



BK1710 / BK1720 Controller User's Guide

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Buskro Ltd.

1738 Orangebrook Court, Unit #1

Pickering, ON, L1W 3G8

Canada

Tel.: (905) 839-6018

Fax: (905) 839-6023

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Manual History

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1.1	02-Sep-08	Appendix Updated. Release of 16-Channel PCM and new PSMs.	1081
1.2	08-Nov-10	Updated HCC DIP Settings for 2500 and 5100 series printheads	

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Appendix C – Power Supplies Assembly Drawings

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Appendix F – Serial Communication

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1.1 Introduction

The BK1710 and BK1720 are powerful system controllers that deliver all-in-one control with powerful job set up, layout, production management, verification, diagnostics, and reporting, all with a familiar Windows-based WYSIWYG interface. Driven by Buskro's Compose IQ software, Buskro controllers offer powerful features including print synchronization across multiple printheads and zones, even across multiple bases. Buskro controllers are also built with a modular, open architecture that will allow expansion as business grows. This includes adding additional software features, more printheads, or additional print technologies.

The BK1710 and BK1720 controllers are more advanced than Buskro's entry level (BK705) and mid level controllers (BK700 and BK1705). It is capable of supporting more printheads, as well as more printhead types. It is modular in design to simplify upgrades, and it has a number of displays to assist in troubleshooting and understanding its current status.

The BK1720 is in essence an expanded version of the BK1710. Through the addition of a second rack, the BK1720 can add the components required to support more printheads. The BK1710 can also be upgraded to become a BK1720 through the use of an upgrade kit (P/N UBK-1710-20 – Print management components are sold separately).

Figure 1-1: *BK1710 / BK1720 Controllers*

1.1.1 Compose IQ

Compose IQ™ is the Windows™ based inkjet control software included with all Buskro controllers. It is designed to control and monitor all aspects of the printing process including production reporting. With Compose IQ™, the user can control the graphic layout and job setup, and monitor the job run progress in real time. Some examples of Compose features include:

- Easy layout tools providing many image types in a WYSIWYG environment.
- Operator screen permits real-time viewing of records, their status, and provides tools to search, reposition, and reprint them.
- Setup and diagnostic windows to identify and monitor the various printheads installed on the system.
- 1:1 product/data monitoring for robust system-wide integrity.
- Complete job audit reporting of current and archived production.
- Network and communication capability with external input devices or other controllers.
- Track products over up to eight independent transport zones.

A number of optional items can either be included with the original purchase or upgraded at a later date. These options include:

- Print Combinations (multiple technologies such as Atlas and Apollo).
- Full process colour printing utilizing the Apollo-4C.
- Partial Match for sequential list lookups.
- PDF file printing support.
- Product tracking over multiple independent transport zones.
- An enhanced communication package for communication with an external device(s) or other Buskro controller(s) through serial means (RS232C).
- An OCR package for applications where a number is received from an external device or controller, looked up in a database, and at an appropriate time, transferred to the printing process.
- A selective control package for situations where it is necessary to control external system elements selectively based on data. In order to implement selective controls, it is necessary to provide localized system controls with a PLC.

Note, programming and implementation of the PLC functions is not included in the price of the upgrade package.

When one of these optional upgrade packages is installed, the user can run in any desired mode supported by the package. This includes standard, client, host, OCR (*OCR package*), and selective (*Selective package*).

1.1.2 Technology Types

The BK1710 and BK1720 controllers are capable of supporting different inks and print technologies. This includes Atlas (available in standard or the fast drying ink version known as Cezanne), Apollo, and Aurora. For more information on the currently available technologies, contact a Buskro representative or visit <http://www.buskro.com/>

1.2 System Drawings

1.2.1 BK1710 Controller Dimensions

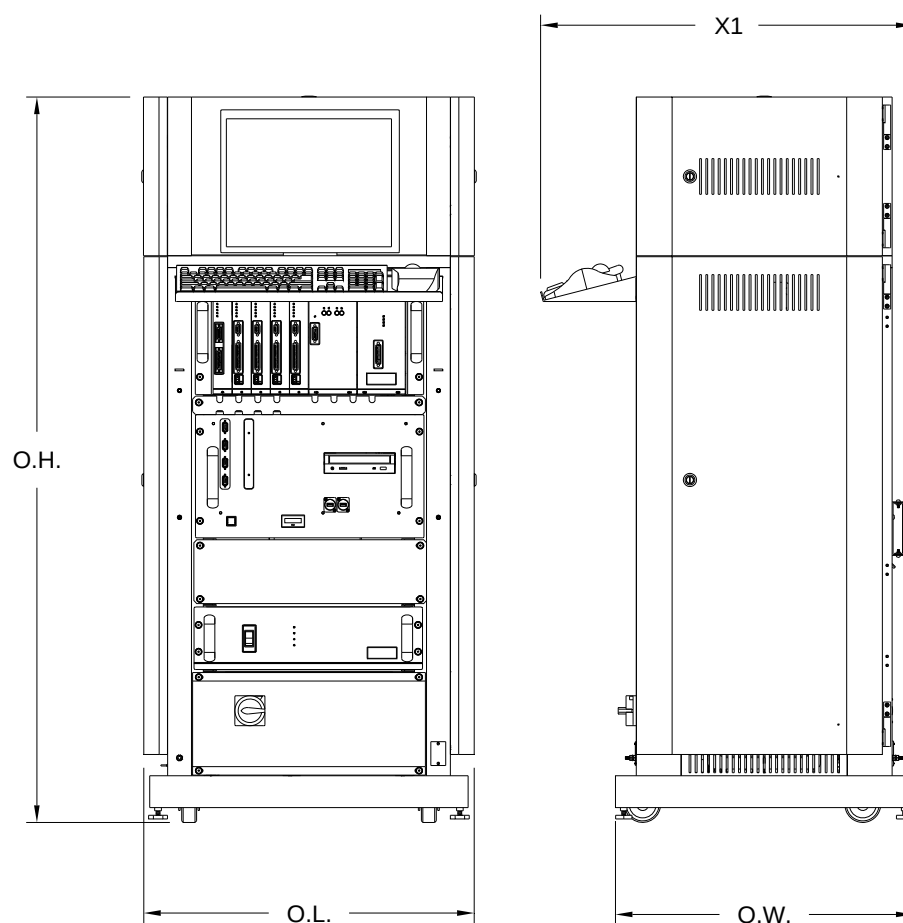


Table 1-1: *BK1710 Controller Dimensions*

Symbol	Description	Dimensions	
O.L.	Overall Length	27.76"	705 mm
O.W.	Overall Width	25.00"	635 mm
O.H.	Overall Height	60.91"	1547 mm
X1	Width including Keyboard Tray	31.28"	795 mm

Table 1-2: *BK1710 Electrical Requirements*

Electrical Requirements	
Line Voltage	200 or 230 VAC
Line Current	15 Amps
Power	3.5 kVA

1.2.2 BK1720 Controller Dimensions

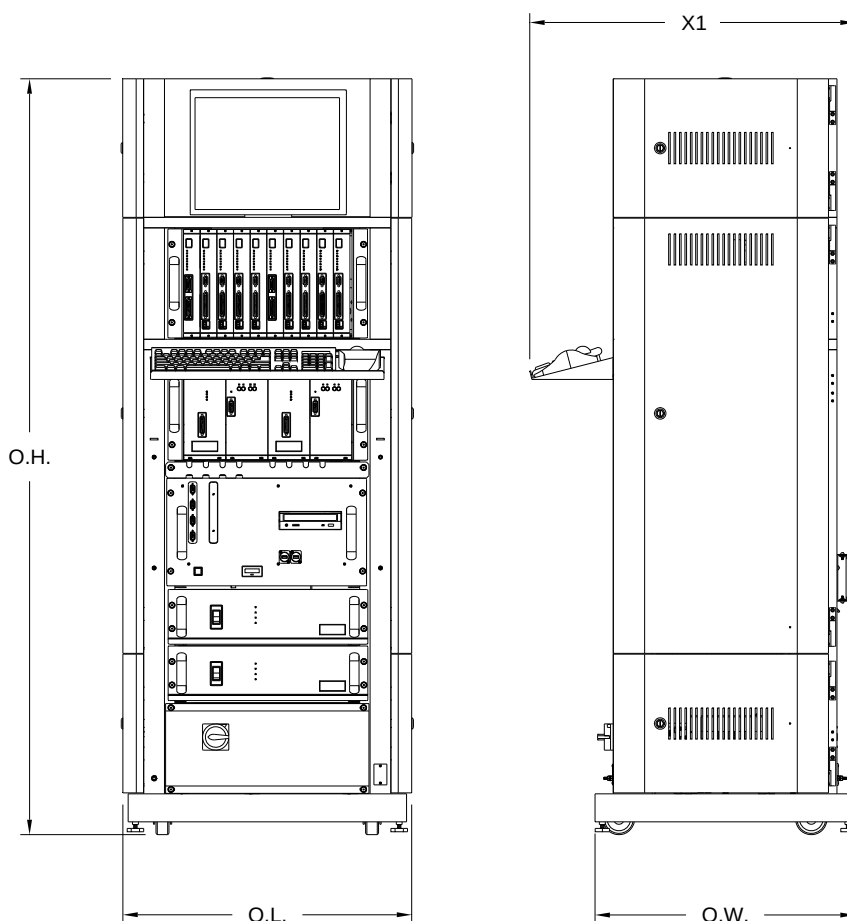


Table 1-3: *BK1720 Controller Dimensions*

Symbol	Description	Dimensions	
O.L.	Overall Length	27.76"	705 mm
O.W.	Overall Width	25.00"	635 mm
O.H.	Overall Height	72.61"	1845 mm
X1	Width including Keyboard Tray	31.28"	795 mm

Table 1-4: *BK1720 Electrical Requirements*

Electrical Requirements	
Line Voltage	200 or 230 VAC
Line Current	15 Amps Max
Power	3.5 kVA

1.2.3 Controller Components

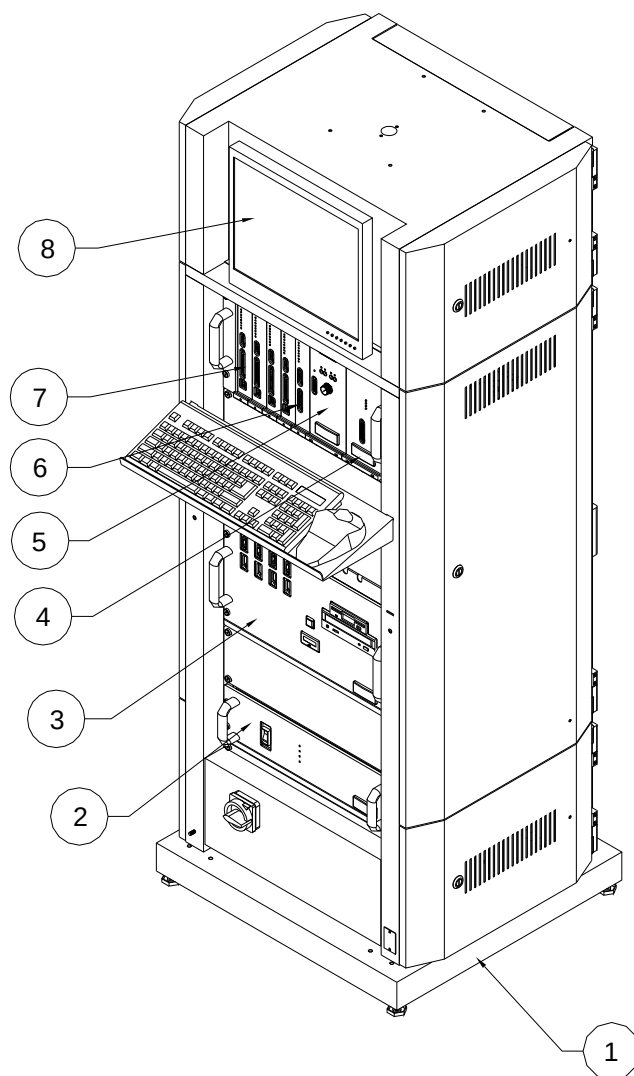


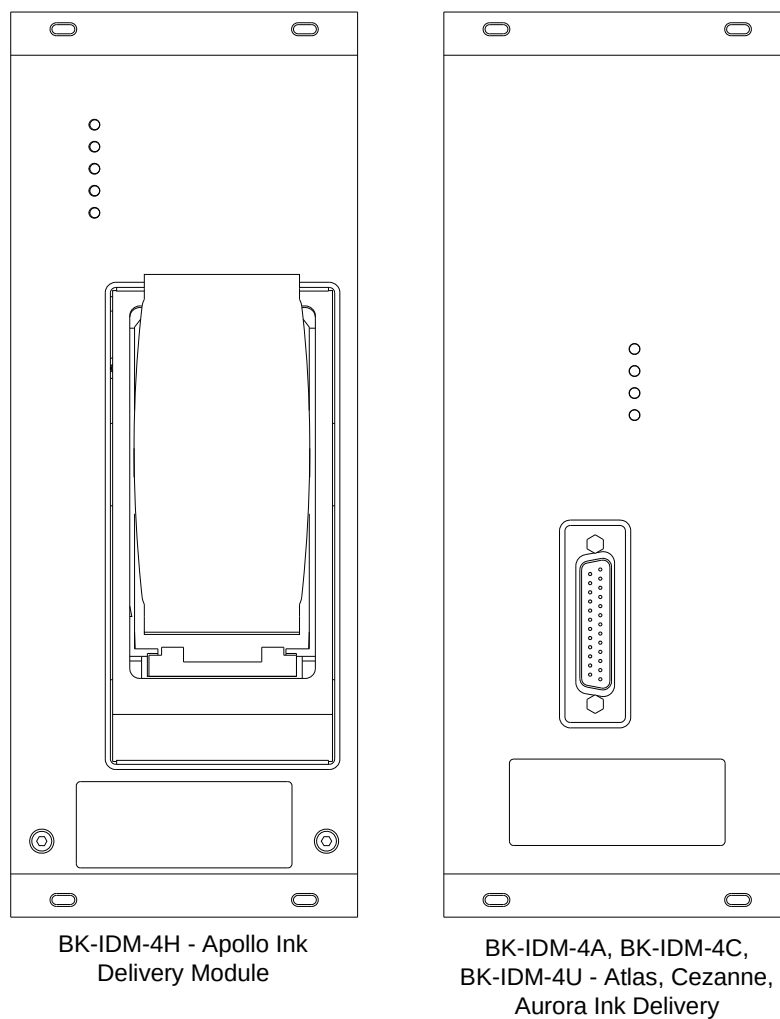
Table 1-5: *Illustration of the various BK1700 Controller Elements*

Item	Description	Reference
1	Controller Cabinet	
2	Controller Power Supply Module	
3	Computer Module	
4	Ink Delivery Module – Apollo, Atlas, Aurora	
5	Pressure Regulator Module	
6	Reservoir Control Card (RCC)	
7	Head Control Card (HCC)	
8	Computer Monitor	

2.1 Ink Delivery Module

The Ink Delivery Module is a rack-mounted module designed to control the ink supply for up to four printheads. It is available for Apollo (P/N BK-IDM-4H which is included in P/N 1700-IDM4H-15NA), Atlas Monet (BK-IDM-4A), Atlas Cezanne (BK-IDM-4C), and Aurora (BK-IDM-4U).

Figure 2-1: *Ink Delivery Modules*

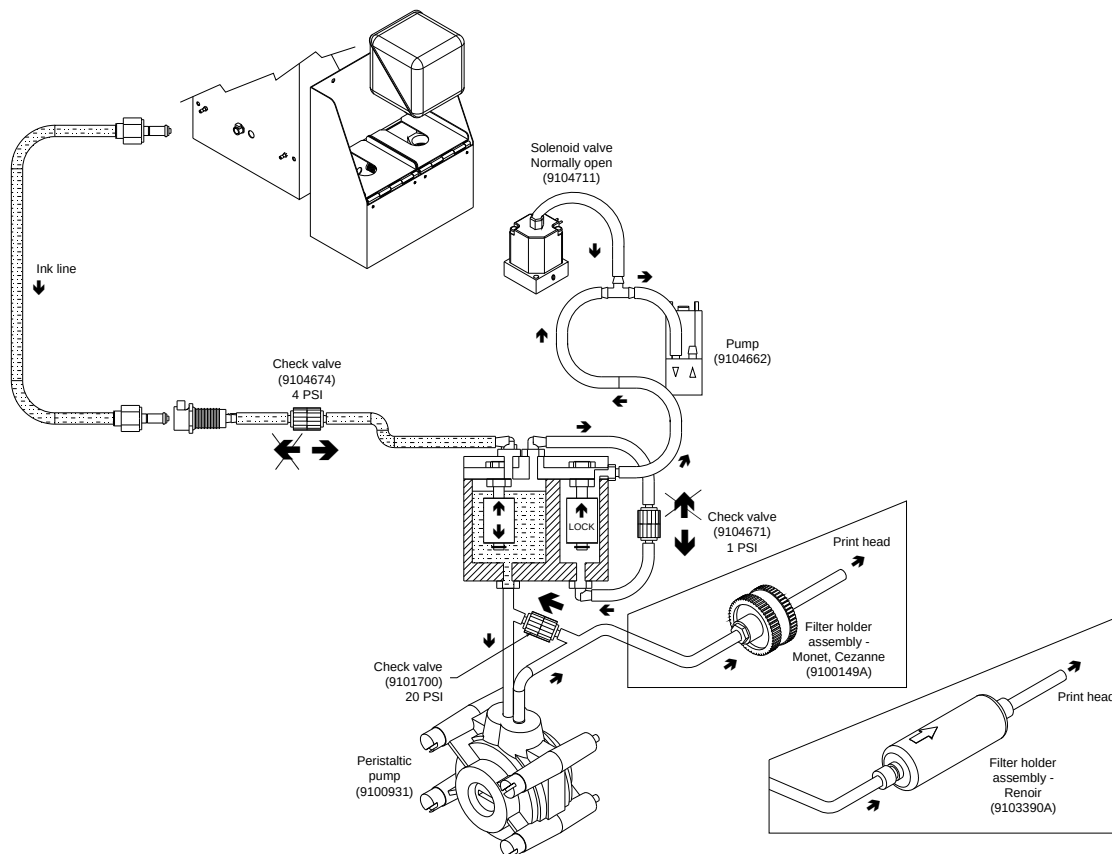


2.1.1 Atlas, Cezanne, and Aurora Ink Supply Line

The ink supply line controls the flow of ink from the ink container (located in the ink bottle holder) to the printhead. The sequence of the ink flow from the container is summarized below:

1. Ink starts in the ink container and is fed into the subcontainer.
2. The float switch determines if the correct amount of ink is in the subcontainer.
3. The peristaltic pump head pumps ink through the filter. If pressure reaches 20 psi, ink is released back into the subcontainer line through the relief valve.
4. The hydrophilic filter filtrates ink before exiting the inkwell.
5. Ink travels from the inkwell to the printhead through the umbilical.
6. The printhead solenoid valves open and close to supply ink to each printbar individually.

Figure 2-2: *Ink Supply Line*



2.1.2 Maintaining the Ink Line

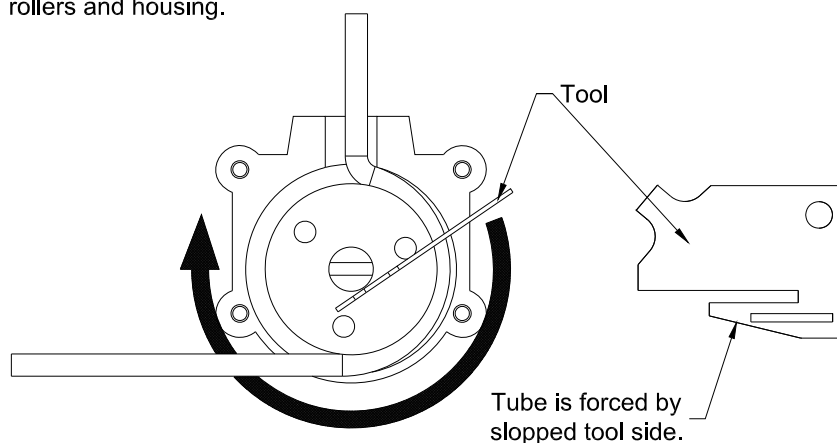
In order to ensure optimum performance, it is important to replace the relief valve, filter, and the tubing once every six months. In order to do this, refer to the following instructions:

1. Turn off the system and wear splash safety goggles and gloves before any maintenance work is done. Use caution as ink lines can be pressurized.
2. Using a flat-head screwdriver, turn the peristaltic pump clockwise in order to remove ink from the ink line between the pump and the relief valve.
3. Replace the relief valve. The arrow on the relief valve must point towards the subcontainer line.
4. Replace the filter. Note that the filter used depends on the type of ink.
5. Replace the tubing in the peristaltic pump using the tool provided (Figure 2-3).
6. Ensure all lines are connected properly and are tie-wrapped on all fittings to prevent ink leakage.

Note: It may be necessary to replace the tubing more frequently than specified above (especially in the peristaltic pump). This should be determined by regularly inspecting the tubing for signs of wear.

Figure 2-3: *Installing Tubing in the Peristaltic Pump*

1. Position the tool below the shaft to allow proper clockwise movement.
2. Fully rotate the tool in the direction shown until the tube is squeezed in between the rollers and housing.



2.1.3 Replacing the Ink Bottle

Once the ink bottle is empty and the ink level in the subcontainer drops, an ink low icon will appear (Figure 2-4). At this time, a fresh bottle of ink should be installed.

Figure 2-4: *Ink Low Alarm*



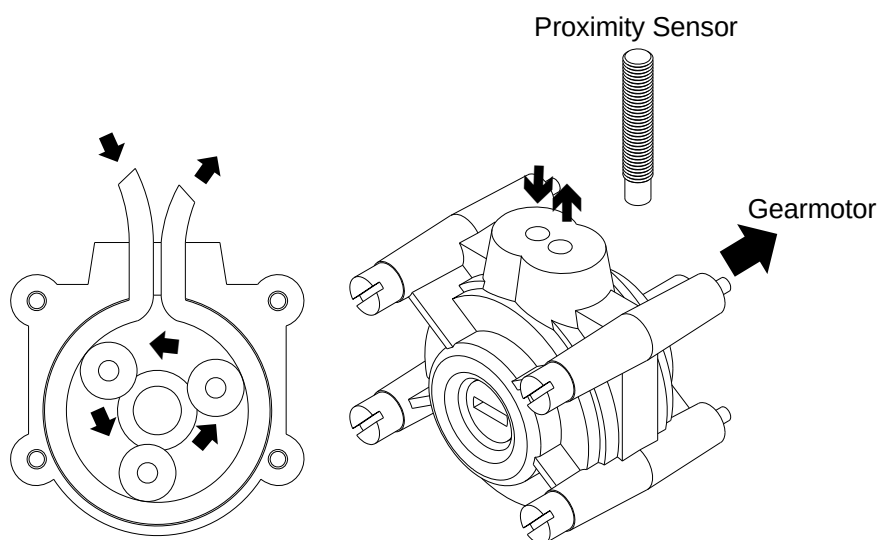
Note: Ink should **NOT** be recycled by placing used ink back into the bottle. Not only can this damage the printhead, but it may also contaminate the filter and result in the ink line bursting due to back pressure.

Never use unapproved fluids with the system (including other inks) as this could cause permanent damage to the system. For example, mixing Monet and Cezanne inks will cause permanent damage to the system. Buskro is not responsible for any damage caused by improper use.

2.1.4 Peristaltic Pump Head

The peristaltic pump head is responsible for pumping ink from the subcontainer to the printhead. The peristaltic pump head displaces a certain amount of ink per stroke. The arrows show the direction of the ink pumping (Figure 2-5). The 12 VDC gearmotor drives the pump in a counter-clockwise direction.

Figure 2-5: *Peristaltic Pump Head*

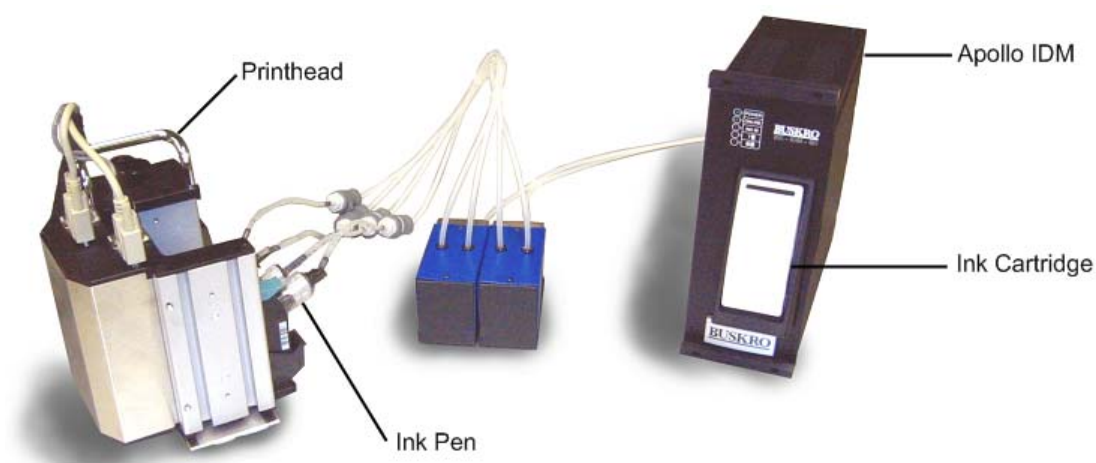


Note: Tubing must be installed properly as shown to prevent ink from pumping backwards.

2.1.5 Apollo Ink Delivery Module

The Apollo Ink Delivery Module (IDM) provides a large 350 mL ink cartridge which distributes ink to up to eight pens simultaneously (for a total vertical coverage of 4" per IDM). Some advantages of using the IDM include the larger ink supply (350 mL versus the standalone 42 mL ink pens), the common ink distribution (to avoid having one ink pen run out of ink before another which can cause waste), and generally lower ink costs.

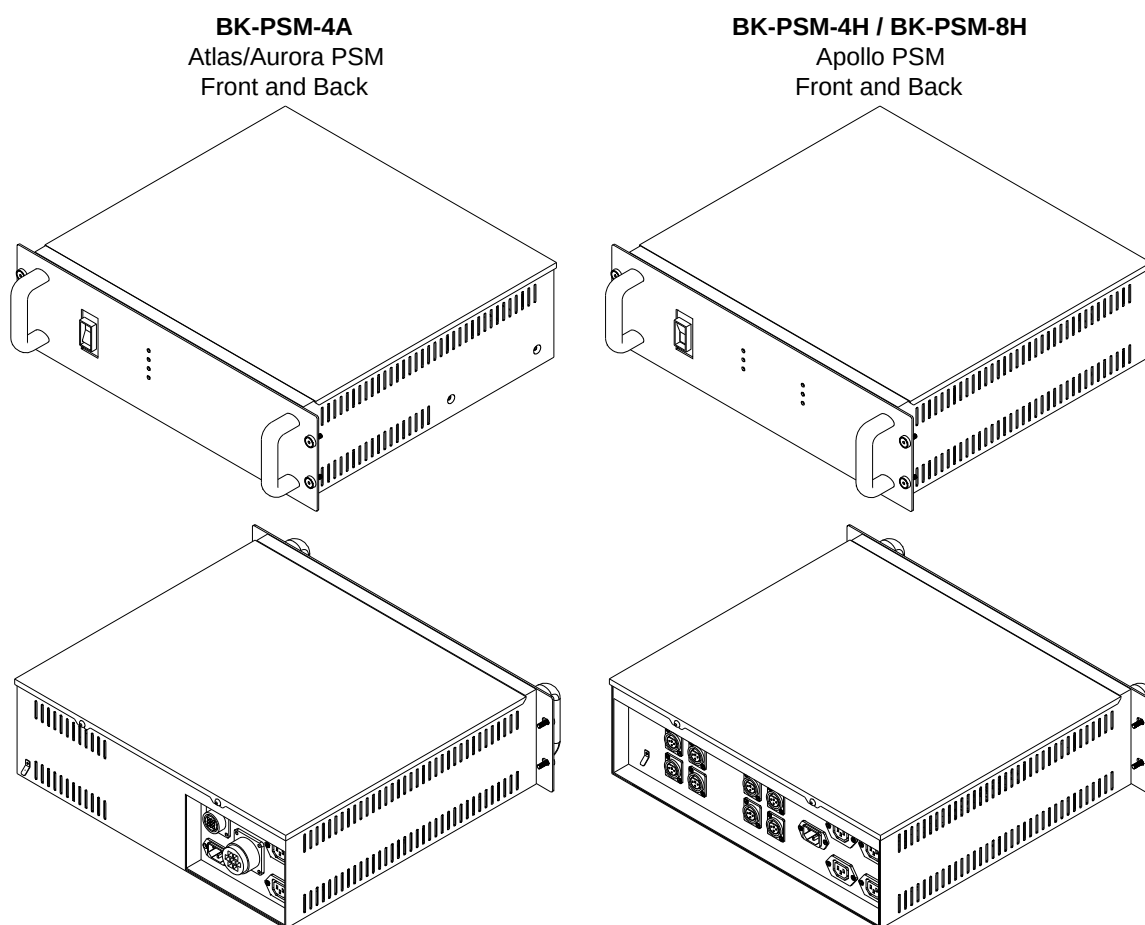
Figure 2-6: *Apollo Ink Delivery System*



2.2 Power Supply Module

The Power Supply Module (Figure 2-7) is a rack mounted module that provides the necessary power requirements for a given technology. Apollo uses the BK-PSM-4H while Atlas and Aurora (Monet, Cezanne, and Renoir inks) use the BK-PSM-4A.

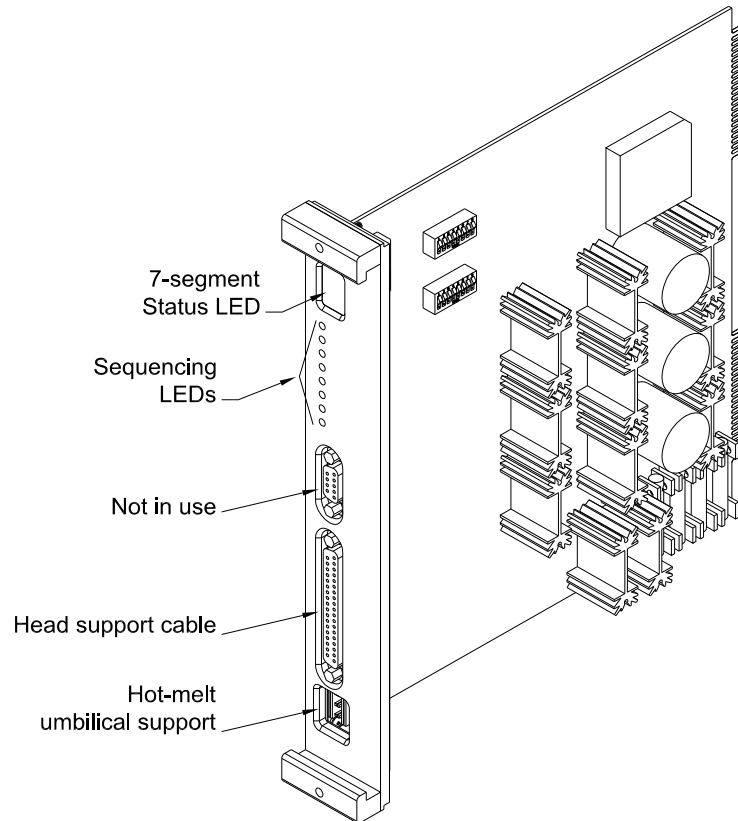
Figure 2-7: *Power Supply Modules (PSM)*



2.3 Head Control Card (HCC)

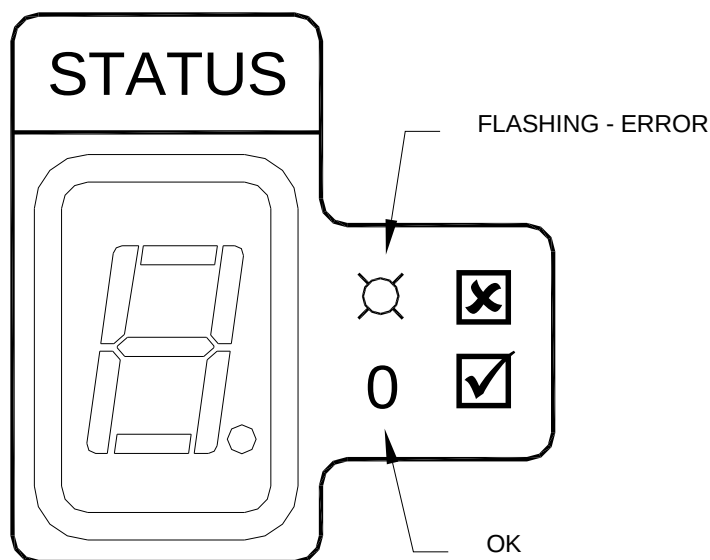
In order to properly control each printhead, all Atlas and Aurora printheads require a separate Head Control Card (Figure 2-8).

Figure 2-8: *Head Support Card (HCC)*



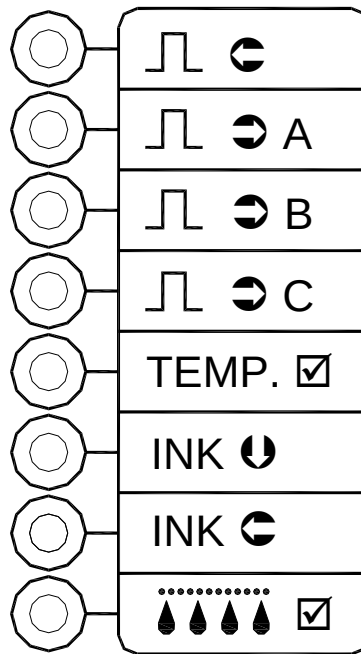
2.3.1 HCC Status and Error Codes, Indication LEDs

In order to reduce downtime while troubleshooting and to monitor the system status at any time, status codes and LEDs are displayed on the front of the controller. The status codes are explained in Figure 2-9 while the LED indicators are explained in Figure 2-10.

Figure 2-9: *Status Display (HCC and RCC)***STATUS/ERROR CODES AND THEIR MEANINGS:**

- 0 - READY**
- 1 - INK LOW**
- 2 - TEMPERATURE LOW**
- 3 - INK EMPTY – RCC ONLY**
- 4 - THERMISTOR SHORT**
- 5 - THERMISTOR OPEN**
- 6 - HEATER FAILURE**
- 7 - LOIS SHORT**
- 8 - LOIS OPEN**
- 9 - PUMP/REFILL FAILURE**

The order of priority is 9 – 0.

Figure 2-10: *LED Indicators (HCC)***LED INDICATORS AND THEIR MEANINGS (from top):**

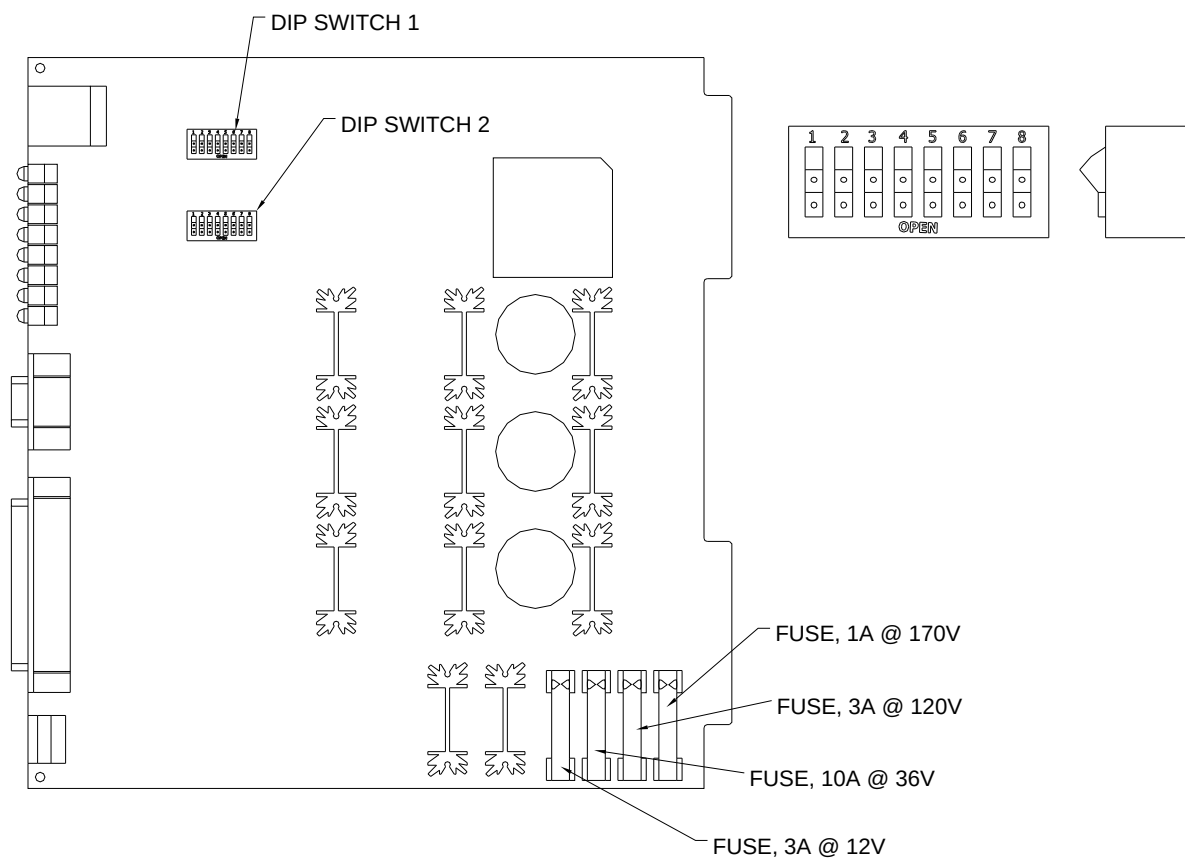
- LED 1 ON - FIRE PULSE IN**
- LED 2 ON - FIRE PULSE OUT A**
- LED 3 ON - FIRE PULSE OUT B**
- LED 4 ON - FIRE PULSE OUT C**
- LED 5 ON - AT TEMPERATURE**
- LED 6 ON - HEAD INK LOW**
- LED 7 ON - REFILL IN PROGRESS**
- LED 8 ON - PURGE ALLOWED**

The “FIRE PULSE OUT A, B, and C” are related to the corresponding jetting assembly firing (for example, the 3250 printhead uses all three jetting assemblies while the 2250 will only use A and B).

2.3.2 HCC DIP Switch Settings

The HCC DIP switch settings will determine the printhead address, the head reservoir address, the necessary IAP voltage, and the printhead type. There are two DIP-switch blocks on each HCC:

Figure 2-11: *HCC Dip Switches*



HCC DIP-SWITCH 1 SETTINGS:**POSITION 1 - HEAD ADDRESS BIT 0****POSITION 2 - HEAD ADDRESS BIT 1****POSITION 3 - HEAD ADDRESS BIT 2****POSITION 4 - HEAD ADDRESS BIT 3****POSITION 5 - RESERVOIR ADDRESS FOR HEAD BIT 0****POSITION 6 - RESERVOIR ADDRESS FOR HEAD BIT 1****POSITION 7 - IAP VOLTAGE BIT 0****POSITION 8 - IAP VOLTAGE BIT 1**Table 2-1: *HCC Head Address Settings (Switch 1 – DIP 1-4), 0 = Open (OFF) 1 = ON*

DIP 1	DIP 2	DIP 3	DIP 4	Description
0	0	0	0	Head 1
1	0	0	0	Head 2
0	1	0	0	Head 3
1	1	0	0	Head 4
0	0	1	0	Head 5
1	0	1	0	Head 6
0	1	1	0	Head 7
1	1	1	0	Head 8
0	0	0	1	Head 9
1	0	0	1	Head 10
0	1	0	1	Head 11
1	1	0	1	Head 12
0	0	1	1	Head 13
1	0	1	1	Head 14
0	1	1	1	Head 15
1	1	1	1	Head 16

Table 2-2: *HCC Reservoir Address Settings (Switch 1 - DIP 5-6), 0 = Open (OFF) 1 = ON*

DIP 5	DIP 6	Description
0	0	Ink Reservoir #1 (RCC #1)
1	0	Ink Reservoir #2 (RCC #2)
0	1	Ink Reservoir #3 (RCC #3)
1	1	Ink Reservoir #4 (RCC #4)

Table 2-3: *HCC IAP Settings (Switch 1 - DIP 7-8), 0 = Open (OFF) 1 = ON*

DIP 7	DIP 8	Description
0	0	IAP 0% Jetting Voltage
1	0	IAP 25% Jetting Voltage
0	1	IAP 33% Jetting Voltage
1	1	IAP 50% Jetting Voltage

HCC DIP-SWITCH 2 SETTINGS:**POSITION 1 - HEAD TYPE BIT 0****POSITION 2 - HEAD TYPE BIT 1****POSITION 3 - HEAD TYPE BIT 2****POSITION 4 - HEAD TYPE BIT 3****POSITION 5 - HEAD TYPE BIT 4****POSITION 6 - RESERVED****POSITION 7 - RESERVED****POSITION 8 - HEATER POWER OPTION**Table 2-4: *HCC Head Type Settings (Switch 2 – DIP 1-5), 0 = Open (OFF) 1 = ON*

DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	Function
0	0	0	0	0	Atlas Head Type (1250)
1	0	0	0	0	Atlas-DV Head Type
0	1	0	0	0	Aurora Head Type (UV 1250)
1	1	0	0	0	Sapphire1 Head Type
0	0	1	0	0	Sapphire2 Head Type (2200 or 2250)
1	0	1	0	0	Sapphire3 Head Type (2300 or 3250)
0	0	1	1	0	Atlas 2520 or 5120
1	0	1	1	0	Aurora 2520 or 5120
0	1	1	1	0	Atlas 2530 or 5130
1	1	1	1	0	Aurora 2530 or 5130

Table 2-5: *HCC Heater Power Settings (Switch 2 - DIP 8), 0 = Open (OFF) 1 = ON*

DIP 8	Description
0	Full Heater Power
1	10% Heater Power (Use for Cezanne)

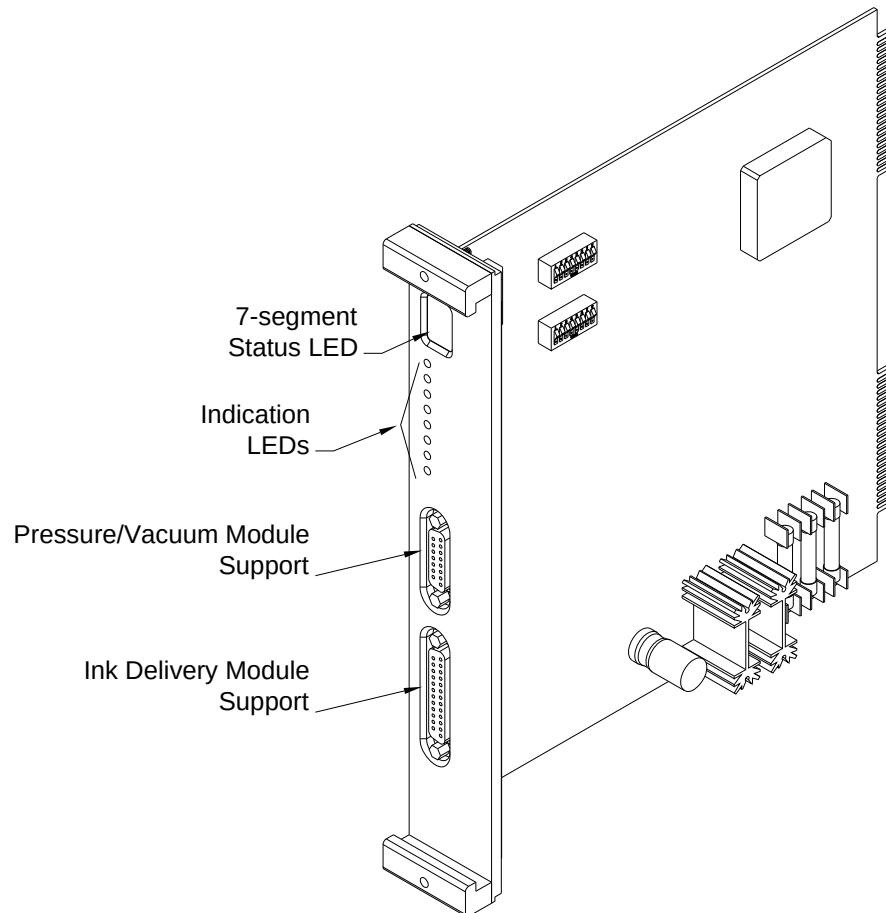
Note: In order for the HCC Heater Power Settings to work, the HCC Eprom (P/N 9105155) must be V1.3 or higher.

In order to use the 2500 or 5100 series printheads, the HCC Eprom must be V1.5 or higher.

2.4 Reservoir Control Card (RCC)

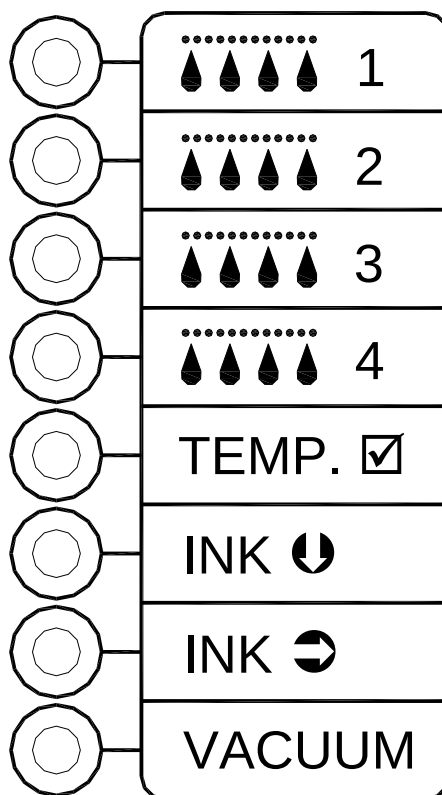
The Reservoir Control Card is used to support one Pressure/Vacuum Module and Ink Delivery Module.

