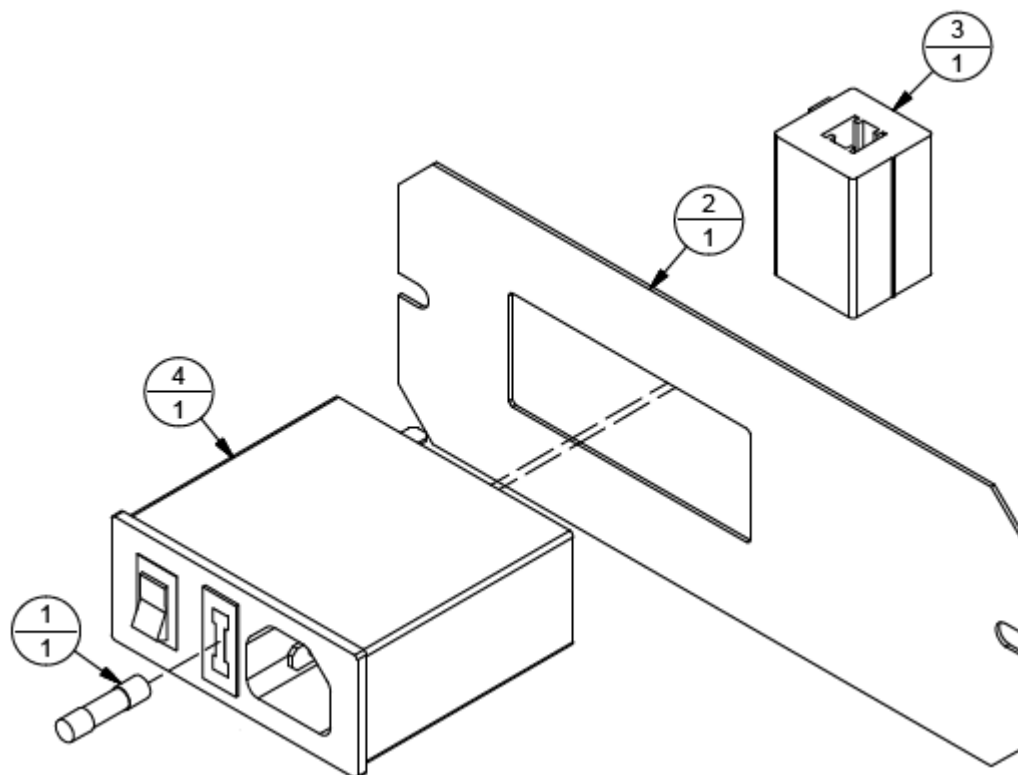
Figure A-21: 9107921A – Bracket Assembly, Atom Input Power

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

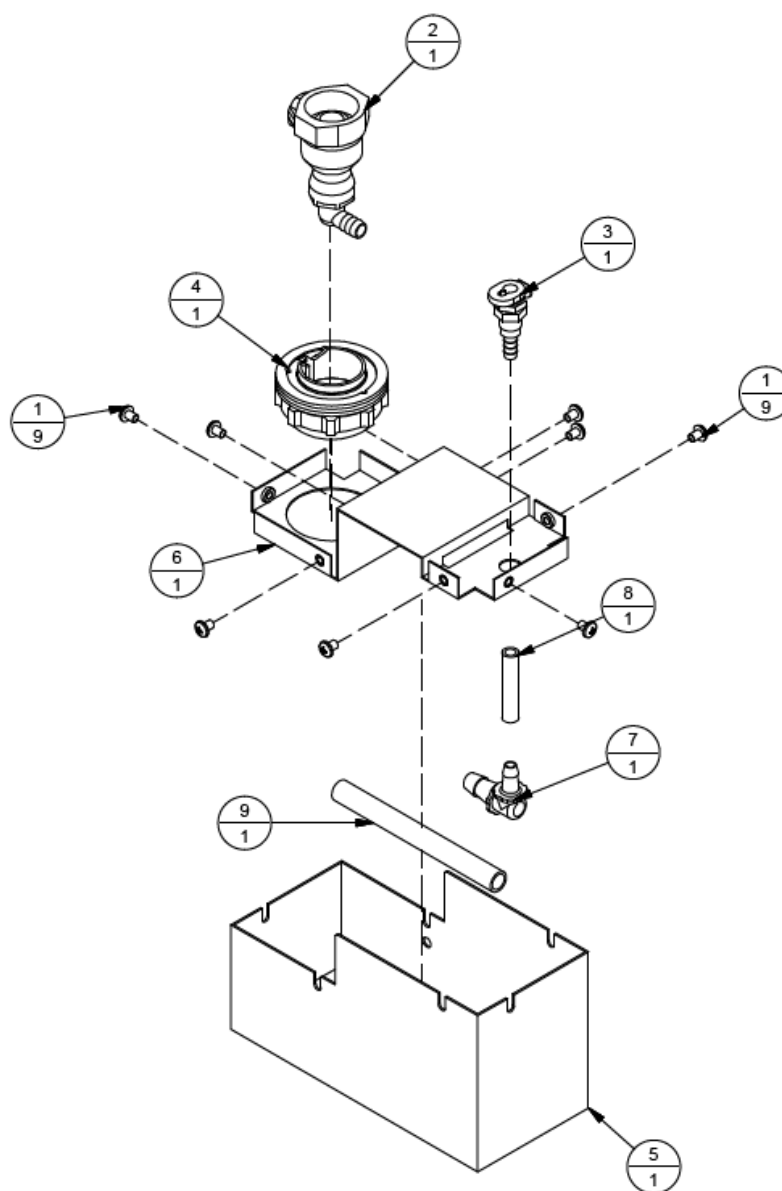


Table A-23: 9107924A – Separator Assembly, Atom

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 1/4"	
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 1/4"	
6	9107924	1	Bracket, Separation	

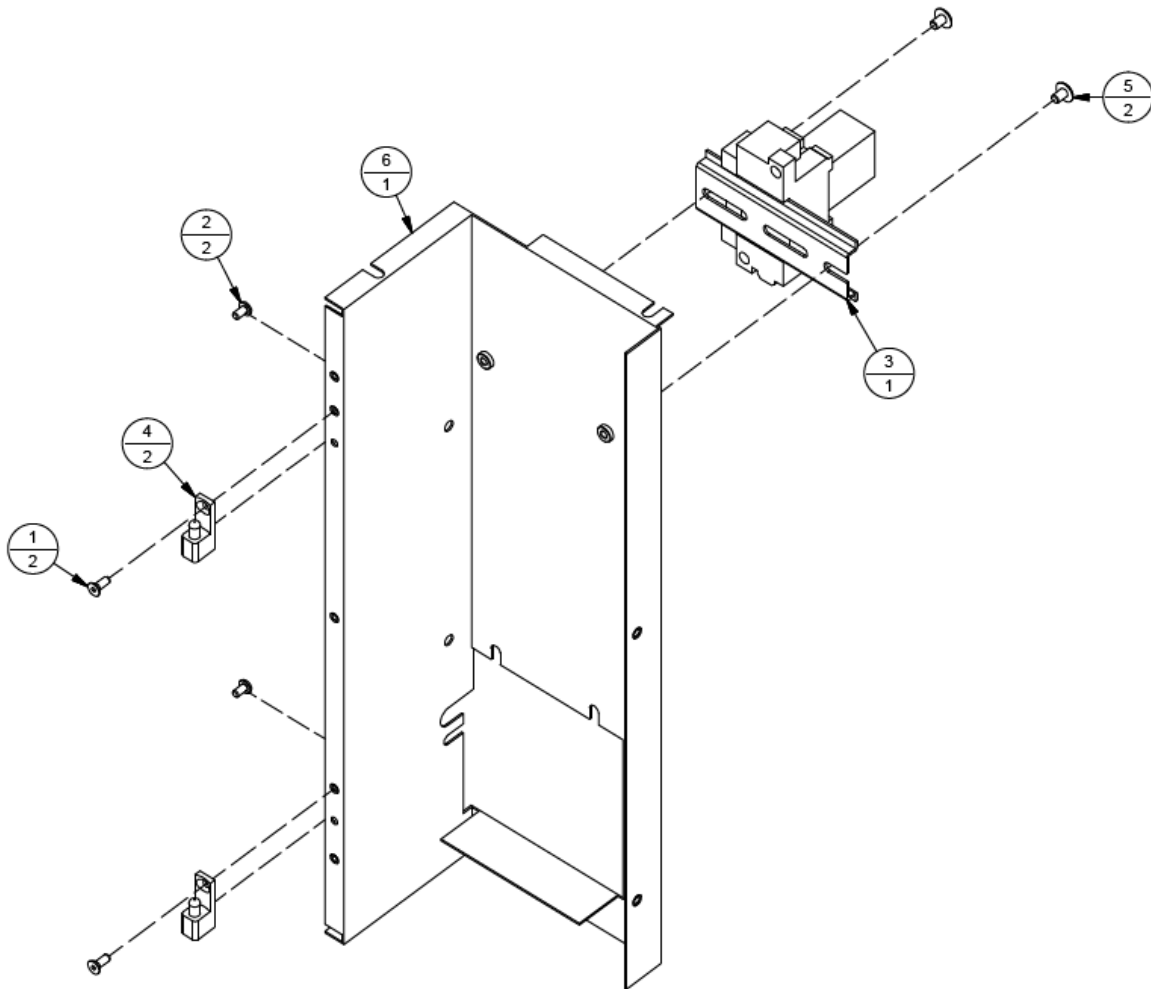
Figure A-23: 9107924A – Separator Assembly, Atom

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.