Figure 2-12: *Reservoir Control Card (RCC)*



2.4.1 RCC Status and Error Codes, Indication LEDs

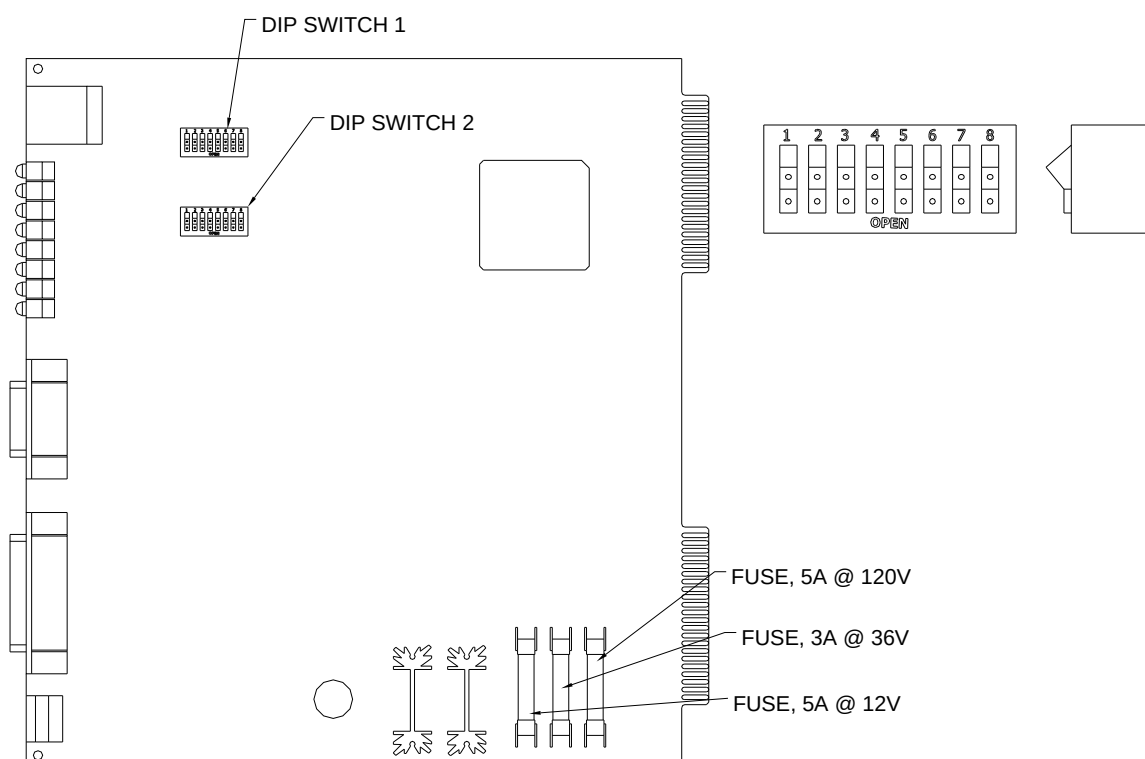
The status codes for the RCC are the same as the HCC. For information on the Status Codes, reference Figure 2-9.

Figure 2-13: *RCC LED Indicators***LED INDICATORS AND THEIR MEANINGS (from top):****LED 1 ON - PURGE 1 (CHANNEL #1)****LED 2 ON - PURGE 2 (CHANNEL #2)****LED 3 ON - PURGE 3 (CHANNEL #3)****LED 4 ON - PURGE 4 (CHANNEL #4)****LED 5 ON - AT TEMPERATURE (IF APPLICABLE)****LED 6 ON - RESERVOIR INK LOW (INK DELIVERY SYSTEM)****LED 7 ON - PUMP INK****LED 8 ON - PUMP VACUUM (IF APPLICABLE)**

2.4.2 RCC DIP Switch Settings

The RCC DIP switch settings will determine the pressure regulator address (Pressure Vacuum Module), the pressure regulator type, the pressure regulator purge type, the ink delivery module address, and the type of ink delivery module. There are two DIP switch blocks on the RCC.

Figure 2-14: *RCC Dip Switches*



RCC DIP-SWITCH 1 SETTINGS:**POSITION 1 - PRESSURE REGULATOR ADDRESS BIT 0****POSITION 2 - PRESSURE REGULATOR ADDRESS BIT 1****POSITION 3 - PRESSURE REGULATOR TYPE BIT 0****POSITION 4 - PRESSURE REGULATOR TYPE BIT 1****POSITION 5 - PRESSURE REGULATOR TYPE BIT 2****POSITION 6 - PRESSURE REGULATOR PURGE TYPE BIT 0****POSITION 7 - PRESSURE REGULATOR PURGE TYPE BIT 1****POSITION 8 - RESERVED**Table 2-6: *RCC Pressure Regulator Address (Switch 1 - DIP 1-2), 0 = Open (OFF) 1 = ON*

DIP 1	DIP 2	Description
0	0	Pressure Regulator #1 (RCC #1, Base Address 1)
1	0	Pressure Regulator #2 (RCC #2, Base Address 5)
0	1	Pressure Regulator #3 (RCC #3, Base Address 9)
1	1	Pressure Regulator #4 (RCC #4, Base Address 13)

Table 2-7: *RCC Pressure Regulator Type (Switch 1 - DIP 3-5), 0 = Open (OFF) 1 = ON*

DIP 3	DIP 4	DIP 5	Description
0	0	0	Original 2-Channel Pressure Regulator (P/N 9100138)
1	0	0	4-Channel P.R., 1 Technology (Head 1-4), Datapath Addr+0, Addr+1, Addr+2, Addr+3, IA Card
0	1	0	4-Channel P.R., 2 Technologies (Head 1-3, Head 5), Datapath Addr+0, Addr+1, Addr+2, Addr+4
1	1	0	4-Channel P.R., 2 Technologies (Head 1-2, Head 5-6), Datapath Addr+0, Addr+1, Addr+4, Addr+5

Note: 1250, 2250, and 3250 printheads are all considered different technologies because the number of nozzles on the heads are different. This is true even if the same ink is used. As a result, in cases where a Datapath card is used, there can only be one technology per group of four data ports. The RCC must also be set accordingly as per Table 2-6 and Table 2-7.

For the Image Accelerator Card, set DIP 3-5 to 1-0-0 (Addr+0, Addr+1, Addr+2, Addr+3) by default. This is because each port can support a different technology. The 0-1-0 and 1-1-0 settings are not relevant for the Image Accelerator Card.

'Addr' represents the base address (1, 5, 9, and 13) as set by DIP 1-2 on switch 1.

Table 2-8: *RCC Purge Settings (Switch 1 - DIP 6-7), 0 = Open (OFF) 1 = ON*

DIP 6	DIP 7	Description
0	0	Constant Purge Type
1	0	Three x 1 second Pulses
0	1	Reserved
1	1	Reserved

RCC DIP SWITCH 2 SETTINGS:**POSITION 1 - RESERVOIR ADDRESS BIT 0****POSITION 2 - RESERVOIR ADDRESS BIT 1****POSITION 3 - RESERVOIR TYPE BIT 0 (Note 3)****POSITION 4 - RESERVOIR TYPE BIT 1 (Note 3)****POSITION 5 - RESERVOIR TYPE BIT 2 (Note 3)****POSITION 6 - RESERVOIR TYPE BIT 3 (Note 3)****POSITION 7 - RESERVED****POSITION 8 - RESERVED**Table 2-9: *RCC Reservoir Address Settings (Switch 2 - DIP 1-2), 0 = Open (OFF) 1 = ON*

DIP 1	DIP 2	Description
0	0	Ink Reservoir #1 (RCC #1)
1	0	Ink Reservoir #2 (RCC #2)
0	1	Ink Reservoir #3 (RCC #3)
1	1	Ink Reservoir #4 (RCC #4)

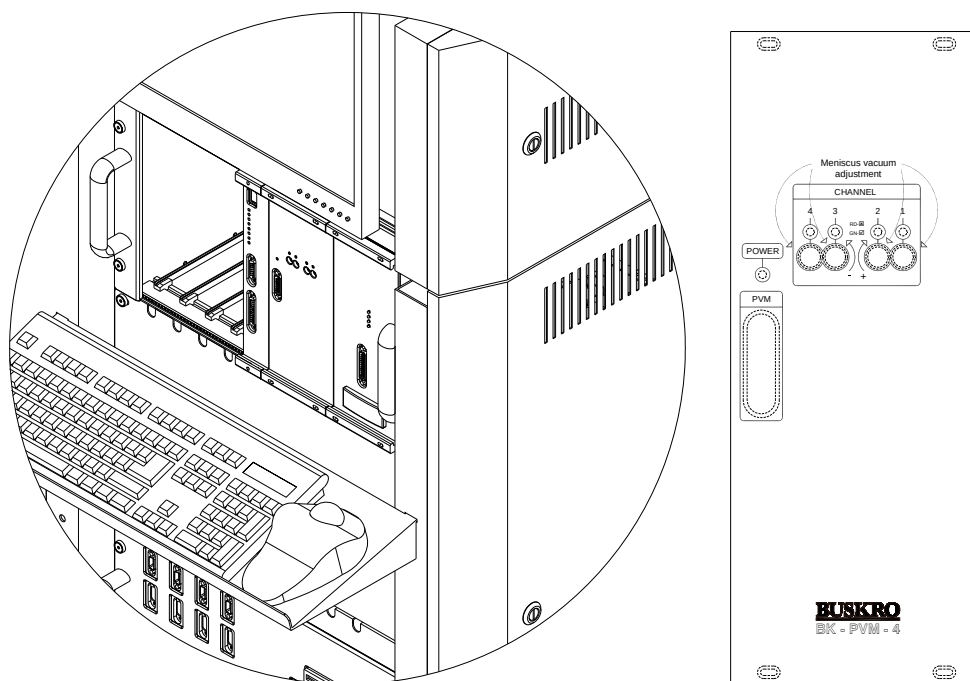
Table 2-10: *RCC Reservoir Type Settings (Switch 2 – DIP 3-6), 0 = Open (OFF) 1 = ON*

DIP 3	DIP 4	DIP 5	DIP 6	Description
0	0	0	0	Atlas / Aurora Reservoir

2.5 Pressure Vacuum Module

The Pressure Vacuum Module (BK-PVM-4A) is a rack-mounted module that controls the meniscus, lung, and purge pressures for Atlas and Aurora technologies. It can support up to four printheads per module. It shares the same physical dimensions as the Ink Delivery Module and can be mounted in the rack of the controller as shown in Figure 2-15.

Figure 2-15: *Pressure/Vacuum Module Integration*



2.5.1 Pressure/Vacuum Adjustment

The meniscus vacuum and the purge pressure of the unit are adjustable as shown in Figure 2-16. While the meniscus vacuum range can vary depending on print technology, the purge pressure is around 50 inches of water (in Wg). 1250 printheads require 3.3 in Wg meniscus while 2200, 2250, 2300, 2500, 3250 and 5100 printheads require 4.7 in Wg. All meniscus settings should be within a tolerance of ± 0.3 in Wg. Earlier models included an LCD meniscus display with a channel selector knob. These items were removed in later models as the meniscus value is displayed in the Compose Test/Diagnostics screen. In cases where the meniscus or purge pressures are being investigated during troubleshooting, measure the actual values with a proper gauge at the printhead.

Note: If the meniscus pressure is too high, it can prevent proper firing of the jet. Air can also be ingested into the ink causing jetouts. If the meniscus pressure is too low, ink can leak out of the head and pool on the orifice plate, material or the transport base. It can also cause misfires or jetouts.

If the purge pressure is too low, it may be ineffective in recovering jets. If the purge pressure is too high, it will use more ink. It will also take longer to remove gas from the ink which could result in jetouts.

If ink leaks from the printhead while the system is powered off, there is likely a leak in the meniscus line or the solenoid is not closing properly.

2.5.2 Status/Warning light

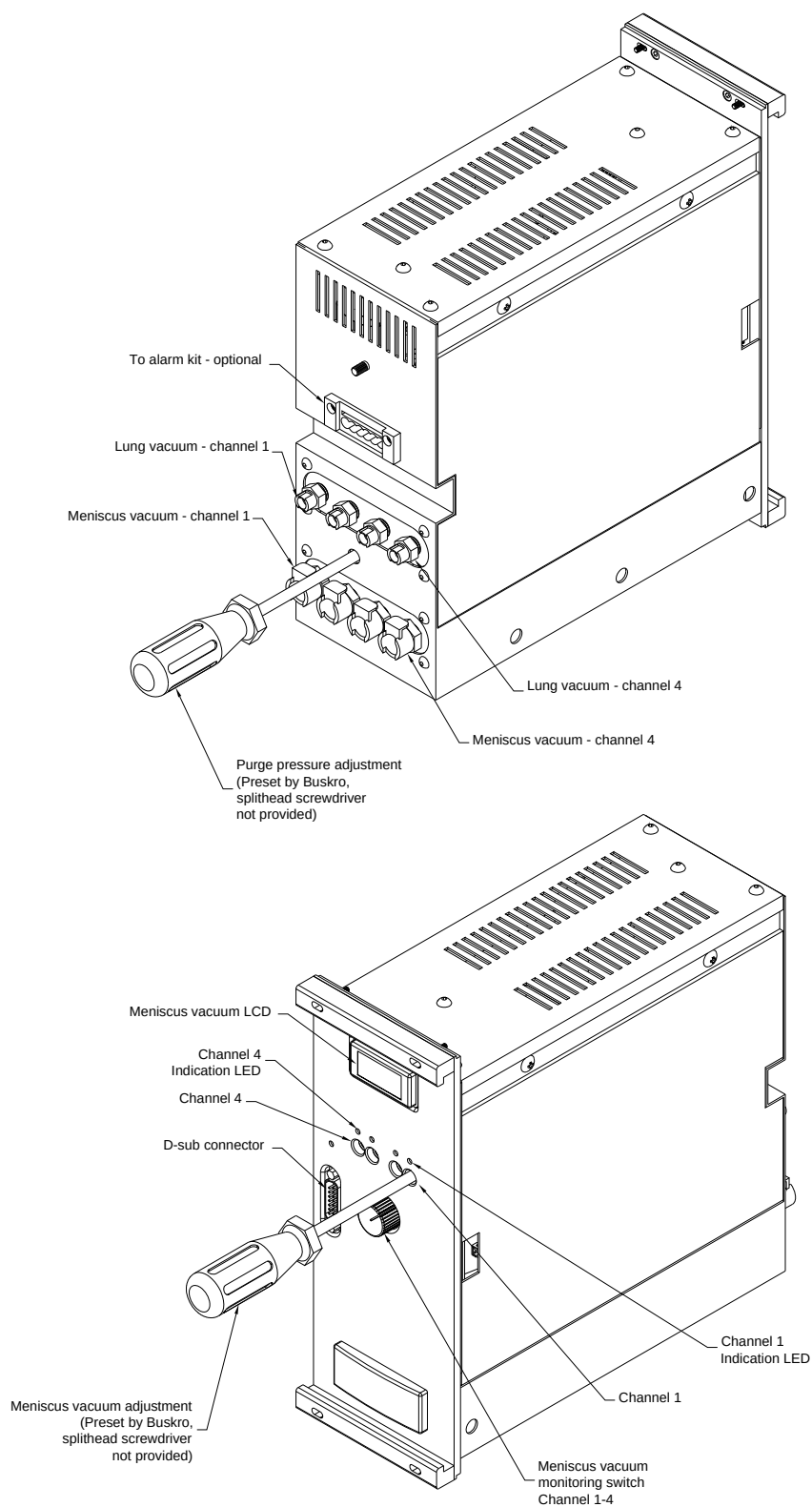
If the meniscus vacuum range is within limits, the LED located above the adjustment opening will be a solid green. Once the meniscus vacuum for the particular channel exceeds the limits, the LED will flash red.

2.5.3 Lung vacuum

The lung vacuum level is not adjustable. Early models utilized a –16 in Hg pump while newer models will be equipped with –23.5 in Hg pumps to increase the efficiency of gas removal.

2.5.4 Needle Valve Filter

Over time, excessive paper dust can cause the sintered filter in the adjustment needle valve to clog which can increase the meniscus vacuum. While it is possible for the system to run normally without the filter, it is highly recommended to ensure that the proper filter is installed to avoid damage to the adjustment needle valve.

Figure 2-16: *Meniscus Vacuum and Purge Pressure Adjustment*

2.6 Datapath and Image Accelerator Card

The Datapath (Figure 2-17) and the Image Accelerator (Figure 2-18) Cards connect to the motherboard through the PCI Bus and perform the following functions:

- When a Buskro transport base is present, interfaces with the Base Interface board or Base control board to receive sensor inputs from the base.
- Where a Buskro transport base is present, interfaces with the Base Interface board or Base control board to control the base and conveyor.
- Provides a communication port for control and monitoring of the “life” support elements.
- Receives configuration information from Compose IQ.
- Transmits status information to Compose IQ, the inkjet control software.
- Controls printhead firing sequence.
- Transfers image data via the data ports.

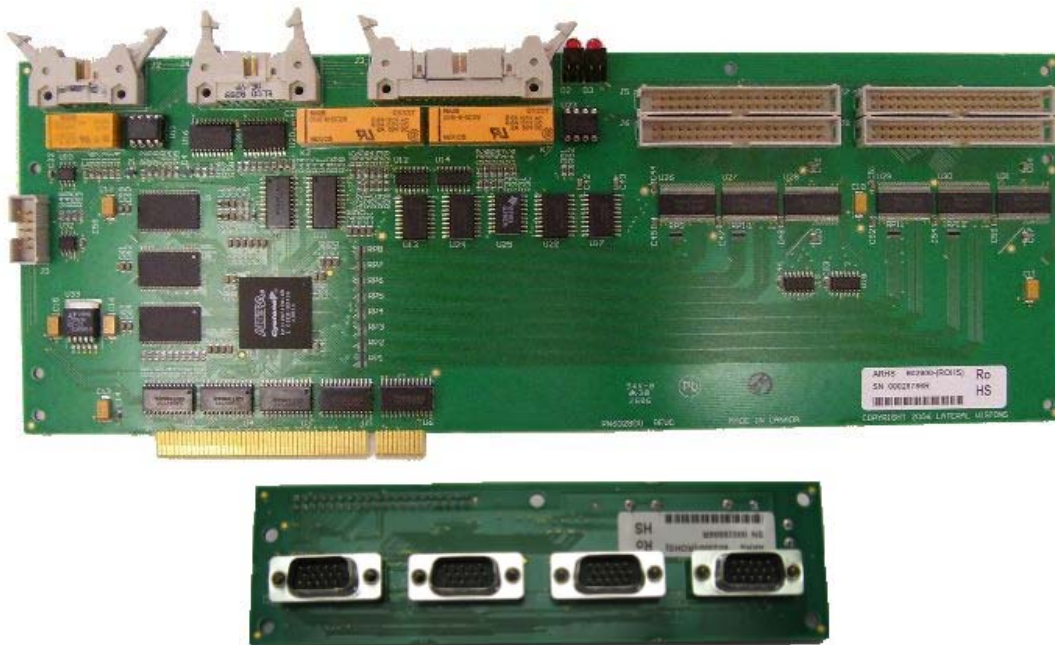
Each Buskro controller is equipped with either a Datapath or Image Accelerator Card.

Figure 2-17: *Datapath Card with Expansion Board*



The Datapath Card supports four data connections for printheads. An expansion board is required to add support for an additional four data connections (for a maximum of eight printheads).

Figure 2-18: Image Accelerator Card with HeadIF Board



The Image Accelerator Card is a replacement for the Datapath card. It is a newer, faster card with more features. For an overview summary of the differences between the Datapath and Image Accelerator Cards, reference Table 2-11.

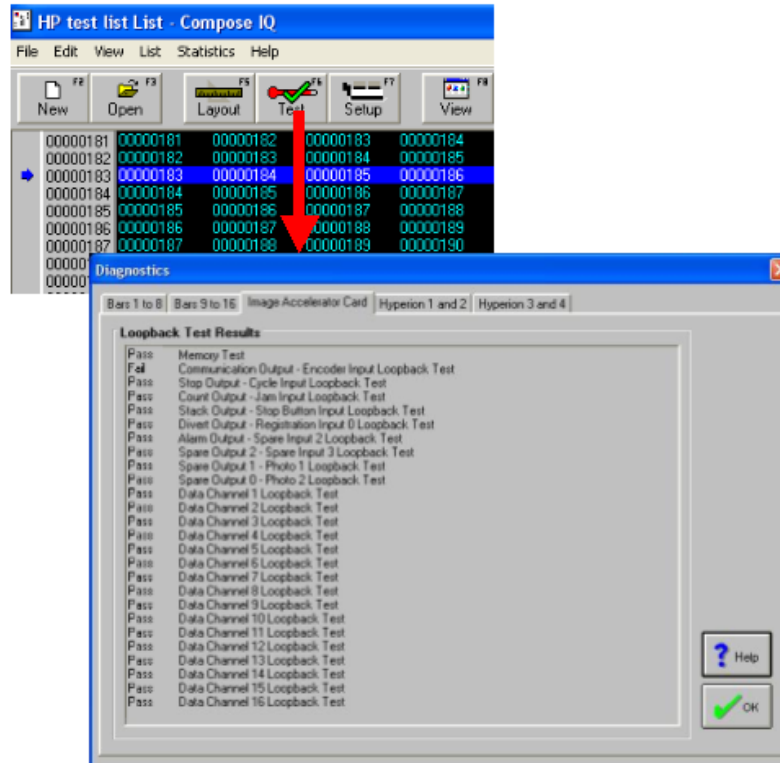
Table 2-11: *Datapath and Image Accelerator Card Comparison*

	Datapath	Image Accelerator
Release Date	1997	2008
RoHS Compliant (Environmental Standard)	No	Yes
Bus Standard	PCI	PCI
Compatible with newer motherboards?	No	Yes
License Method	Lock Chip or Dongle	Dongle
Expansion Hardware	Expansion Board	HeadIF Card
Firmware	EPROM (Hardware Updates)	Flash Memory (Software Updates)
Compose Version	V8.00 or Earlier	V8.01 or Higher
Maximum Data Ports	8	16
Data Transfer	Partial Streaming	Full Streaming
Tracking Resolution	1"	1/4"
Self Diagnostics	No	Yes
Double Data Rate	No	Yes
Input Protection	Not opto-isolated	Opto-isolated
Hyperion Support	No	Yes

2.6.1 Image Accelerator Card Diagnostics

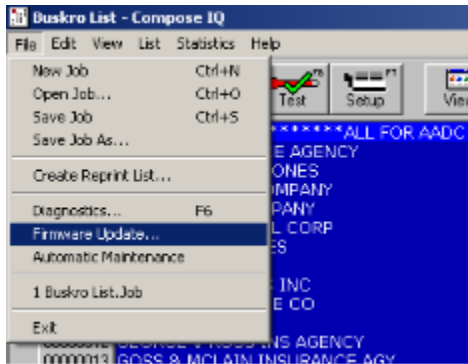
The Image Accelerator Card has the ability to diagnose itself to assist with troubleshooting. It is able to test its internal memory, all inputs and outputs, and all the data channels (print ports). This can be accessed through the Test / Diagnostics screen (Figure 2-19).

Figure 2-19: Image Accelerator Card Diagnostics



2.6.2 Firmware Updates

With Buskro's new line of electronics (Image Accelerator Card, HP Interface Board II, and SSB CPU II), firmware updates can be made directly through Compose (Figure 2-20). This simplifies the upgrade process by eliminating the need to replace a hardware EPROM for each firmware change.

Figure 2-20: *Firmware Update*

The firmware update procedure is as follows:

1. Choose “**File**” then “**Firmware Update**”. The current firmware version is displayed in the dialog box. The “**Update**” button is only enabled for existent boards.
2. To update the Image Accelerator Card, press the “**Update**” button beside “**Accelerator FPGA**”. The update takes approximately 30 seconds to complete. The update progress is displayed in the progress bar.
3. Before updating an HP Interface Board II or SSB CPU II, power down the system and set the Program DIP Switch on the respective board (position 8) to ON. Then reboot the system.
4. To update the HP Interface Board II or SSB CPU II, press the update button. The update takes approximately 4 minutes to complete. The update progress is displayed in the progress bar.
5. After updating an HP Interface Board II or SSB CPU II, power down the system and set the Program DIP Switch on the respective board (position 8) to OFF. Then reboot the system.
6. If the Compose Release notes indicate that the CPLD on the board requires updating, power down the system and set the CPLD Program DIP Switch (position 7) to ON and the Program DIP Switch (position 8) to OFF before rebooting the system. The RUN LED will blink rapidly to indicate the CPLD programming progress, after which the RUN LED will resume its normal (1 second on, 1 second off) blink rate.
7. After updating the CPLD, power down the system and set the CPLD Program DIP switch (position 7) OFF. Then reboot the system.

Note: NEVER interrupt a Firmware update. If the update does not complete successfully, retry the update.

The SSB CPU II board (System Support CPU) is part of the BK700 and BK1705 controllers, not the BK1710 or BK1720.

2.7 Field Connection Board

The Field Connection Board (FCB) serves as an interface and electrical isolation between the controller's internal circuitry and external equipment. The FCB has a number of inputs and outputs. The inputs mainly deal with sensor signals (jam detectors, photo sensors, a shaft encoder, and a cycle input) that are brought out on individual connectors on the connector panel associated with the FCB. They are also available as a group on a single input cable connector. The outputs are also brought out on a cable connector and provide relay contact outputs for such functions as a stop signal to the inkjet equipment, control of a stack function (to control the speed of a conveyor for stacking purposes), and a diverter.

When the Buskro controller is used with a standard Buskro base, all communications with the base are internal through a ribbon cable and the connections on FCB are not needed.

The external connections provide a more general interface to allow the controller to work with a variety of equipment that does not necessarily conform to Buskro's standards. The actual operation and connections to the board are discussed in detail in the Appendix.

2.8 Optional Hardware

2.8.1 Serial Card (P/N BK-COMM)

The Serial Card is a "smart" high-speed serial communications card equipped with its own processor. It is designed to plug into a PCI slot on the computer motherboard and has 4 connectors for serial communications cables. These connectors are standard RS-232 connectors in a DB-25 configuration and use a null modem.

2.8.2 Expansion Board (P/N BK-EXP-1700)

The Expansion Board is only used with the Datapath Card. It is used to add the capacity for four more data ports (for up to four more printheads), allows for a second technology to be added, and provides access to use the Tracking Board.

2.8.3 Image Accelerator Expansion Module (P/N BK-EXP-IAC)

The Expansion Module is used to add the capacity for an additional four data ports for systems utilizing the Image Accelerator Board. This kit is not required to add multiple technologies or to access the Tracking Board as these features are inherent in the Image Accelerator Card. To activate these features, the appropriate license option is required (BKLI-OPT-CBO for multiple technologies and BKLI-OPT-TRK for Tracking).

2.8.4 Tracking Board (P/N BK-TRACK-1700)

The Tracking Board kit allows users to define eight independent tracking zones (transport zones) to allow Compose to track the position of the piece in a production line.

3.1 Introduction

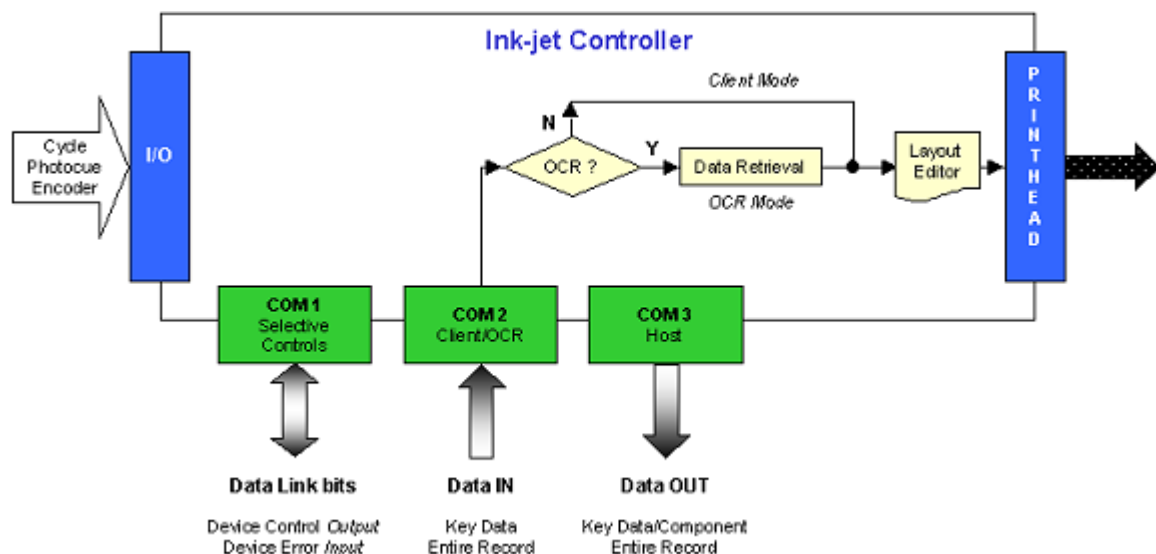
In general, Buskro print technology is designed to work with a Buskro controller equipped with Compose IQ software. Compose IQ is a Windows® based application that controls all operational aspects of a Buskro inkjet system. This easy-to-use control software delivers powerful job setup, layout, production management, record control, diagnostics, and reporting.

Compose IQ is a built-in package capable of supporting systems applications in which machine control, data acquisition, print sequencing, and product tracking or a combination thereof may be required. Essentially, the software provides the following rudimentary tools:

- Product tracking and print sequencing
- Communication with reading devices or other controllers
- Data output communication with other devices
- Machine control utilizing a PLC with communication
- Data acquisition and record retrieval in OCR mode

The software offers three distinct building blocks for the implementation of a system. This includes client (*slave*) mode, OCR mode, and selective device control supporting host mode (*master*) for data echo requirements. Figure 3-1 below illustrates the different configurations:

Figure 3-1: Block diagram of various models and the I/O devices required



3.2 Host/Client Mode

3.2.1 Client Mode

Client mode permits the controller to accept data **directly** from another controller (device) via the serial COM2 port, and at the appropriate time, print out some or all of the data based on the image layout. A number of baud rates and physical definition tools are offered to tailor the controller to the physical delays of the system and provide a data communication link with a host controller (device).

3.2.2 Host Mode

Host mode provides a means whereby a portion or all of the printed record data is output on COM3 such that it can be acquired and used by a downstream controller/device. This capability allows for the creation of distributed systems in which a number of printers can be networked together and controlled by a host controller.

3.3 OCR Mode

The OCR mode functions in much the same way as the client mode with the addition of a lookup and data retrieval process occurring prior to image creation. This capability supports reading devices that send limited data via the serial COM2 port, representing a key that maps onto a defined component of the data file such that a search will find and retrieve the entire record corresponding to the key. As with the client mode, the resulting record's components are then printed out as defined by the image layout.

3.4 Selective Inserting Mode

Completing the suite of controller products is a selective device control operation. With this, individual records are sourced from the aforementioned applications or the resident database and subsequently queried prior to the printing operation. As a result, various upstream and downstream devices can be actuated via a PLC based on the contents of these records. Included with this is a data echo feature that outputs all or part of the printed record on the COM3 serial port for communication with other downstream client controllers. This creates a distributed network of printers.

PLC control and communication is enabled through the COM1 port where a number of virtual input/output points are transmitted and stored directly in the PLC for further processing. Using this type of system architecture, logical functions are performed by the generic printer controller with the PLC providing localized system customization to implement the instructions supplied by the controller.

3.5 Compose IQ Dongle

The Dongle is a serialized device that is installed in one of the USB ports of the controller. It acts as the license enabling mechanism for users with a Compose Version of 6 or later. It must have a valid dongle information file encrypted within it to become active. The correct dongle information file specific to the serial number of the physical dongle and to the print technology and Compose functionality purchased is required. The Dongle is field-programmable so that options may be added without swapping Dongles. The Dongle requires drivers that are loaded with Compose V6.03 or later. In the Compose Help system the *driver* installation procedure is listed.

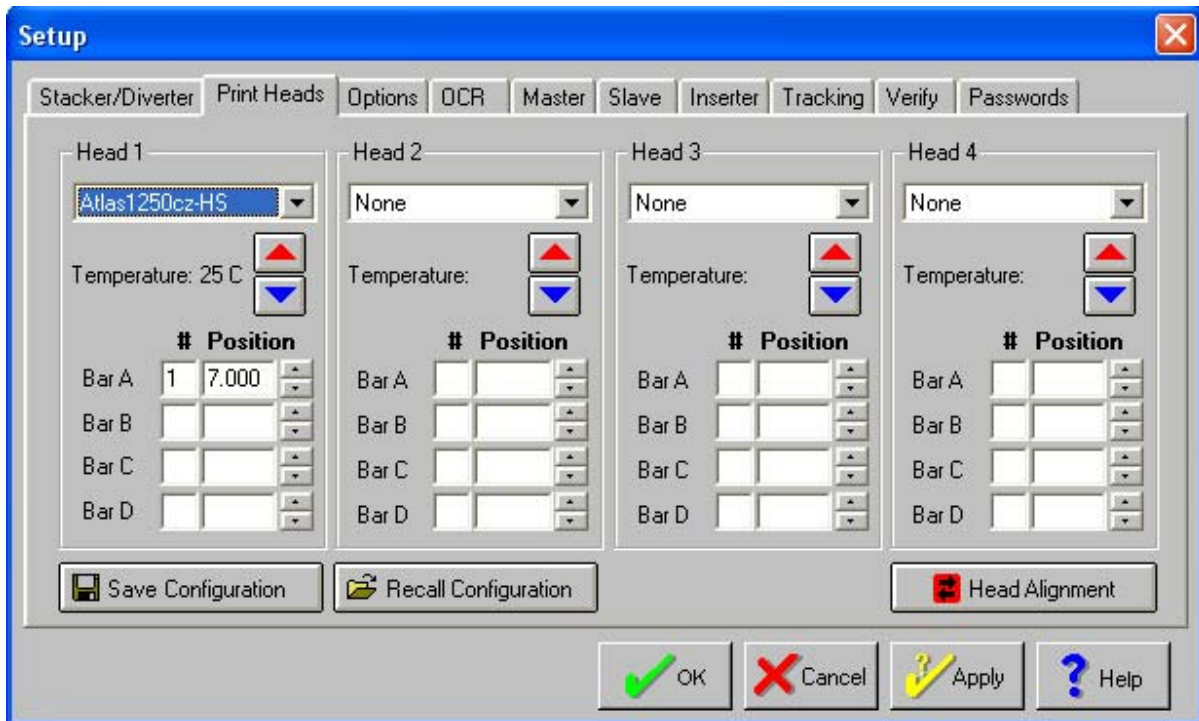
3.6 Compose Software

For more detailed information about Compose IQ, reference the help file included with the software. Only some of the basic functions are described in this manual.

3.6.1 Printhead Drivers

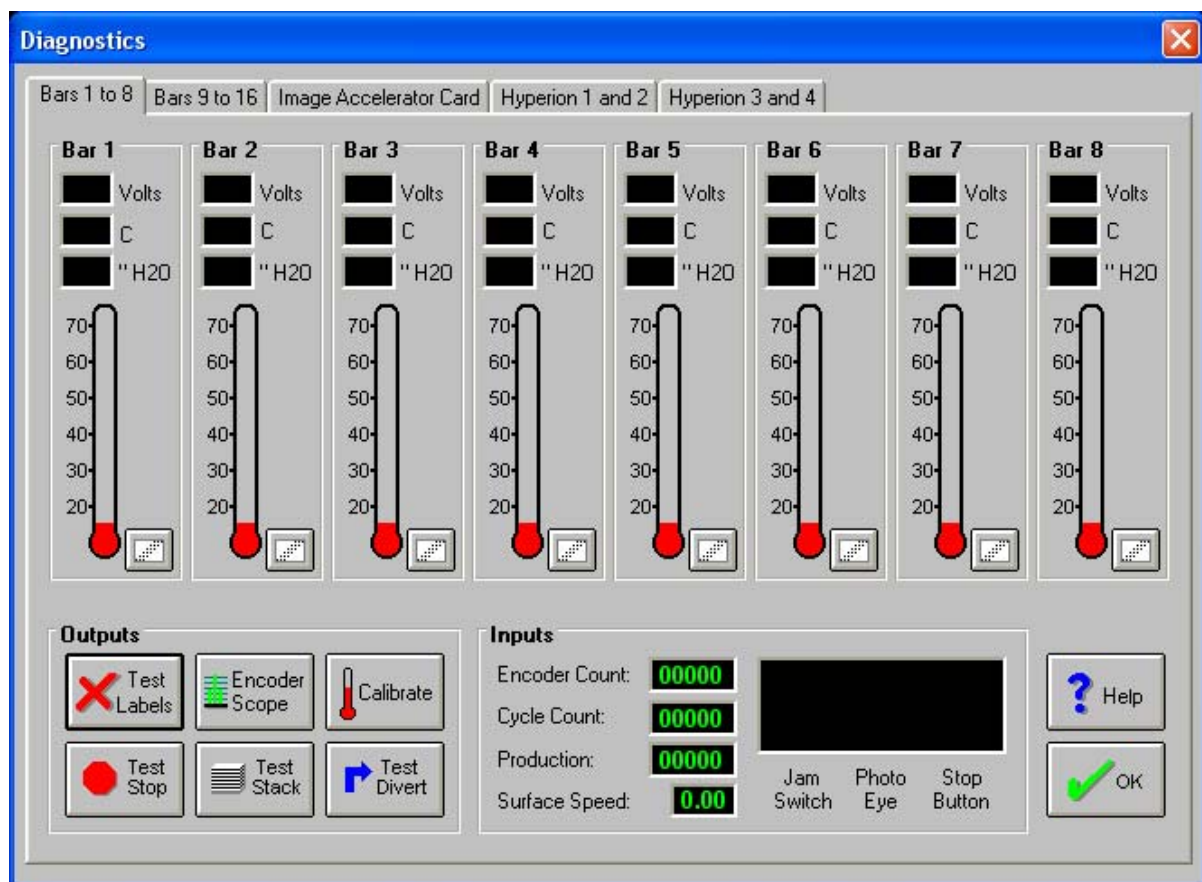
In order to integrate the print technology with Compose, the proper printhead driver must be specified in the Setup menu as well as its relative distance from the photo sensor (Figure 3-2).

Figure 3-2: *Compose Setup Window*



3.6.2 Diagnostics Screen

The Compose diagnostic screen displays the voltage and temperature readings for each printbar (Figure 3-3). The voltage value can be different for each jetting assembly. As a result, it is preset before shipment with the factory settings. The normal voltage range is 80-100 volts. The temperature reading depends on the ink technology used.

Figure 3-3: *Compose Diagnostics Window*

Note: Only trained technicians should make adjustments to the Voltage as it can affect print performance.

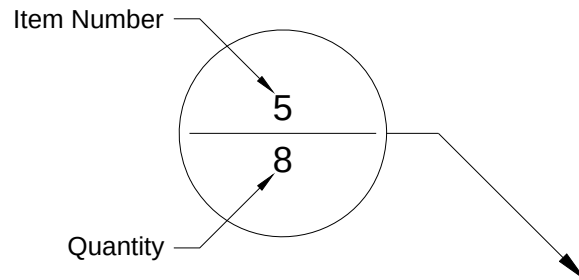
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Balloon Annotation and Parts Listing



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: BK1710-FRM – Frame, Rack Type, BK1710 Controller

Item	Part Number	Quantity	Description	Reference
1	404520	4	Screw, BHCS, 10-32 UNF x 3/8"	
2	9103360A	1	Side Door Assembly, Left	Page A-14
3	9103407A	1	Controller Top Assembly	Page A-16
4	9103408A	1	Side Door Assembly, Right	Page A-17
5	9103447A	1	Terminal Block Assembly	Page A-21
6	9103869A	2	Side Cover Assembly	Page A-28
7	BK-1700-TRAN	1	Transformer Assembly	Page A-5
8	BK17XX-FRM	1	Frame, Rack Type, BK17XX Series	Page A-3

Figure A-1: BK1710-FRM – Frame, Rack Type, BK1710 Controller

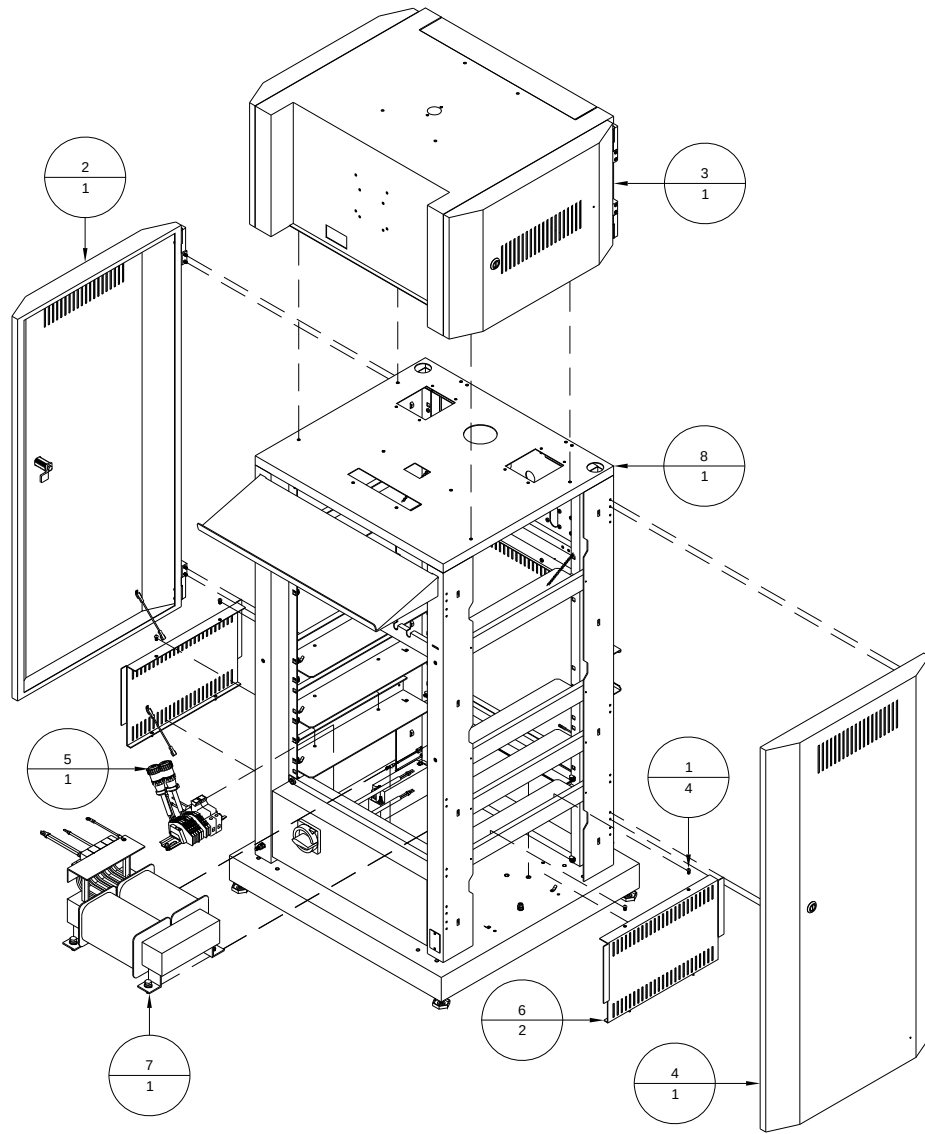


Table A-2: BK1720-FRM – Frame, Rack Type, BK1720 Controller

Item	Part Number	Quantity	Description	Reference
1	404530	4	Screw, BHCS, 10-32 UNF x 1/2"	
2	9103314	4	Nut, Cage, 10-32 UNF	
3	9103360A	1	Side Door Assembly, Left	Page A-14
4	9103407A	1	Controller Top Assembly	Page A-16
5	9103408A	1	Side Door Assembly, Right	Page A-17
6	9103409A	2	Side Door Assembly, Top	Page A-18
7	9103447A	1	Terminal Block Assembly	Page A-21
8	9103770A	1	Umbilical Bracket Assembly	Page A-26
9	9103861	1	Shelf, Add-on Subrack	
10	BK-1700-TRAN	1	Transformer Assembly	Page A-5
11	BK17XX-FRM	1	Frame, Rack Type, BK17XX Series	Page A-3

Figure A-2: BK1720-FRM – Frame, Rack Type, BK1720 Controller

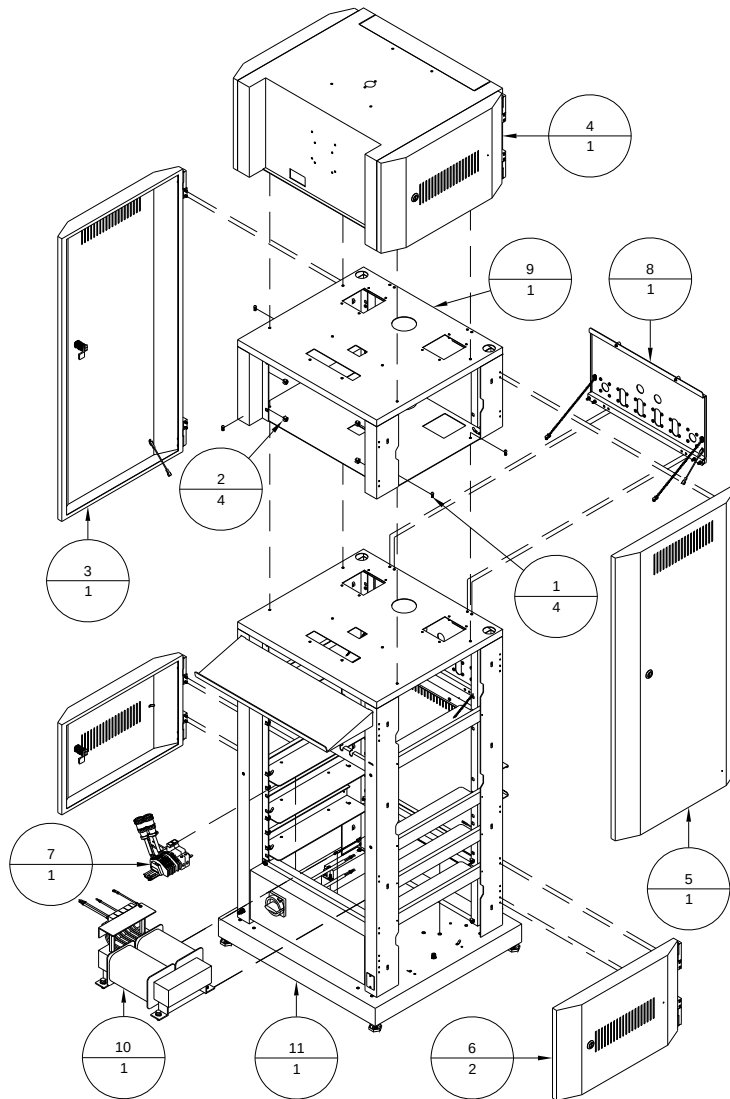


Table A-3: *BK17XX-FRM – Frame, Rack Type, BK17XX Controller*

Item	Part Number	Quantity	Description	Reference
1	401330	4	Screw, PHMS, 4-40 UNC x 1/2"	
2	405530	2	Screw, BHCS, 1/4-20 UNC x 1/2"	
3	420010	10	Nut, 1/4-20 UNC	
4	439007	5	Lockwasher, 1/4", External Tooth	
5	439010	5	Lockwasher, 1/4" ID	
6	803020	1	Label, High Voltage	
7	9103103	1	Cover, IEC Receptacle	
8	9103216	1	Bracket, Cabinet Keyboard	
9	9103219A	4	Caster Wheel Assembly	Page A-11
10	9103225	4	Leveling Foot, 3/8-16 UNC	
11	9103314	30	Nut, Cage, 10-32 UNF	
12	9103403A	1	Rear Guard Assembly	Page A-15
13	9103423A	1	Back Cover Support Assembly	Page A-19
14	9103425A	1	Cable Bracket Assembly	Page A-20
15	9103584	1	Cabinet, 19" Subrack	
16	9103769A	1	Support Bracket Assembly	Page A-25
17	9103770A	1	Umbilical Bracket Assembly	Page A-26
18	9103863A	1	Front Guard Assembly	Page A-27
19	9103871A	1	Rear Cover Assembly	Page A-29
20	9104125A	1	Printhead Parking Bracket Assembly	Page A-30
21	9104632	1	Filter, RFI, EEJ Series	