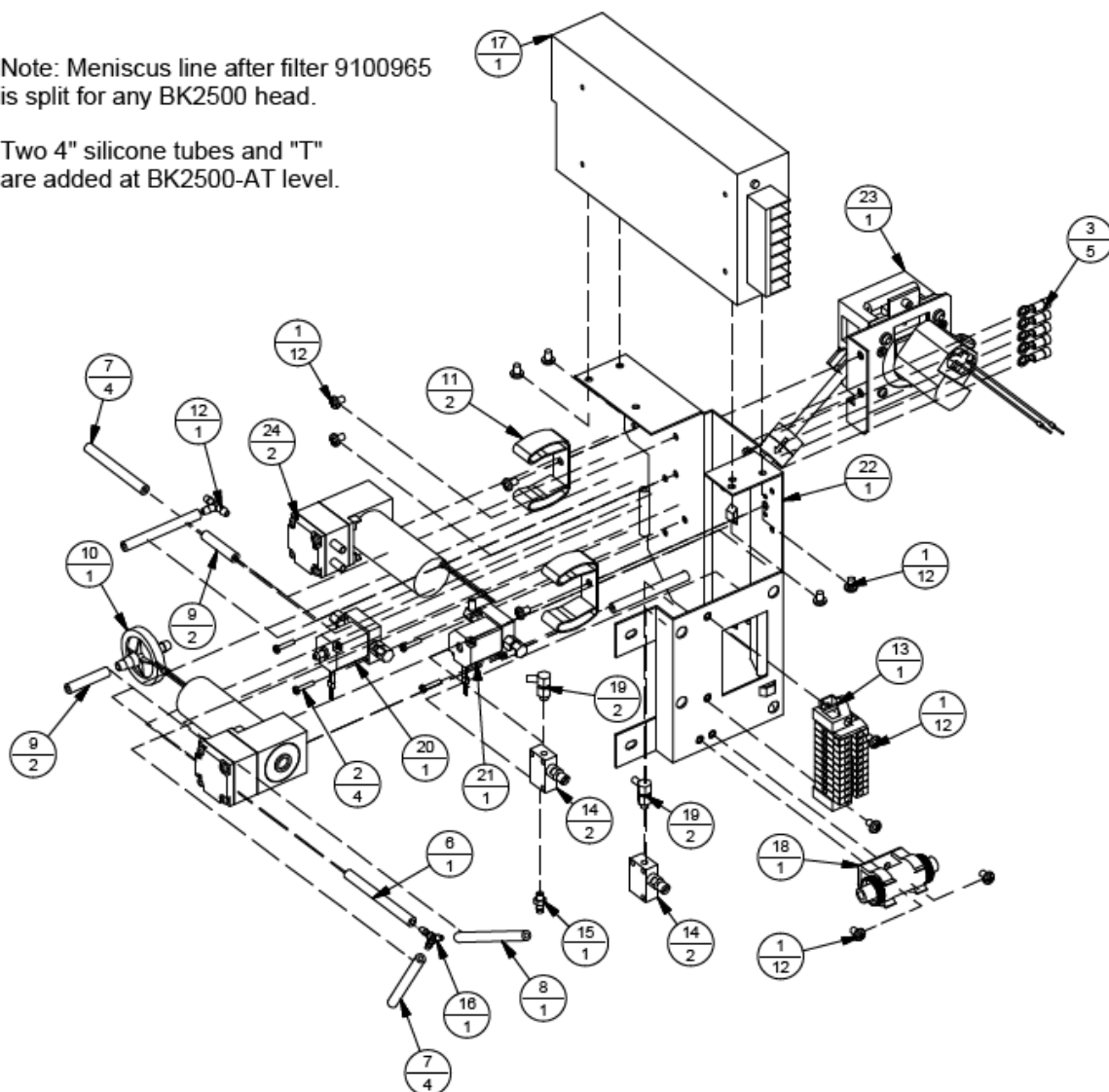
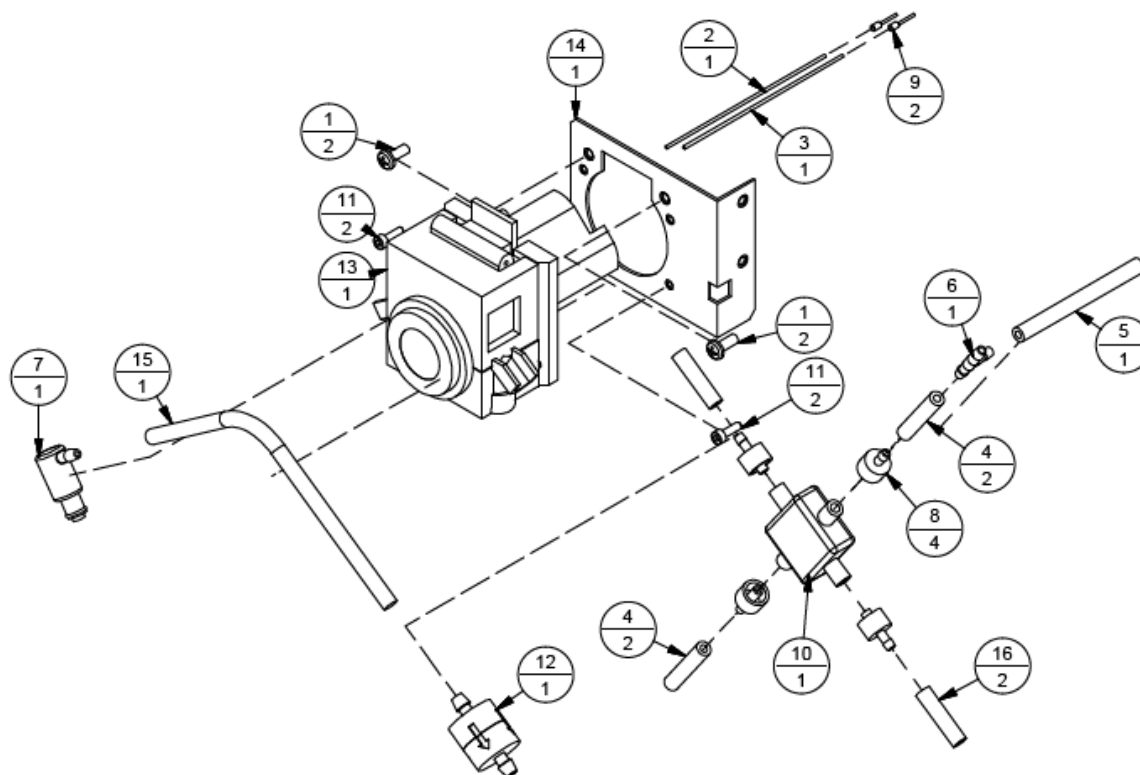


Table A-25: 9107926A – Ink Pump Bracket Assembly, Atom

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, 1/4" OD x 1/8" ID	
5	9100472	1 x 5"	Tubing, Silicone, 1/4" 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, 1/4" OD x 1/8" ID	
16	9108116	2 x 5"	Tubing, Ink, 1/4" 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	

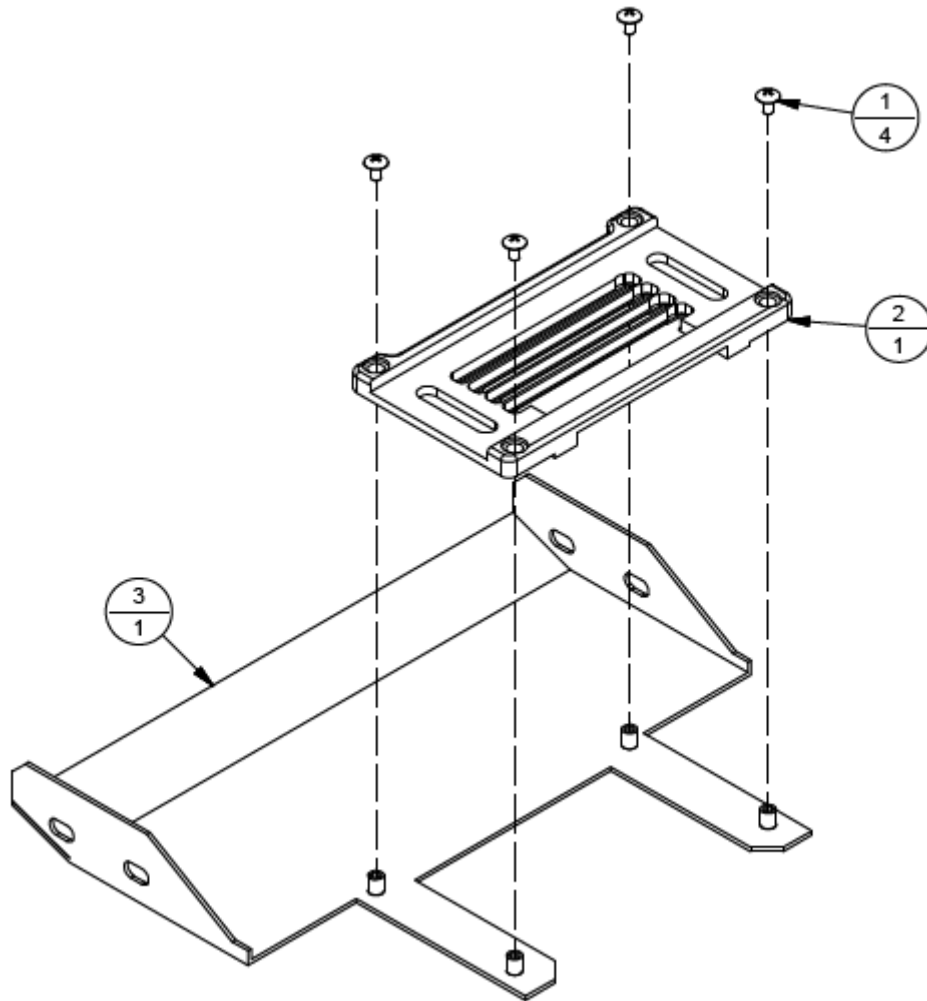
Figure A-26: 9107927A – Shoe Assembly, Atom 2500