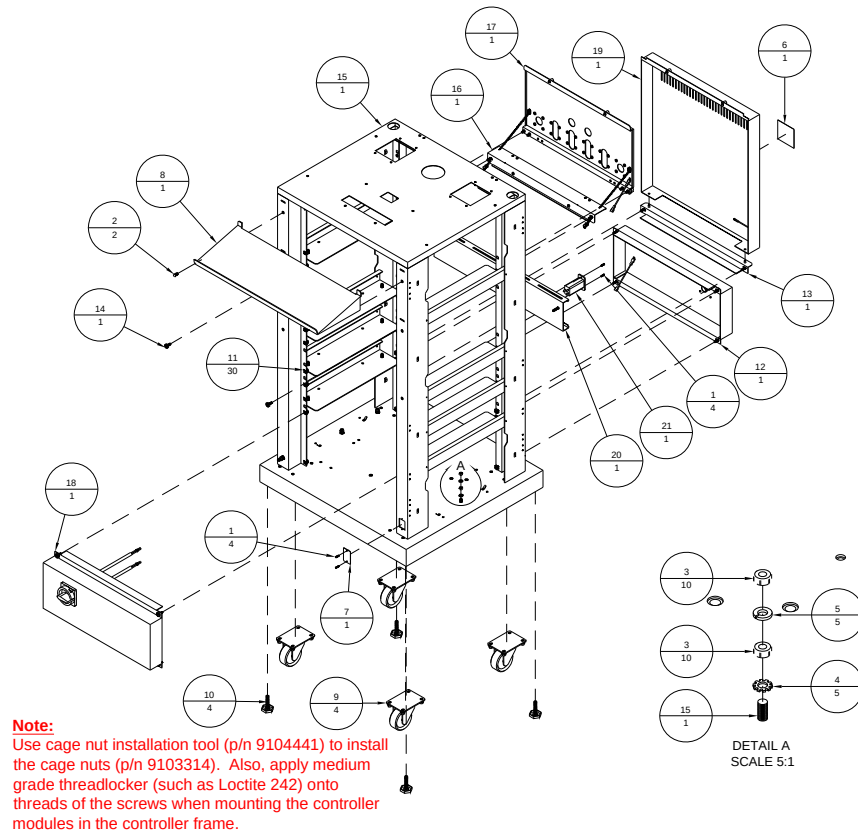
Figure A-3: *BK17XX-FRM – Frame, Rack Type, BK17XX Controller*

Table A-4: BK-1700-TRAN – Transformer Assembly

Item	Part Number	Quantity	Description	Reference
1	406670	4	Screw, HHMS, 5/16-18 UNC x 1"	
2	439015	4	Lockwasher, 5/16 ID	
3	440015	4	Washer, 5/16 ID	
4	606033	2	Cable, #14-3, SJOW-A, 14"	
5	606040	1	Cable, #14-2, SJOW, BK/WH, 15"	
6	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
7	609120	1	Terminal, Ring, ¼", 16-14 AWG, Non-Ins.	
8	9102681	1	Wire, #14, Green/Yellow, 17"	
9	9103433	10	Ferrule, #14 AWG, Blue	
10	9103434	3	Ferrule, #14, Dual Wire, Blue	
11	9103700	1	Transformer, 2 kVA, 200/208/230/250	

Figure A-4: BK-1700- TRAN – Transformer Assembly

NOTE:

Line = Black

Neutral = White

Ground = Green or Green/Yellow

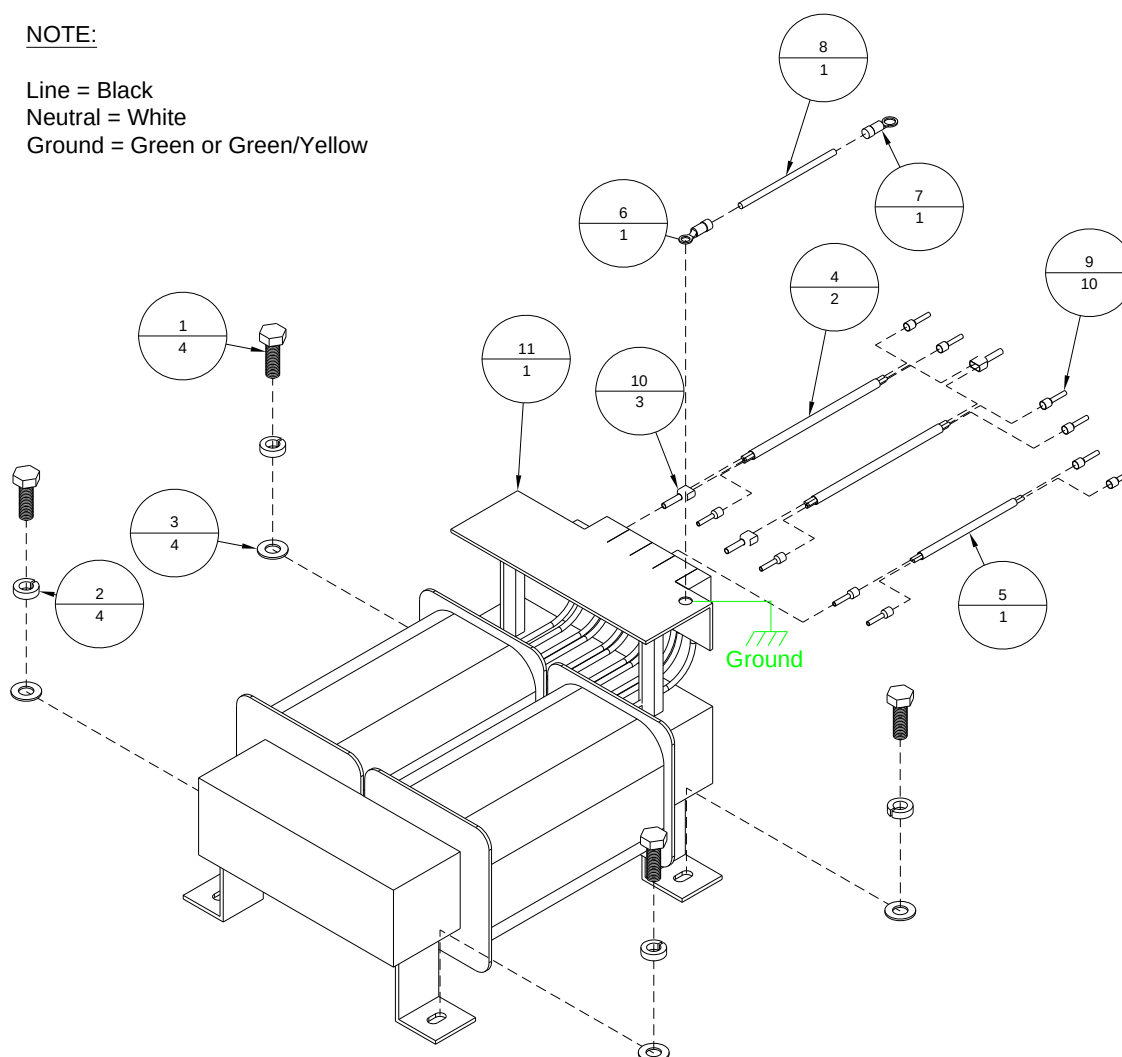


Table A-5: *BK-PCM-16 – Module, Computer Assembly*

Item	Part Number	Quantity	Description	Reference
1	404520	6	Screw, BHCS, 10-32 UNF x 3/8"	
2	420004	6	Nut, 4-40 UNC	
3	420008	6	Nut, 10-32 UNF	
4	439004	6	Lockwasher, No. 4	
5	439009	6	Lockwasher, No. 10	
6	9103177	1	Cover, Computer Cabinet	
7	9104116A	1	HeadIF Assembly	Page A-30
8	9104127	3	Bracket, Blocking 4-Channel	
9	9104130A	1	Computer PCM Chassis Assembly	Page A-33
10	9104131A	1	Faceplate Assembly, BK-PCM-16	Page A-35
11	9104135A	1	Image Accelerator Card Assembly	Page A-36

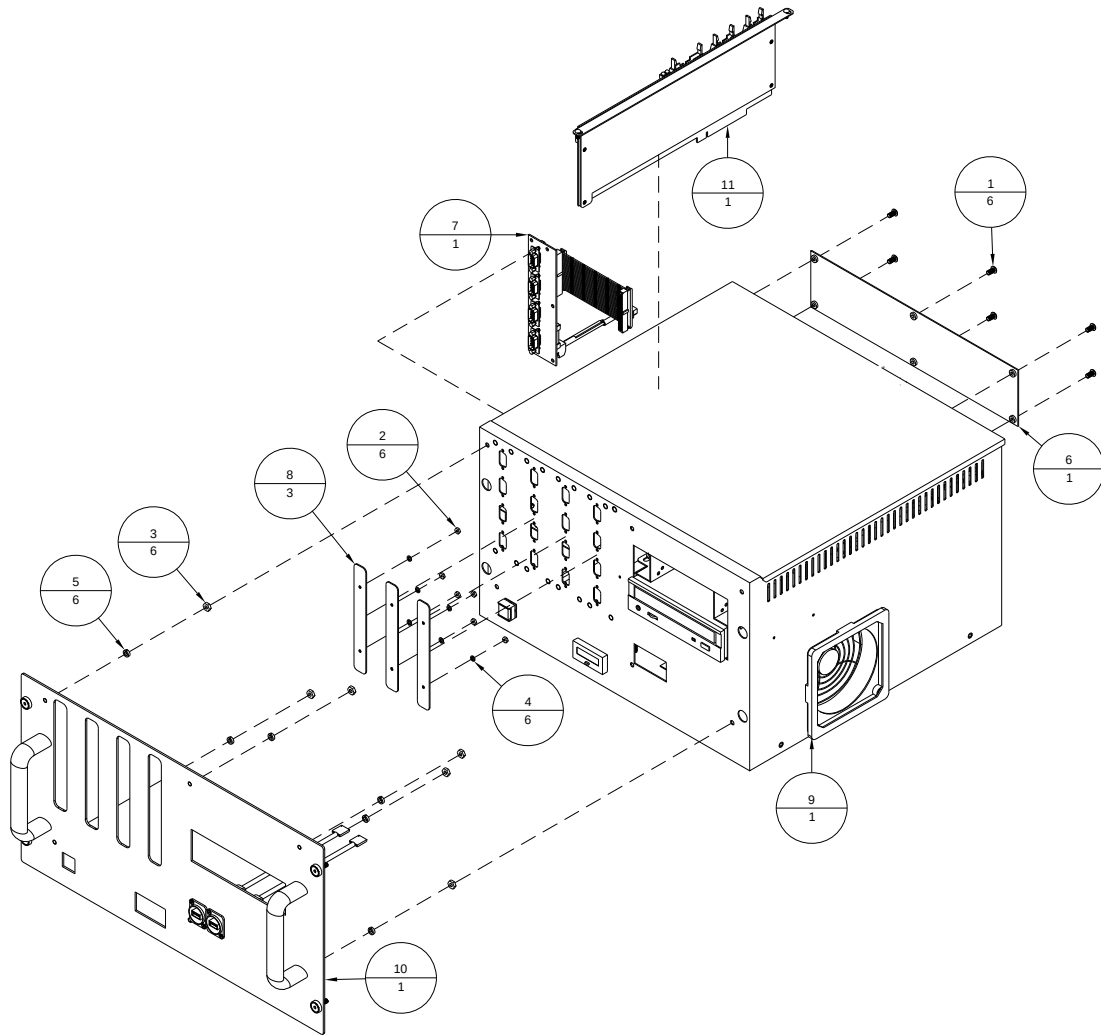
Figure A-5: *BK-PCM-16 – Module, Computer Assembly*

Table A-6: *BK-RACK-0 – Rack, Frame, Unpopulated*

Item	Part Number	Quantity	Description	Reference
1	9102801	1	Subrack, 6U for 220 mm card	
2	9102803	2	Insert, Rack, Threaded, M2.5 mm	
3	9103004A	2	Side Bracket Assembly, Rack	Page A-8

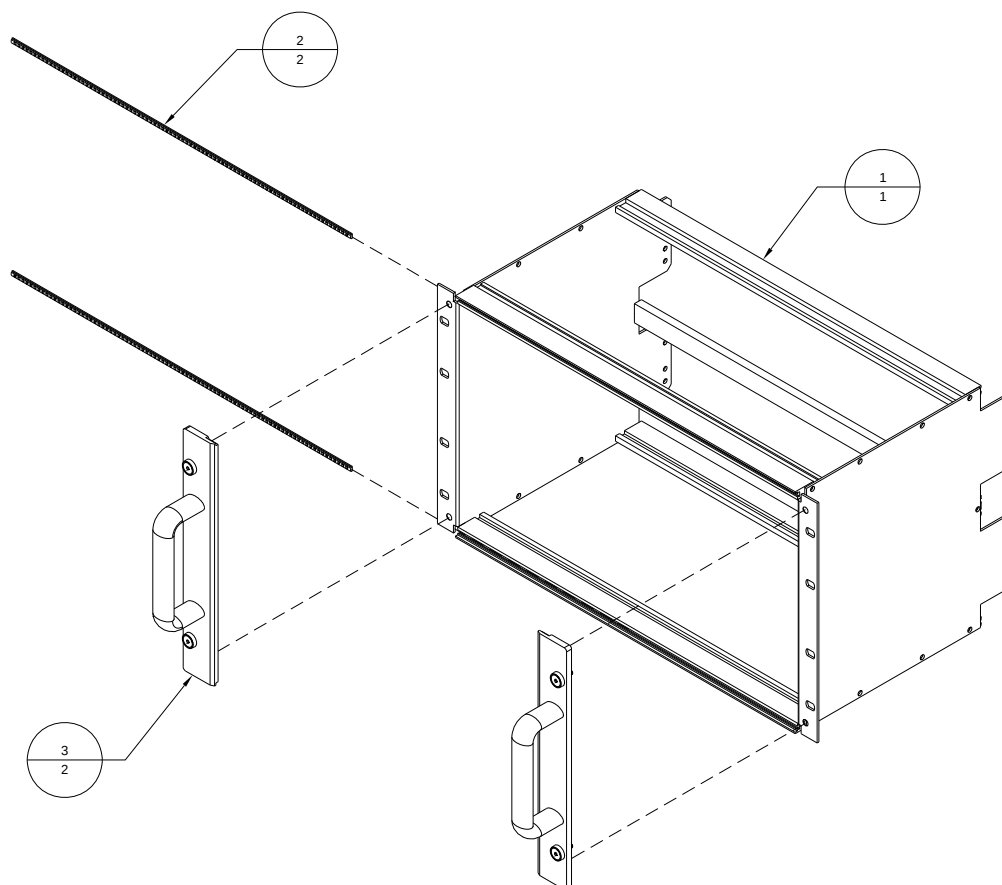
Figure A-6: *BK-RACK-0 – Rack, Frame, Unpopulated*

Table A-7: 9103004A – Side Bracket Assembly, Rack

Item	Part Number	Quantity	Description	Reference
1	404010	2	Screw, FHCS, 10-32 UNF x 1/4"	
2	404050	2	Screw, FHCS, 10-32 UNF x 3/4"	
3	9102847	1	Handle, Pull, 5/16-18	
4	9103004	1	Plate, Side, Rack	
5	9103111	2	Screw, FHMS, 5/16-18 UNC x 5/8"	
6	9103315	2	Washer, Cup, 10-32 UNF Flat Head	

Figure A-7: 9103004A – Side Bracket Assembly, Rack

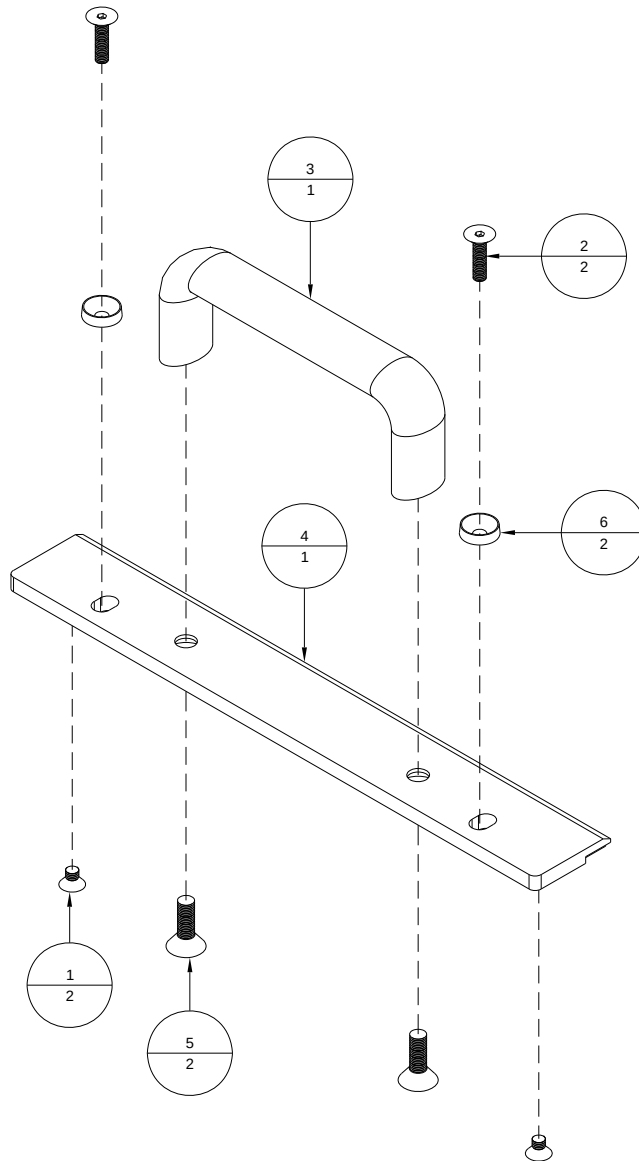


Table A-8: 9103178A – Field Connection Board Assembly

Item	Part Number	Quantity	Description	Reference
1	401310	12	Screw, PHMS, 4-40 UNC x 1/4"	
2	402310	4	Screw, PHMS, 6-32 UNC x 1/4"	
3	440530	4	Washer, #6 Nylon	
4	615063	5	Connector, Female, 3-Pin, BLA3	
5	615066	1	Connector, Female, 4-Pin, BLA4	
6	9100711A	5	Field Sensor Cable Assembly	
7	9100723A	1	Field Encoder Cable Assembly	
8	9100724A	5	Jam/Proxi/Photocue Extension Cable	
9	9100725A	1	Shaft Encoder Extension Cable	
10	9100731	1	Board, Field Connection	
11	9103178	1	Connector Plate, FCB	

Figure A-8: 9103178A – Field Connection Board Assembly

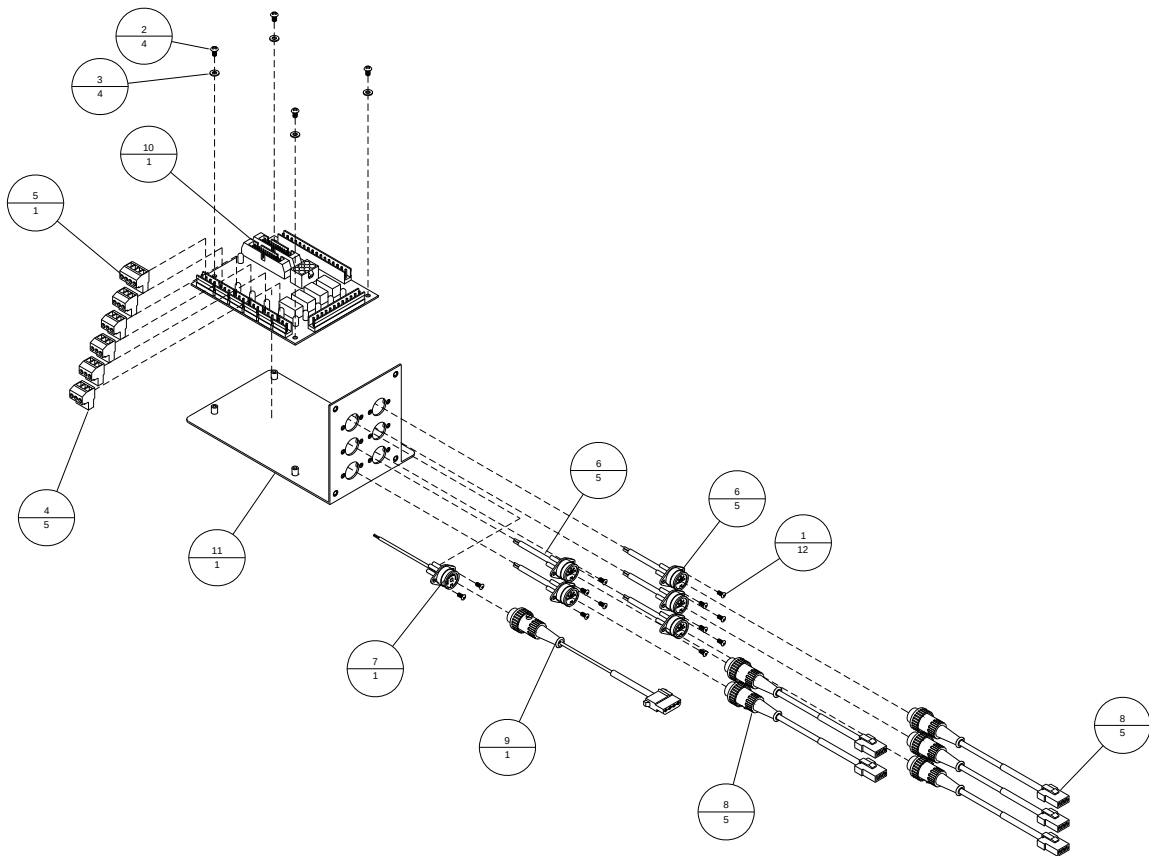


Table A-9: 9103217A – Cover Assembly, 3U

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x ¾"	
2	9103217	1	Cover, Blind, 3U	
3	9103315	4	Washer, Cup, 10-32 UNF Flat Head	

Figure A-9: 9103217A – Cover Assembly, 3U

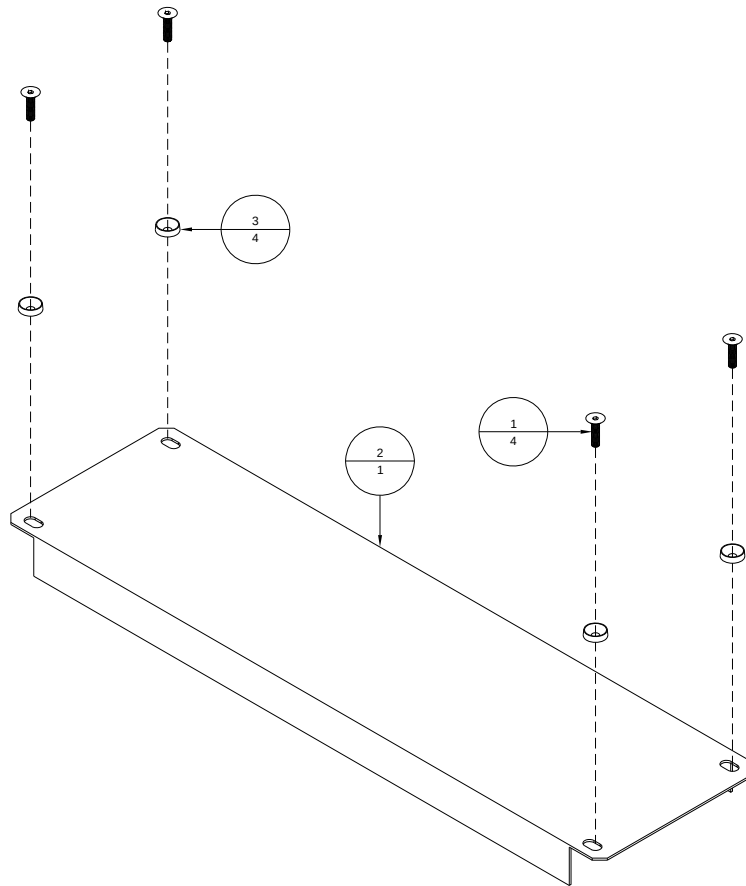


Table A-10: 9103219A – Caster Wheel Assembly

Item	Part Number	Quantity	Description	Reference
1	420015	4	Nut, 5/16-18 UNC	
2	439015	4	Lockwasher, 5/16 ID	
3	440015	4	Washer, 5/16 ID	
4	9103219	1	Caster Wheel, 3" DIA	

Figure A-10: 9103219A – Caster Wheel Assembly

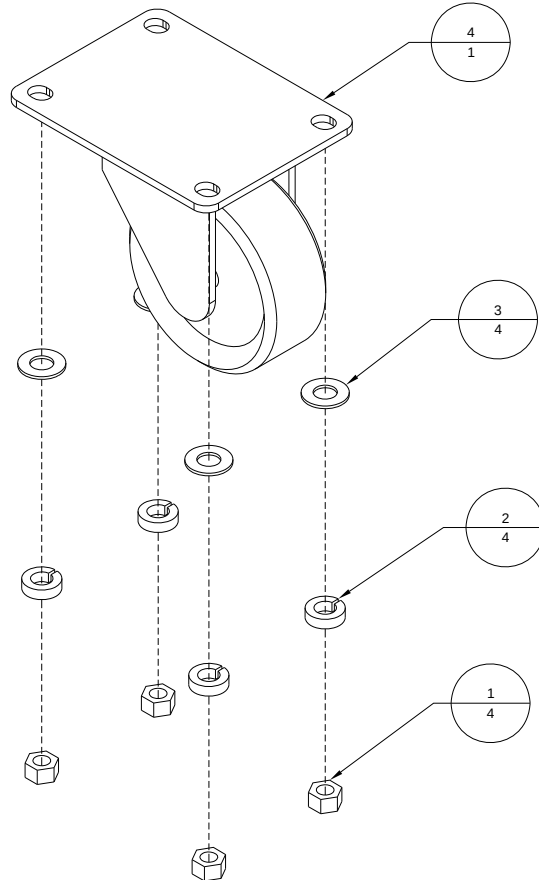


Table A-11: 9103285A – Dongle Assembly

Item	Part Number	Quantity	Description	Reference
1	9103278	1	Dongle, USB	
2	9103285	1	Ball Chain, No. 10, 4.5"	
3	9103286	2	Ball Chain Coupling Type "D"	
4	9103287	1	Split Ring, 0.52" ID	

Figure A-11: 9103285A – Dongle Assembly

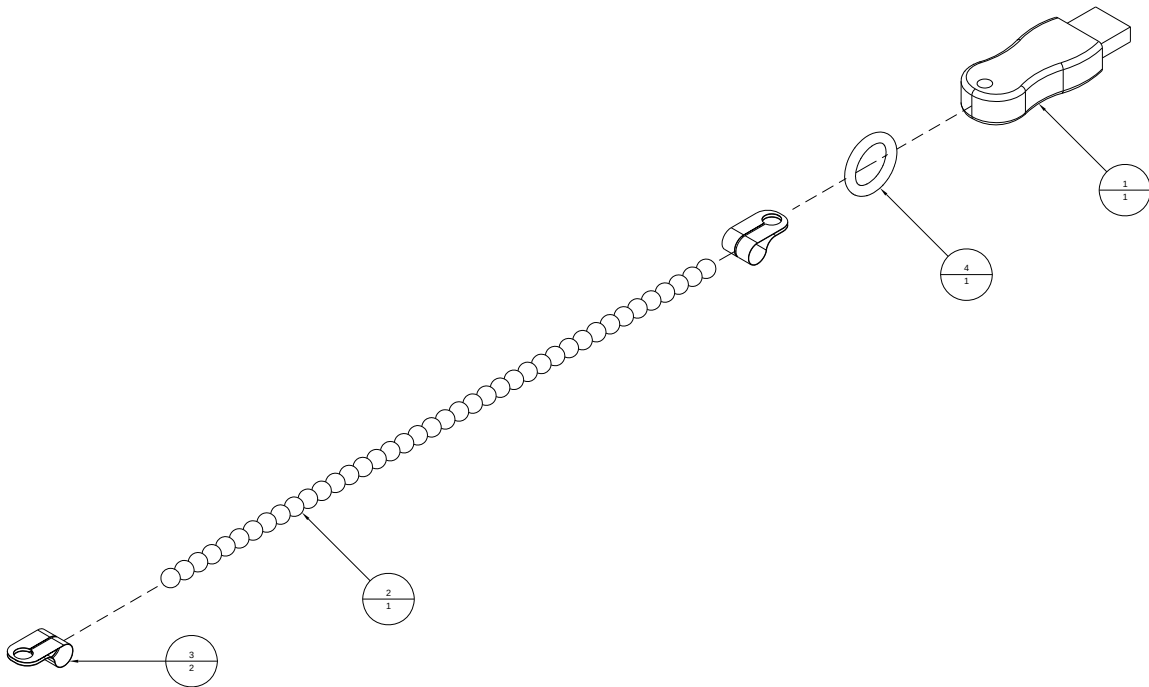


Table A-12: 9103288A – Cover Assembly, Blind Umbilical

Item	Part Number	Quantity	Description	Reference
1	404510	2	Screw, BHCS, 10-32 UNF x ¼"	
2	9103288	1	Cover, Cabinet Umbilical, Blind	

Figure A-12: 9103288A – Cover Assembly, Blind Umbilical

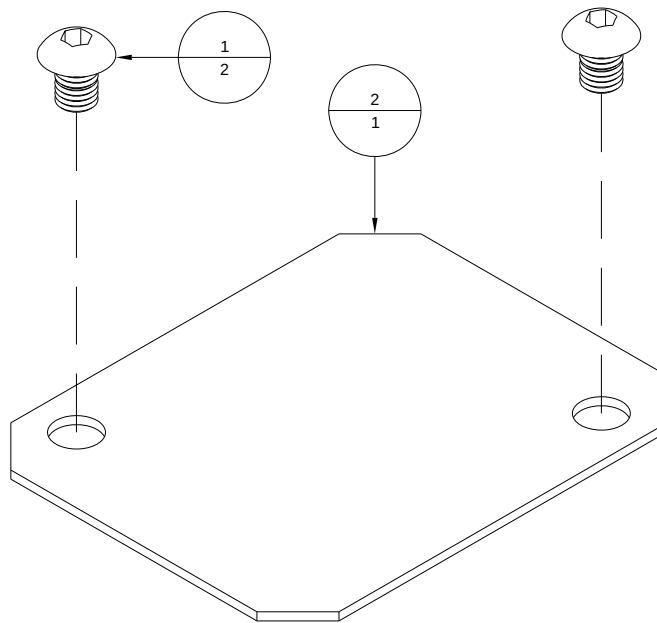


Table A-13: 9103360A – Side Door Assembly, Left

Item	Part Number	Quantity	Description	Reference
1	404240	4	Screw, SHCS, 10-32 UNF x 5/8"	
2	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
3	609110	2	Connector, Push-On, 16-14 AWG, Blue	
4	9102681	1	Wire, #14, Green/Yellow, 20"	
5	9103360	1	Door, Side, Cabinet	
6	9103372	2	Hinge, Front Mount, Adjustable	
7	9103373	1	Latch, Quarter Turn	

Figure A-13: 9103360A – Side Door Assembly, Left

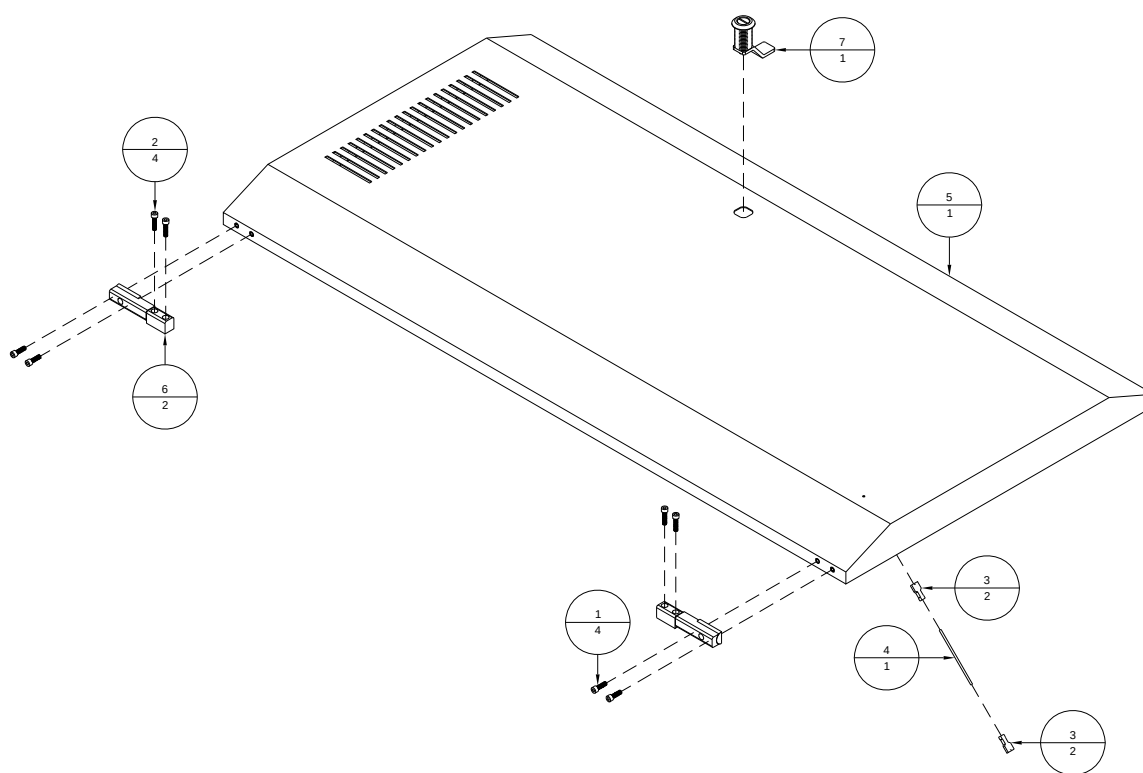


Table A-14: 9103403A – Rear Guard Assembly

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x ¾"	
2	609110	2	Connector, Push-On, 16-14 AWG, Blue	
3	615425	1	Hole Plug, 7/8"	
4	9102681	1	Wire, #14, Green/Yellow, 20"	
5	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
6	9103403	4	Hole Plug, Dome, 0.187"	
7	9103863	1	Cover, Bottom Guard	

Figure A-14: 9103403A – Rear Guard Assembly

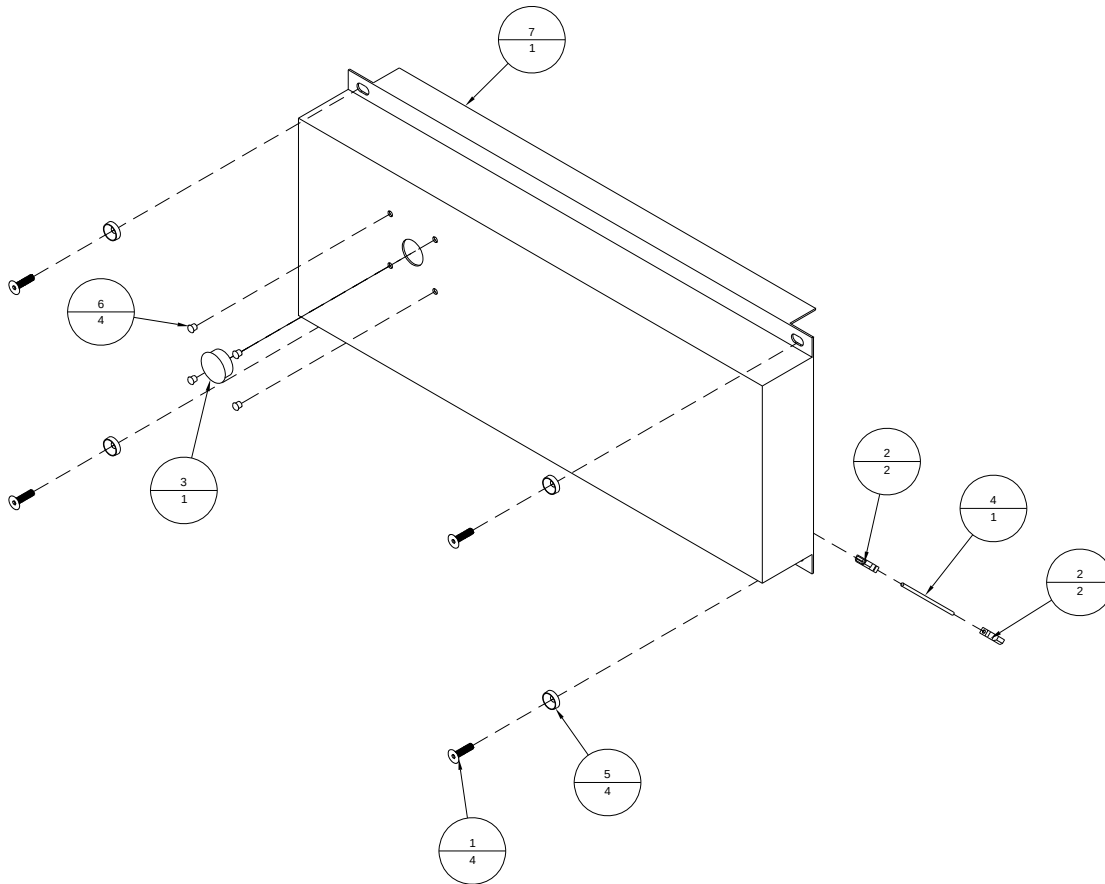


Table A-15: 9103407A – Controller Top Assembly

Item	Part Number	Quantity	Description	Reference
1	404530	8	Screw, BHCS, 10-32 UNF x ½"	
2	420008	2	Nut, 10-32 UNF	
3	439008	4	Lockwasher, #10, External Tooth	
4	440008	2	Washer, #10 ID	
5	615426	1	Hole Plug 1-1/8"	
6	9103406	1	Mount, Monitor, LCD	
7	9103409A	2	Side Door Assembly, Top	Page A-18

Figure A-15: 9103407A – Controller Top Assembly

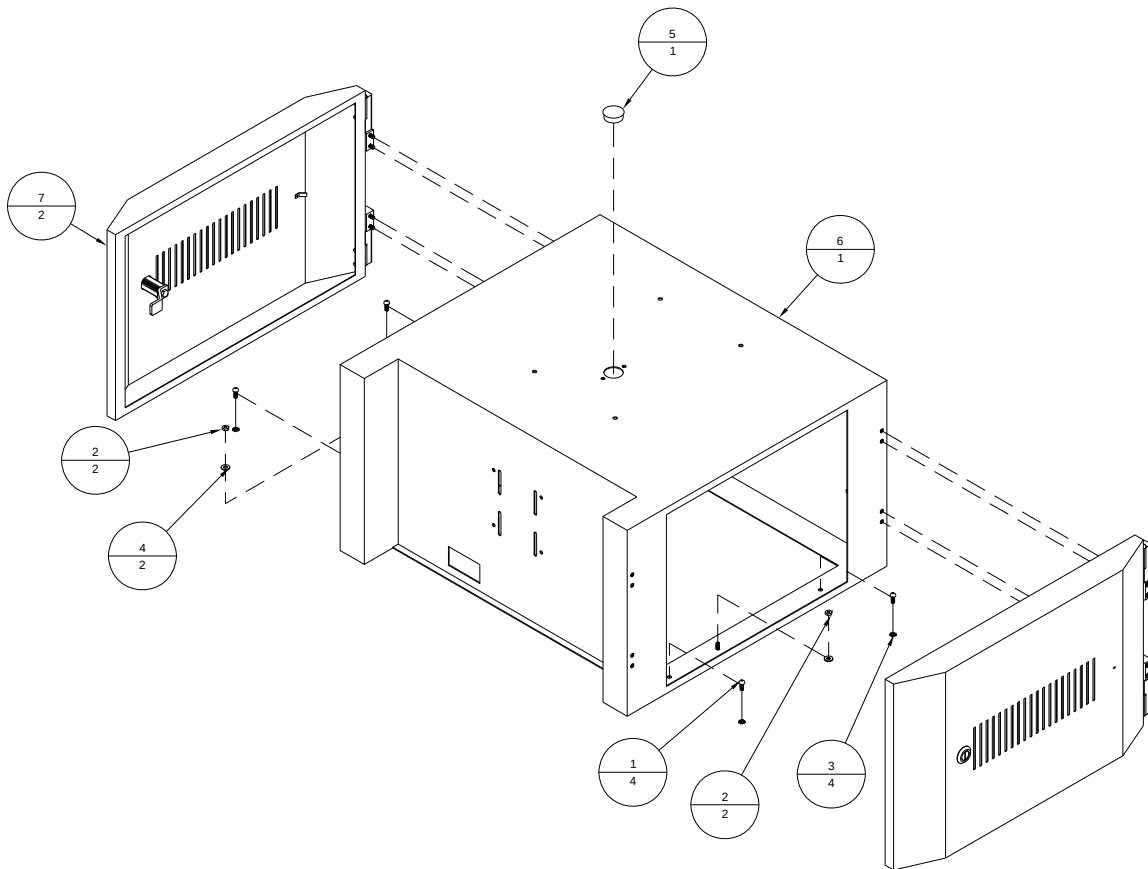


Table A-16: 9103408A – Side Door Assembly, Right

Item	Part Number	Quantity	Description	Reference
1	404240	4	Screw, SHCS, 10-32 UNF x 5/8"	
2	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
3	609110	2	Connector, Push-On, 16-14 AWG, Blue	
4	9102681	1	Wire, #14, Green/Yellow, 20"	
5	9103372	2	Hinge, Front Mount, Adjustable	
6	9103373	1	Latch, Quarter Turn	
7	9103408	1	Door, Side, Cabinet	

Figure A-16: 9103408A – Side Door Assembly, Right

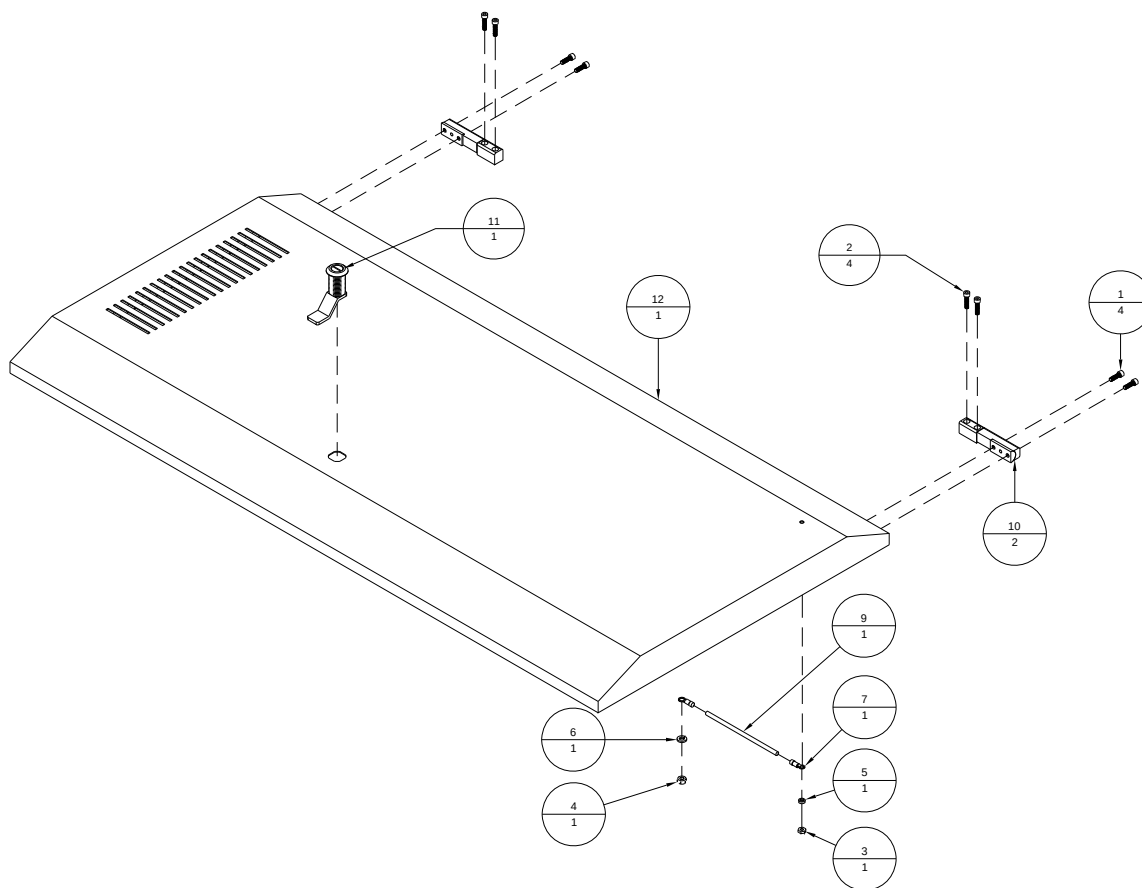


Table A-17: 9103409A – Side Door Assembly, Top

Item	Part Number	Quantity	Description	Reference
1	404240	4	Screw, SHCS, 10-32 UNF x 5/8"	
2	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
3	9103362	1	Door, Side, Cabinet, Short	
4	9103372	2	Hinge, Front Mount, Adjustable	
5	9103373	1	Latch, Quarter Turn	

Figure A-17: 9103409A – Side Door Assembly, Top

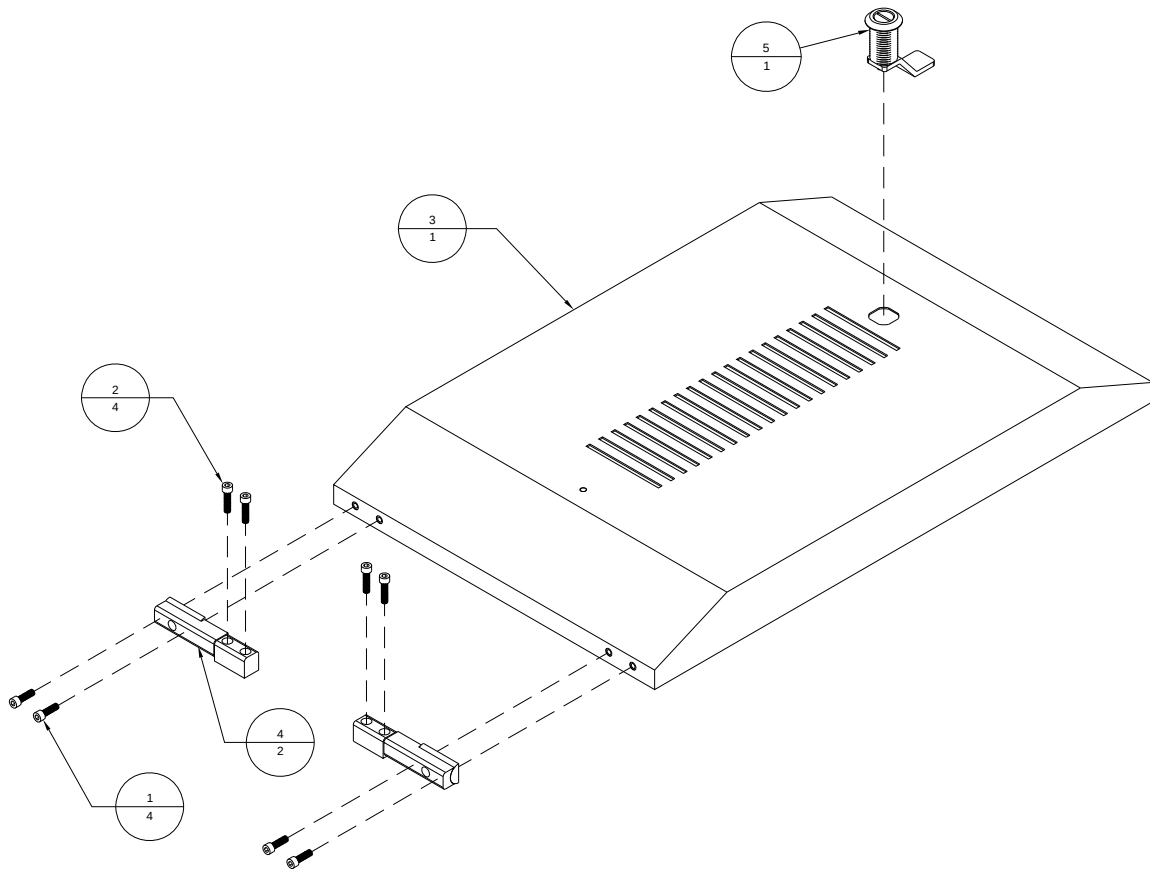


Table A-18: 9103423A – Back Cover Support Assembly

Item	Part Number	Quantity	Description	Reference
1	404050	2	Screw, FHCS, 10-32 UNF x ¾"	
2	9103315	2	Washer, Cup, 10-32 UNF Flat Head	
3	9103423	1	Bracket, Back Cover Support	

Figure A-18: 9103423A – Back Cover Support Assembly

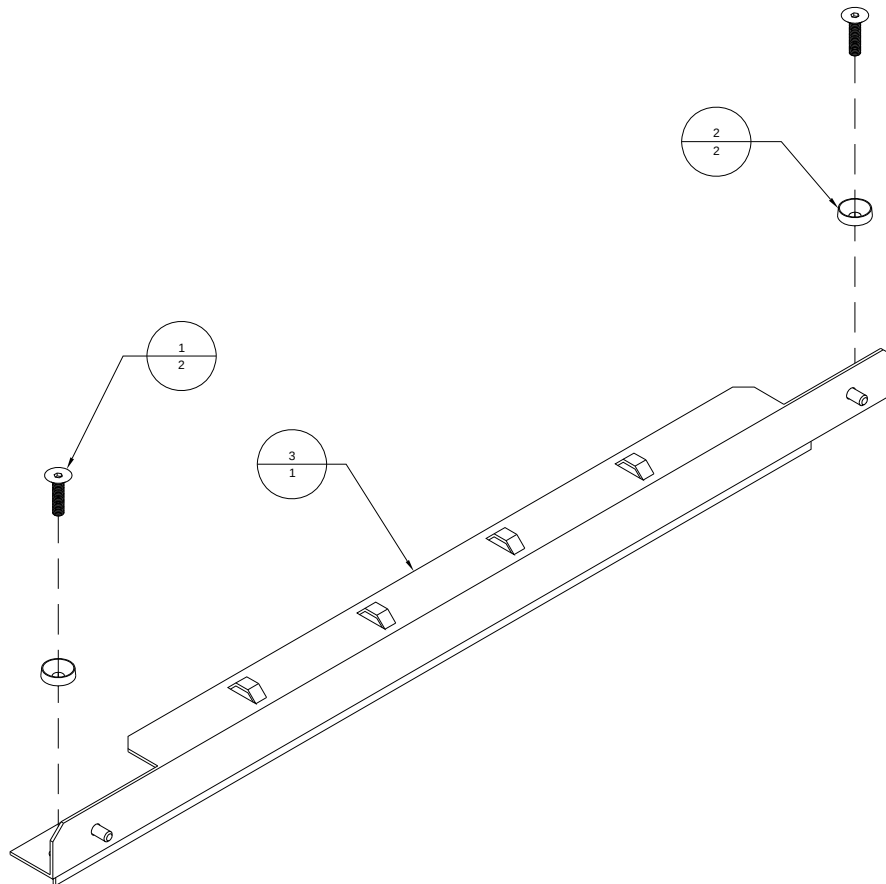


Table A-19: 9103425A – Cable Bracket Assembly

Item	Part Number	Quantity	Description	Reference
1	404050	2	Screw, FHCS, 10-32 UNF x ¾"	
2	9103315	2	Washer, Cup, 10-32 UNF Flat Head	
3	9103425	1	Bracket, Gap Cover, Front	

Figure A-19: 9103425A – Cable Bracket Assembly

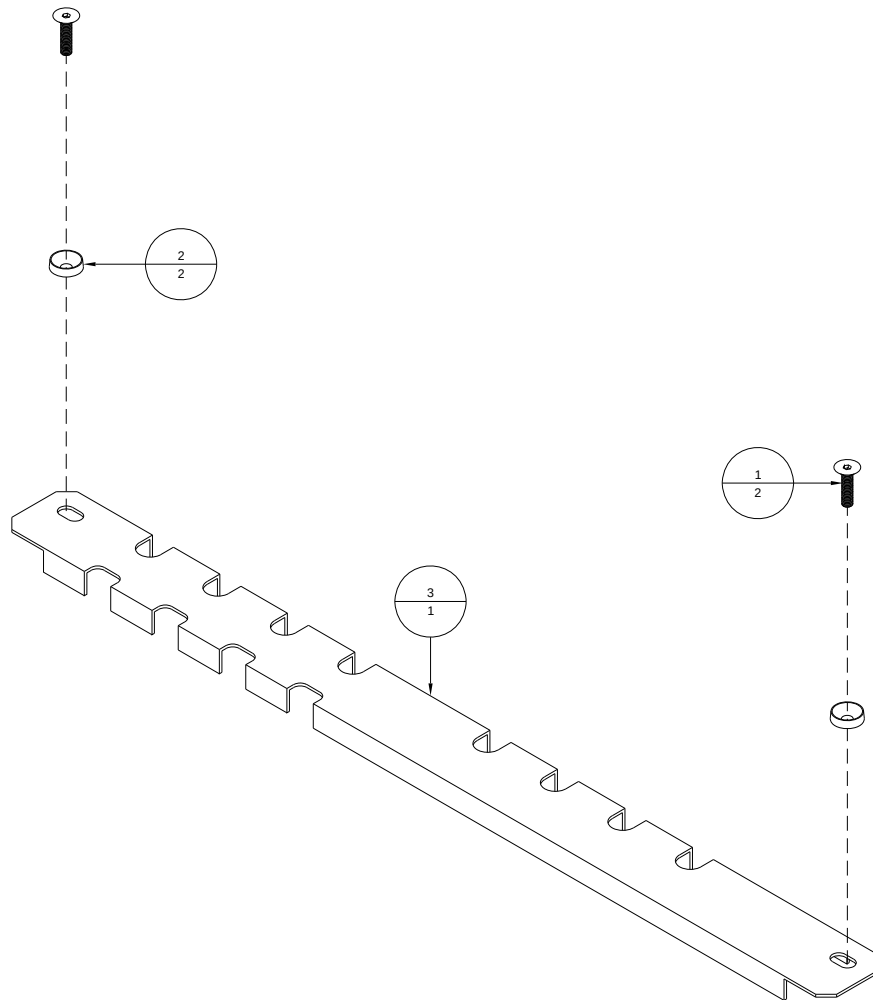


Table A-20: 9103447A – Terminal Block Assembly, World

Item	Part Number	Quantity	Description	Reference
1	404530	2	Screw, BHCS, 10-32 UNF x ½"	
2	439009	2	Lockwasher, No. 10	
3	440008	2	Washer, #10 ID	
4	606008	1	Wire, #14, White, 12"	
5	606010	1	Wire, #14, Black, 12"	
6	609120	1	Terminal Ring, ¼", 16-14 AWG, Non-Ins.	
7	615021	1	T-Rail, DIN, 7"	
8	9102046	1	Terminal Marker, WS 12/6, L1	
9	9102047	1	Terminal Marker, WS 12/6, L2	
10	9102050	2	Terminal Marker, WS 12/6, L	
11	9102051	2	Terminal Marker, WS 12/6, N	
12	9102681	1	Wire, #14, Green/Yellow, 7"	
13	9103256	2	Cord, 10A/250VAC, 3m, Harmonized, IEC	
14	9103433	5	Ferrule, #14 AWG, Blue	
15	9103436	6	Terminal Block, Z-Roofstyle	
16	9103437	1	Terminal Block, Z-Roofstyle, Ground	
17	9103438	3	End Plate	
18	9103442	3	End Bracket	
19	9103447	2	Fuse Holder, 13/32" DIA	
20	9104887	6	Ferrule, #17 AWG / 1 mm ² , Yellow	

Figure A-20: 9103447A – Terminal Block Assembly, World

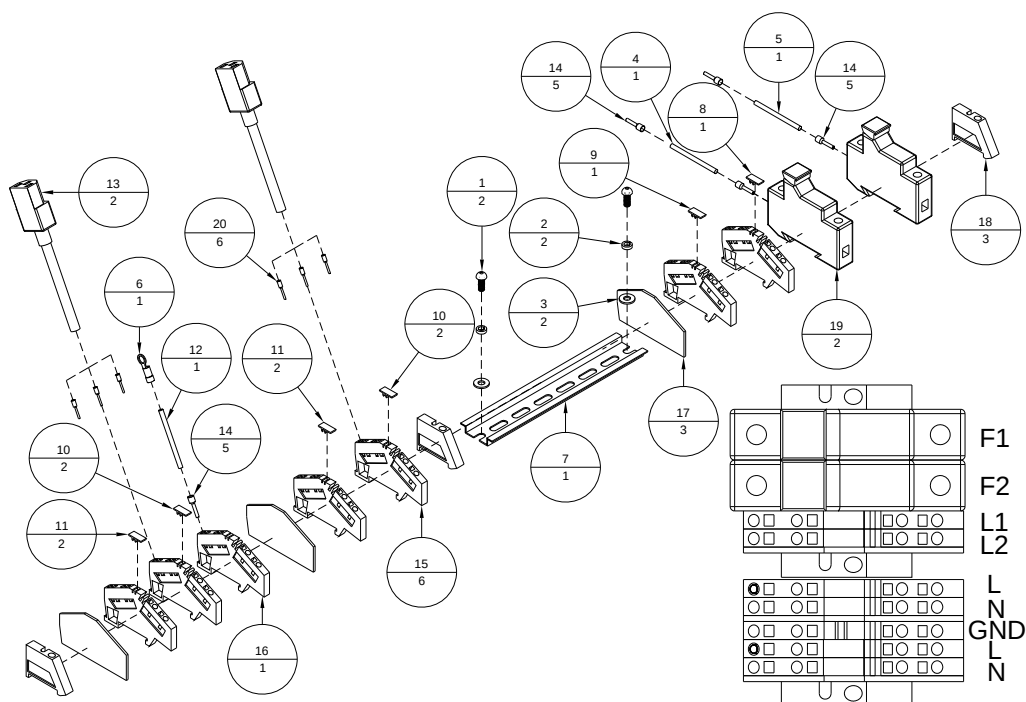


Table A-21: 9103455A – Cover Assembly, Blind Card

Item	Part Number	Quantity	Description	Reference
1	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
2	9102909	2	Screw, M2.5 x 6, Panhead	
3	9102986	2	Handle, HCC and RCC	
4	9103455	1	Bracket, Blind Card	

Figure A-21: 9103455A – Cover Assembly, Blind Card

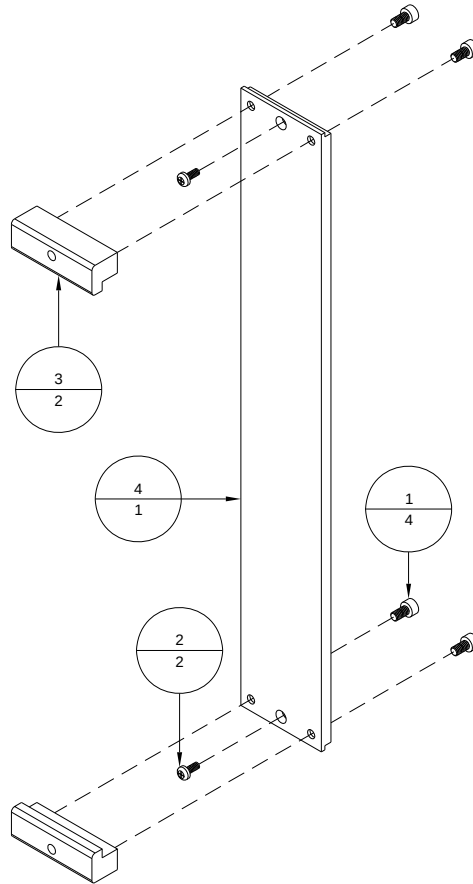


Table A-22: 9103568A – Cover Assembly, Blind Module

Item	Part Number	Quantity	Description	Reference
1	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
2	9102909	4	Screw, M2.5 x 6, Panhead	
3	9102941	2	Handle, Module	
4	9103568	1	Bracket, Blind 6U Module	

Figure A-22: 9103568A – Cover Assembly, Blind Module

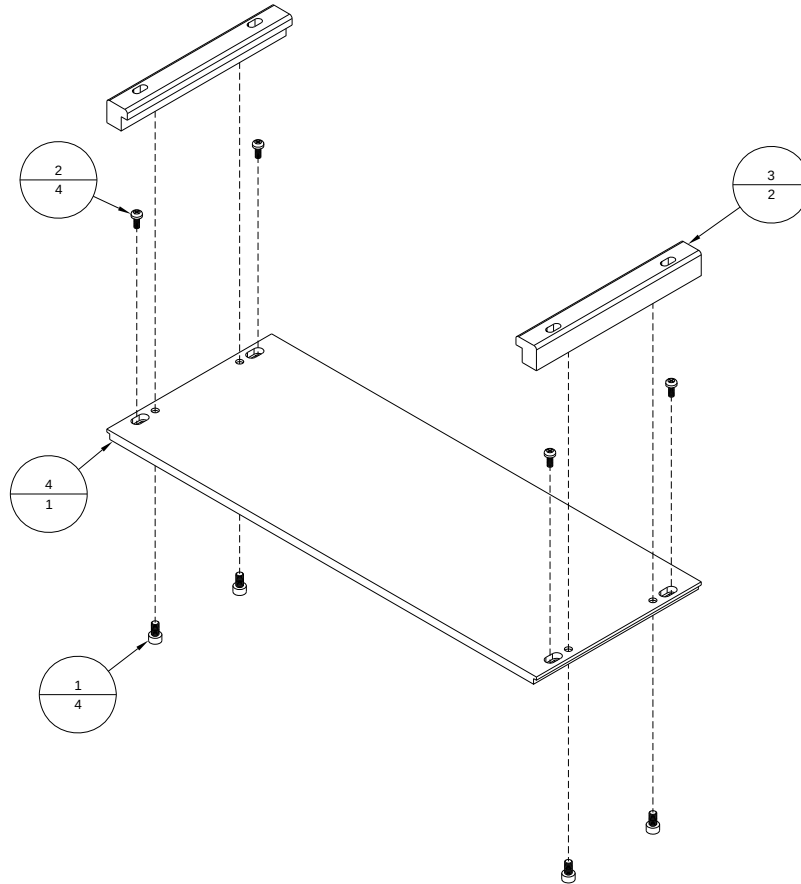


Table A-23: 9103677A – Cover, Blank 6U

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x ¾"	
2	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
3	9103677	1	Cover, Blank 6U	

Figure A-23: 9103677A – Cover, Blank 6U

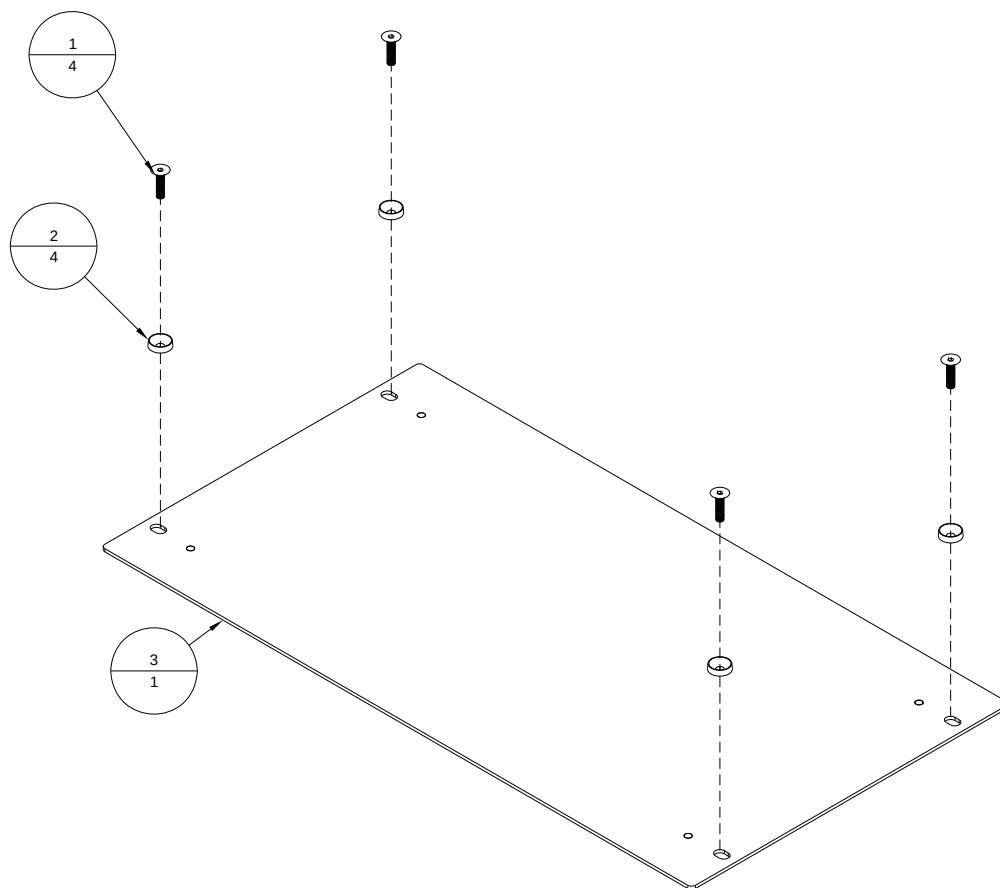


Table A-24: 9103769A – Support Bracket Assembly

Item	Part Number	Quantity	Description	Reference
1	404050	2	Screw, FHCS, 10-32 UNF x ¾"	
2	9103315	2	Washer, Cup, 10-32 UNF Flat Head	
3	9103769	1	Bracket, Support	

Figure A-24: 9103769A – Support Bracket Assembly

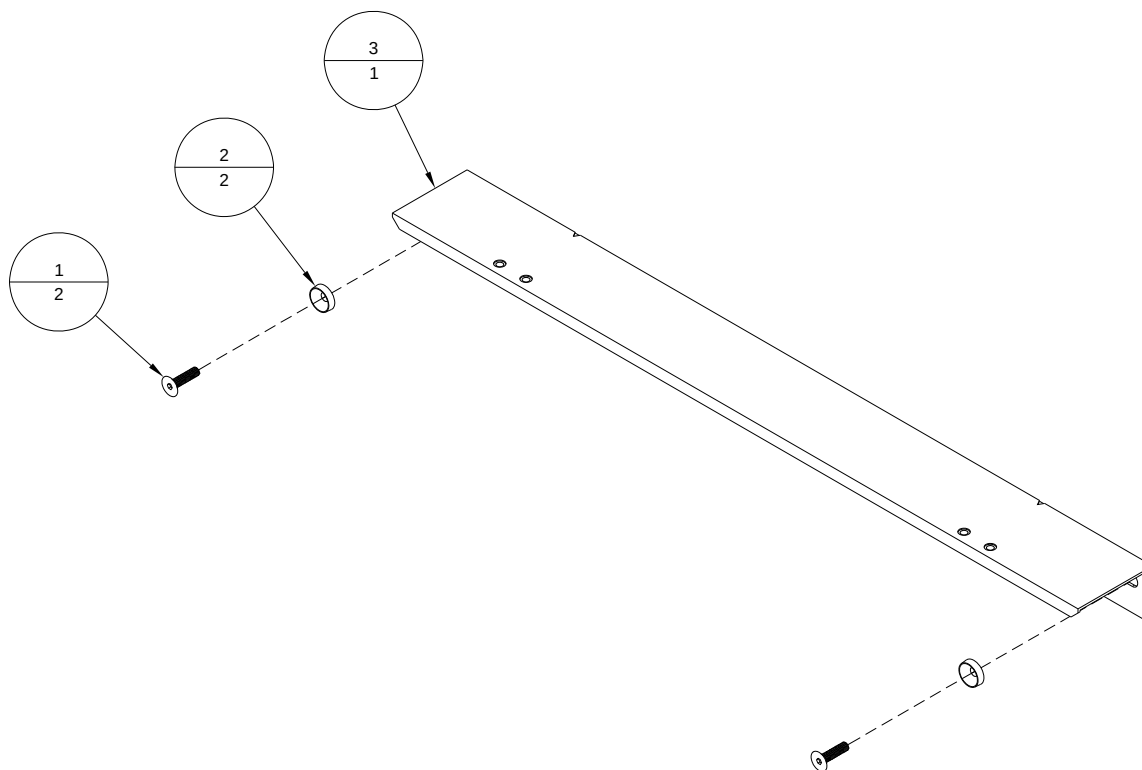


Table A-25: 9103770A – Umbilical Bracket Assembly

Item	Part Number	Quantity	Description	Reference
1	404240	4	Screw, SHCS, 10-32 UNF x 5/8"	
2	404250	4	Screw, SHCS, 10-32 UNF x 3/4"	
3	404320	2	Screw, SHCS, 10-32 UNF x 3/8"	
4	420008	2	Nut, 10-32 UNF	
5	439009	4	Lockwasher, No. 10	
6	609110	2	Connector, Push-On, 16-14 AWG, Blue	
7	9102681	1	Wire, #14, Green/Yellow, 8"	
8	9103285	2	Ball Chain, No. 10, 9"	
9	9103286	4	Ball Chain Coupling Type "D"	
10	9103372	1	Hinge, Front Mount, Adjustable	
11	9103372	1	Hinge, Front Mount, Adjustable	
12	9103770	1	Bracket, Umbilical	

Figure A-25: 9103770A – Umbilical Bracket Assembly

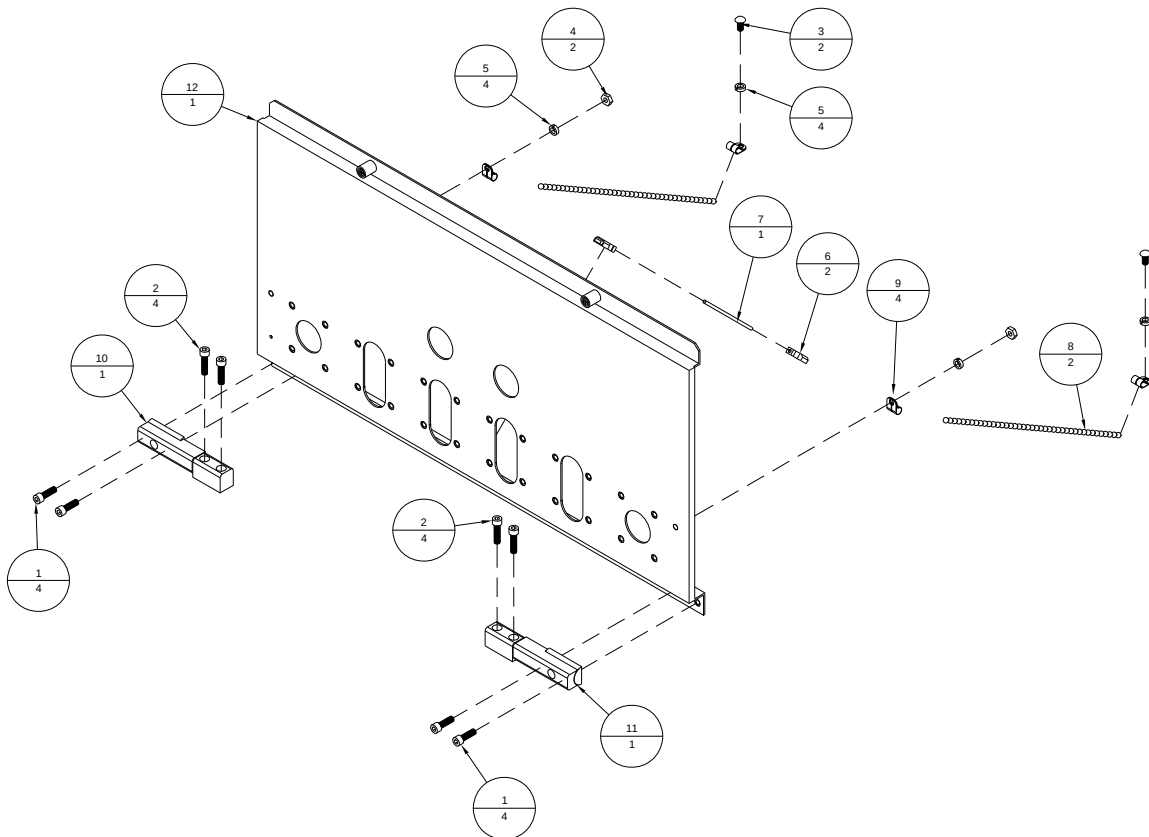


Table A-26: 9103863A – Front Guard Assembly

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x ¾"	
2	606033	2	Cable, #14-3, SJOW-A, 24"	
3	609110	2	Connector, Push-On, 16-14 AWG, Blue	
4	9102681	1	Wire, #14, Green/Yellow, 20"	
5	9103187	1	Switch, Padlock, 25A	
6	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
7	9103433	8	Ferrule, #14 AWG, Blue	
8	9103863	1	Cover, Bottom Guard	

Figure A-26: 9103863A – Front Guard Assembly

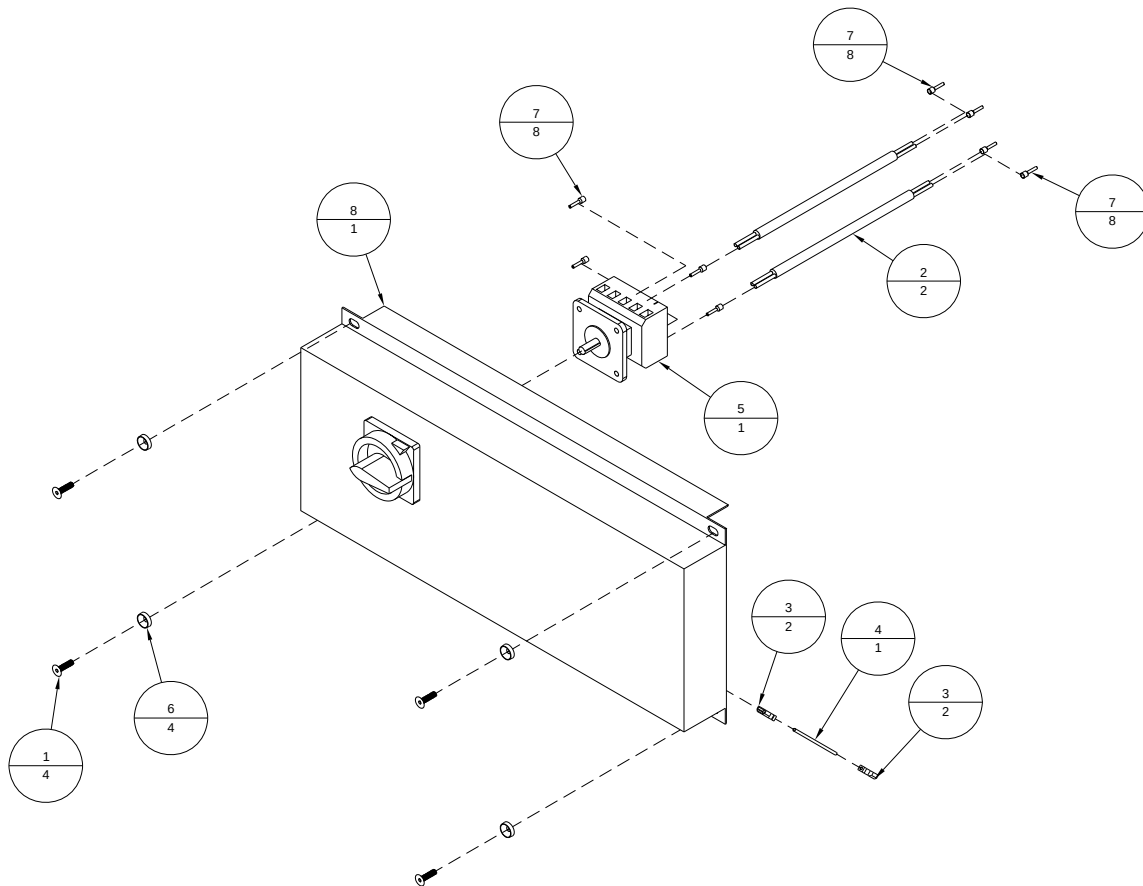


Table A-27: 9103869A – Side Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	609110	2	Connector, Push-On, 16-14 AWG, Blue	
2	9102681	1	Wire, #14, Green/Yellow, 20"	
3	9103869	1	Bracket, Lower Vent	

Figure A-27: 9103869A – Side Cover Assembly

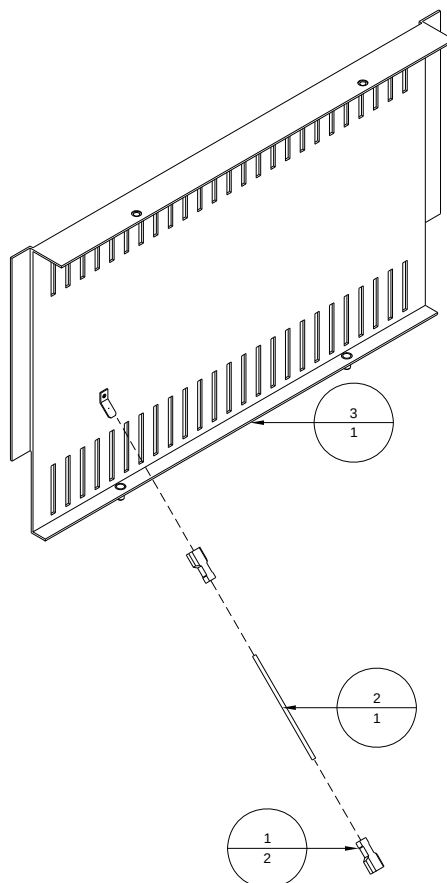


Table A-28: 9103871A – Rear Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	609110	2	Connector, Push-On, 16-14 AWG, Blue	
2	9102681	1	Wire, #14, Green/Yellow, 20"	
3	9103871	1	Cover, Computer/Power Supplies	

Figure A-28: 9103871A – Rear Cover Assembly

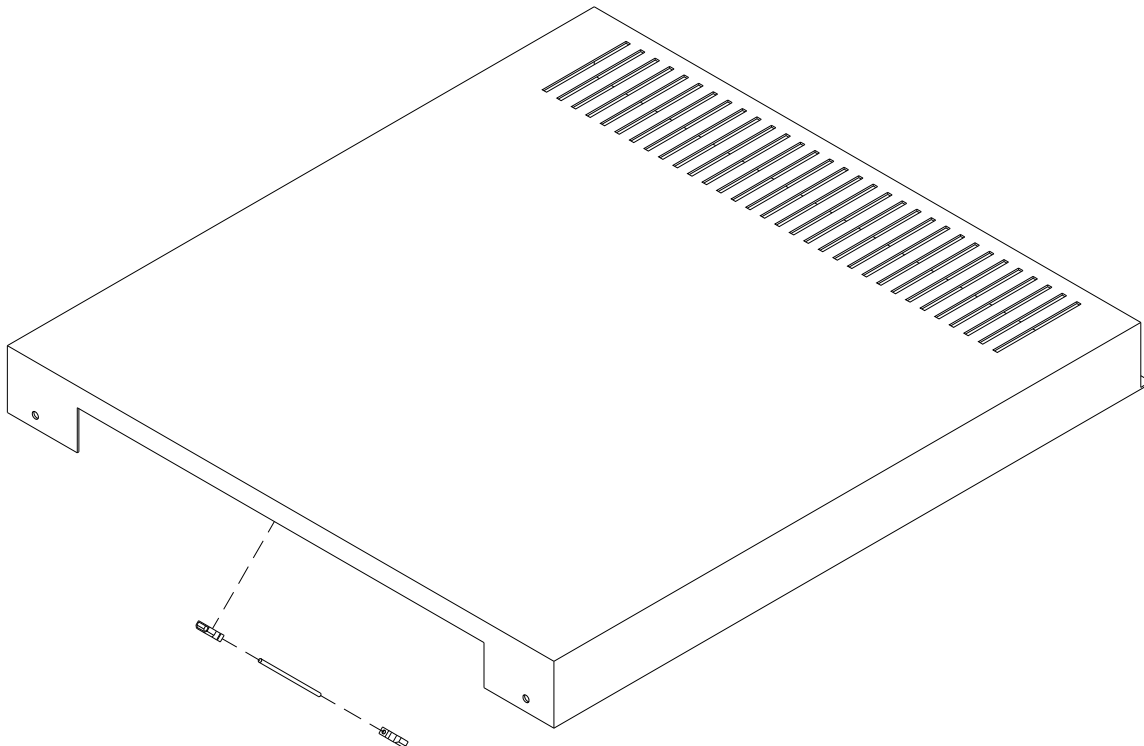


Table A-29: 9104116A – HeadIF Assembly

Item	Part Number	Quantity	Description	Reference
1	615322	8	Female Screwlock, 4-40 UNC	
2	9102011A	1	Cable, 12 VDC Power	
3	9104116	1	Board, Head Interface (HeadIF)	
4	9104334A	1	Cable, Twist Pair, HeadIF Board	

Figure A-29: 9104116A – HeadIF Assembly

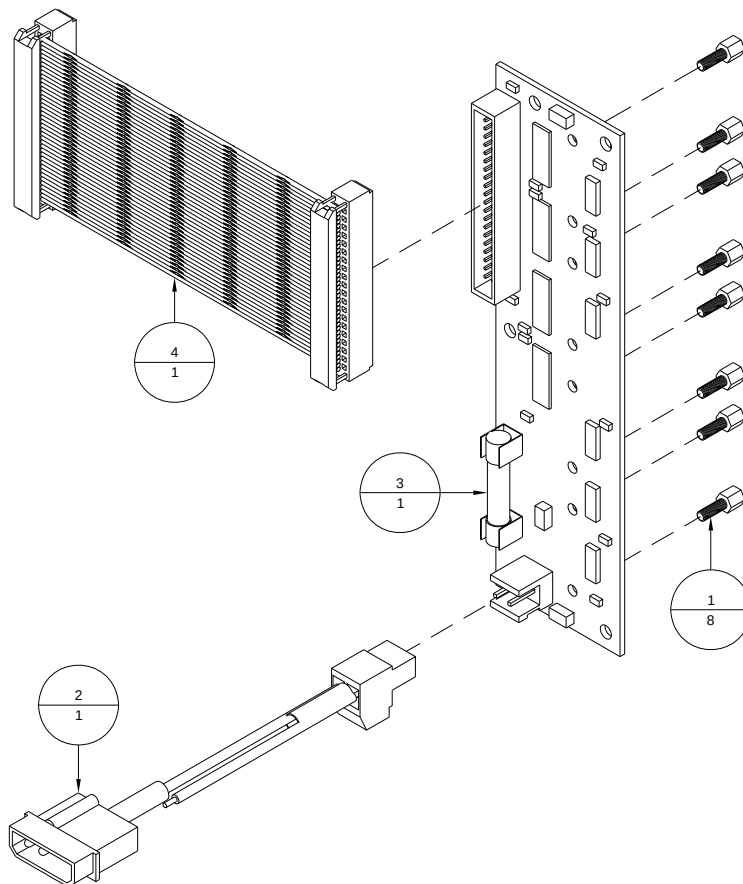


Table A-30: 9104125A – Printhead Parking Bracket Assembly

Item	Part Number	Quantity	Description	Reference
1	404530	2	Screw, BHCS, 10-32 UNF x ½"	
2	405570	2	Screw, BHCS, ¼-20 UNC x 1"	
3	9104125	1	Printhead Parking Bracket	
4	9104126	1	Printhead Parking Holder	

Figure A-30: 9104125A – Printhead Parking Bracket Assembly

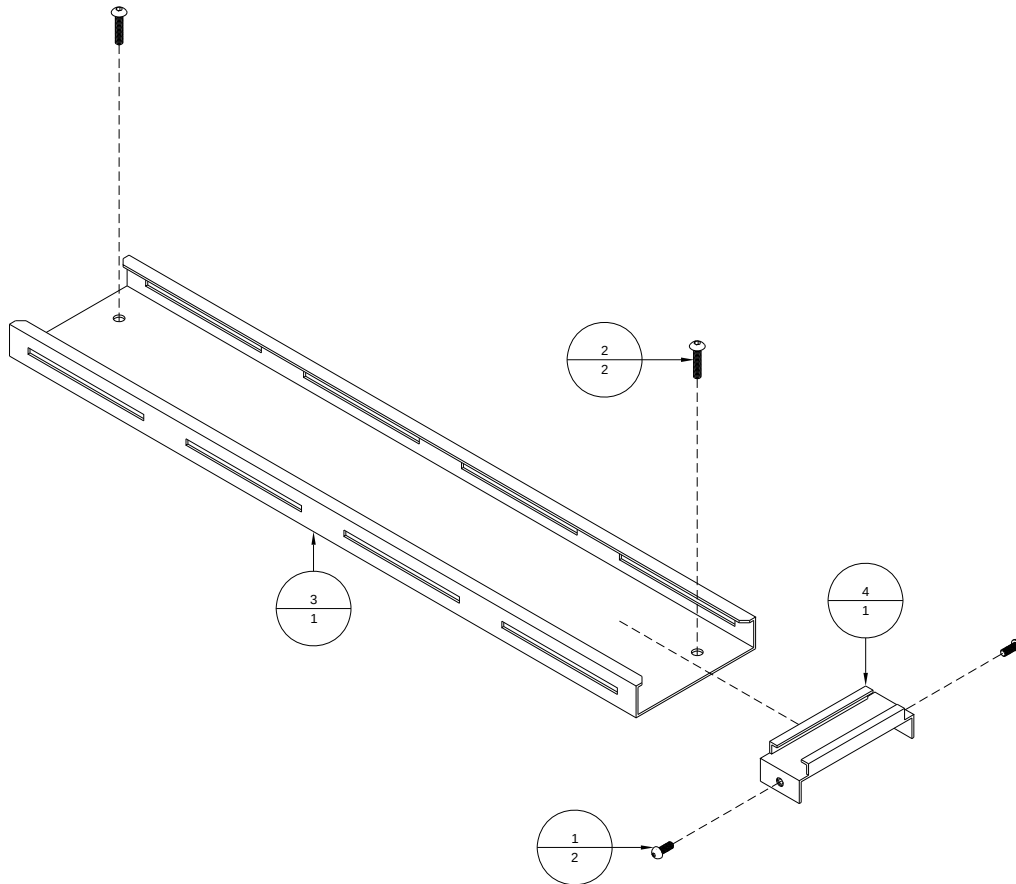


Table A-31: 9104127A – Computer Drive Mount Assembly

Item	Part Number	Quantity	Description	Reference
1	402320	4	Screw, PHMS, 6-32 UNC x 3/8"	
2	413506	4	Screw, BHCS, M3 x 6 mm	
3	439006	8	Lockwasher, No. 6	
4	440005	8	Washer, #6	
5	600333	1	Hard Drive	
6	803601	1	DVD-ROM, Black	
7	9102882	1	Hard Drive Mount	

Figure A-31: 9104127A – Computer Drive Mount Assembly

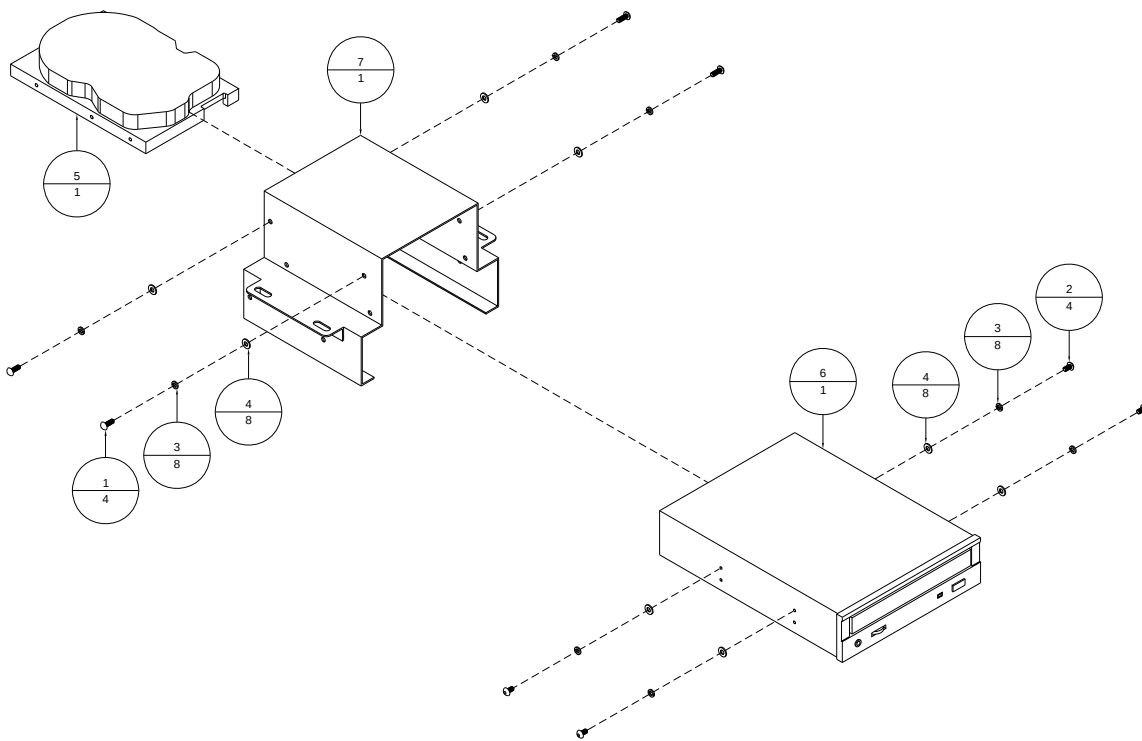


Table A-32: 9104130A – Computer PCM Chassis Assembly

Item	Part Number	Quantity	Description	Reference
1	401310	8	Screw, PHMS, 4-40 UNC x 1/4"	
2	402310	17	Screw, PHMS, 6-32 UNC x 1/4"	
3	402320	4	Screw, PHMS, 6-32 UNC x 3/8"	
4	403510	4	Screw, BHCS, 8-32 UNC x 1/4"	
5	404520	6	Screw, BHCS, 10-32 UNF x 3/8"	
6	420007	4	Nut, 8-32 UNC	
7	420008	2	Nut, 10-32 UNF	
8	439009	10	Lockwasher, No. 10	
9	440008	8	Washer, No. 10	
10	600101A	1	Counter Assembly	
11	609110	2	Connector, Push-On, Blue	
12	614307A	1	Cable, I/O Assembly	
13	615322	4	Female Screwlock, 4-40 UNC	
14	806600	1	Software, Windows	
15	9101863	1	Power Supply, 12V, ATX	
16	9101971	1	Software, Compose IQ	
17	9102681	1	Wire, #14, Green/Yellow, 20"	
18	9102781A	1	Fan Assembly, 12 VDC	
19	9102782	1	Filter, 12 VDC Fan	
20	9102783	1	Fan, Finger Guard Metal	
21	9103178A	1	Field Connection Board Assembly	Page A-9
22	9103185	4	Screw, FPHM, 8-32 UNC x 1-3/4"	
23	9103188	4	Cover, Computer Slot	
24	9103196A	1	Cable, Data Ribbon, DB9 Male	
25	9103317A	1	Cable, Switch Pushbutton Assembly	
26	9103471A	1	Cable, FCB Output	
27	9103472A	1	Cable, FCB Input	
28	9104119A	1	Cable, Controller I/O Receptacle, 18"	
29	9104127A	1	Computer Drive Mount Assembly	Page A-32
30	9104130	1	Enclosure, Computer DPI/DPII	
31	9104133	1	Cover, Computer Module	
32	9104294	1	CPU, Pentium 4, Socket 775	
33	9104370	1	Card, Video, PCI Express	
34	9104418	1	Bracket, DP Card Support	
35	9104649	1	Memory, 1 GB (DDR 2)	
36	9104724	1	Motherboard, Socket 775	
37	9104953	1	Cable, DB9M Serial Adapter	