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 1/4"	
5	9106735	2	Screw, FHCS, 4-40 UNC, 1/4", SS	
6	9107930	1	Door, Atom	

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

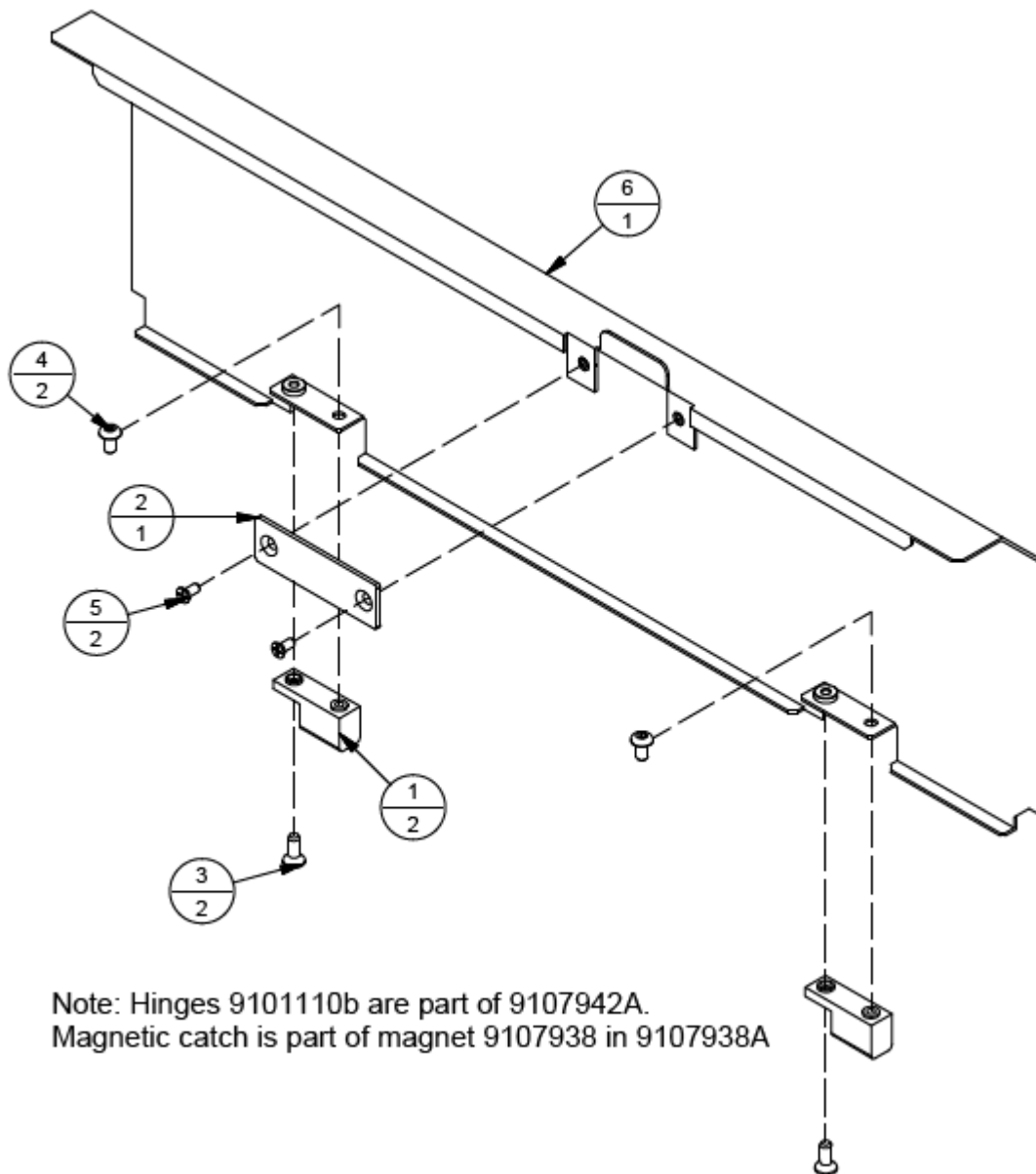


Table A-28: 9107935A – Connector Assembly, Encoder

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

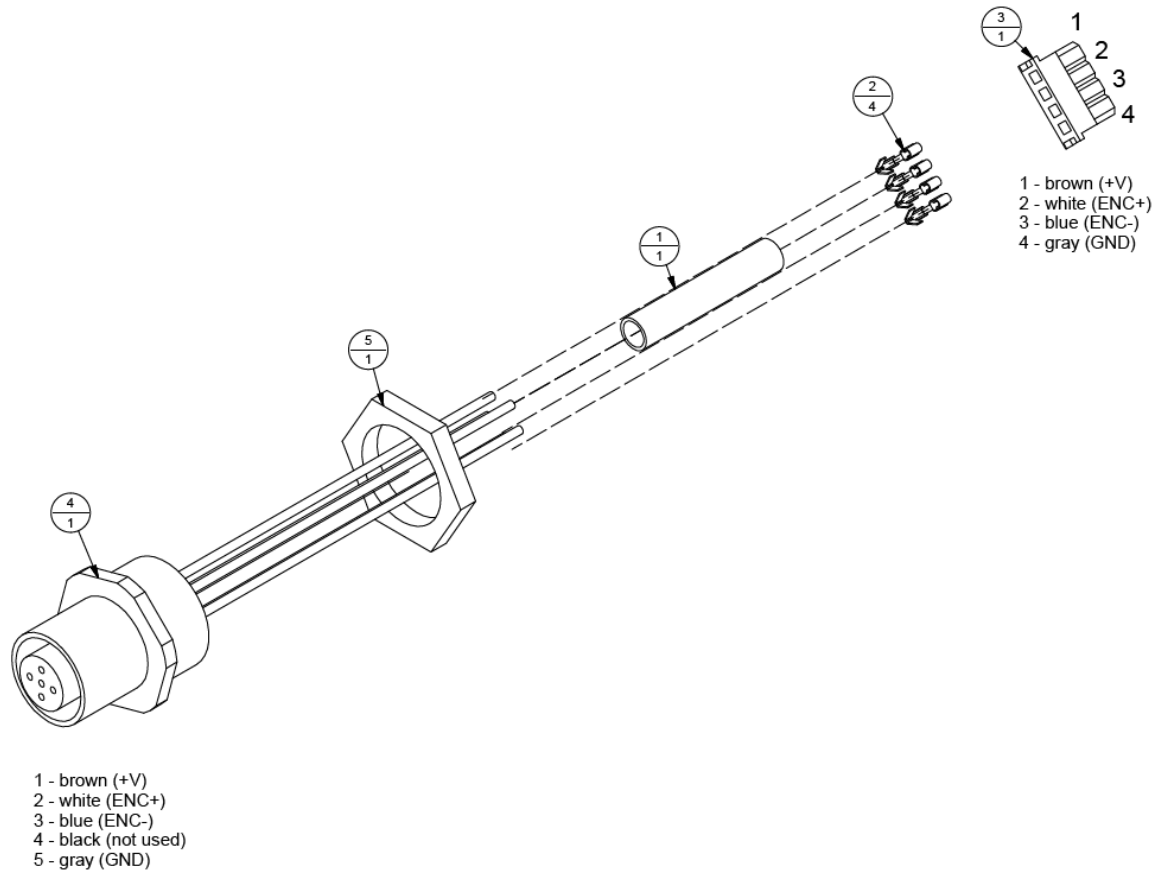


Table A-29: 9107938A – Right Bracket Assembly, Atom

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	

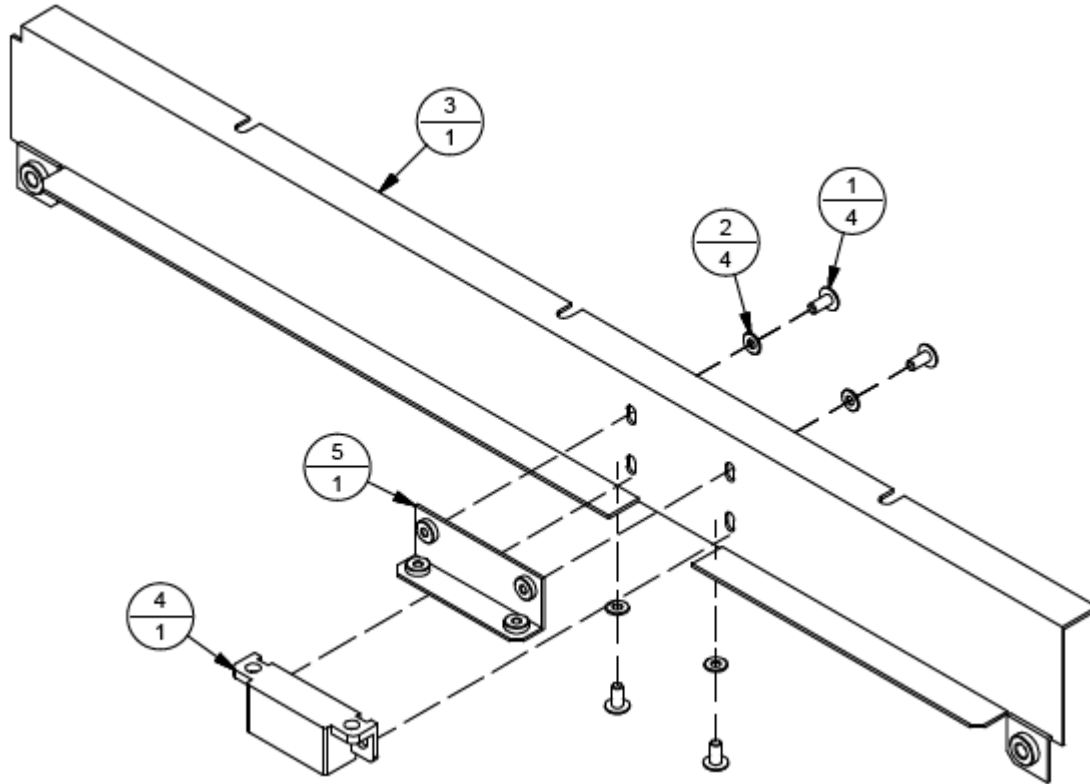
Figure A-29: 9107938A – Right Bracket Assembly, Atom