Figure A-32: 9104130A – Computer PCM Chassis Assembly

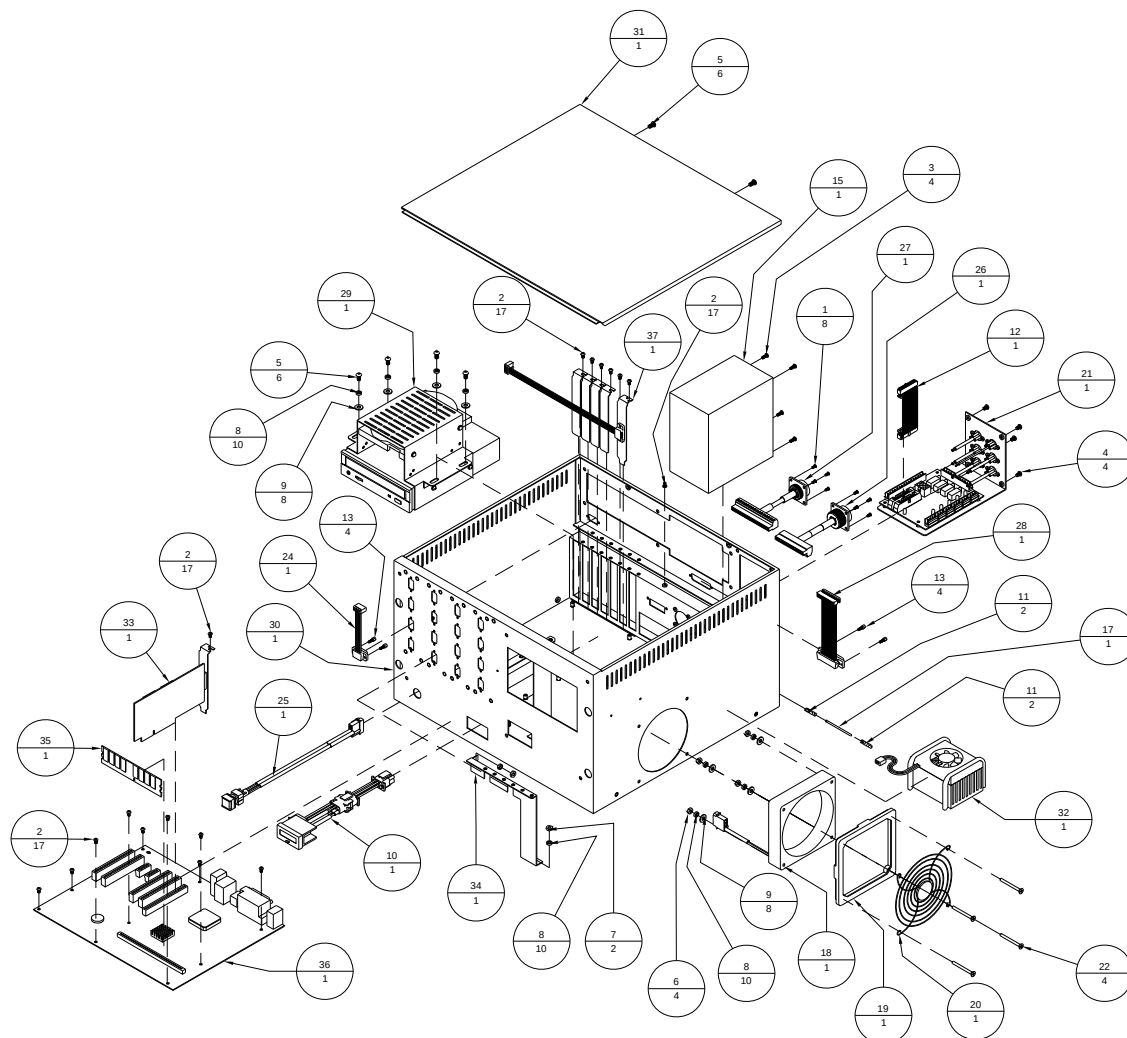


Table A-33: 9104131A – Faceplate Assembly, BK-PCM-16

Item	Part Number	Quantity	Description	Reference
1	401010	4	Screw, FHCS, 4-40 UNC x 1/4"	
2	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
3	406530	4	Screw, BHCS, 5/16-18 UNC x 1/2"	
4	439015	4	Lockwasher, 5/16 ID	
5	9102847	2	Handle, Pull, 5/16-18	
6	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
7	9104119	2	Cable, USB-B To Header	
8	9104131	1	Faceplate, Computer Module, 16-Channel	
9	9104132	2	Connector, Serial Bus (USB Adapter)	

Figure A-33: 9104131A – Faceplate Assembly, BK-PCM-16

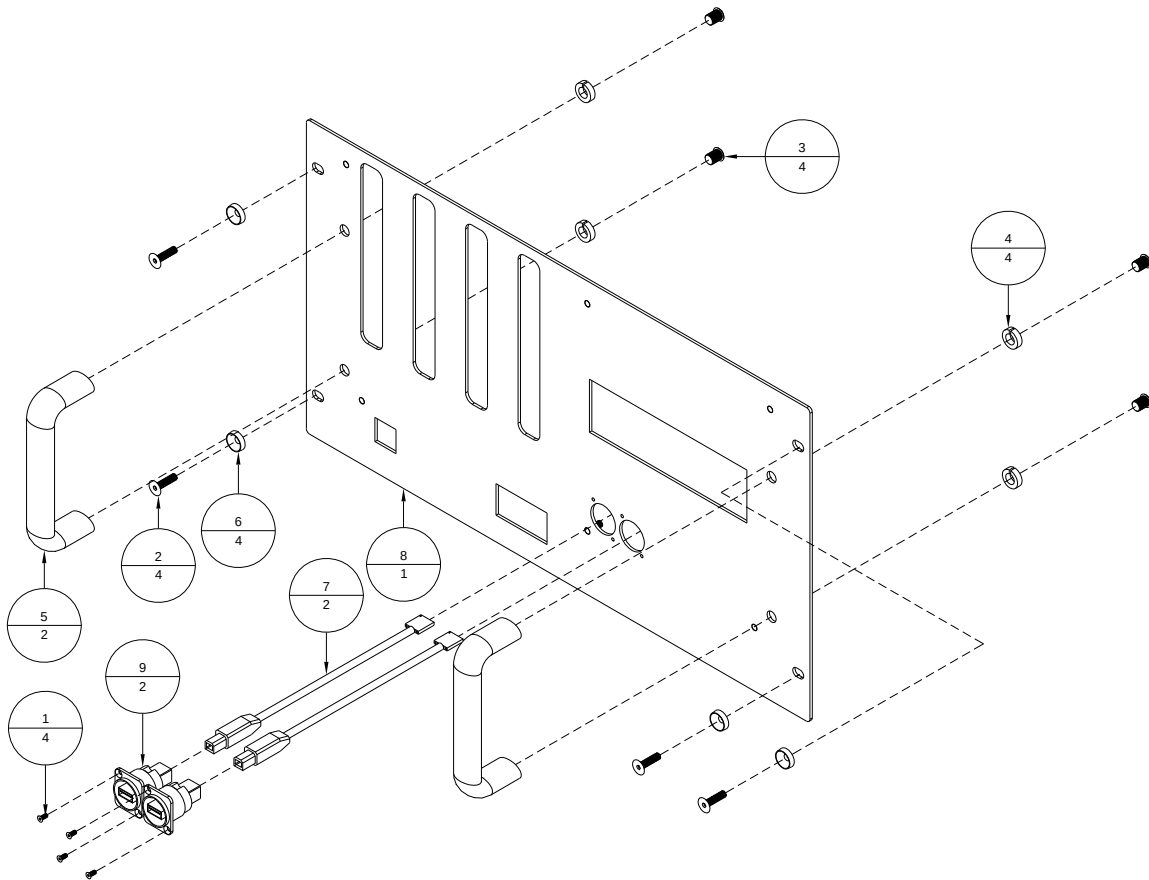
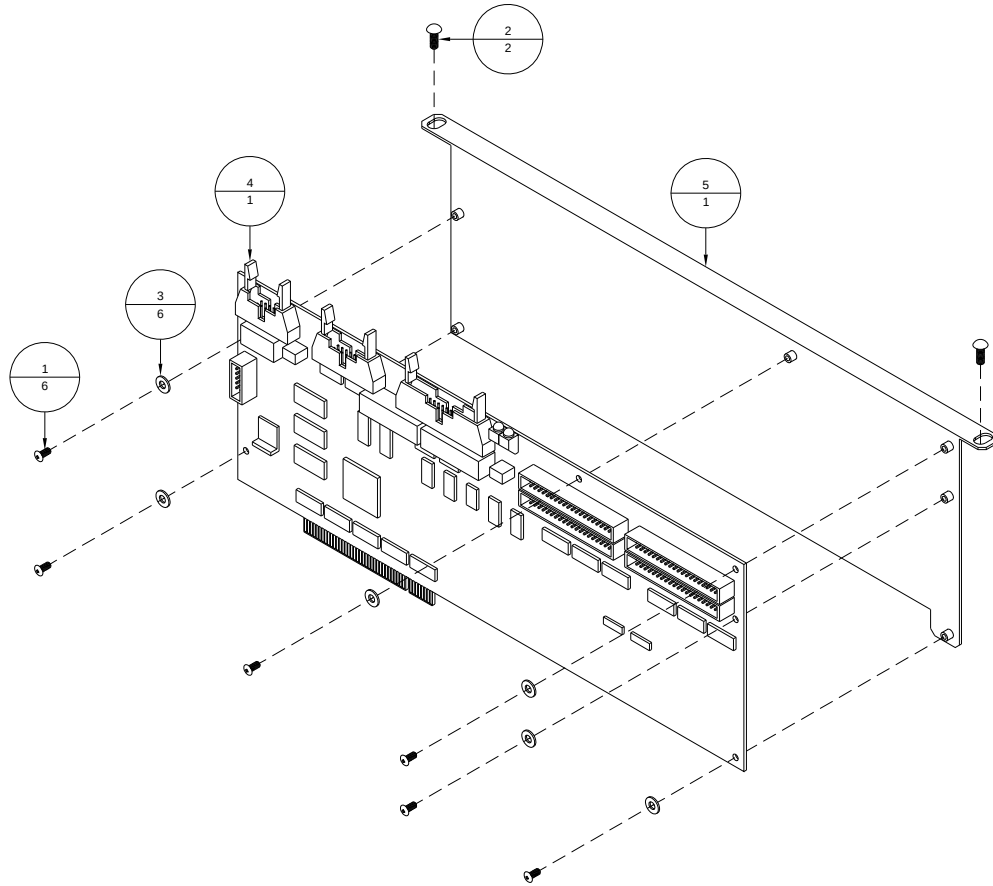


Table A-34: 9104135A – Image Accelerator Card Assembly, PCM

Item	Part Number	Quantity	Description	Reference
1	401310	6	Screw, PHMS, 4-40 UNC x 1/4"	
2	402320	2	Screw, PHMS, 6-32 UNC x 3/8"	
3	440530	6	Washer, #6, Nylon	
4	9104115	1	Card, Image Accelerator	
5	9104135	1	Bracket, Image Accelerator Card	

Figure A-34: 9104135A – Image Accelerator Card Assembly, PCM



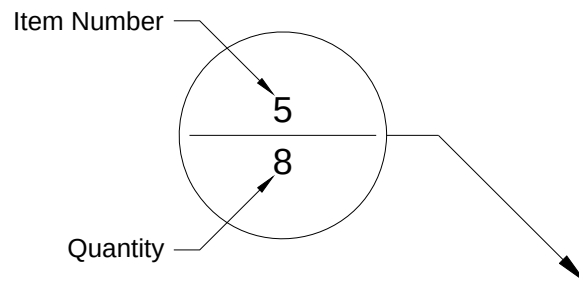
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Balloon Annotation and Parts Listing



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 B-1: *BK1710AU – Controller, BK1710 Atlas Monet*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	4	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1710-FRM	1	Frame, Rack Type, BK1710	Appendix A
8	BK-IDM-4A	1	Module, Atlas Ink Delivery, 4-Channel	Page B-9
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

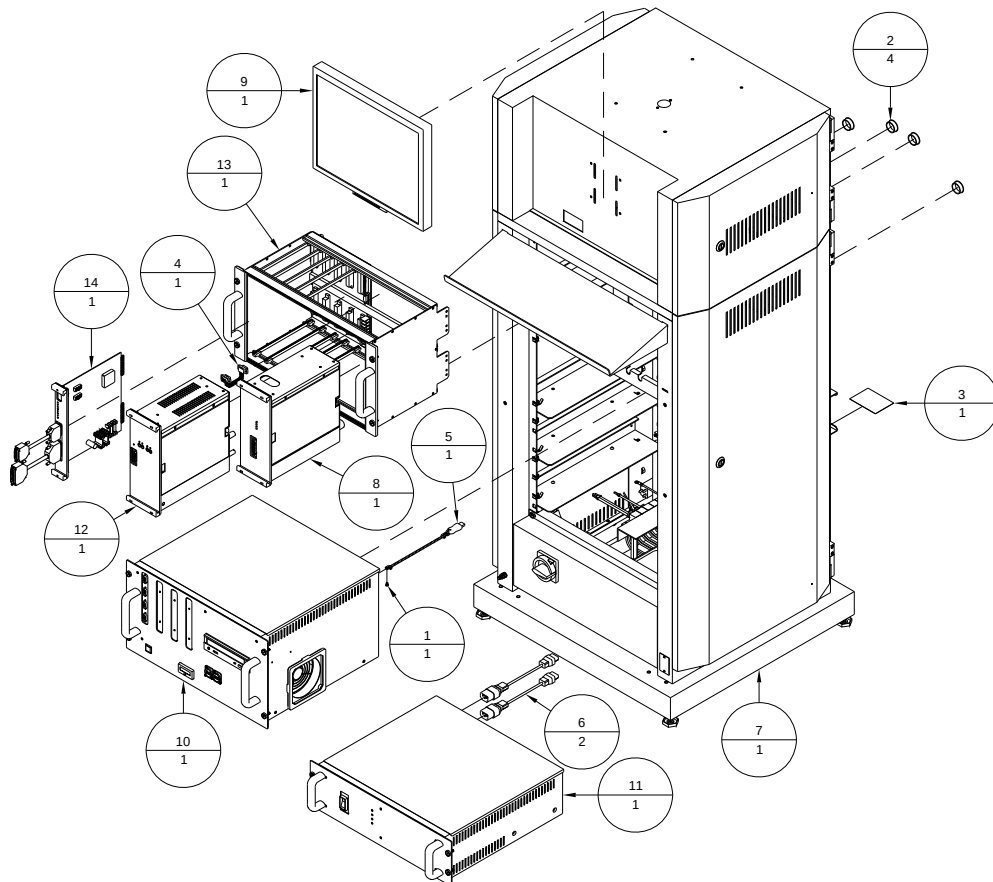
Figure B-1: *BK1710AU – Controller, BK1710 Atlas Monet*

Table B-2: *BK1710CU – Controller, BK1710 Atlas Cezanne*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	4	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1710-FRM	1	Frame, Rack Type, BK1710	Appendix A
8	BK-IDM-4C	1	Module, Atlas Ink Delivery, 4-Channel	Page B-10
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

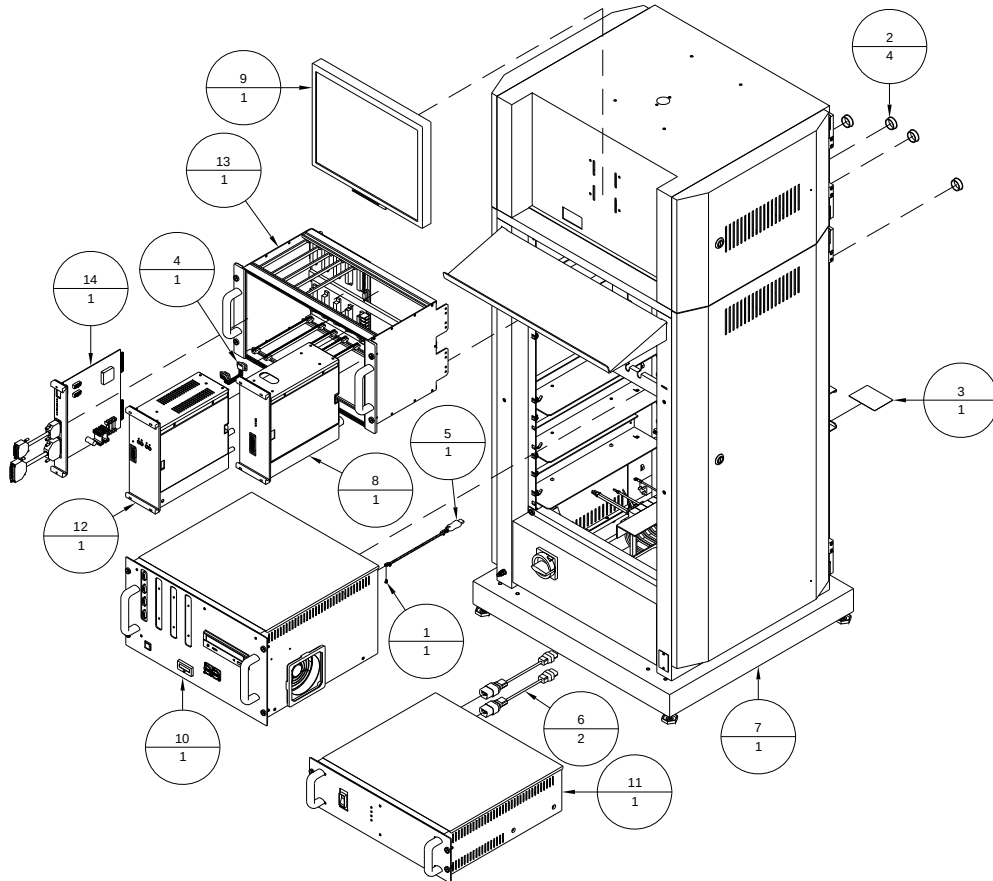
Figure B-2: *BK1710CU – Controller, BK1710 Atlas Cezanne*

Table B-3: *BK1710HU – Controller, BK1710 Apollo*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	4	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103285A	1	Dongle Assembly	Appendix A
5	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
6	BK1710-FRM	1	Frame, Rack Type, BK1710	Appendix A
7	BK-MON-LCD17	1	Monitor, 17" LCD	
8	BK-PCM-16	1	Module, Computer Assembly	Appendix A
9	BK-PSM-4H	1	Module, Apollo Power Supply, 4-Channel	Appendix C

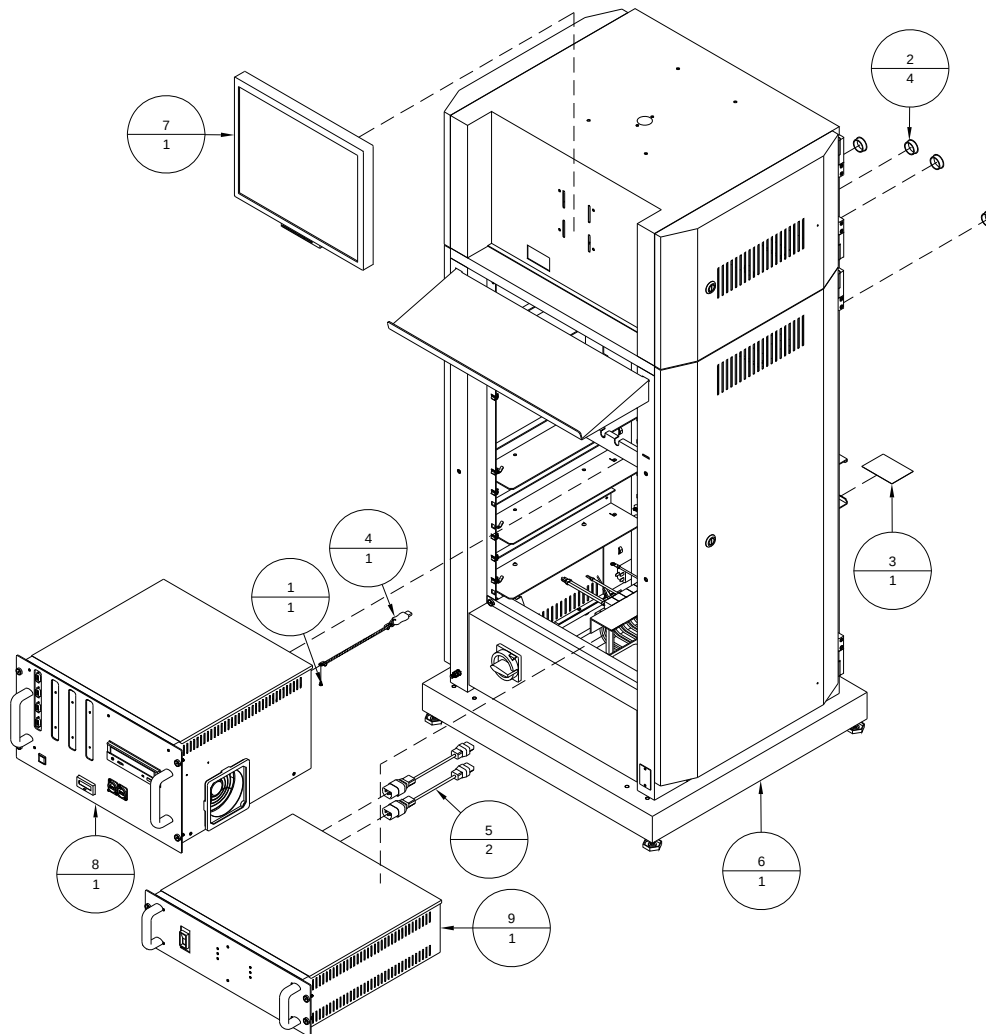
Figure B-3: *BK1710HU – Controller, BK1710 Apollo*

Table B-4: *BK1710UU – Controller, BK1710 Aurora*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	4	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1710-FRM	1	Frame, Rack Type, BK1710	Appendix A
8	BK-IDM-4U	1	Module, Aurora Ink Delivery, 4-Channel	Page B-11
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

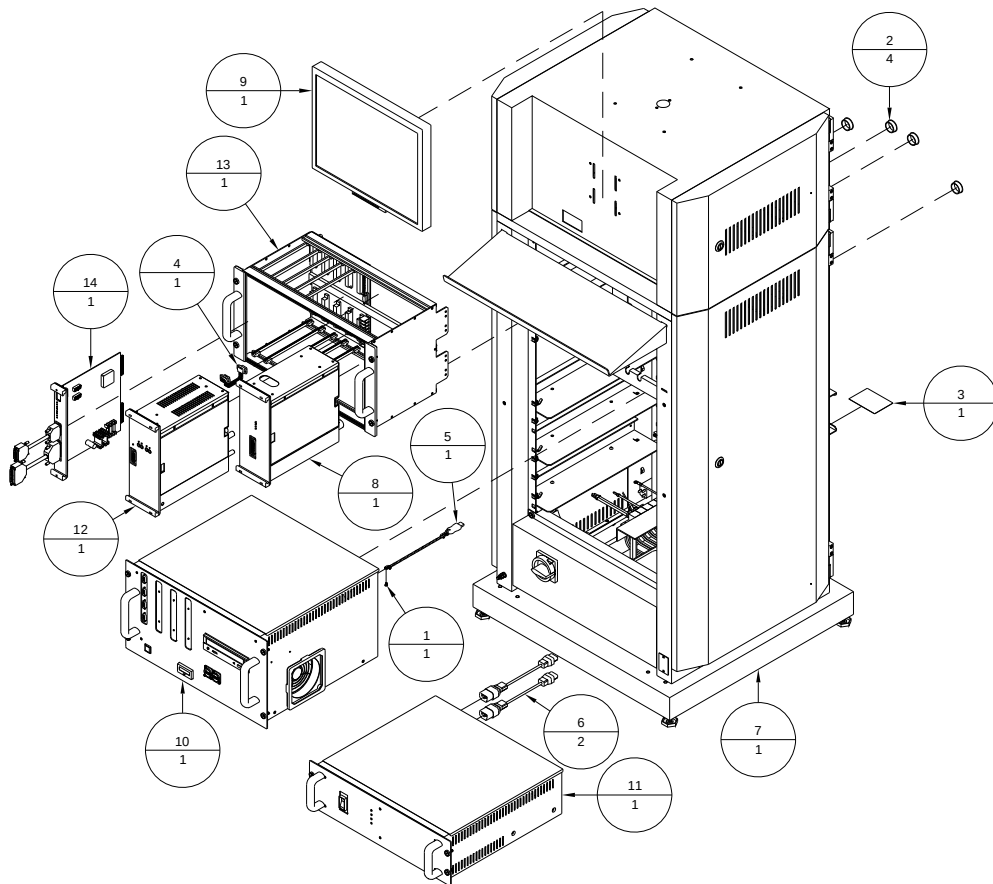
Figure B-4: *BK1710UU – Controller, BK1710 Aurora*

Table B-5: *BK1720AU – Controller, BK1720 Atlas Monet*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	8	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1720-FRM	1	Frame, Rack Type, BK1720	Appendix A
8	BK-IDM-4A	1	Module, Atlas Ink Delivery, 4-Channel	Page B-9
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

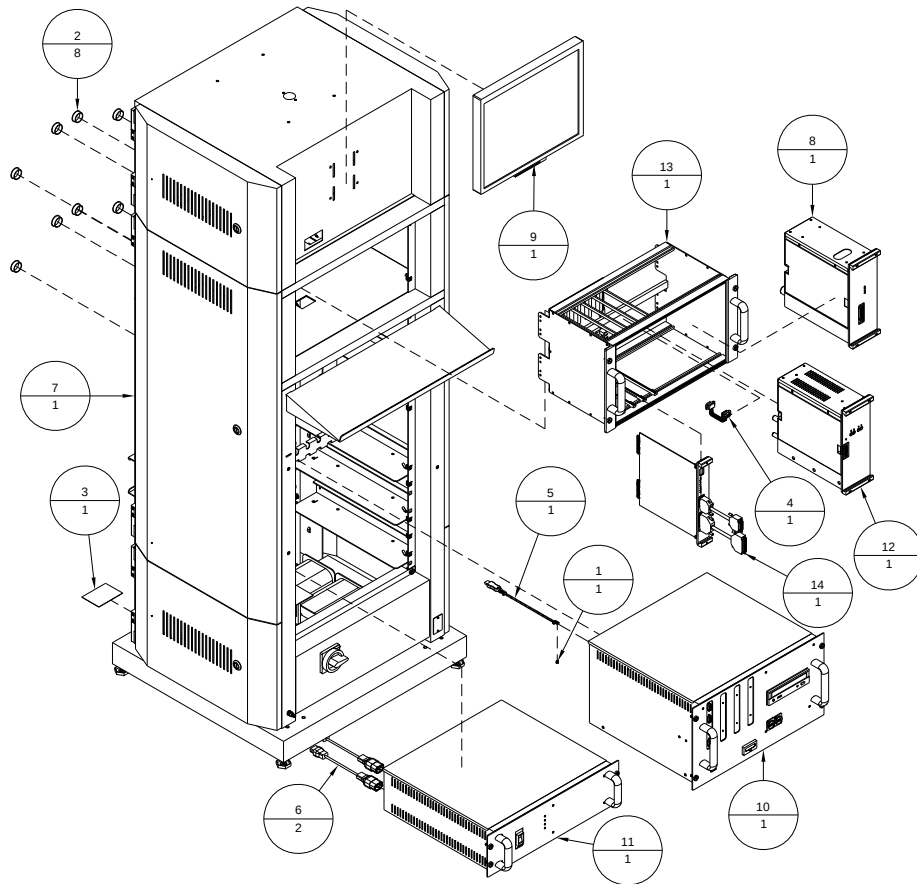
Figure B-5: *BK1720AU – Controller, BK1720 Atlas Monet*

Table B-6: *BK1720CU – Controller, BK1720 Atlas Cezanne*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	8	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1720-FRM	1	Frame, Rack Type, BK1720	Appendix A
8	BK-IDM-4C	1	Module, Cezanne Ink Delivery, 4-Channel	Page B-10
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

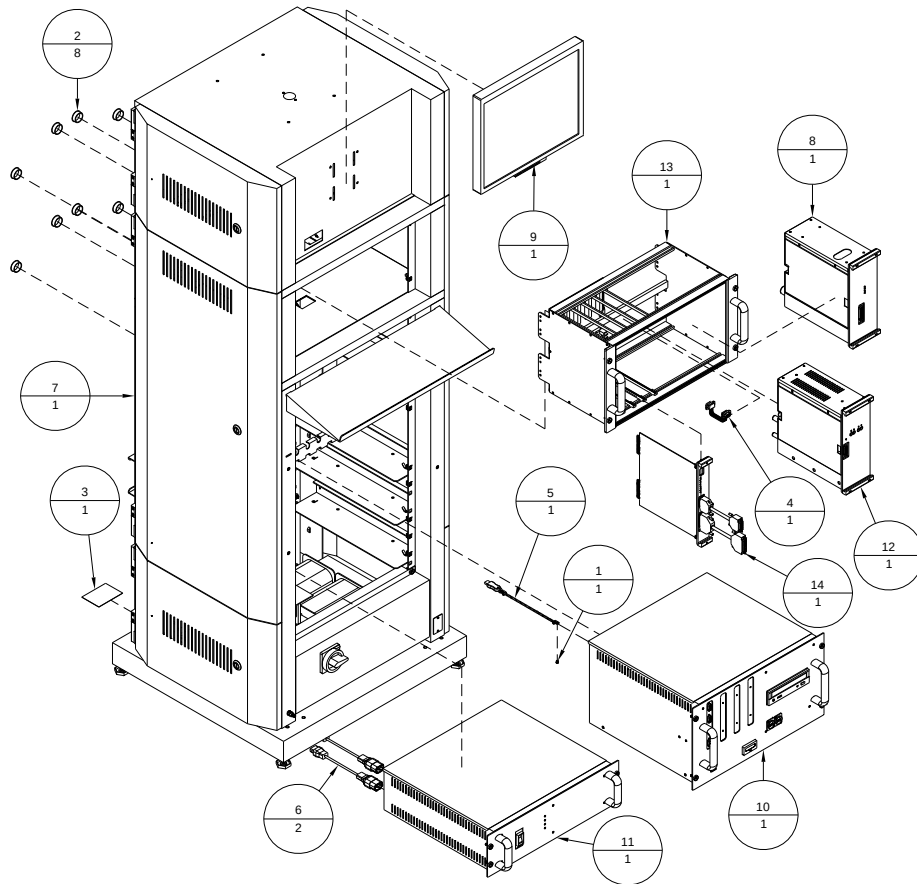
Figure B-6: *BK1720CU – Controller, BK1720 Atlas Cezanne*

Table B-7: *BK1720UU – Controller, BK1720 Aurora*

Item	Part Number	Quantity	Description	Reference
1	402310	1	Screw, PHMS, 6-32 UNC x 1/4"	
2	615426	8	Hole Plug, 1-1/8"	
3	9101627	1	Buskro Serial Number Label	
4	9103237A	1	Cable, System Communication, 50"	
5	9103285A	1	Dongle Assembly	Appendix A
6	9104511	2	Cord, Set, 10A/250V, 2m, IEC-IEC	
7	BK1720-FRM	1	Frame, Rack Type, BK1720	Appendix A
8	BK-IDM-4U	1	Module, Aurora Ink Delivery, 4-Channel	Page B-11
9	BK-MON-LCD17	1	Monitor, 17" LCD	
10	BK-PCM-16	1	Module, Computer Assembly	Appendix A
11	BK-PSM-4A	1	Module, Power Supply, Atlas/Aurora	Appendix C
12	BK-PVM-4A	1	Module, Pressure/Vacuum, 4-Channel	Appendix G
13	BK-RACK-4	1	Rack, Frame, Backplane	Page B-13
14	BK-RCC-4A	1	Reservoir Control Card Assembly	Page B-14

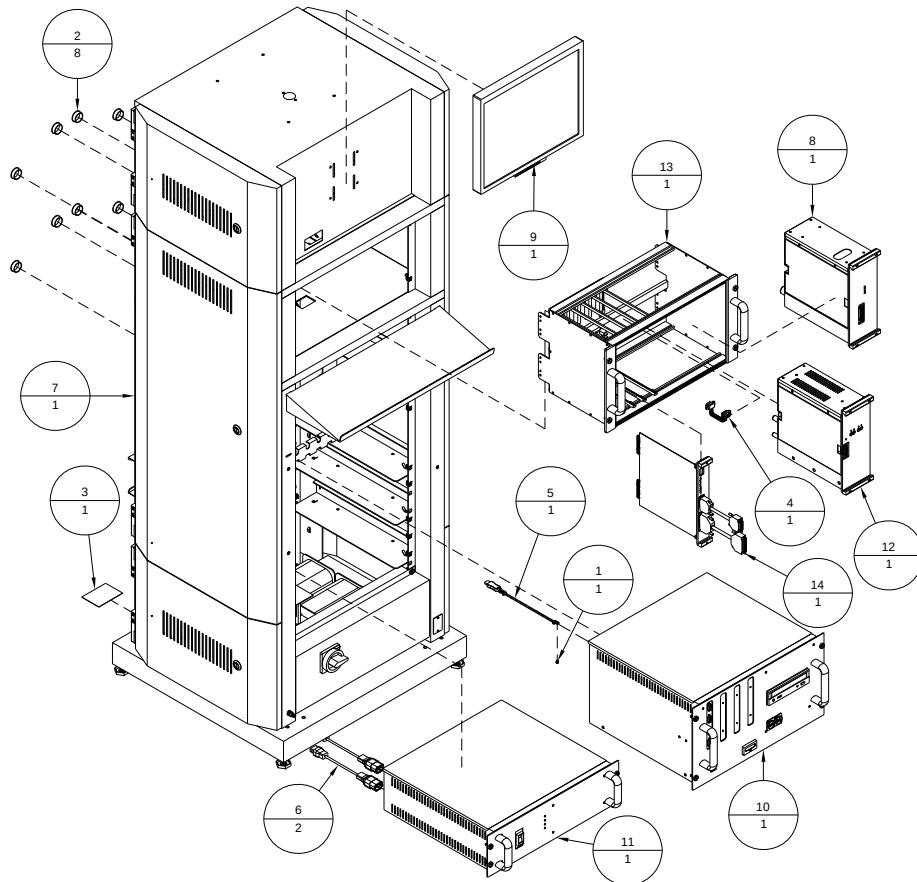
Figure B-7: *BK1720UU – Controller, BK1720 Aurora*

Table B-8: *BK-HCC-1A – Head Control Card Assembly*

Item	Part Number	Quantity	Description	Reference
1	401310	2	Screw, PHMS, 4-40 UNC x 1/4"	
2	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
3	420006	3	Nut, 6-32 UNC	
4	439004	2	Lockwasher, #4	
5	439006	3	Lockwasher, #6	
6	615322	4	Female Screwlock, 4-40 UNC	
7	9102823	1	Head Control Card (HCC)	
8	9102909	2	Screw, M2.5 x 6, Cross Recessed	
9	9102947	1	Bracket, HCC	
10	9102949	1	Front Plate, HCC	
11	9102986	2	Handle, HCC and RCC	
12	9103431	1	Bezel Screen	

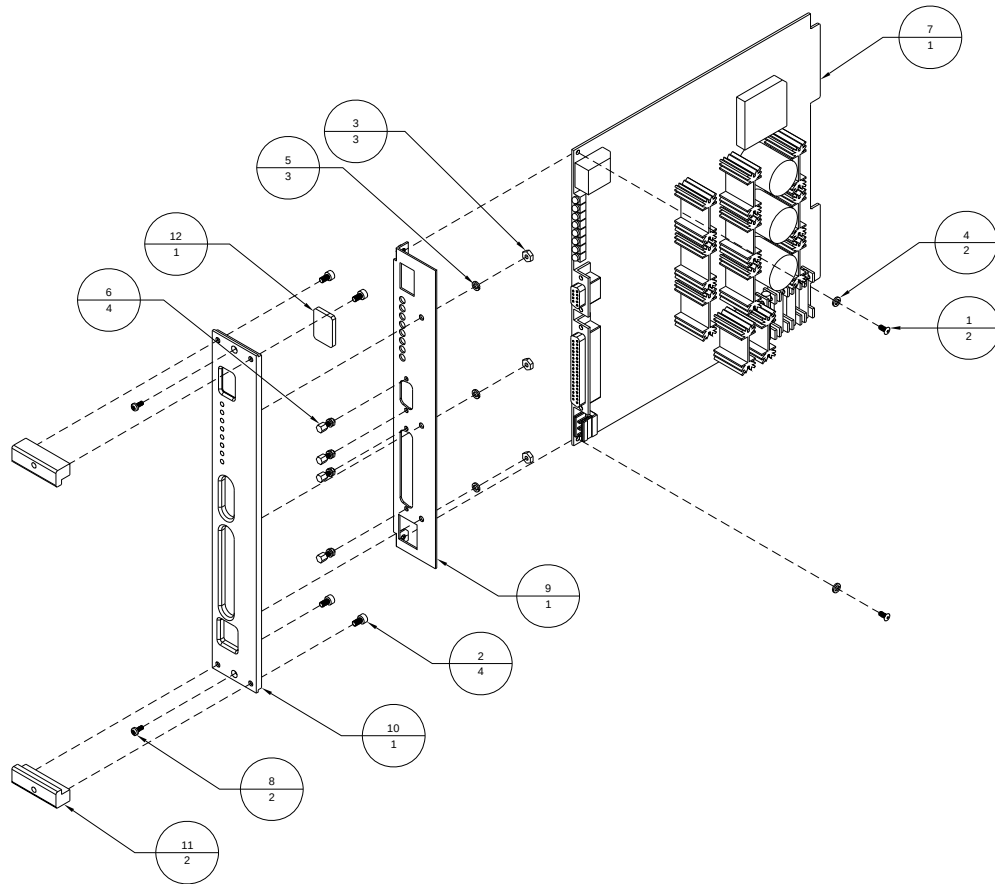
Figure B-8: *BK-HCC-1A – Head Control Card Assembly*

Table B-9: *BK-IDM-4A – Ink Delivery Module, Atlas*

Item	Part Number	Quantity	Description	Reference
1	BKINK-MONBK1000	1	Ink, Monet Black, 1L	
2	9102942A	1	Pumping Station Assembly, Atlas	Page B-17
3	9103430A	1	Ink Bottle Bracket Assembly	Page B-23

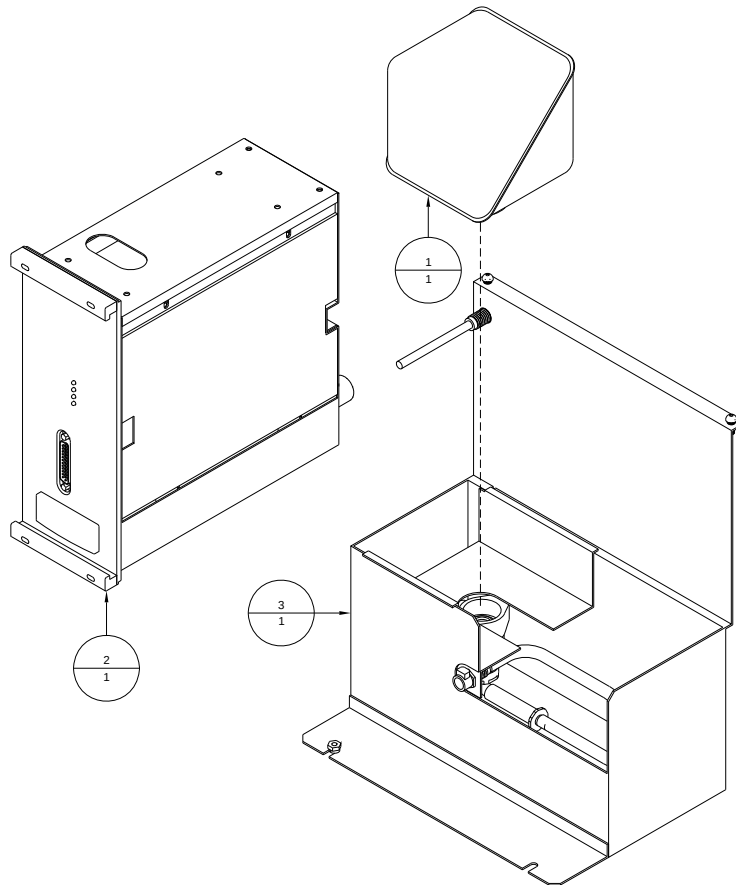
Figure B-9: *BK-IDM-4A – Ink Delivery Module, Atlas*

Table B-10: *BK-IDM-4C – Ink Delivery Module, Atlas Cezanne*

Item	Part Number	Quantity	Description	Reference
1	BKINK-CEZBK1000	1	Ink, Cezanne Black, 1L	
2	9102942A	1	Pumping Station Assembly, Atlas	Page B-17
3	9103431A	1	Ink Bottle Bracket Assembly, Cezanne	Page B-24

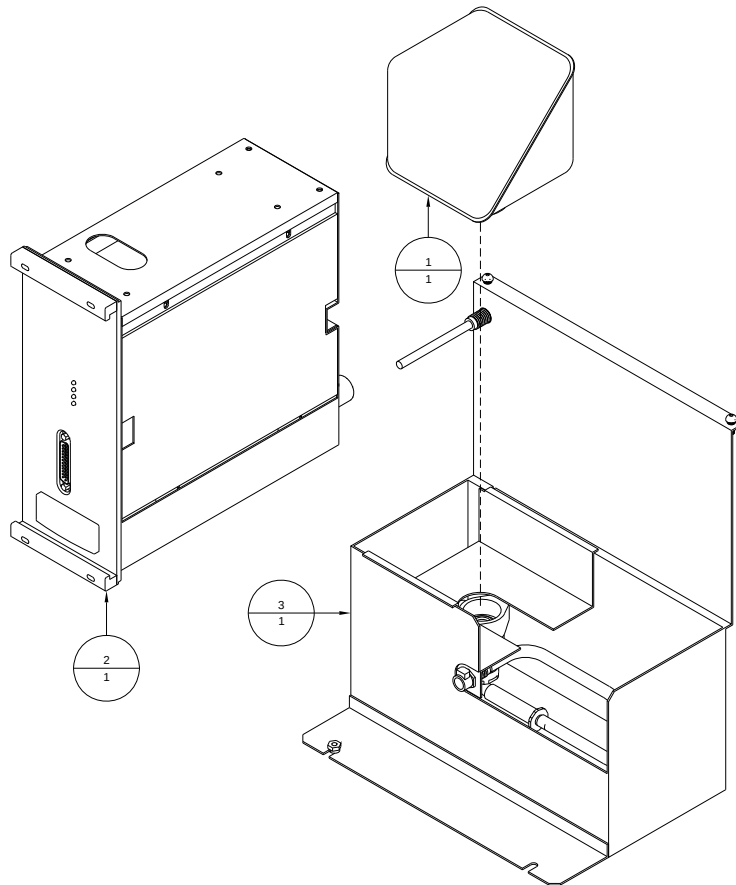
Figure B-10: *BK-IDM-4C – Ink Delivery Module, Atlas Cezanne*

Table B-11: *BK-IDM-4U – Ink Delivery Module, Aurora*

Item	Part Number	Quantity	Description	Reference
1	9103997A	1	Pumping Station Assembly, UV	Page B-29
2	9104000A	1	Ink Bottle Bracket Assembly, UV	Page B-31
3	BKINK-RENBK1000	1	Ink, Renoir Black, 1L	

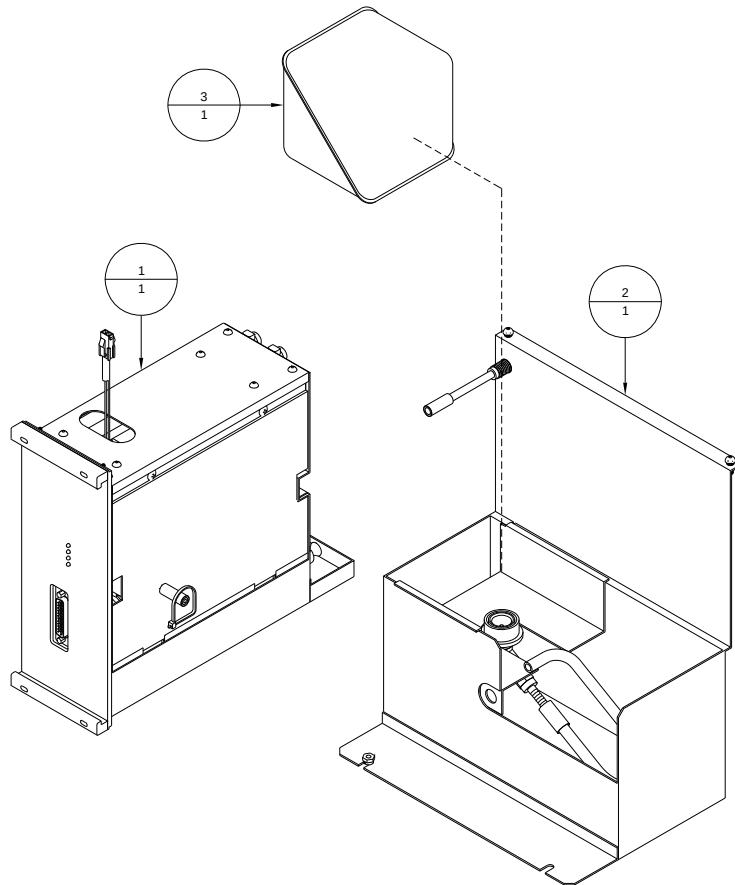
Figure B-11: *BK-IDM-4U – Ink Delivery Module, Aurora*

Table B-12: *BK-RACK-0 – Rack, Frame, Unpopulated*

Item	Part Number	Quantity	Description	Reference
1	9102801	1	Subrack, 6U for 220 mm Card	
2	9102803	2	Insert, Rack, Threaded, M2.5 mm	
3	9103004A	2	Side Bracket Assembly, Rack	Page B-19