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	

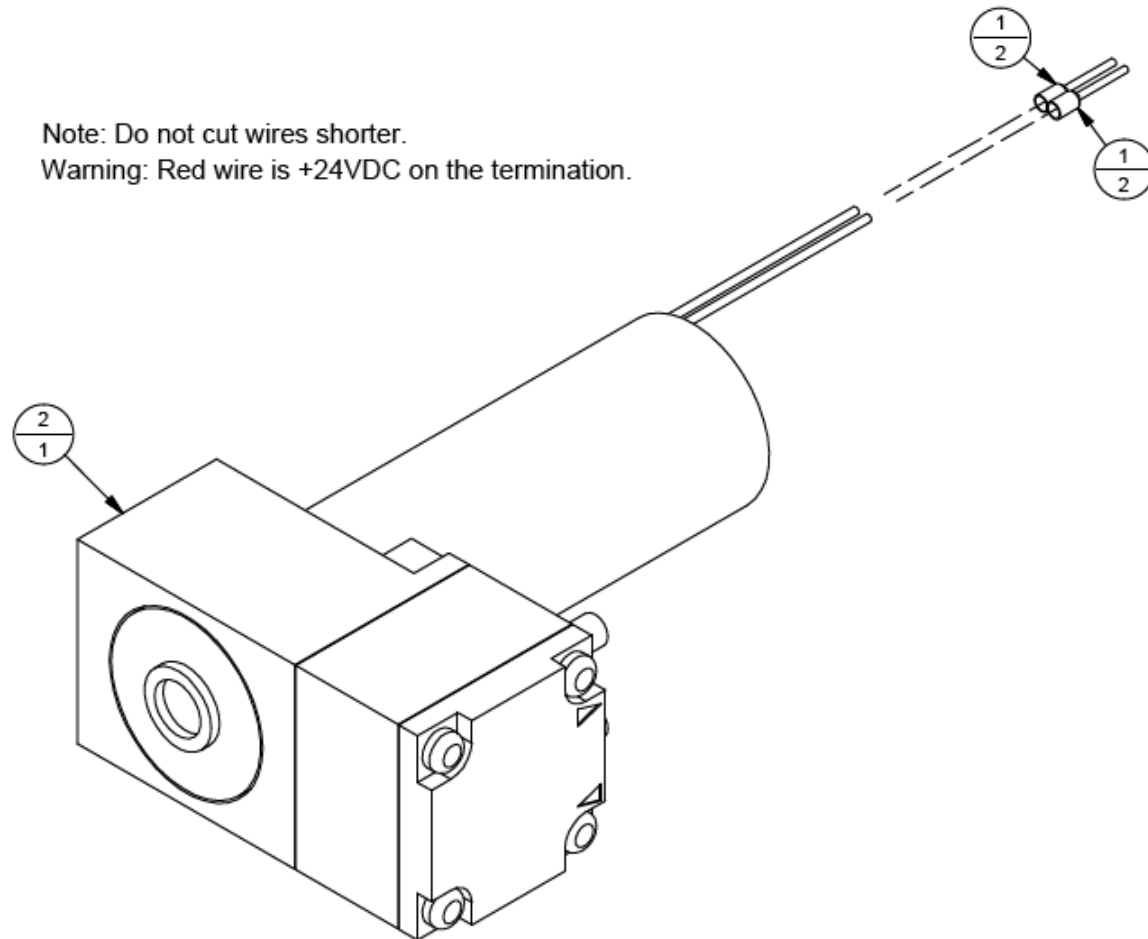
Figure A-30: 9107943A – Air Pump Assembly, Atom

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

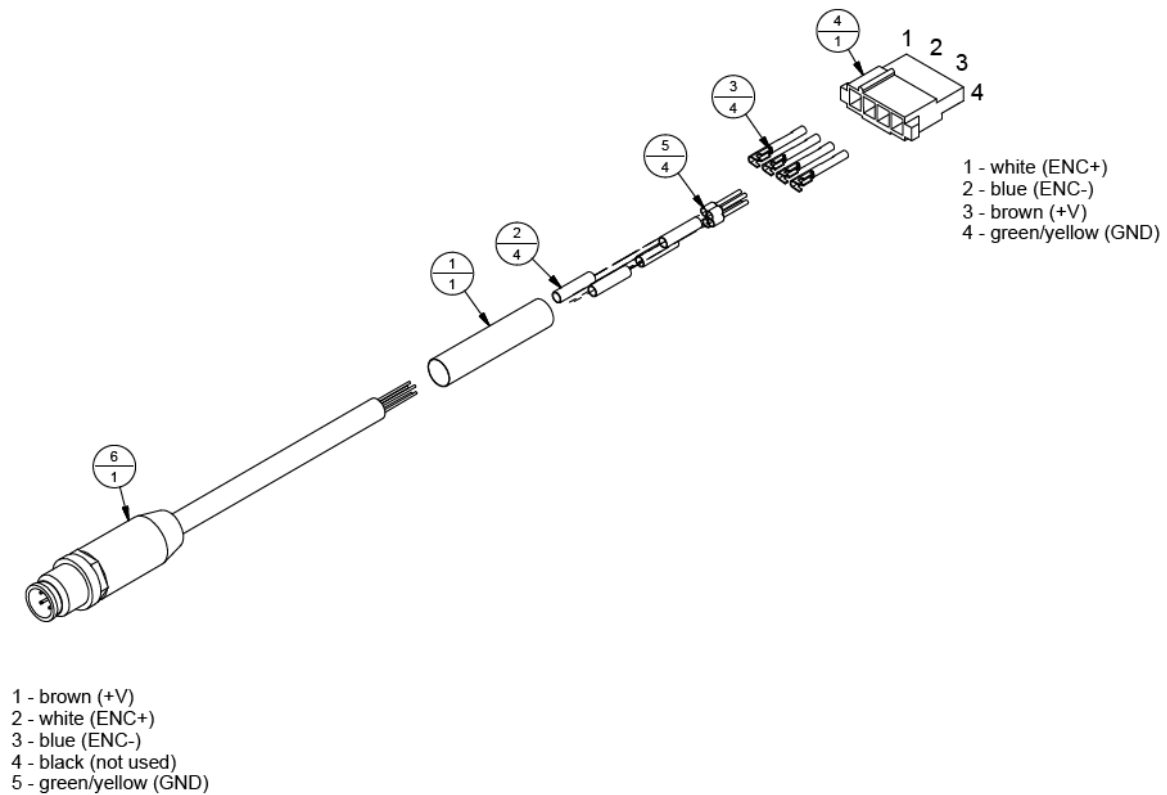


Table A-32: 9108204A – Connector Assembly, Photoeye

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