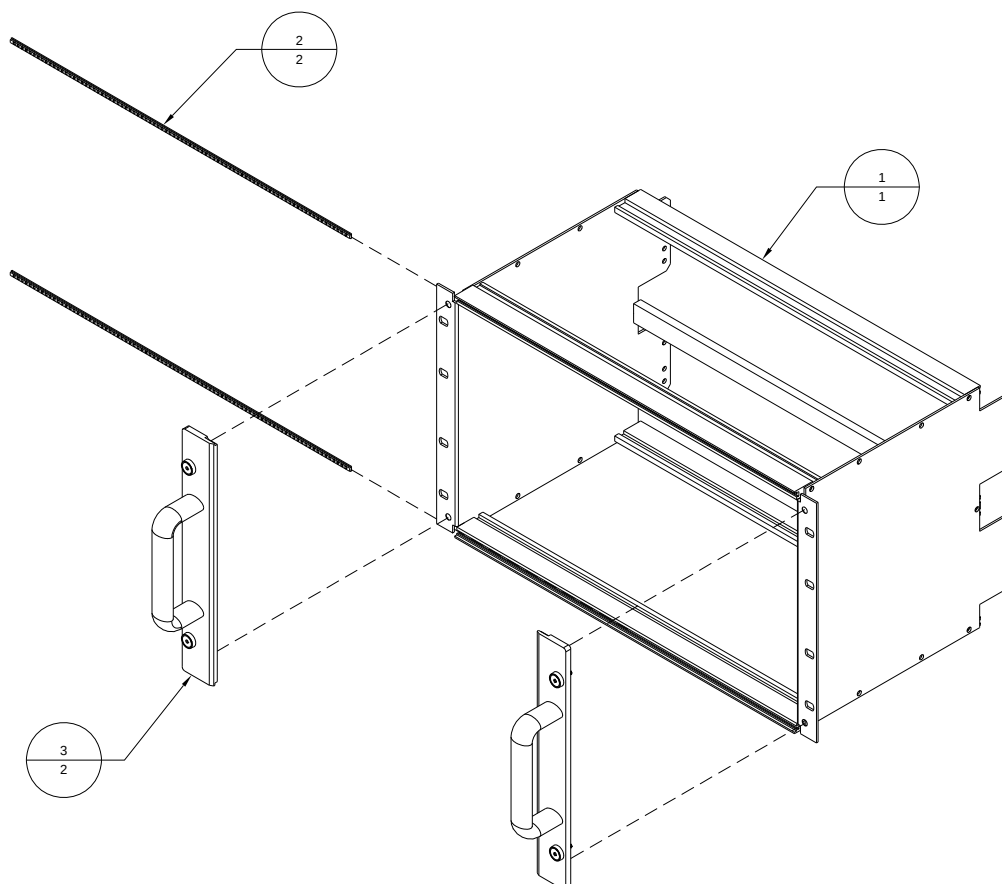
Figure B-12: *BK-RACK-0 – Rack, Frame, Unpopulated*

Table B-13: *BK-RACK-4 – Rack, Frame, Backplane, 4-Channel*

Item	Part Number	Quantity	Description	Reference
1	401309	18	Screw, PHMS, M2.5 x 6 mm	
2	9102802	10	Cardguide, 220 mm	
3	9102803	3	Insert, Rack, Threaded, M2.5 mm	
4	9102821	1	Back Plane, Card Cage	
5	BK-RACK-0	1	Rack, Frame, Unpopulated	Page B-12

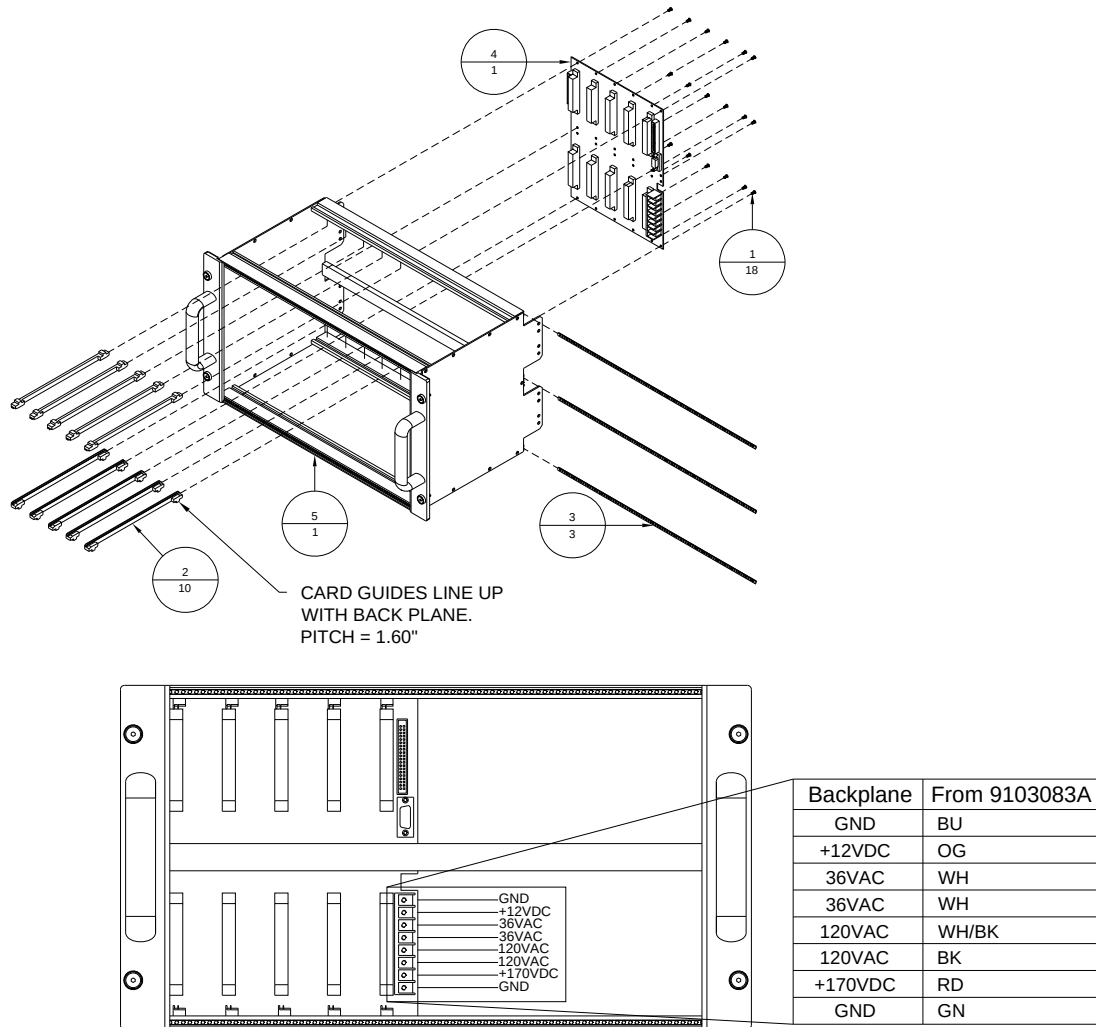
Figure B-13: *BK-RACK-4 – Rack, Frame, Backplane, 4-Channel*

Table B-14: *BK-RCC-4A – Reservoir Control Card Assembly*

Item	Part Number	Quantity	Description	Reference
1	401310	2	Screw, PHMS, 4-40 UNC x 1/4"	
2	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
3	420006	3	Nut, 6-32 UNC	
4	439004	2	Lockwasher, #4	
5	439006	3	Lockwasher, #6	
6	615322	4	Female Screwlock, 4-40 UNC	
7	9102822	1	Reservoir Control Card (RCC)	
8	9102909	2	Screw, M2.5 x 6, Cross Recessed	
9	9102948	1	Bracket, RCC	
10	9102950	1	Front Plate, RCC	
11	9102984A	1	Cable, Pressure Regulator, RCC	
12	9102985A	1	Cable, Pumping Station, RCC	
13	9102986	2	Handle, HCC and RCC	
14	9103431	1	Bezel Screen	

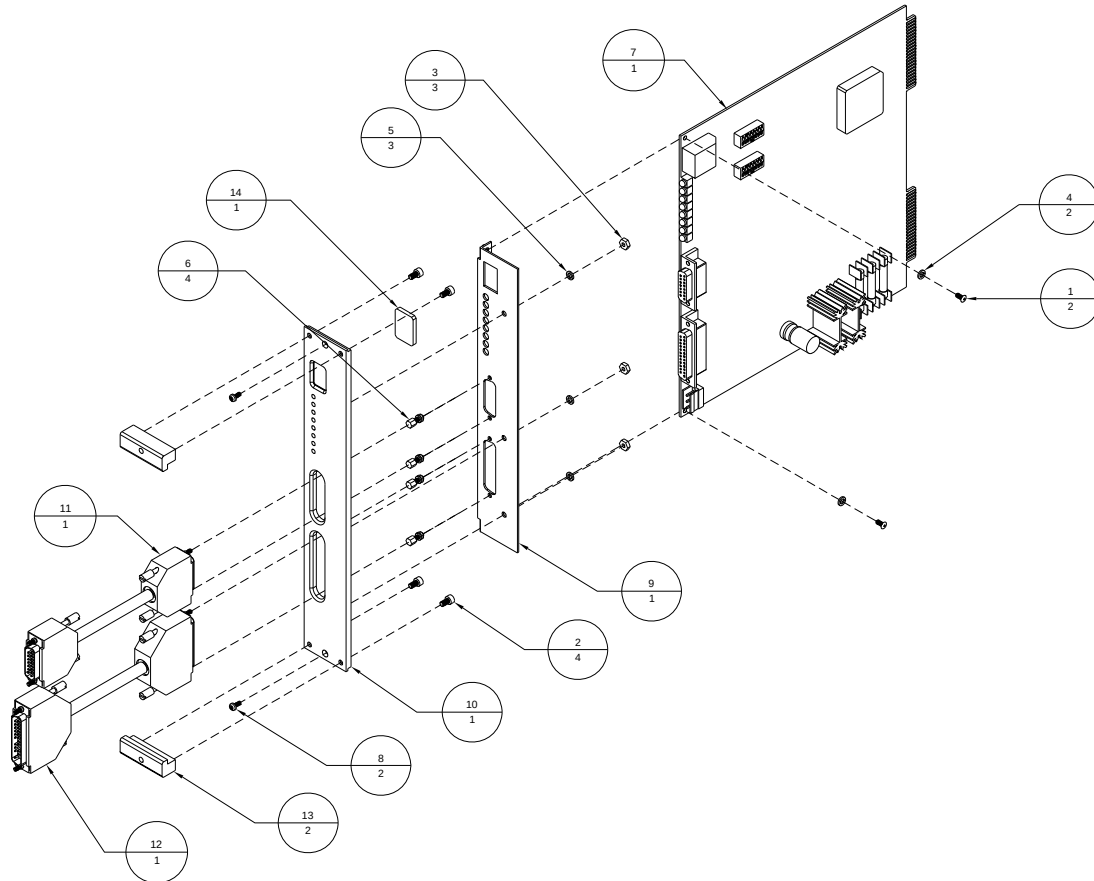
Figure B-14: *BK-RCC-4A – Reservoir Control Card Assembly*

Table B-15: 9102152A – Ink Line Assembly, Atlas

Item	Part Number	Quantity	Description	Reference
1	9101691	2	Coupling Insert, 1/8" ID	
2	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 24" Lg.	

Figure B-15: 9102152A – Ink Line Assembly, Atlas

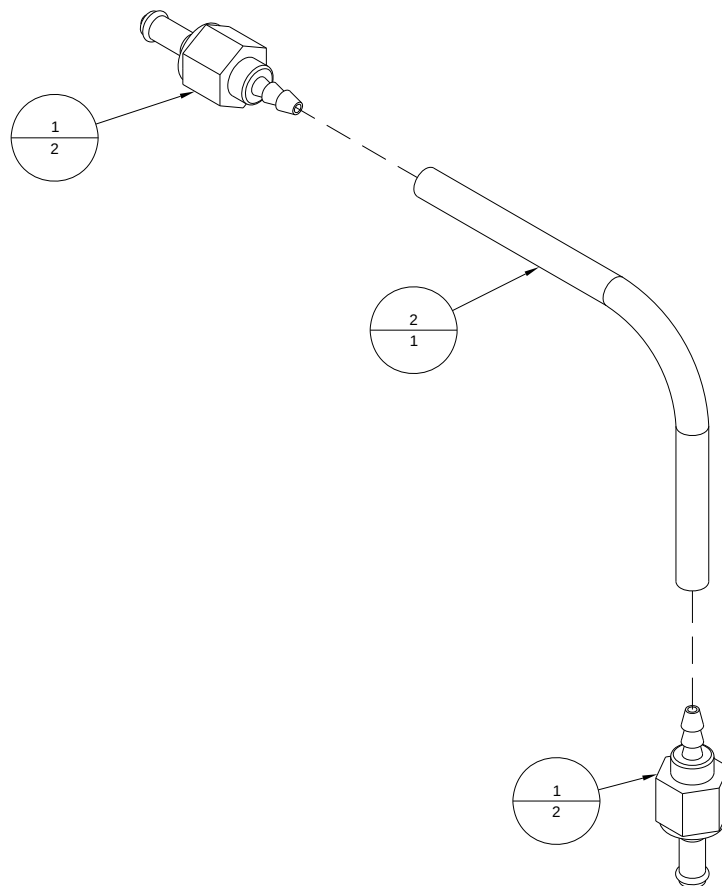


Table B-16: 9102155A – Ink Line Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	609003	1	Shrink Wrap, 3/8" ID, 24" Lg.	
2	9101691	2	Coupling Insert, 1/8" ID	
3	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 24" Lg.	

Figure B-16: 9102155A – Ink Line Assembly, Aurora

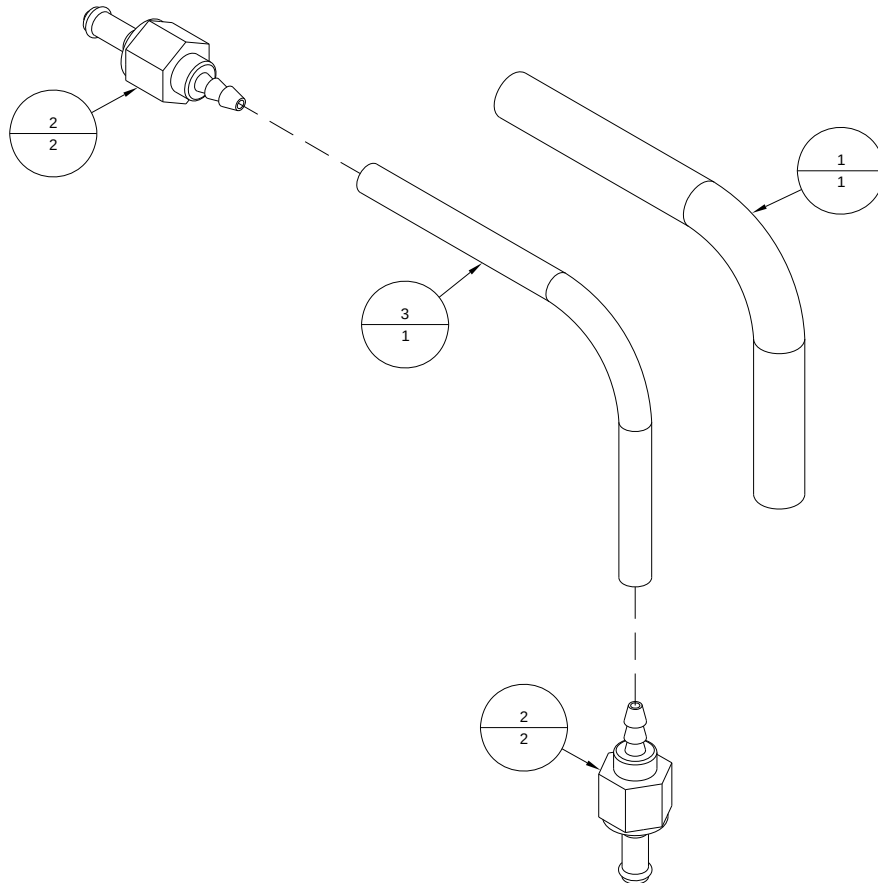


Table B-17: 9102942A – Pumping Station Assembly, Atlas

Item	Part Number	Quantity	Description	Reference
1	401309	4	Screw, PHMS, M2.5 x 6 mm	
2	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
3	403510	9	Screw, BHCS, 8-32 UNC x 1/4"	
4	420006	6	Nut, 6-32 UNC	
5	420008	1	Nut, 10-32 UNF	
6	420010	1	Nut, 1/4-20 UNC	
7	439006	6	Lockwasher, #6	
8	439009	1	Lockwasher, #10	
9	439010	1	Lockwasher, 1/4" ID	
10	609111	1	Terminal Ring, #10, 16-14 AWG, Blue	
11	609120	1	Terminal Ring, 1/4", 16-14 AWG, Non-Ins.	
12	615322	2	Female Screwlock, 4-40 UNC	
13	9102681	1	Wire, #14, Green/Yellow, 12" Lg.	
14	9102940	1	Plate, Front, Pumping Station Module	
15	9102941	2	Handle, Module	
16	9102942	1	Bracket, Main, Pumping Station	
17	9103015	1	Board, Reservoir Connector	
18	9103016A	1	Pumping Station Assembly, Atlas	Page B-19
19	9103019A	1	Manifold Block Assembly, Atlas	Page B-20
20	9103054	2	Cover, Control Module, Side	
21	9103109	4	Screw, Truss, 8-32 UNC x 1/4"	
22	9103429	1	Tray, Spill	
23	9103429A	1	Cable, Drive, Atlas Pumping Module	

Figure B-17: 9102942A – Pumping Station Assembly, Atlas

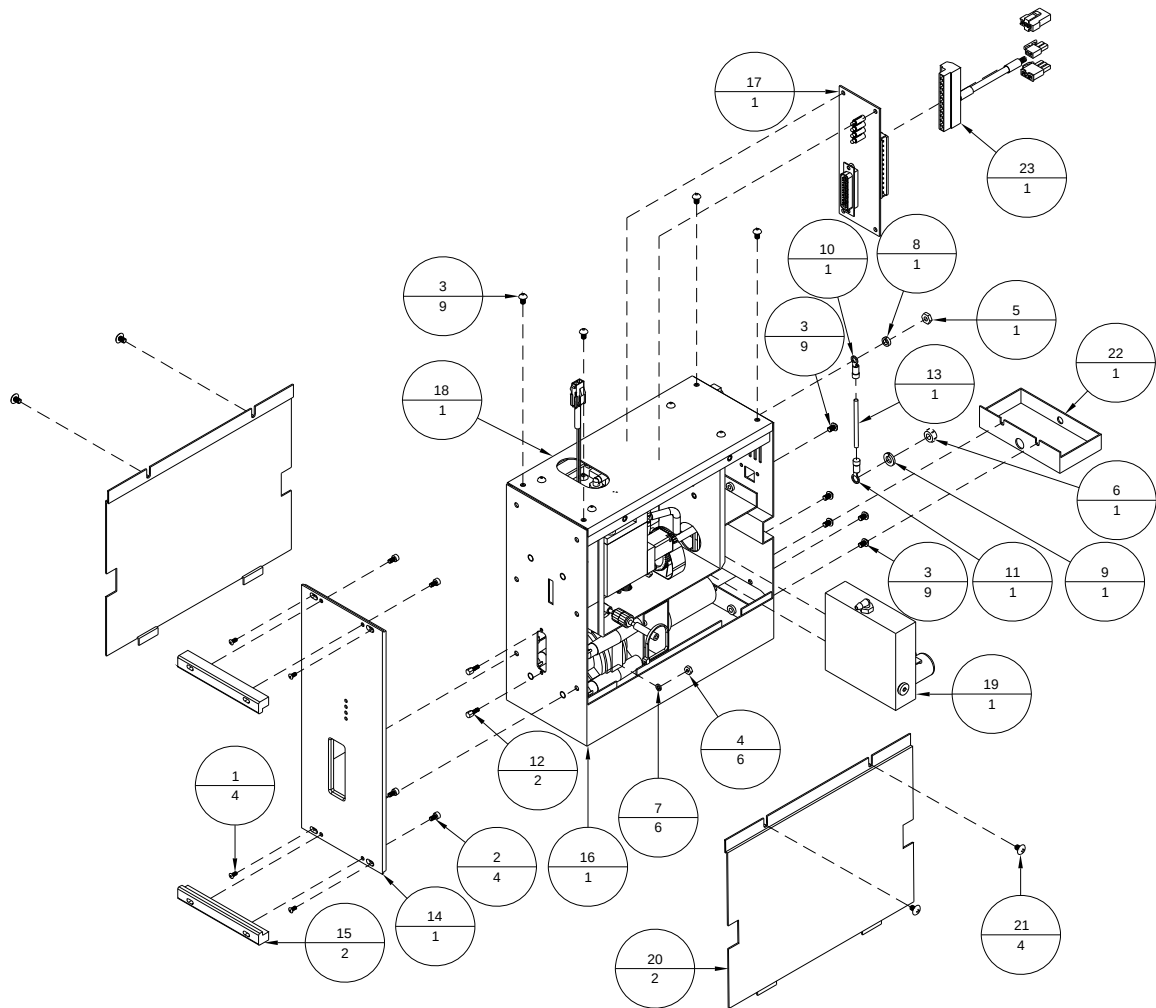


Table B-18: 9103004A – Side Bracket Assembly, Rack

Item	Part Number	Quantity	Description	Reference
1	404010	2	Screw, FHCS, 10-32 UNF x 1/4"	
2	404050	2	Screw, FHCS, 10-32 UNF x 3/4"	
3	9102847	1	Handle, Pull, 5/16-18	
4	9103004	1	Plate, Side, Rack	
5	9103111	2	Screw, FHMS, 5/16-18 UNC x 5/8"	
6	9103315	2	Washer, Cup, 10-32 UNF, Flat Head	

Figure B-18: 9103004A – Side Bracket Assembly, Rack

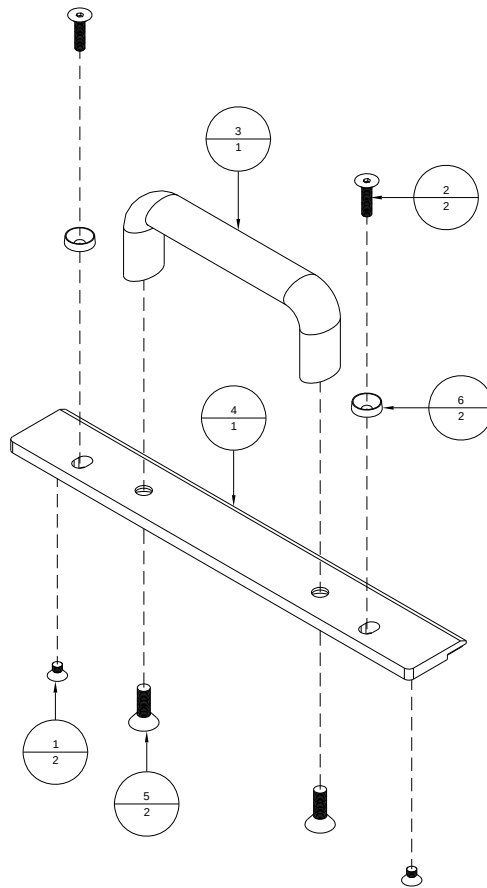


Table B-19: 9103016A – Pumping Subbracket Assembly, Atlas

Item	Part Number	Quantity	Description	Reference
1	401310	3	Screw, PHMS, 4-40 UNC x 1/4"	
2	403510	4	Screw, BHCS, 8-32 UNC x 1/4"	
3	404510	3	Screw, BHCS, 10-32 UNF x 1/4"	
4	404550	1	Screw, BHCS, 10-32 UNF x 3/4"	
5	615140	15	Lashing Tie, Small	
6	630004A	1	Cycle Proximity Switch Assembly	
7	9100149A	1	Filter Holder Assembly, IDS	
8	9100876	1	Coupling, 0.5" DIA	
9	9100931	1	Peristaltic Pump Head	
10	9100936A	1	Gearmotor Assembly	
11	9100971	1	Gripper Clip	
12	9101290	2	Fitting, Tee, 1/8" ID	
13	9101700	1	Check Valve, 1/8" ID	
14	9102116	3	Tubing, Pharmed, 1/4" x 1/8", 1" Lg.	
15	9102116	2	Tubing, Pharmed, 1/4" x 1/8", 3" Lg.	
16	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 8" Lg.	
17	9103016	1	Bracket, Atlas ID Module, Top	
18	9103017	1	Bracket, Atlas Pumping Components	
19	9104660A	1	Ink Reservoir Assembly, Atlas	Page B-33

Figure B-19: 9103016A – Pumping Subbracket Assembly, Atlas

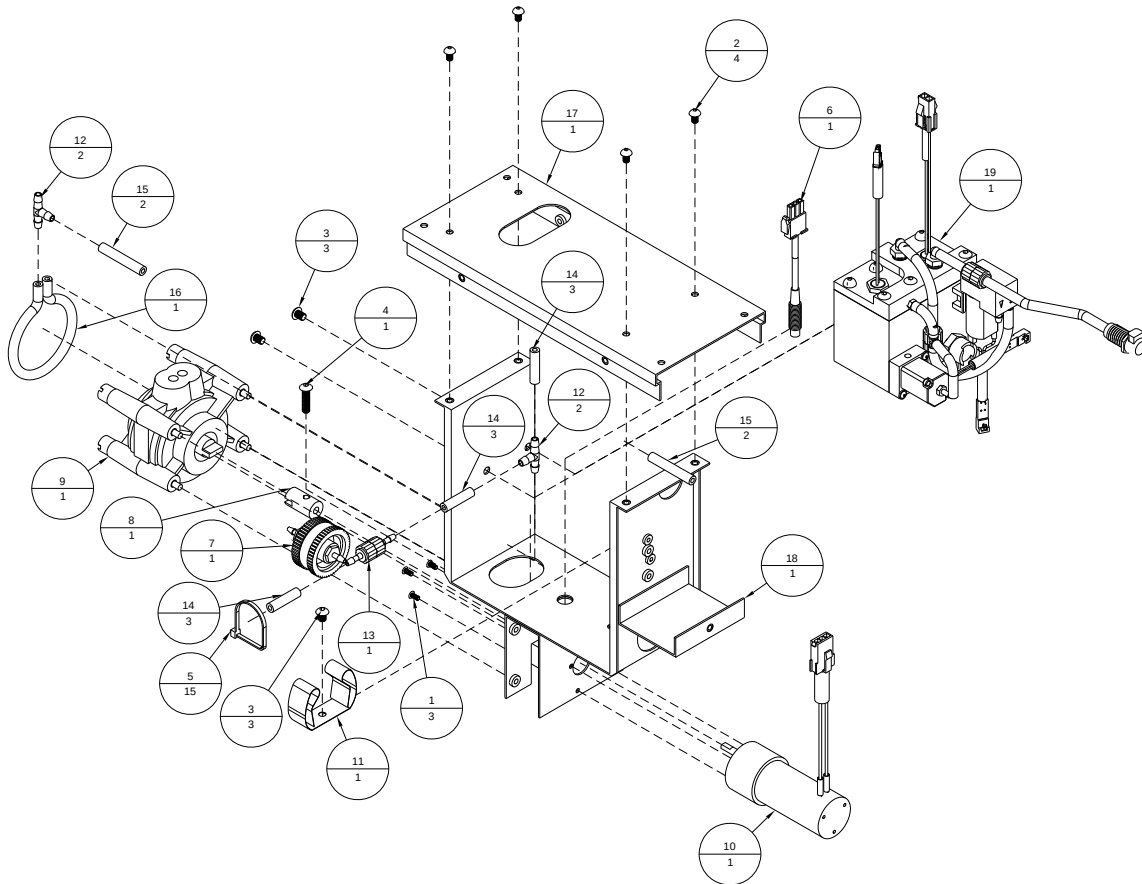


Table B-20: 9103019A – Manifold Block Assembly, Atlas

Item	Part Number	Quantity	Description	Reference
1	9102085	1	Connector "L", 1/8-27 NPT, 1/8" ID	
2	9102150	4	Coupling Body, 1/8" NPT	
3	9103019	1	Manifold Block, Atlas	
4	9103290	4	Caplug, VC Series, 0.750" DIA, Black	
5	9104542	1	Plug, 5/16-24 UNF, O-Ring EPDM P.C.	

Figure B-20: 9103019A – Manifold Block Assembly, Atlas

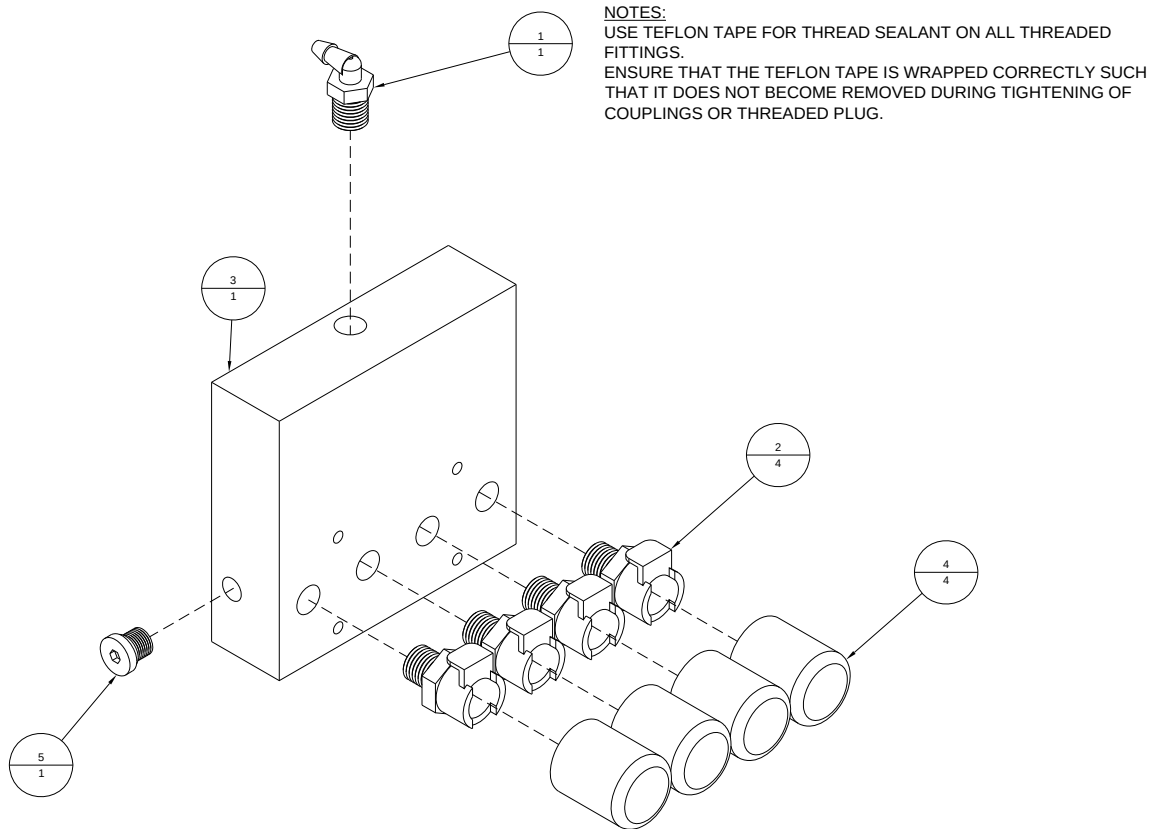


Table B-21: 9103390A – Filter, Assembly, 10 μ m

Item	Part Number	Quantity	Description	Reference
1	9103257	2	Luer, Male, 1/8" ID Tubing, Black	
2	9103390	1	Filter, 10 μ m, UV	

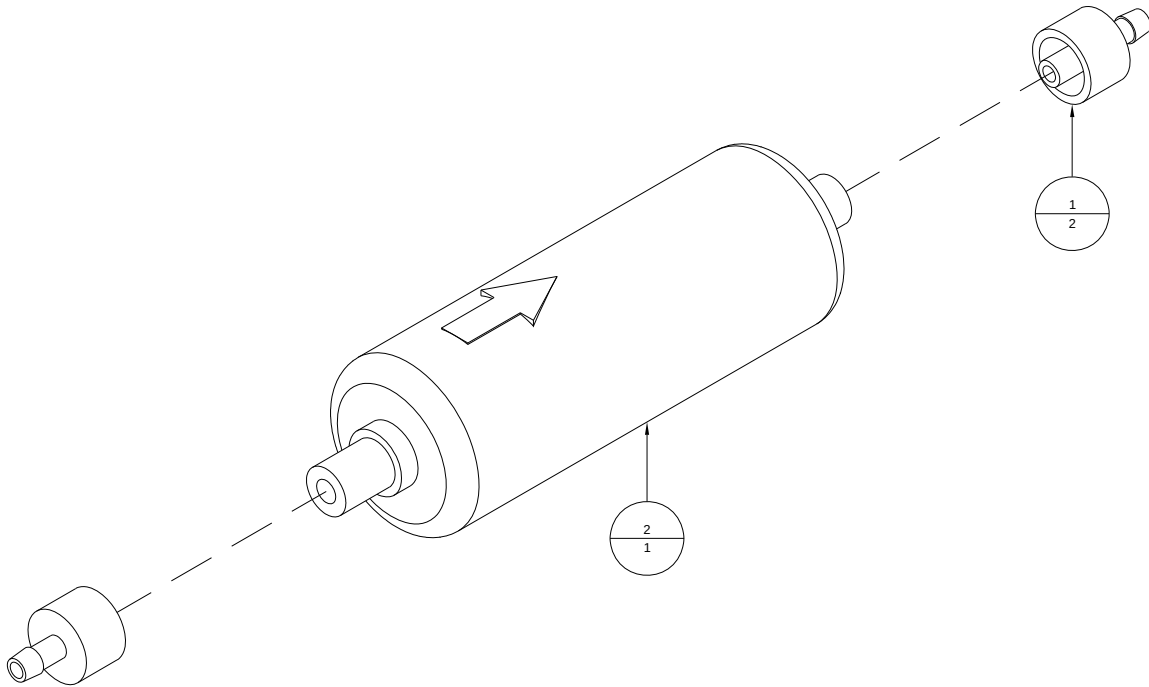
Figure B-21: 9103390A – Filter, Assembly, 10 μ m

Table B-22: 9103430A – Ink Bottle Bracket Assembly, Atlas Monet

Item	Part Number	Quantity	Description	Reference
1	404530	2	Screw, BHCS, 10-32 UNF x 1/2"	
2	420008	1	Nut, 10-32 UNF	
3	439009	1	Lockwasher, #10	
4	9100967	1	Coupling Body, Puncture Seal, 3/8" OD	
5	9101692	1	Coupling Body, 1/8" ID, Panel Mount	
6	9101770	1	Bracket, Ink Bottle	
7	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 10" Lg.	
8	9102152A	1	Ink Line Assembly	Page B-15
9	9103430	1	Bracket, Ink Bottle	

Figure B-22: 9103430A – Ink Bottle Bracket Assembly, Atlas Monet

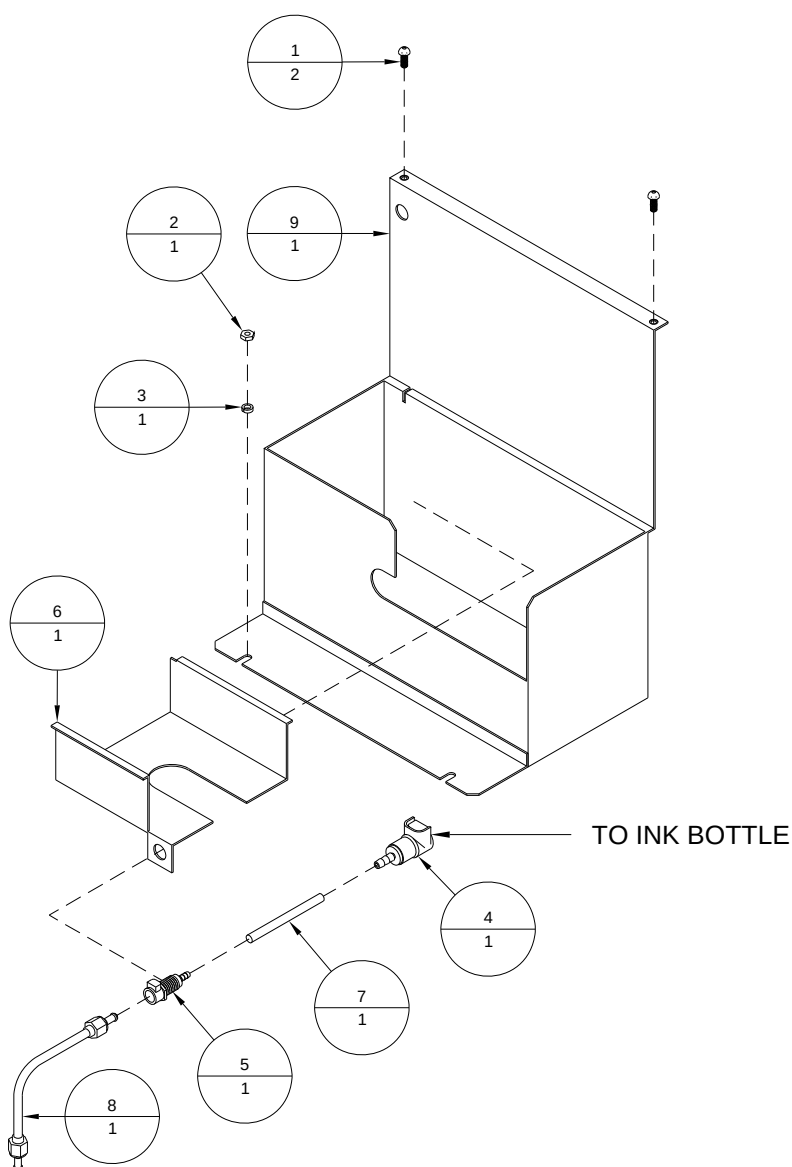


Table B-23: 9103431A – Ink Bottle Bracket Assembly, Atlas Cezanne

Item	Part Number	Quantity	Description	Reference
1	404530	2	Screw, BHCS, 10-32 UNF x ½"	
2	420008	1	Nut, 10-32 UNF	
3	439009	1	Lockwasher, #10	
4	9101770	1	Bracket, Ink Bottle	
5	9102132	1	Tubing, Pharmed, 3/8" x ¼", 7.5" Lg.	
6	9102152A	1	Ink Line Assembly	Page B-15
7	9103430	1	Bracket, Ink Bottle	
8	9103908	1	Tubing, Pharmed, ½" x 3/8", 2" Lg.	
9	9103909	1	Coupling, UDC Series, Non-spill, 3/8" ID	
10	9103910	1	Coupling Body, ¼" ID Tubing	
11	9103911	1	Fitting, 3/8" to ¼" ID	

Figure B-23: 9103430A – Ink Bottle Bracket Assembly, Atlas Cezanne

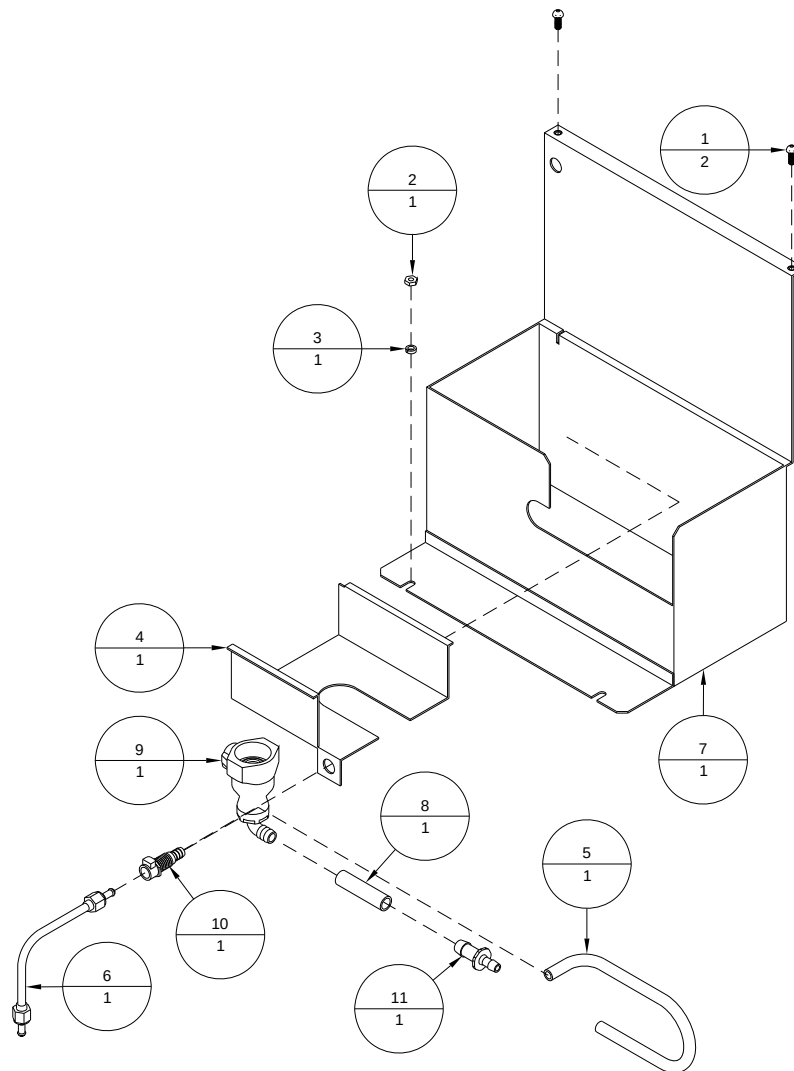


Table B-24: 9103564A – Electronics Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	401330	6	Screw, PHMS, 4-40 UNC x ½"	
2	420004	6	Nut, 4-40 UNC	
3	439004	6	Lockwasher, #4	
4	9103564	1	Bracket, Electronics Cover	

Figure B-24: 9103564A – Electronics Cover Assembly

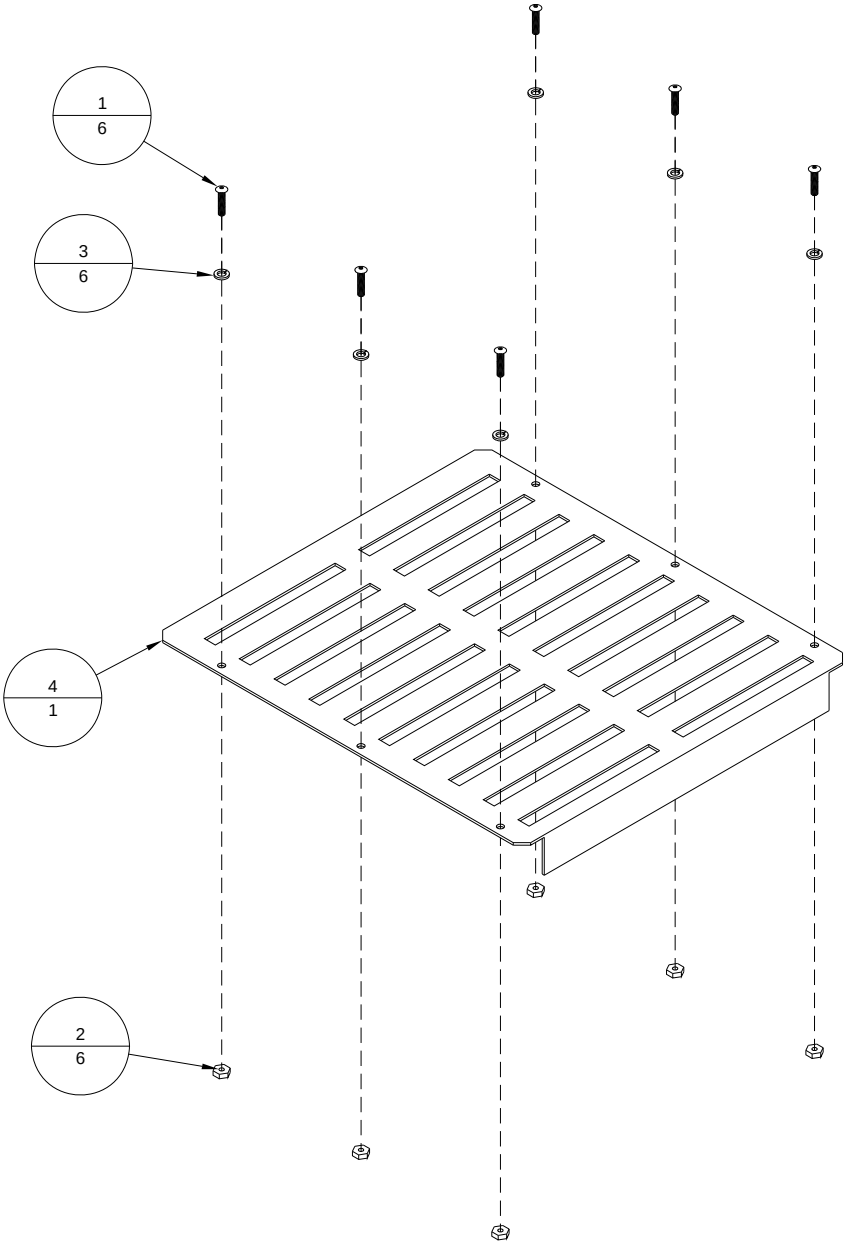


Table B-25: 9103872A – Backplane Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	401309	3	Screw, PHMS, M2.5 x 6 mm	
2	402320	6	Screw, PHMS, 6-32 UNC x 3/8"	
3	609110	2	Connector, Push-on, Blue	
4	9102681	1	Wire, #14, Green/Yellow, 24" Lg.	
5	9103083A	1	Cable, Backplane, 5 x 8	
6	9103872	1	Cover, Backplane Guard	

Figure B-25: 9103872A – Backplane Cover Assembly

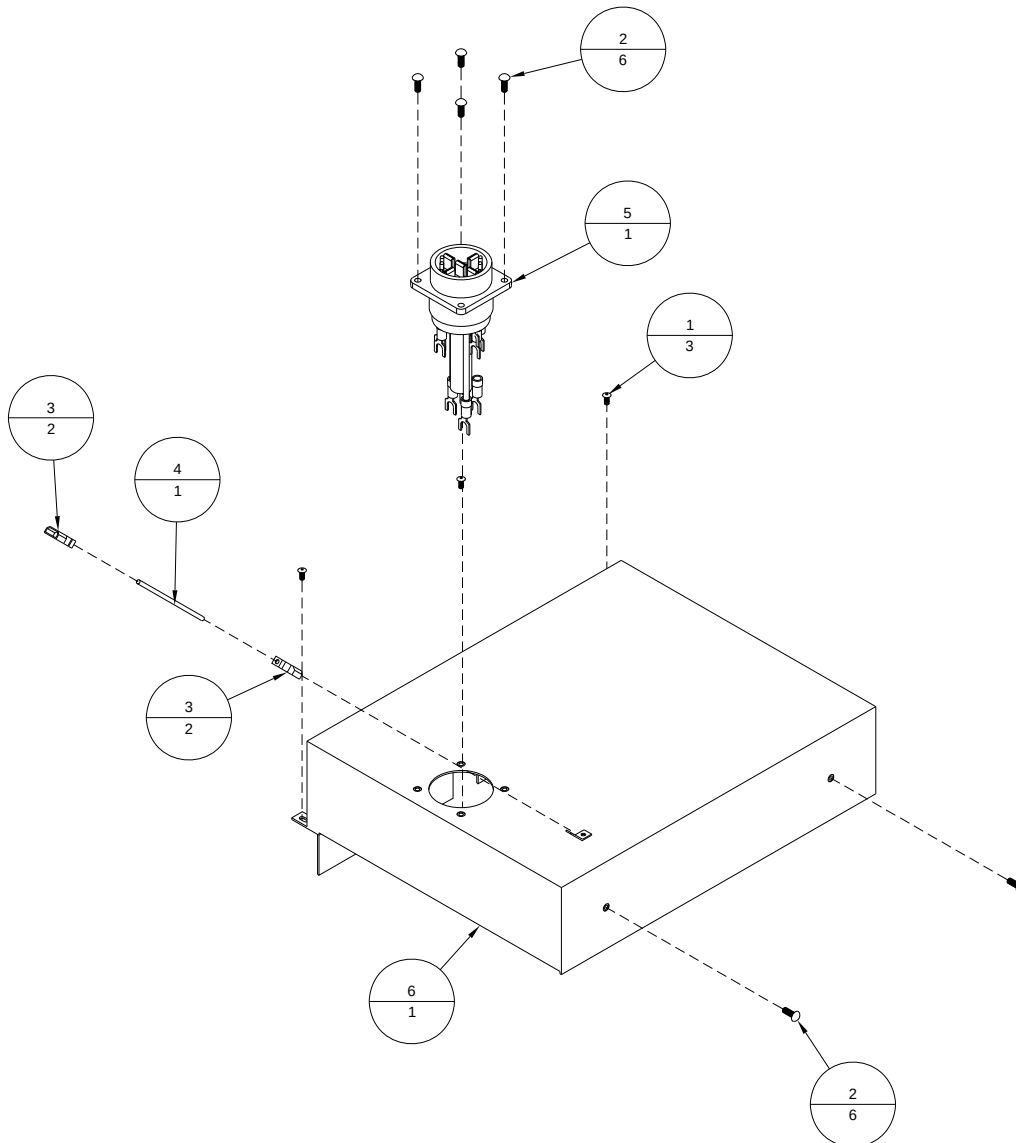


Table B-26: 9103962A – Dual Guard Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	402320	12	Screw, PHMS, 6-32 UNC x 3/8"	
2	609110	2	Connector, Push-on, Blue	
3	9102681	1	Wire, #14, Green/Yellow, 24" Lg.	
4	9103083A	2	Cable, Backplane, 5 x 8	
5	9103962	1	Cover, Backplane Guard, Dual	

Figure B-26: 9103962A – Dual Guard Cover Assembly

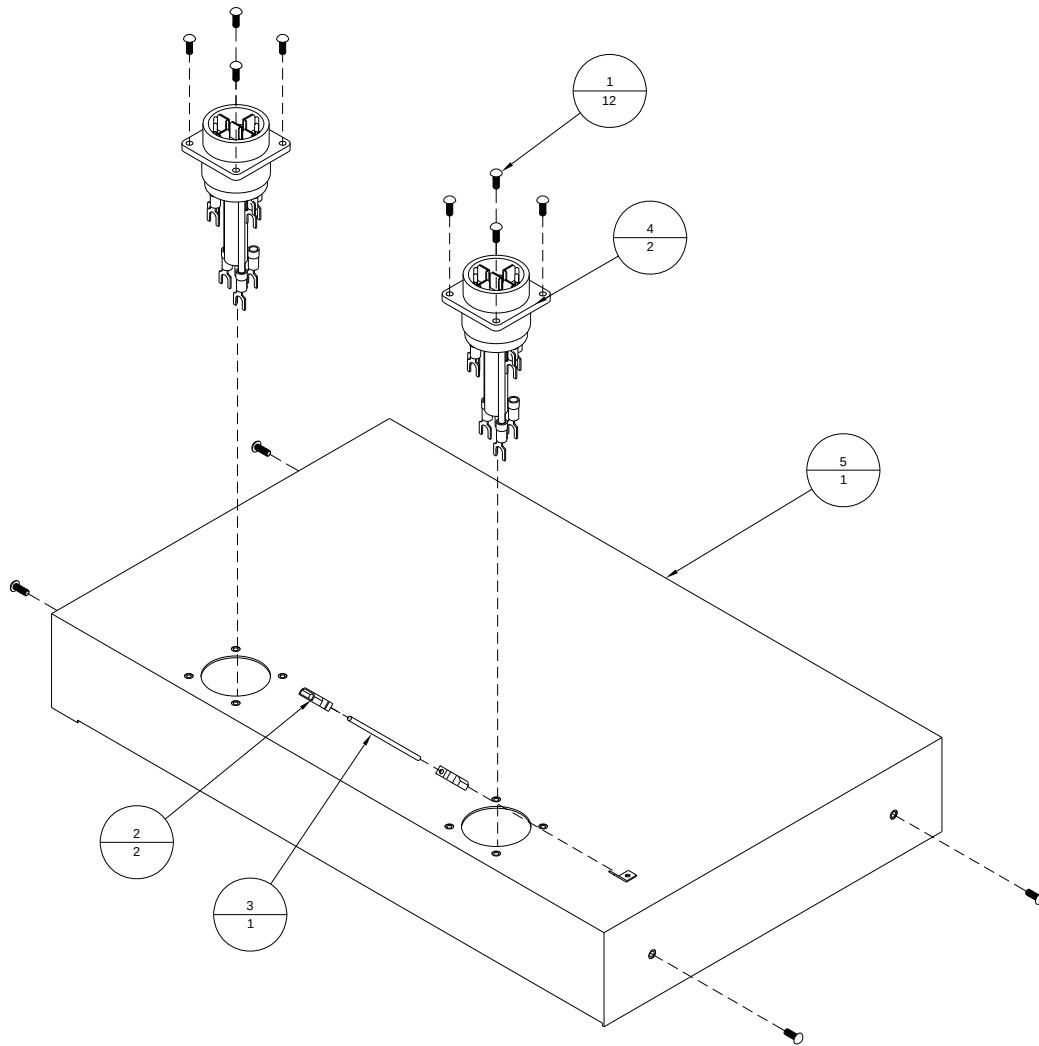


Table B-27: 9103996A – Pumping Subbracket Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	401310	3	Screw, PHMS, 4-40 UNC x 1/4"	
2	403510	4	Screw, BHCS, 8-32 UNC x 1/4"	
3	404510	3	Screw, BHCS, 10-32 UNF x 1/4"	
4	404550	1	Screw, BHCS, 10-32 UNF x 3/4"	
5	609003	1	Shrink Wrap, 3/8" ID, 13" Lg.	
6	615140	15	Lashing Tie, Small	
7	630004A	1	Cycle Proximity Switch Assembly	
8	9100876	1	Coupling, 0.5" DIA	
9	9100931	1	Peristaltic Pump Head	
10	9100936A	1	Gearmotor Assembly	
11	9100971	1	Gripper Clip	
12	9101290	2	Fitting, Tee, 1/8" ID	
13	9101700	1	Check Valve, 1/8" ID	
14	9102116	3	Tubing, Pharmed, 1/4" x 1/8", 1" Lg.	
15	9102116	2	Tubing, Pharmed, 1/4" x 1/8", 3" Lg.	
16	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 8" Lg.	
17	9103016	1	Bracket, Atlas ID Module, Top	
18	9103017	1	Bracket, Atlas Pumping Components	
19	9103390A	1	Filter, Assembly, 10µm, UV	Page B-21
20	9104660A	1	Ink Reservoir Assembly, Atlas	Page B-33

Figure B-27: 9103996A – Pumping Subbracket Assembly, Aurora

NOTE:

Shrink wrap (black) all Pharmed tubing except for the section of tube inside peristaltic pump.

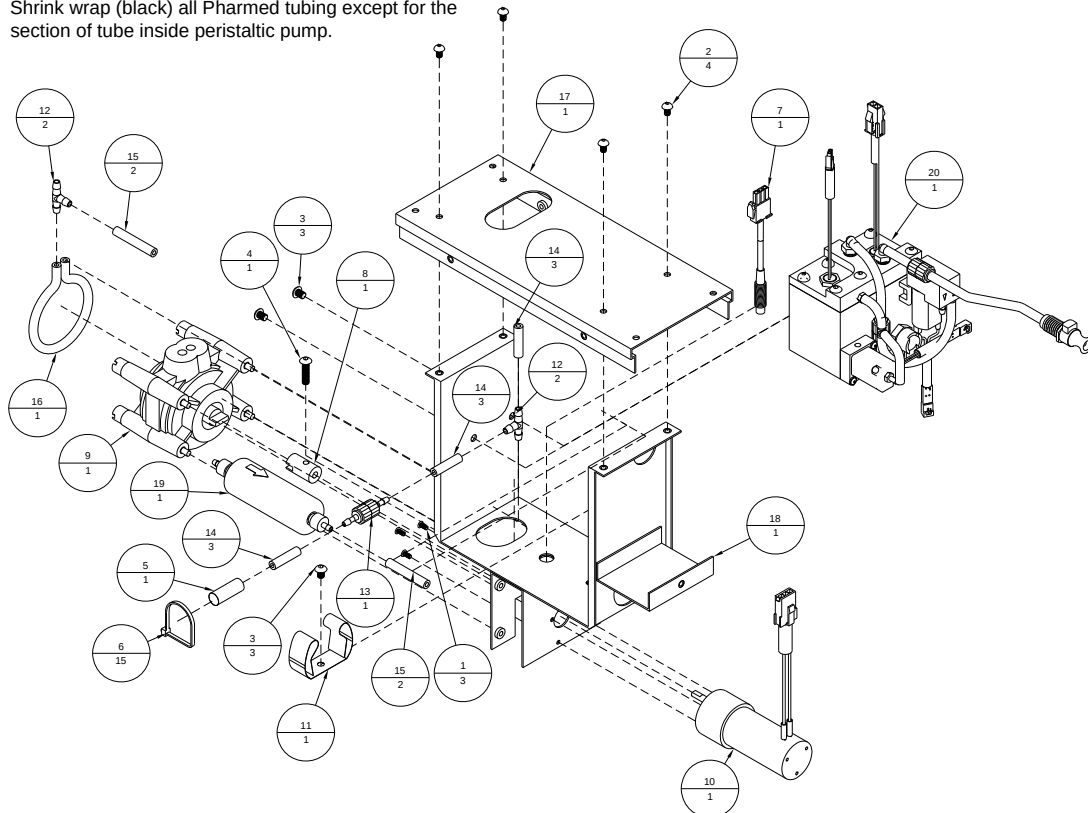


Table B-28: 9103997A – Pumping Station Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	401309	4	Screw, PHMS, M2.5 x 6 mm	
2	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
3	403510	9	Screw, BHCS, 8-32 UNC x 1/4"	
4	420006	6	Nut, 6-32 UNC	
5	420008	1	Nut, 10-32 UNF	
6	420010	1	Nut, 1/4-20 UNC	
7	439006	6	Lockwasher, #6	
8	439009	1	Lockwasher, #10	
9	439010	1	Lockwasher, 1/4" ID	
10	609111	1	Terminal Ring, #10, 16-14 AWG, Blue	
11	609120	1	Terminal Ring, 1/4", 16-14 AWG, Non-Ins.	
12	615322	2	Female Screwlock, 4-40 UNC	
13	9102681	1	Wire, #14, Green/Yellow, 12" Lg.	
14	9102940	1	Plate, Front, Pumping Station Module	
15	9102941	2	Handle, Module	
16	9102942	1	Bracket, Main, Pumping Station	
17	9103015	1	Board, Reservoir Connector	
18	9103054	2	Cover, Control Module, Side	
19	9103109	4	Screw, Truss, 8-32 UNC x 1/4"	
20	9103429	1	Tray, Spill	
21	9103429A	1	Cable, Drive, Atlas Pumping Module	
22	9103996A	1	Pumping Subbracket Assembly, Aurora	Page B-28
23	9104016A	1	Manifold Block Assembly, Aurora	Page B-32

Figure B-28: 9103997A – Pumping Station Assembly, Aurora

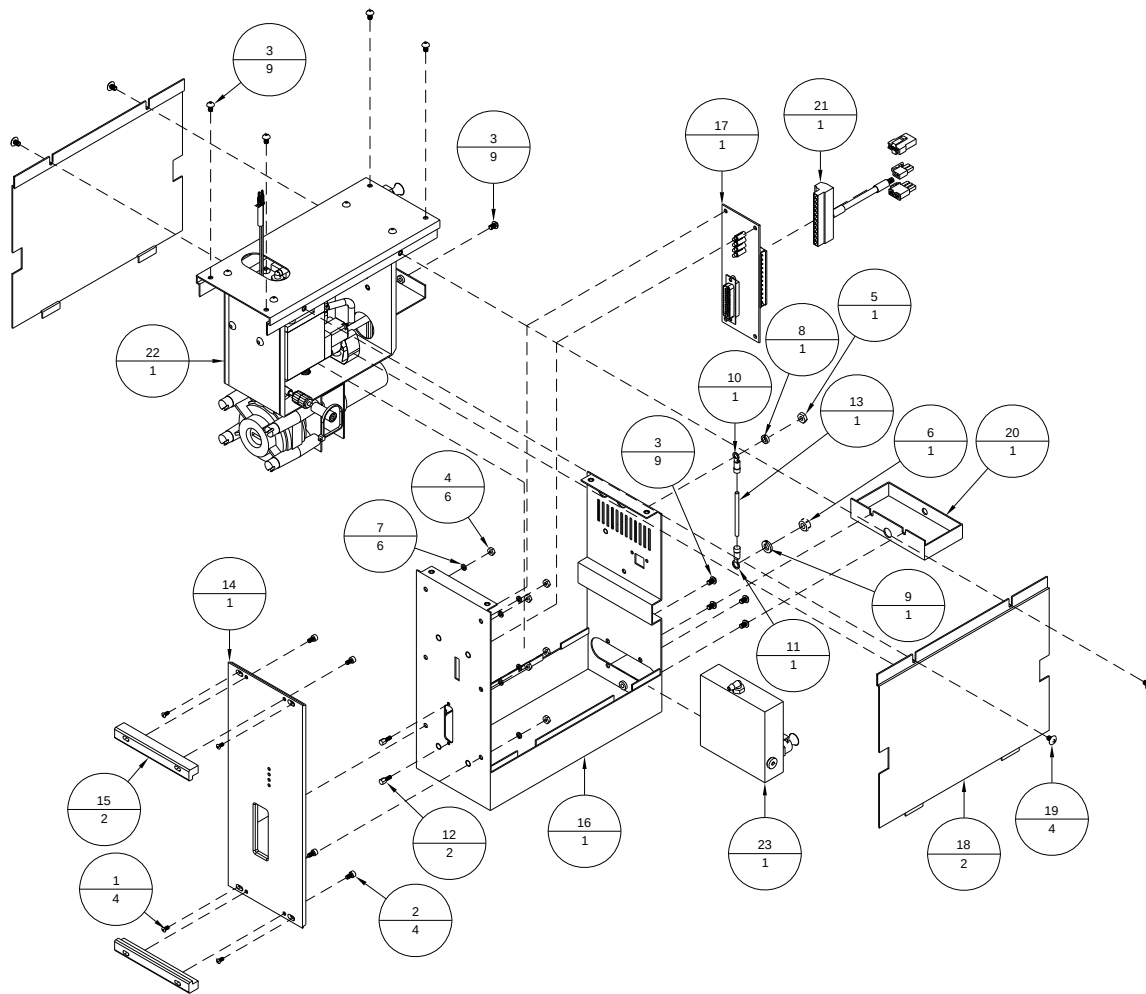


Table B-29: 9104000A – Ink Bottle Bracket Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	404530	2	Screw, BHCS, 10-32 UNF x ½"	
2	420008	1	Nut, 10-32 UNF	
3	439009	1	Lockwasher, #10	
4	9101770	1	Bracket, Ink Bottle	
5	9103430	1	Bracket, Ink Bottle	
6	9104497A	1	Bottle Coupling Assembly, Aurora	Page B-33

Figure B-29: 9104000A – Ink Bottle Bracket Assembly, Aurora

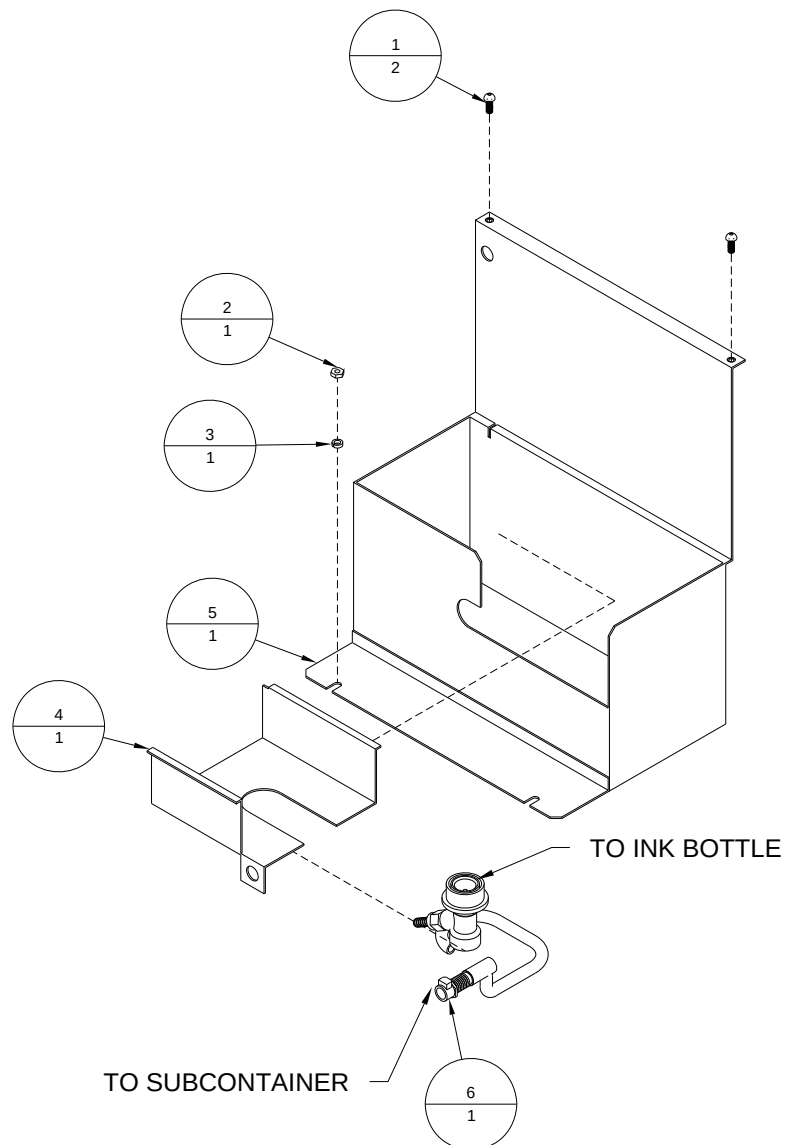
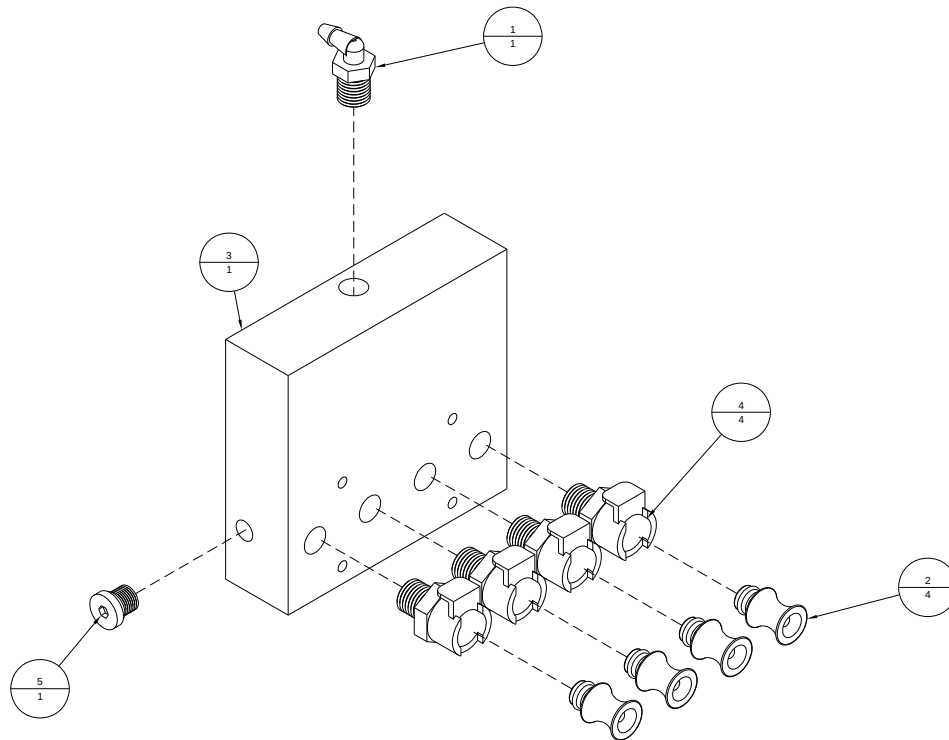


Table B-30: 9104016A – Manifold Block Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	9102085	1	Connector "L", 1/8-27 NPT, 1/8" ID	
2	9102627	4	Plug, Body, EPDM O-Ring	
3	9103019	1	Manifold Block	
4	9104017	4	Coupling Body, 1/8" NPT	
5	9104542	1	Plug, 5/16-24 UNF, O-Ring, EPDM P.C.	

Figure B-30: 9104016A – Manifold Block Assembly, Aurora

**NOTES:**

USE TEFLON TAPE FOR THREAD SEALANT ON ALL
THREADED FITTINGS.

ENSURE THAT THE TEFLON TAPE IS WRAPPED CORRECTLY
SUCH THAT IT DOES NOT BECOME REMOVED DURING
TIGHTENING OF COUPLINGS OR THREADED PLUG.

Table B-31: 9104497A – Bottle Coupling Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	9102132	1	Tubing, Pharmed, 3/8" x 1/4", 13" Lg.	
2	9102236	1	Coupling, Renoir Ink Bottle Cap	
3	9102247	1	Shrink Wrap, 1/2" ID, 13" Lg.	
4	9104497	1	Coupling Body, 1/4" ID, Panel Mount	

Figure B-31: 9104497A – Bottle Coupling Assembly, Aurora

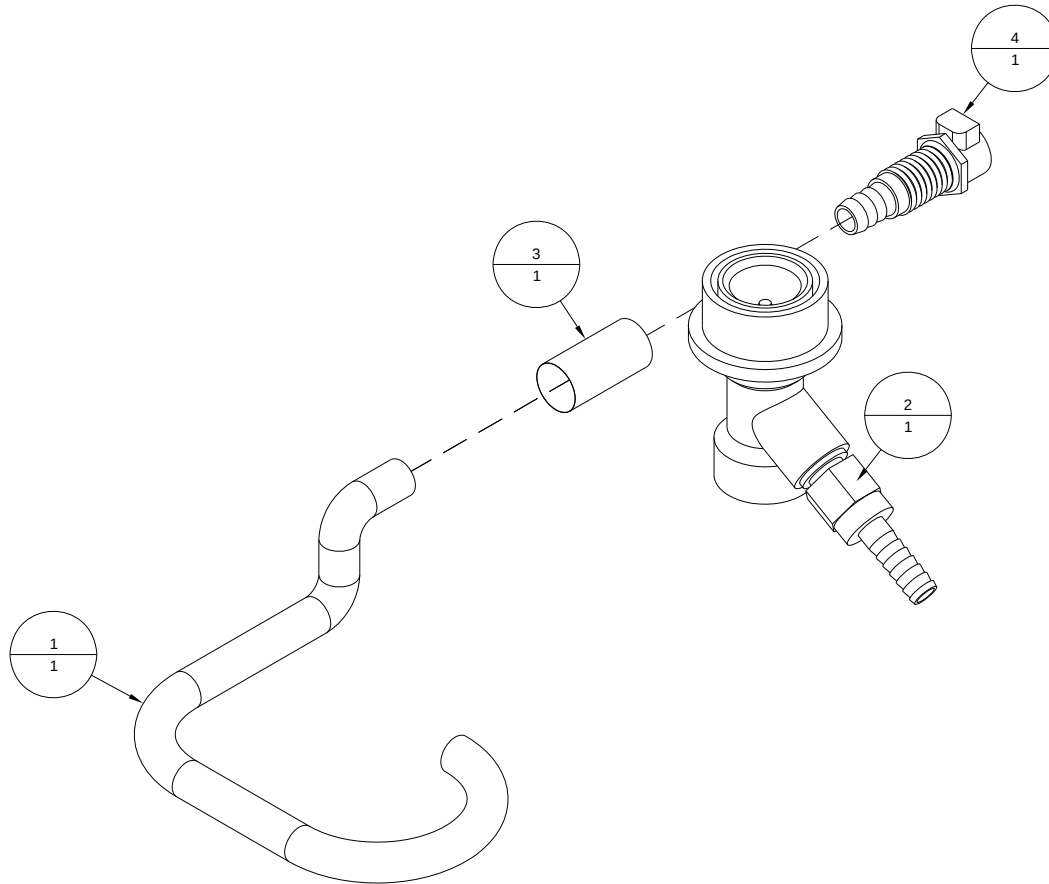


Table B-32: 9104660A – Ink Reservoir Assembly, Atlas

Item	Part Number	Quantity	Description	Reference
1	401330	2	Screw, PHMS, 4-40 UNC x 1/2"	
2	404520	1	Screw, BHCS, 10-32 UNF x 3/8"	
3	404530	3	Screw, BHCS, 10-32 UNF x 1/2"	
4	404550	3	Screw, BHCS, 10-32 UNF x 3/4"	
5	439004	2	Lockwasher, #4	
6	439009	7	Lockwasher, #10	
7	615102	1	Tie Mount	
8	615140	14	Lashing Tie, Small	
9	615141	1	Lashing Tie, Large	
10	9100149	1	Connector, 1/8" NPT, 1/8" ID	
11	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 3" Lg.	
12	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 2.5" Lg.	
13	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 1.5" Lg.	
14	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 1" Lg.	
15	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 3" Lg.	
16	9100877	1	O-Ring, 1-7/8 x 1-3/4 x 1/16, EPDM P.C.	
17	9101290	1	Fitting, Tee, 1/8" ID	
18	9101692	1	Coupling Body, 1/8" ID Tubing, Panel Mnt.	
19	9102085	1	Connector, 1/8-27 NPT, 1/8" ID	
20	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 1" Lg.	
21	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 4" Lg.	
22	9102150	1	Coupling Body, 1/8" NPT	
23	9104660	1	Reservoir, Ink/Air	
24	9104661A	1	Reservoir Cover Assembly	Page B-36
25	9104662A	1	Pump Assembly	
26	9104671	1	Check Valve, 1/8" ID, Barbed, 1 PSI	
27	9104674	1	Check Valve, 1/8" ID, Barbed, 4 PSI	
28	9104711A	1	Solenoid Valve Assembly, 3-Way, N.O.	
29	9104717	1	O-Ring, 1-1/8 x 1 x 1/16, EPDM P.C.	

Figure B-32: 9104660A – Ink Reservoir Assembly, Atlas

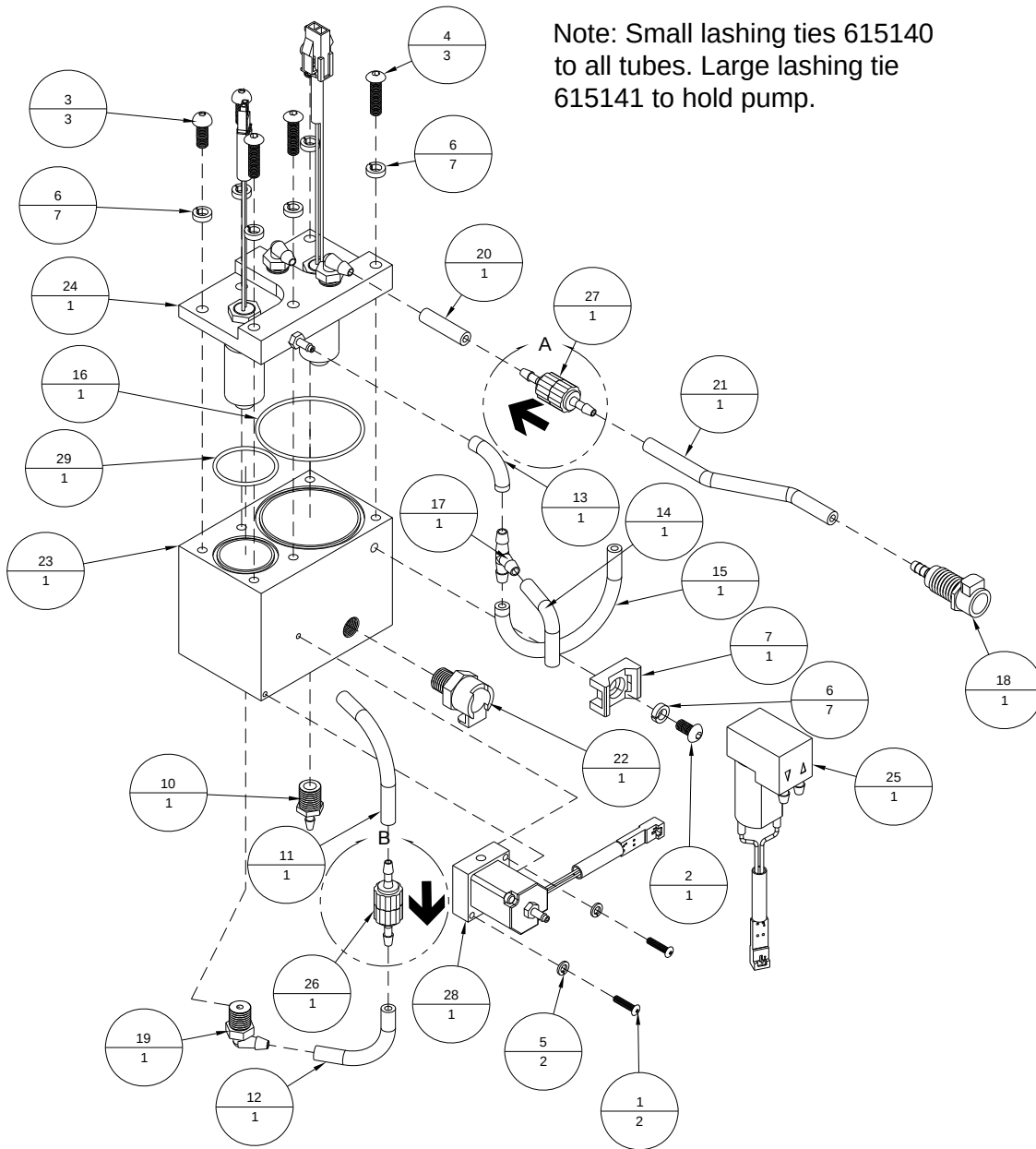
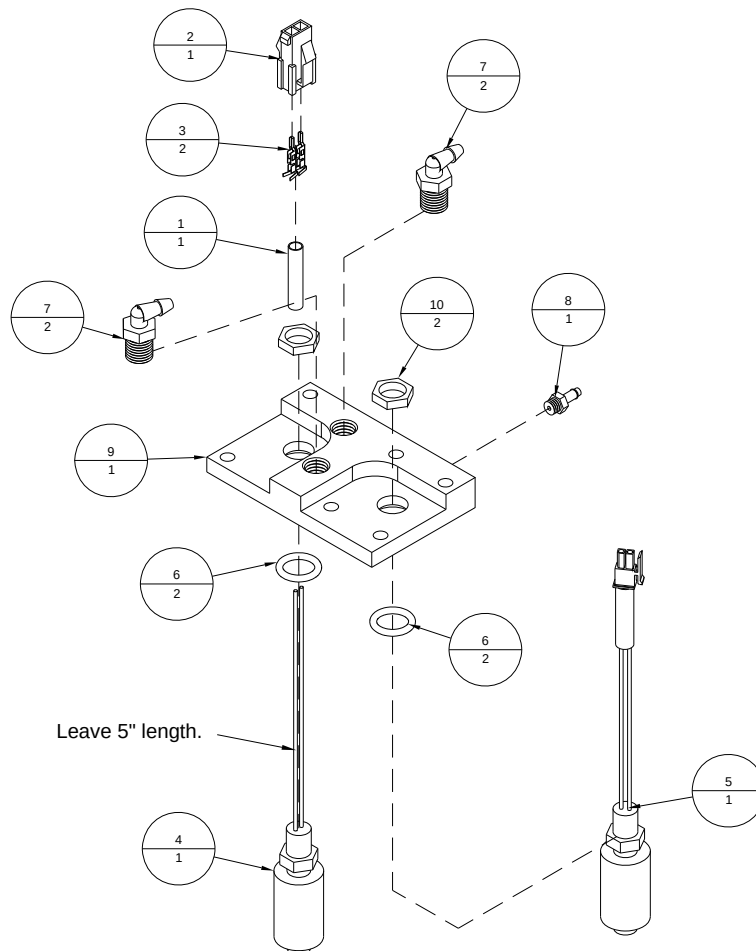


Table B-33: 9104661A – Reservoir Cover Assembly

Item	Part Number	Quantity	Description	Reference
1	609000	1	Shrink Wrap, 3/16" ID, 5" Lg	
2	9100206	1	Receptacle, 2-Pin, Mini-Fit Jr	
3	9100207	2	Contact, Male, 18-22 AWG, Series 5558	
4	9100966	1	Float Switch, Micro-miniature	
5	9100966A	1	Float Switch Assembly, Secondary	
6	9101297	2	O-Ring, 7/16 x 5/8 x 3/32, EPDM P.C.	
7	9102085	2	Connector, Elbow, 1/8-27 NPT, 1/8" ID	
8	9102973	1	Fitting, 10-32 UNF x 1/8 ID	
9	9104661	1	Cover, Reservoir	
10	N/A	2	Included with 9100966	

Figure B-33: 9104661A – Reservoir Cover Assembly



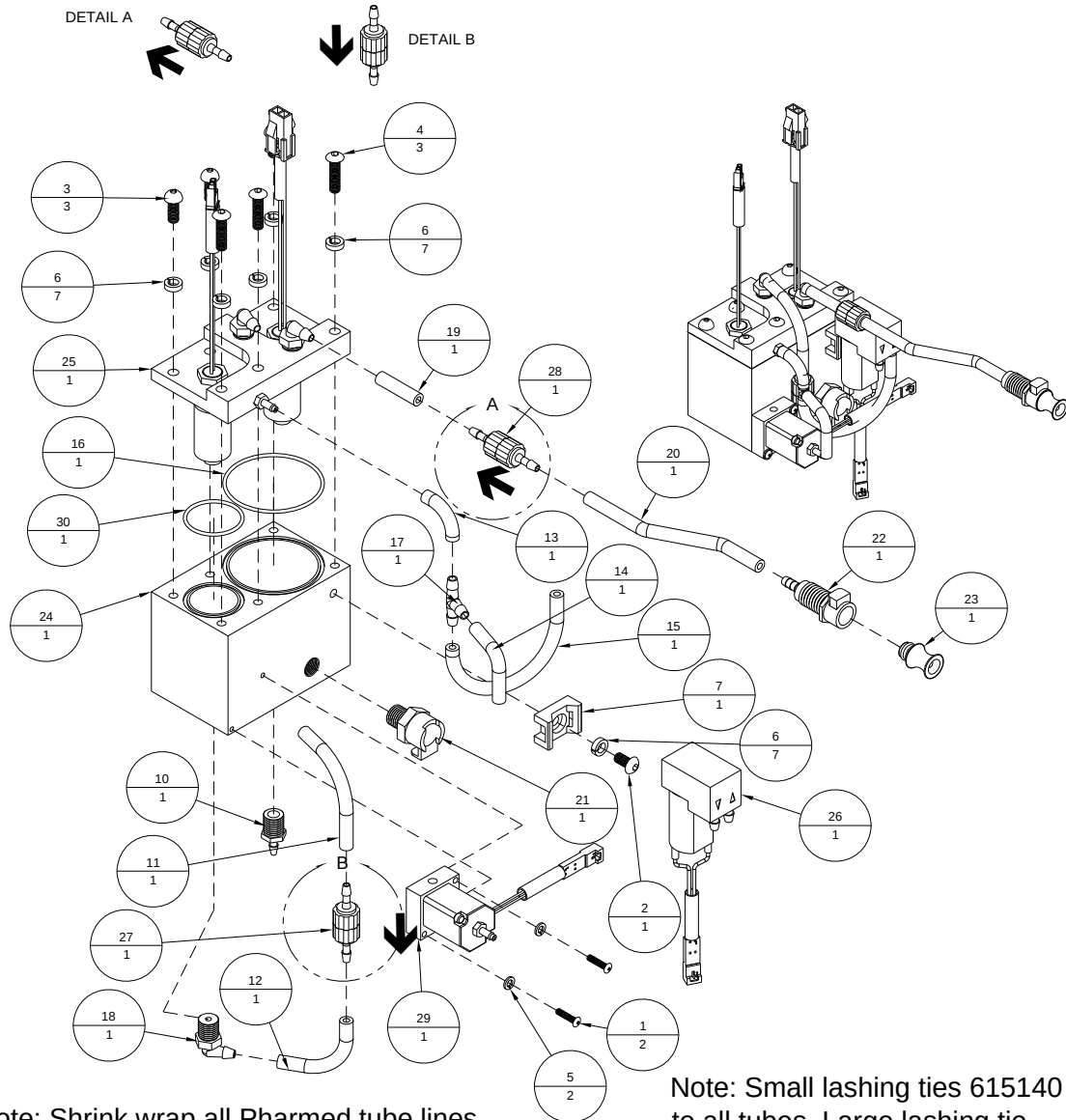
Note: Use teflon tape on two elbow connectors, 1/8-27 NPT threads.

Table B-34: 9104663A – Ink Reservoir Assembly, Aurora

Item	Part Number	Quantity	Description	Reference
1	401330	2	Screw, PHMS, 4-40 UNC x 1/2"	
2	404520	1	Screw, BHCS, 10-32 UNF x 3/8"	
3	404530	3	Screw, BHCS, 10-32 UNF x 1/2"	
4	404550	3	Screw, BHCS, 10-32 UNF x 3/4"	
5	439004	2	Lockwasher, #4	
6	439009	7	Lockwasher, #10	
7	615102	1	Tie Mount	
8	615140	14	Lashing Tie, Small	
9	615141	1	Lashing Tie, Large	
10	9100149	1	Connector, 1/8" NPT, 1/8" ID	
11	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 3" Lg.	
12	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 2.5" Lg.	
13	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 1.5" Lg.	
14	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 1" Lg.	
15	9100472	1	Tubing, Silicone, 1/4" OD x 1/8" ID, 3" Lg.	
16	9100877	1	O-Ring, 1-7/8 x 1-3/4 x 1/16, EPDM P.C.	
17	9101290	1	Fitting, Tee, 1/8" ID	
18	9102085	1	Connector, 1/8-27 NPT, 1/8" ID	
19	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 1" Lg.	
20	9102116	1	Tubing, Pharmed, 1/4" x 1/8", 4" Lg.	
21	9102150	1	Coupling Body, 1/8" NPT	
22	9102625	1	Coupling, Panel Mount, 1/4" OD	
23	9102627	1	Plug, Body, EPDM O-Ring	
24	9104660	1	Reservoir, Ink/Air	
25	9104661A	1	Reservoir Cover Assembly	Page B-36
26	9104662A	1	Pump Assembly	
27	9104671	1	Check Valve, 1/8" ID, Barbed, 1 PSI	
28	9104674	1	Check Valve, 1/8" ID, Barbed, 4 PSI	
29	9104711A	1	Solenoid Valve Assembly, 3-Way, N.O.	
30	9104717	1	O-Ring, 1-1/8 x 1 x 1/16, EPDM P.C.	

Figure B-34: 9104663A – Ink Reservoir Assembly, Aurora

Note: Use teflon tape on one elbow, one straight and one quick disconnect connectors, 1/8-27 NPT threads.



Note: Shrink wrap all Pharmed tube lines,
Lashing ties to all barbed ink line fittings.

Note: Small lashing ties 615140
to all tubes. Large lashing tie
615141 to hold pump.

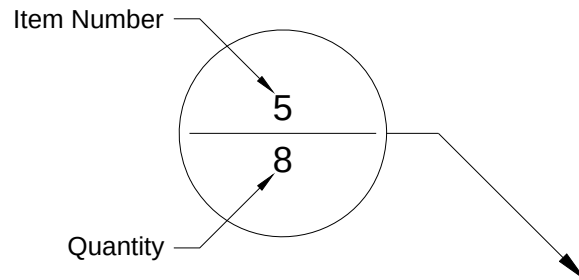
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Balloon Annotation and Parts Listing



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 C-1: BK-PSM-4A – Module, Atlas/Aurora Power Supply, Release 2

Item	Part Number	Quantity	Description	Reference
1	401010	6	Screw, FHCS, 4-40 UNC x 1/4"	
2	402320	8	Screw, PHMS, 6-32 UNC x 3/8"	
3	404520	2	Screw, BHCS, 10-32 UNF x 3/8"	
4	420008	9	Nut, 10-32 UNF	
5	439008	2	Lockwasher, #10 External Tooth	
6	439009	8	Lockwasher, #10	
7	606000	2	Wire, #16, Black, 14" Lg.	
8	606001	1	Wire, #16, Red, 12" Lg.	
9	606005	1	Wire, #16, Green, 12" Lg.	
10	606008	1	Wire, #14, White, 8" Lg.	
11	606008	1	Wire, #14, White, 12" Lg.	
12	606009	2	Wire, #16, White, 14" Lg.	
13	606010	1	Wire, #14, Black, 8" Lg.	
14	606039	1	Cable, #14-2, Shielded, BK/RD, 12" Lg.	
15	606359	2	Wire, #16, Green/Yellow, 14" Lg.	
16	609000	3	Shrink Wrap, 3/16" ID, 1" Lg.	
17	609110	8	Connector, Push-on, 16-14 AWG, Blue	
18	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
19	609113	3	Connector, Push-on, Yellow	
20	609116	2	Terminal, Ring, #10, 22-18 AWG, Red	
21	614106A	1	Cable, Atlas/Aurora PSM, Vout	
22	614123	2	Contact, Female, 18-16 AWG, Blue	
23	9101935	4	Screw, PHMS, M3 x 5 mm	
24	9102205	1	Switch, Breaker, 15A, 2 Pole, Green	
25	9102246	1	Wire, #18, Green/Yellow, 8" Lg.	
26	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
27	9102681	1	Wire, #14, Green/Yellow, 20" Lg.	
28	9102862	1	Receptacle, Male, 250 VAC/10A, IEC	
29	9103082A	1	Cable, Atlas/Aurora Power Supply	
30	9103117	1	Board, 170V Power Supply	
31	9103160	1	Receptacle, 17-9 Reverse Sex	
32	9103167	2	Receptacle, Female, 120 VAC, 15A, IEC	
33	9103175A	1	Terminal Block Assembly, Atlas/Aurora	Page C-11
34	9103176	1	Board, Power Supply Display, Atlas/Aur.	
35	9103176A	1	Cable, Power Supply Display Board	
36	9103433	5	Ferrule, #14 AWG, Blue	
37	9103435	8	Ferrule, #16 AWG, Red	
38	9103539A	1	Transformer Assembly, 170VDC	Page C-23
39	9104133	1	Cover, PCM / PSM	
40	9104163	1	Chamber, Atlas Power Supply	
41	9104165	1	Power Supply, Switching, 12VDC/13A	
42	9104192A	1	Faceplate Assembly, Atlas/Aurora PSM	Page C-26
43	9104557	4	Lockwasher, #4, External Tooth	

Figure C-1: BK-PSM-4A – Module, Atlas/Aurora Power Supply, Release 2

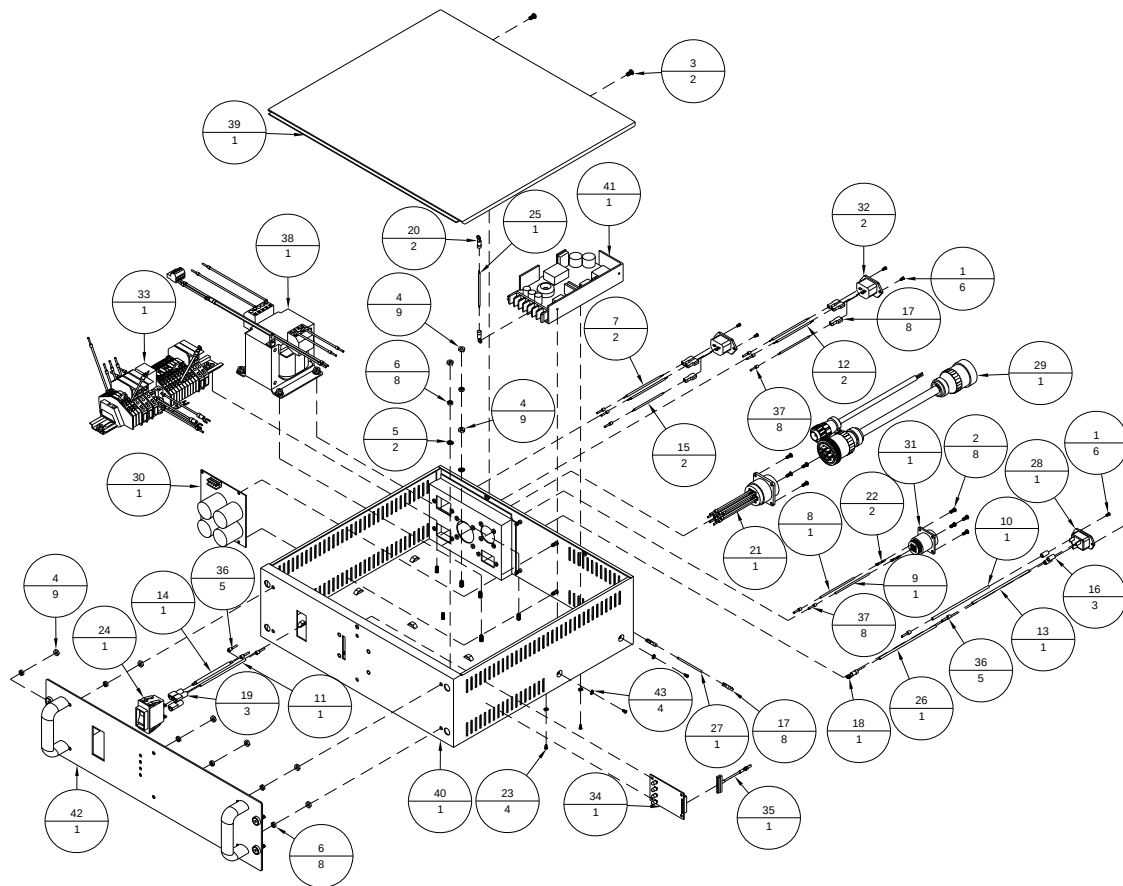


Table C-2: BK-PSM-4A – Module, Atlas/Aurora Power Supply, Release 1

Item	Part Number	Quantity	Description	Reference
1	403520	2	Screw, BHCS, 8-32 UNC x 3/8"	
2	420008	13	Nut, 10-32 UNF	
3	439009	13	Lockwasher, No. 10	
4	440008	6	Washer, #10 ID	
5	606008	1	Wire, #14, White, 12" Lg.	
6	606010	1	Wire, #14, Black, 12" Lg.	
7	606010	1	Wire, #14, Black, 6" Lg.	
8	609111	2	Terminal, Ring, #10, 16-14 AWG, Blue	
9	609113	3	Connector, Push-On, Yellow	
10	9102205	1	Switch, Breaker, 20A, 2 Pole, Green	
11	9102681	1	Wire, #14, Green/Yellow, 10" Lg.	
12	9103082A	1	Cable, Atlas Power Supply	
13	9103109	4	Screw, Trus, 8-32 UNC x 1/4"	
14	9103116	1	Cover, Power Supply Enclosure	
15	9103176	1	Board, Power Supply Display, Atlas	
16	9103176A	1	Cable, Power Supply Display Board	
17	9103411	1	Chamber, Power Supply, Universal	
18	9103412A	1	Faceplate Assembly, Power Supply	Page C-13
19	9103417A	1	Power Supply Subbracket Assembly	Page C-17
20	9103433	3	Ferrule, #14 AWG, Blue	