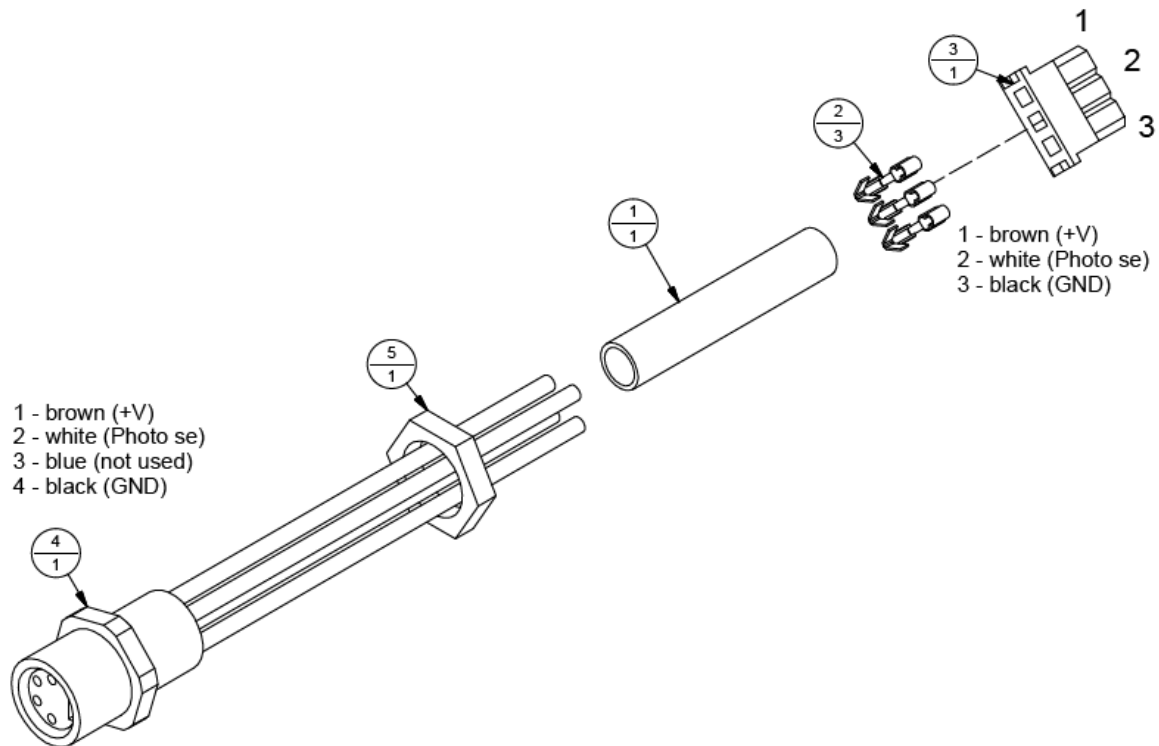


Table A-33: 9108206A – Cable Assembly, Photoeye

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

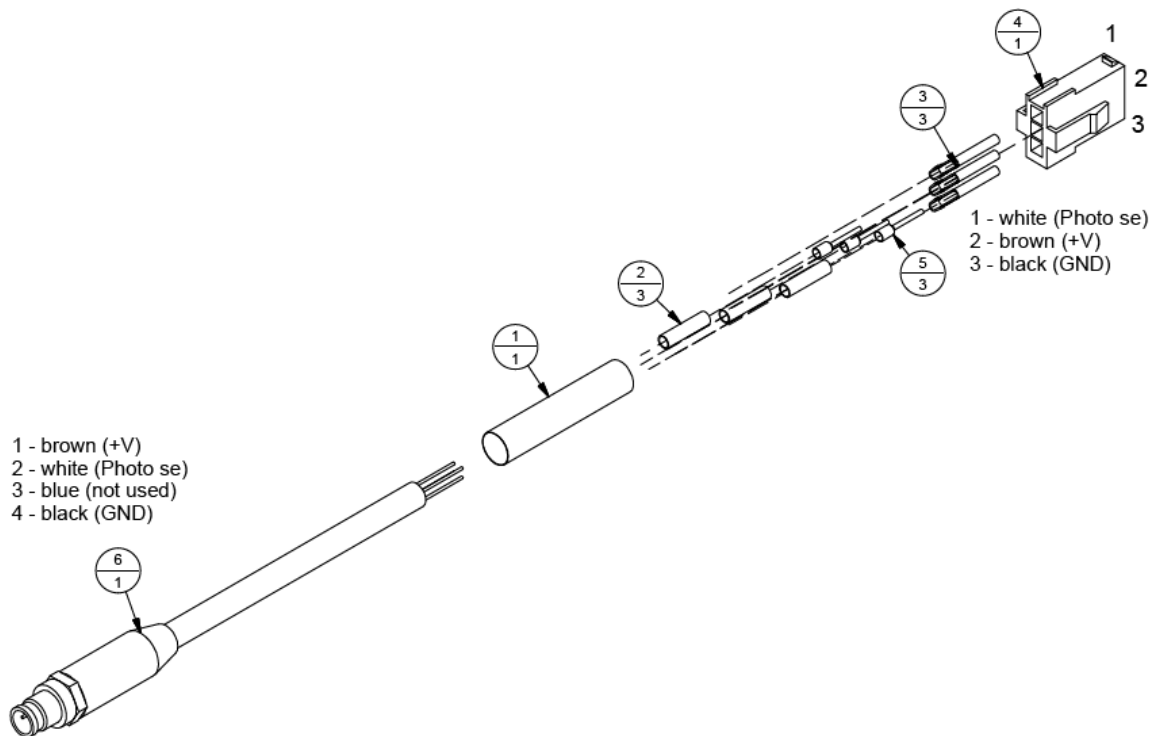
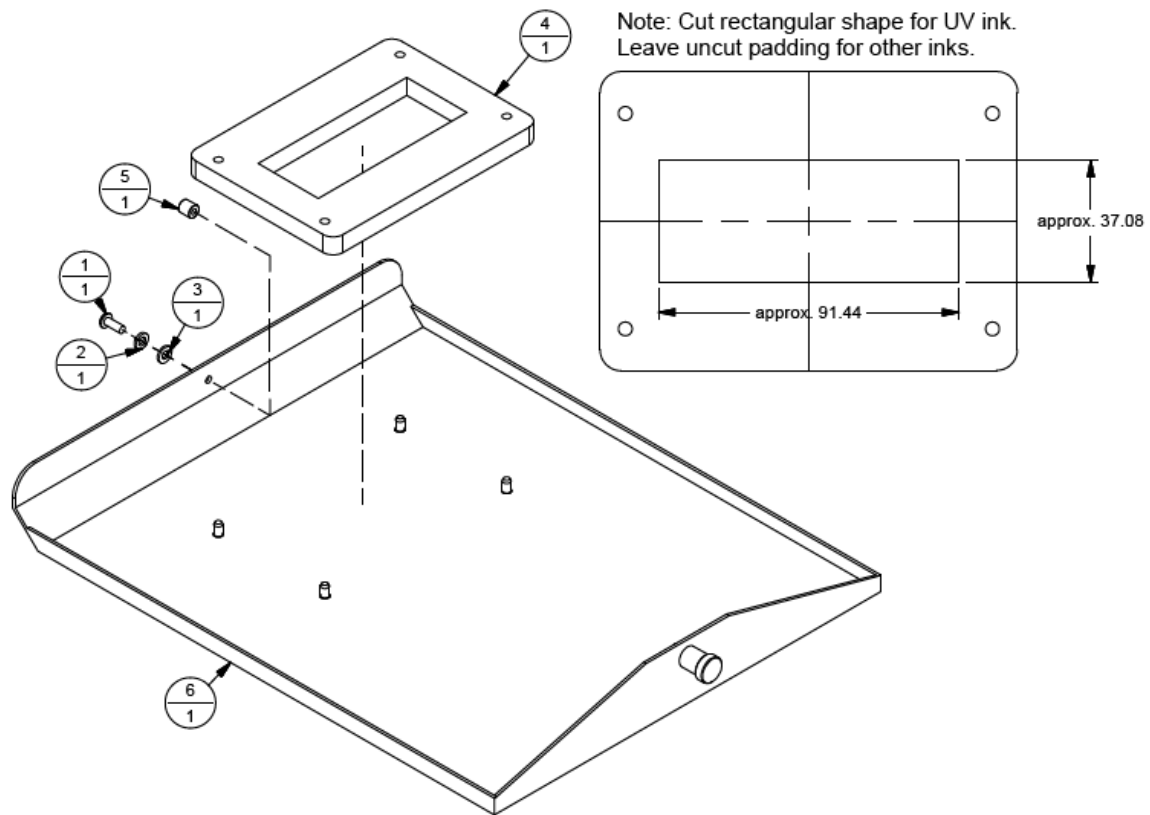


Table A-34: 9108208A – Cap Assembly, 2500 Atom

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



List of Schematics

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

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

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.

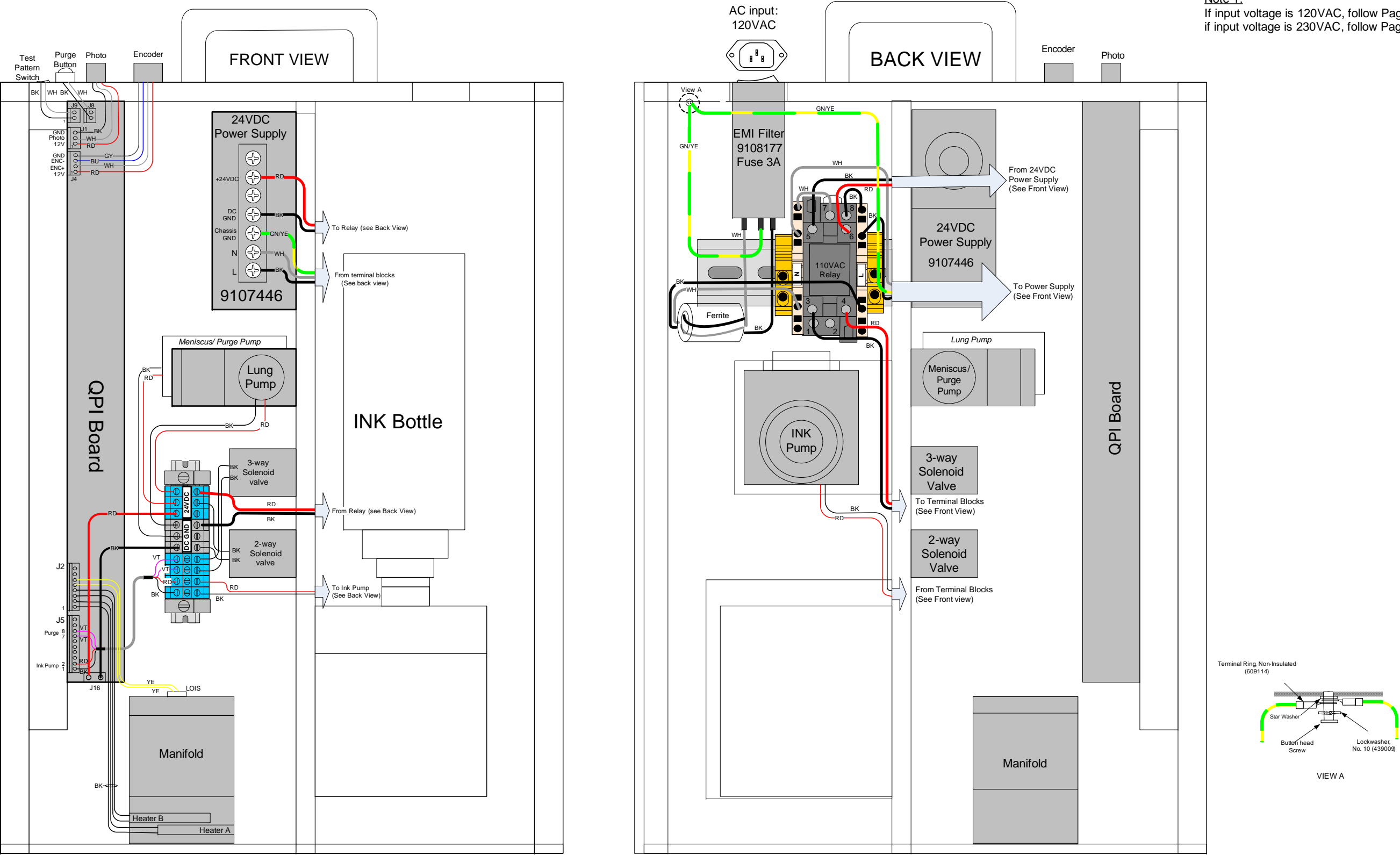


Figure B-2: 9107439AC – Atom Wiring Diagram, 230VAC

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