Figure C-2: BK-PSM-4A – Module, Atlas/Aurora Power Supply, Release 1

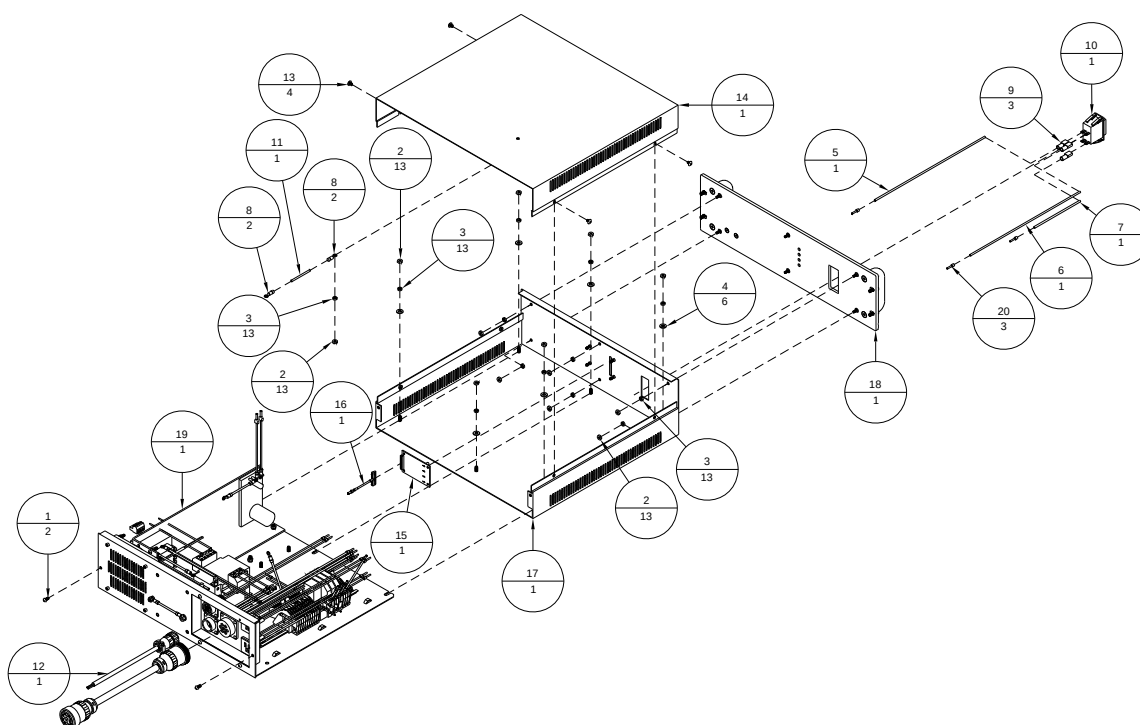


Table C-3: *BK-PSM-4H – Module, Apollo Power Supply, Release 2*

Item	Part Number	Quantity	Description	Reference
1	401510	4	Screw, BHCS, 4-40 UNC x 1/4"	
2	9104164A	1	Chassis Assembly, Apollo PSM, 4-Ch.	Page C-24
3	9104490	1	Cover, 4-Channel Apollo PSM	

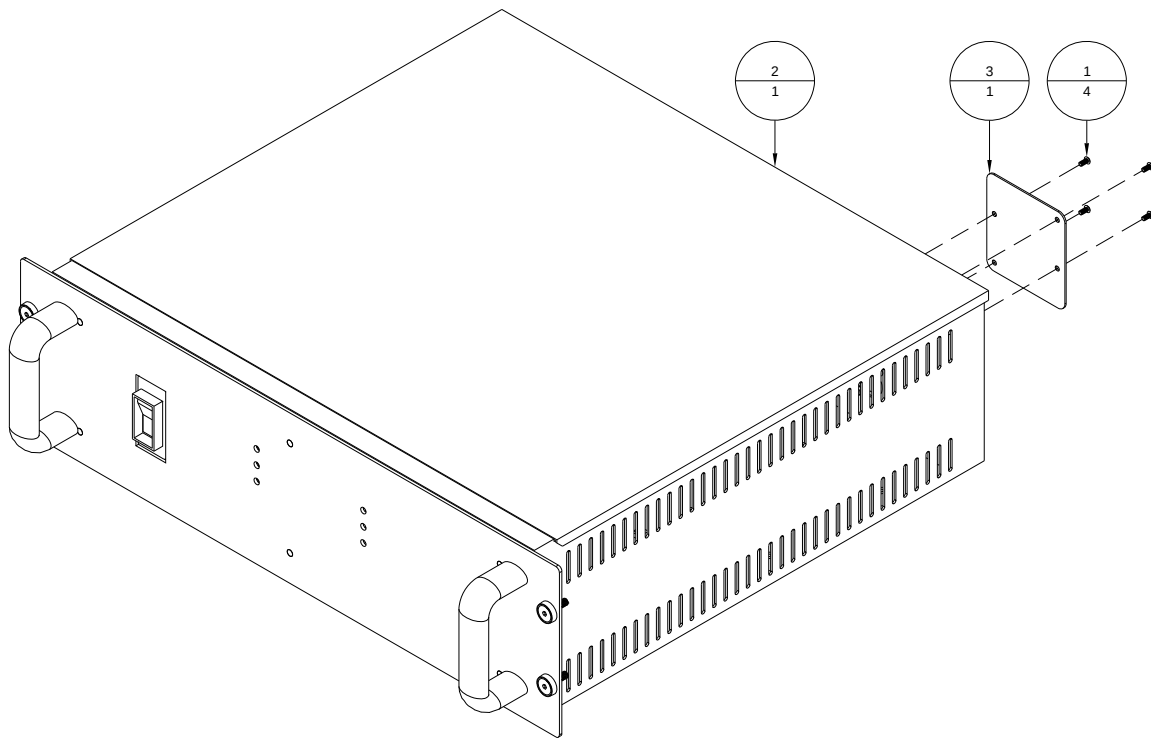
Figure C-3: *BK-PSM-4H – Module, Apollo Power Supply, Release 2*

Table C-4: BK-PSM-4H – Module, Apollo Power Supply, Release 1

Item	Part Number	Quantity	Description	Reference
1	403520	2	Screw, BHCS, 8-32 UNC x 3/8"	
2	420008	13	Nut, 10-32 UNF	
3	439009	13	Lockwasher, No. 10	
4	440008	6	Washer, #10 ID	
5	606008	1	Wire, #14, White, 12" Lg.	
6	606010	1	Wire, #14, Black, 30" Lg.	
7	606010	1	Wire, #14, Black, 12" Lg.	
8	609111	2	Terminal, Ring, #10, 16-14 AWG, Blue	
9	609113	3	Connector, Push-On, Yellow	
10	9102205	1	Switch, Breaker, 20A, 2 Pole, Green	
11	9102681	1	Wire, #14, Green/Yellow, 10" Lg.	
12	9103109	4	Screw, Trus, 8-32 UNC x 1/4"	
13	9103116	1	Cover, Power Supply Enclosure	
14	9103176A	1	Cable, Power Supply Display Board	
15	9103411	1	Chamber, Power Supply, Universal	
16	9103413A	1	Faceplate Assembly, Power Supply	Page C-14
17	9103414	1	Board, Power Supply Display, Apollo	
18	9103418A	1	Power Supply Subbracket Assembly	Page C-18
19	9103433	3	Ferrule, #14 AWG, Blue	

Figure C-4: BK-PSM-4H – Module, Apollo Power Supply, Release 1

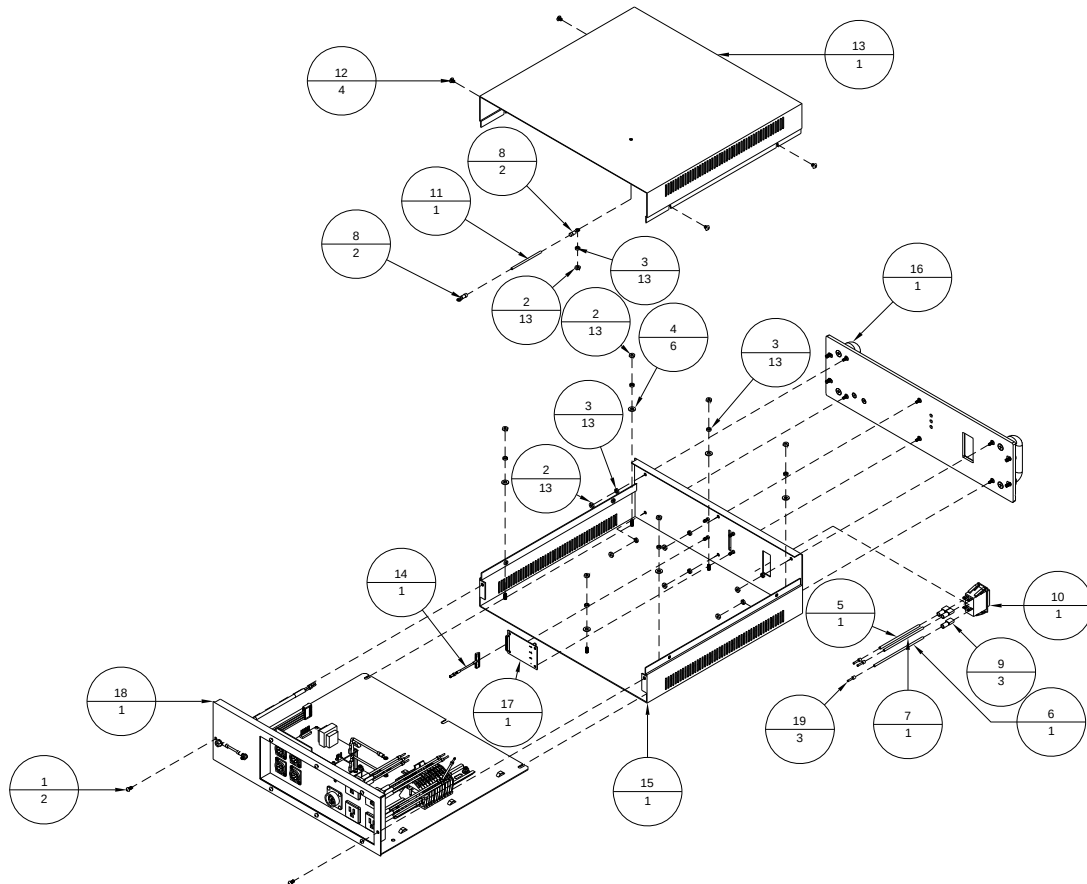
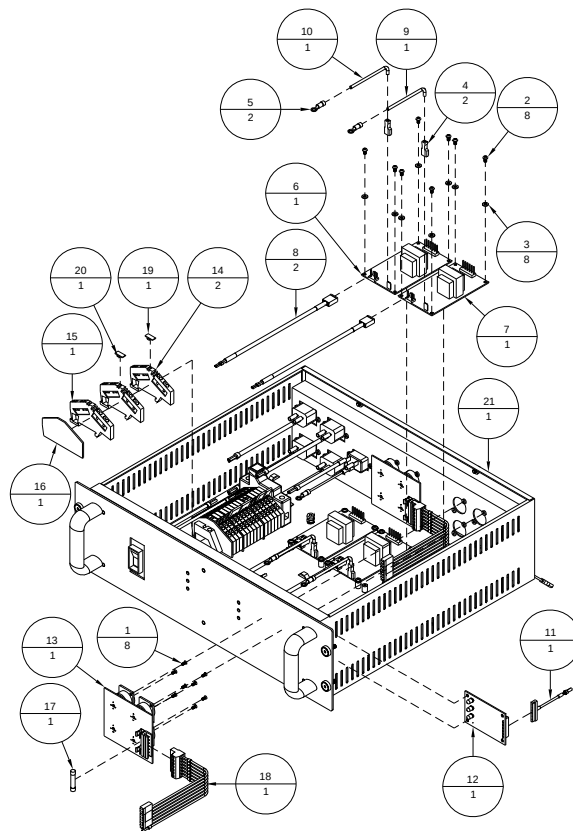


Table C-5: *BK-PSM-8H – Module, Apollo Power Supply, 8-Channel*

Item	Part Number	Quantity	Description	Reference
1	401010	8	Screw, FHCS, 4-40 UNC x 1/4"	
2	402310	8	Screw, PHMS, 6-32 UNC x 1/4"	
3	440530	8	Washer, #6, Nylon	
4	609110	2	Connector, Push-on, 16-14 AWG, Blue	
5	609111	2	Terminal, Ring, #10, 12-10 AWG, Non-Ins	
6	9102418	1	Power Supply, Switching, 5.1VDC, 8A	
7	9102419	1	Power Supply, Switching, 28VDC, 1.8A	
8	9102580A	2	Cable, 5VDC, 28VDC Power Input	
9	9102681	1	Wire, #14, Green/Yellow, 17"	
10	9102681	1	Wire, #14, Green/Yellow, 14"	
11	9103176A	1	Cable, Power Supply Display Board	
12	9103414	1	Board, Power Supply Display, Apollo	
13	9103420	1	Board, 5VDC/28VDC Power Supply	
14	9103436	2	Terminal Block, ZDU 4-2/4AN	
15	9103437	1	Terminal Block, Ground, ZPE 4-2/4AN	
16	9103438	1	End Plate, ZAP ZDU 4-2/4AN	
17	9103445	1	Fuse, 3A, 250V, 1/4 x 1-1/4", Slo-blo	
18	9103638A	1	Cable, Apollo Power Supply	
19	9103740	1	Terminal Marker, WS 12/6, 5VDC	
20	9103741	1	Terminal Marker, WS 12/6, 28VDC	
21	9104164A	1	Chassis Assembly, Apollo PSM, 4-Ch	Page C-24

Figure C-5: *BK-PSM-8H – Module, Apollo Power Supply, 8-Channel***NOTE:**

ALL ITEMS EXCEPT 9104164A ARE PART OF UBK-PSM-8H.

Table C-6: 9103171A – Terminal Block Assembly, Atlas/Aurora, Release 1

Item	Part Number	Quantity	Description	Reference
1	420008	2	Nut, 10-32 UNF	
2	439009	2	Lockwasher, No. 10	
3	440008	2	Washer, No. 10	
4	606000	1	Wire, #16, Black, 5" Lg.	
5	606002	1	Wire, #16, Blue, 4" Lg.	
6	606008	1	Wire, #14, White, 6" Lg.	
7	606009	1	Wire, #16, White, 4" Lg.	
8	606010	3	Wire, #14, Black, 4" Lg.	
9	606021	1	Wire, #16, Brown, 5" Lg.	
10	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
11	610100	1	Relay, 120 VAC	
12	615004	1	Relay Base	
13	615021	1	T-Rail, DIN, 12" Lg.	
14	9100096	1	Fuse, 10A, 250V, ¼ x 1-1/4", Slo-blo	
15	9100286	1	Fuse, 2A, 250V, ¼ x 1-1/4", Time Delay	
16	9102050	2	Terminal Marker, WS 12/6, L	
17	9102051	3	Terminal Marker, WS 12/6, N	
18	9102052	1	Terminal Marker, WS 12/6, 12VDC	
19	9102053	1	Terminal Marker, WS 12/6, 170 VDC	
20	9102297	2	Terminal Marker, WS 12/6, L'	
21	9102299	1	Terminal Marker, WS 12/6, GND	
22	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
23	9102767	4	Terminal Marker, WS 12/6, 250V	
24	9102768	1	Terminal Marker, WS 12/6, T2A L	
25	9102769	1	Terminal Marker, WS 12/6, T3A L	
26	9102770	1	Terminal Marker, WS 12/6, T10A L	
27	9103433	9	Ferrule, #14 AWG, Blue	
28	9103435	7	Ferrule, #16 AWG, Red	
29	9103436	11	Terminal Block, Z-Roofstyle	
30	9103437	2	Terminal Block, Z-Roofstyle, Ground	
31	9103438	2	End Plate	
32	9103439	2	Cross-Connection	
33	9103440	4	Fuse Terminal, ZSI 2.5/2, ¼ x 1-1/14, 10A	
34	9103441	2	End Plate, Fuse Terminal	
35	9103442	2	End Bracket, EW 35	
36	9103445	1	Fuse, 3A, 250V, 1/4- x 1-1/4", Slo-blo	
37	9103446	1	Fuse, 5A, ¼" x 1-1/4"	
38	9104363	1	Terminal Marker, WS 12/6, T5A L	

Figure C-6: 9103171A – Terminal Block Assembly, Atlas/Aurora, Release 1

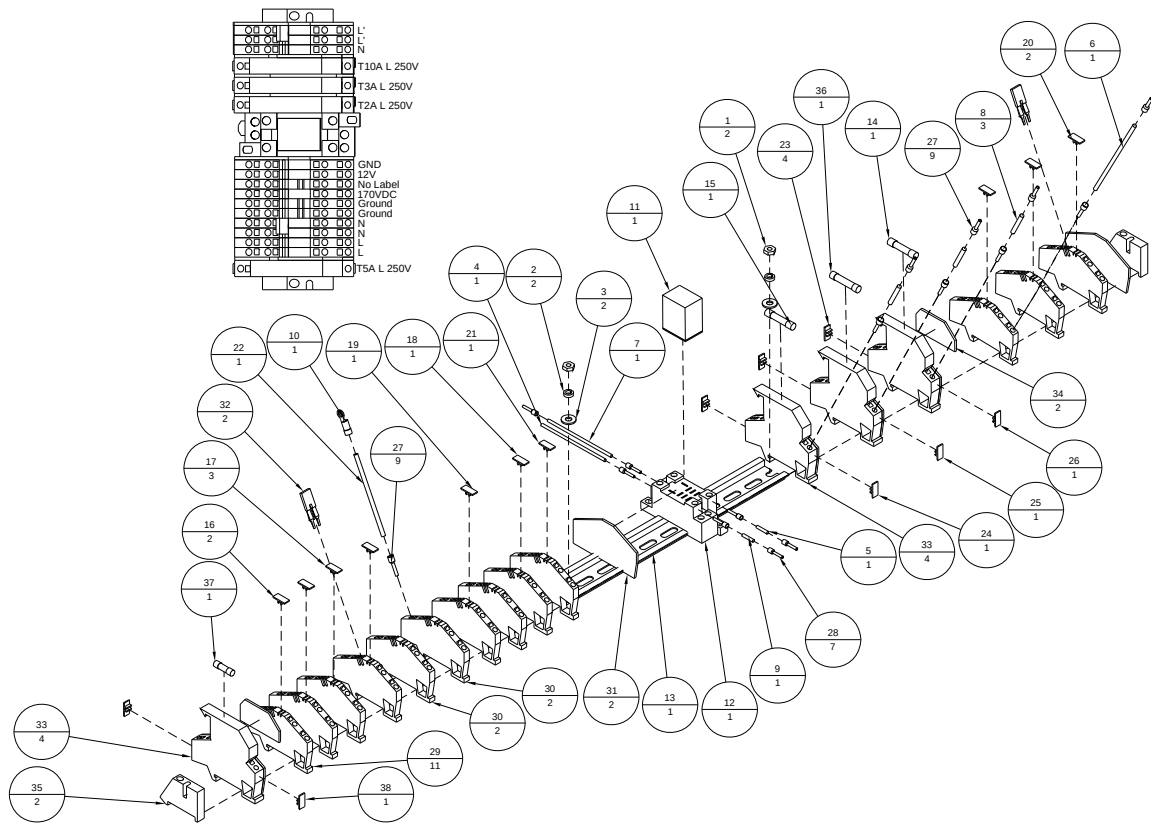


Table C-7: 9103173A – Terminal Block Assembly, Apollo Release 1

Item	Part Number	Quantity	Description	Reference
1	420008	2	Nut, 10-32 UNF	
2	439009	2	Lockwasher, No. 10	
3	440008	2	Washer, #10 ID	
4	615021	1	T-Rail, DIN, 8" Lg.	
5	9100218	1	Label, Fuse, T15A L 250V	
6	9102050	1	Terminal Marker, WS 12/6, L	
7	9102051	3	Terminal Marker, WS 12/6, N	
8	9102297	2	Terminal Marker, WS 12/6, L'	
9	9103436	8	Terminal Block, Z-Roofstyle	
10	9103437	3	Terminal Block, Z-Roofstyle, Ground	
11	9103438	3	End Plate	
12	9103439	2	Cross-Connection	
13	9103442	2	End Bracket, EW 35	
14	9103447	1	Fuse Holder, 13/32" DIA	
15	9103448	1	Fuse, 15A, 250V, 13/32 x 1-1/2", Slo-blo	
16	9103740	1	Terminal Marker, WS 12/6, 5VDC	
17	9103741	1	Terminal Marker, WS 12/6, 28VDC	

Figure C-7: 9103173A – Terminal Block Assembly, Apollo Release 1

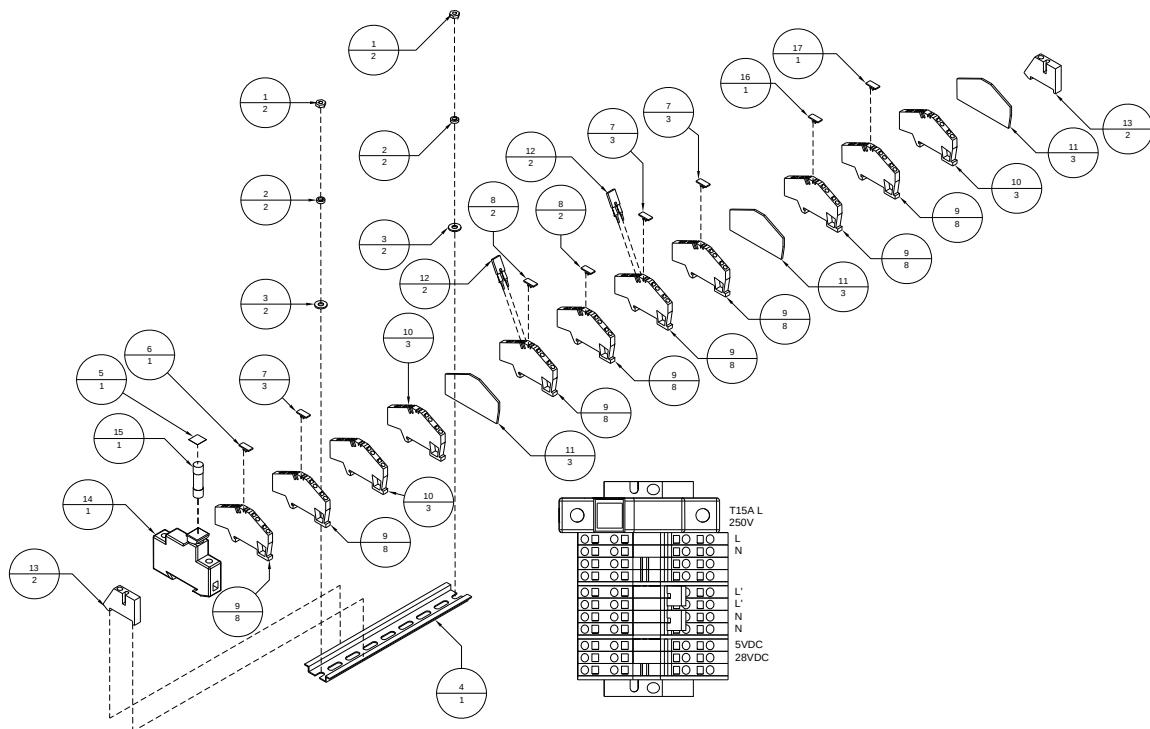


Table C-8: 9103174A – Terminal Block Assembly, Apollo Release 2

Item	Part Number	Quantity	Description	Reference
1	420008	2	Nut, 10-32 UNF	
2	439009	2	Lockwasher, #10	
3	440008	2	Washer, #10 ID	
4	615021	1	T-Rail, DIN, 8" Lg.	
5	9100218	1	Label, Fuse, T15A L 250V	
6	9102045	3	Terminal Marker, WS 12/6, N'	
7	9102050	2	Terminal Marker, WS 12/6, L	
8	9102051	2	Terminal Marker, WS 12/6, N	
9	9102297	3	Terminal Marker, WS 12/6, L'	
10	9103436	12	Terminal Block, Z-Roofstyle	
11	9103437	3	Terminal Block, Z-Roofstyle, Ground	
12	9103438	3	End Plate	
13	9103439	2	Cross-Connection	
14	9103442	2	End Bracket, EW 35	
15	9103447	1	Fuse Holder, 13/32" DIA	
16	9103448	1	Fuse, 15A, 250V, 13/32 x 1-1/2", Slo-blo	
17	9103740	1	Terminal Marker, WS 12/6, 5VDC	
18	9103741	1	Terminal Marker, WS 12/6, 28VDC	
19	9104270	2	Cross-connection, ZQV 4/3	

Figure C-8: 9103174A – Terminal Block Assembly, Apollo Release 2

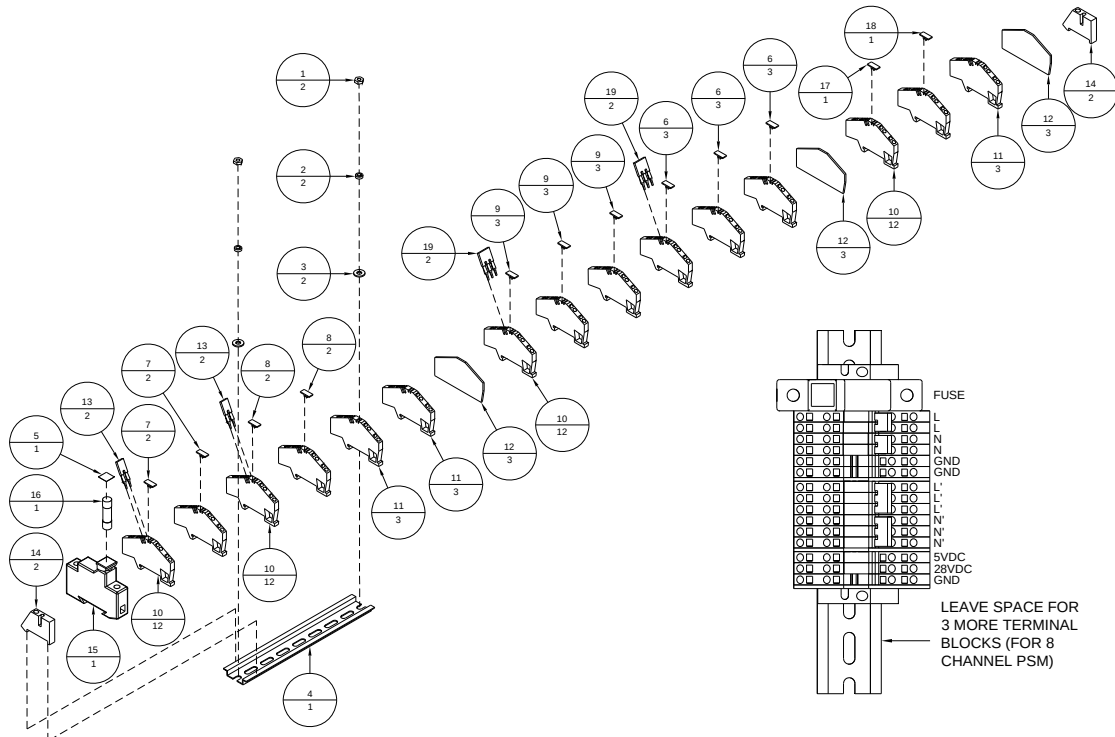


Table C-9: 9103175A – Terminal Block Assembly, Atlas/Aurora Release 2

Item	Part Number	Quantity	Description	Reference
1	420008	2	Nut, 10-32 UNF	
2	439009	2	Lockwasher, #10	
3	440008	2	Washer, #10 ID	
4	606000	3	Wire, #16, Black, 4" Lg.	
5	606002	1	Wire, #16, Blue, 4" Lg.	
6	606009	1	Wire, #16, White, 8" Lg.	
7	606009	1	Wire, #16, White, 4" Lg.	
8	606020	1	Wire, #18, Black, 6" Lg.	
9	606020	1	Wire, #18, Black, 16" Lg.	
10	606021	1	Wire, #16, Brown, 4" Lg.	
11	606026	1	Wire, #18, Blue, 16" Lg.	
12	606029	1	Wire, #18, White, 16" Lg.	
13	606032	1	Wire, #18, Brown, 16" Lg.	
14	609108	4	Terminal, Fork, #10, 22-18 AWG, Red	
15	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
16	610100	1	Relay, 120 VAC	
17	615004	1	Relay Base	
18	615021	1	T-Rail, DIN, 12" Lg.	
19	646007	2	Fuse, 5A, 250V, ¼ x 1-1/4", Time Delay	
20	9100096	1	Fuse, 10A, 250V, ¼ x 1-1/4", Time Delay	
21	9100286	1	Fuse, 2A, 250V, ¼ x 1-1/4", Time Delay	
22	9102046	1	Terminal Marker, WS 12/6, L1	
23	9102050	1	Terminal Marker, WS 12/6, L	
24	9102051	3	Terminal Marker, WS 12/6, N	
25	9102052	1	Terminal Marker, WS 12/6, 12VDC	
26	9102053	1	Terminal Marker, WS 12/6, 170VDC	
27	9102297	2	Terminal Marker, WS 12/6, L'	
28	9102299	1	Terminal Marker, WS 12/6, GND	
29	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
30	9102767	5	Terminal Marker, WS 12/6, 250V	
31	9102768	1	Terminal Marker, WS 12/6, T2A L	
32	9102769	1	Terminal Marker, WS 12/6, T3A L	
33	9102770	1	Terminal Marker, WS 12/6, T10A L	
34	9103433	1	Ferrule, #14 AWG, Blue	
35	9103435	14	Ferrule, #16 AWG, Red	
36	9103436	11	Terminal Block, ZDU 4-2/4AN	
37	9103437	2	Terminal Block, Z-Roofstyle, Ground	
38	9103438	2	End Plate	
39	9103439	2	Cross-Connection, ZQV 4/2	
40	9103440	5	Fuse Terminal, ZSI 2.5/2, ¼ x 1-1/4, 10A	
41	9103441	2	End Plate, Fuse Terminal	
42	9103442	2	End Bracket, EW 35	
43	9103445	1	Fuse, 3A, 250V, ¼ x 1-1/4", Time Delay	
44	9103539	4	Ferrule, #18 AWG, White	
45	9103724	1	Ferrule, Twin #18 AWG, White	
46	9104363	2	Terminal Marker, WS 12/6, T5A L	

Figure C-9: 9103175A – Terminal Block Assembly, Atlas/Aurora Release 2

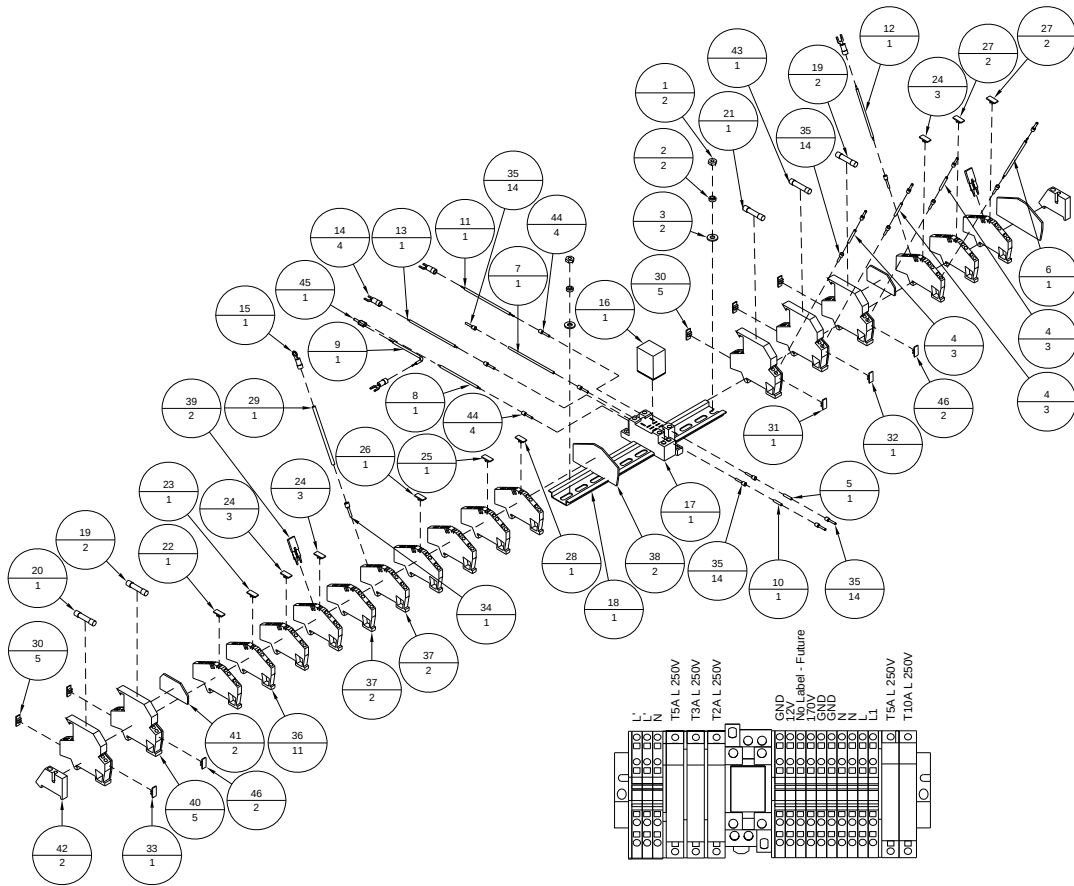


Table C-10: 9103412A – Faceplate Assembly, Atlas/Aurora PSM, Release 1

Item	Part Number	Quantity	Description	Reference
1	404020	2	Screw, FHCS, 10-32 UNF x 3/8"	
2	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
3	9102846	2	Handle, Pull, 1/4-20	
4	9103112	4	Screw, FHMS, 1/4-20 UNC x 1/2"	
5	9103183	1	Nameplate, Buskro Logo	
6	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
7	9103412	1	Faceplate, Power Supply	

Figure C-10: 9103412A – Faceplate Assembly, Atlas/Aurora PSM, Release 1

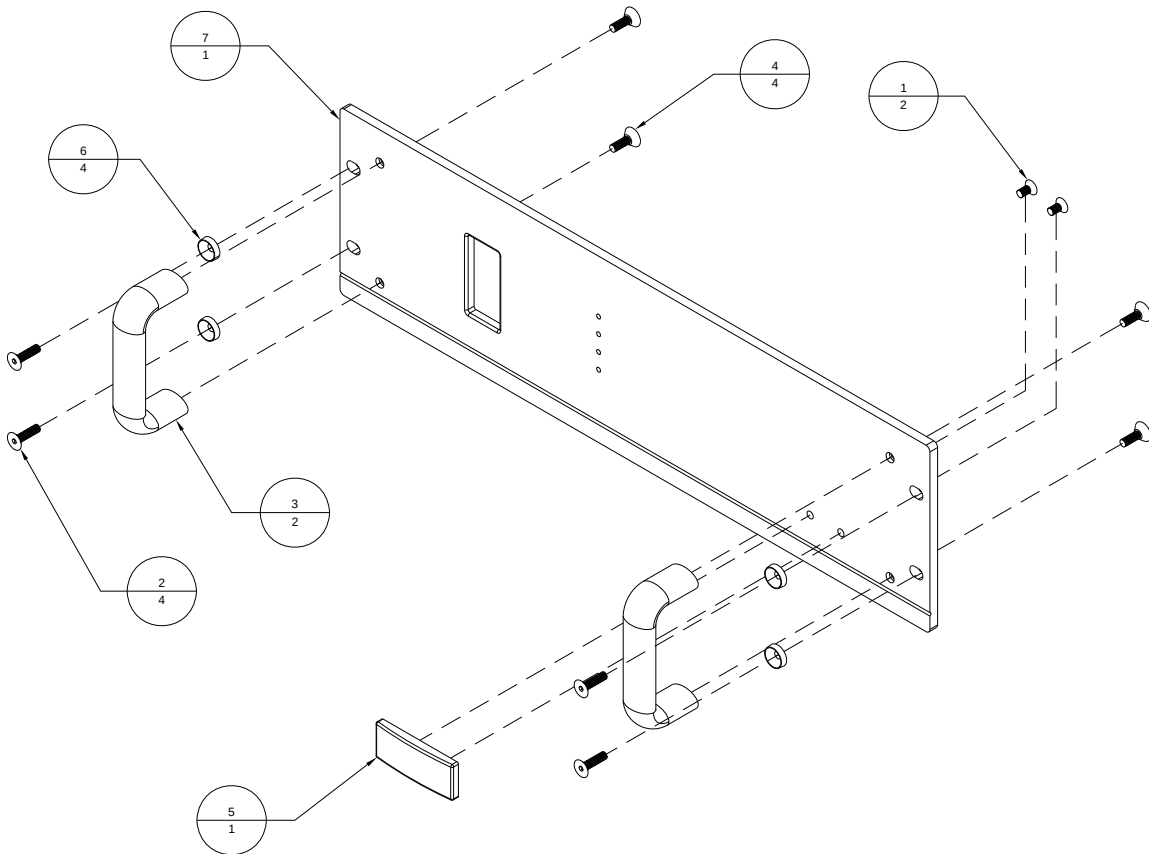


Table C-11: 9103413A – Faceplate Assembly, Power Supply, Apollo, Release 1

Item	Part Number	Quantity	Description	Reference
1	404020	2	Screw, FHCS, 10-32 UNF x 3/8"	
2	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
3	9102846	2	Handle, Pull, 1/4-20	
4	9103112	4	Screw, FHMS, 1/4-20 UNC x 1/2"	
5	9103183	1	Nameplate, Buskro Logo	
6	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
7	9103413	1	Faceplate, Power Supply, Apollo	

Figure C-11: 9103413A – Faceplate Assembly, Power Supply, Apollo, Release 1

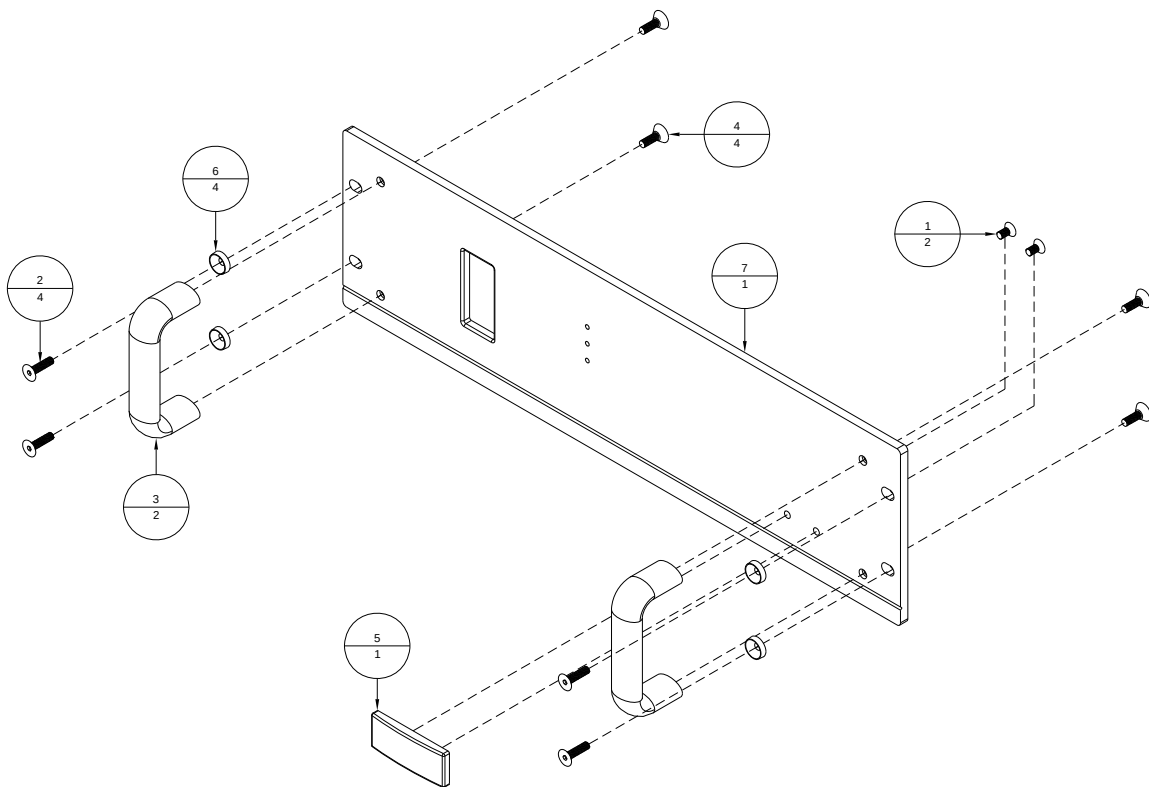


Table C-12: 9103416A – Subbracket Assembly, Atlas/Aurora, Release 1

Item	Part Number	Quantity	Description	Reference
1	402320	12	Screw, PHMS, 6-32 UNC x 3/8"	
2	403530	4	Screw, BHCS, 8-32 UNC x 1/2"	
3	420008	1	Nut, 10-32 UNF	
4	439009	1	Lockwasher, No. 10	
5	606000	2	Wire, #16, Black, 12" Lg.	
6	606001	1	Wire, #16, Red, 12" Lg.	
7	606002	1	Wire, #16, Blue, 12" Lg.	
8	606005	1	Wire, #16, Green, 12" Lg.	
9	606008	1	Wire, #14, White, 6" Lg.	
10	606008	1	Wire, #14, White, 12" Lg.	
11	606009	2	Wire, #16, White, 12" Lg.	
12	606010	1	Wire, #14, Black, 6" Lg.	
13	606010	3	Wire, #14, Black, 12" Lg.	
14	606021	1	Wire, #16, Brown, 12" Lg.	
15	609000	4	Shrink Wrap, 3/16" ID, 1" Lg.	
16	609111	5	Terminal, Ring, #10, 16-14 AWG, Blue	
17	614102	1	Receptacle, 17-3, Male	
18	614106	1	Receptacle, Female, 23-7	
19	614109	3	Pin, Power Contact	
20	614110	7	Socket, Power Contact	
21	614123	2	Contact, Female, 18-16 AWG, Blue	
22	9102681	4	Wire, #14, Green/Yellow, 6" Lg.	
23	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
24	9103160	1	Receptacle, 17-9, Reverse Sex	
25	9103416	1	Subbracket, Atlas/Aurora Power Supply	
26	9103433	17	Ferrule, #14 AWG, Blue	
27	9103567	2	Socket, Straight Blade, 15A/125VAC	

Figure C-12: 9103416A – Subbracket Assembly, Atlas/Aurora, Release 1

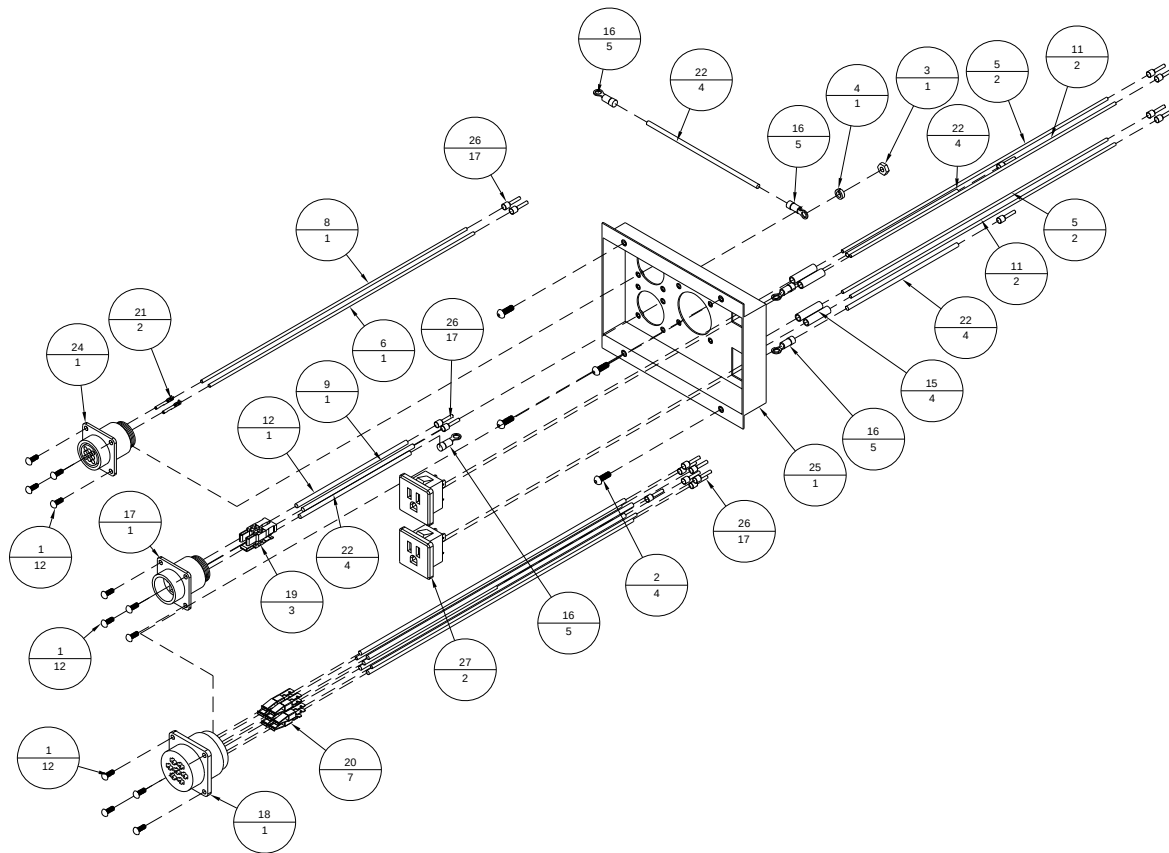


Table C-13: 9103417A – Power Supply Subbracket Assembly, Release 1

Item	Part Number	Quantity	Description	Reference
1	420007	4	Nut, 8-32 UNC	
2	420008	7	Nut, 10-32 UNF	
3	420010	1	Nut, 1/4-20 UNC	
4	439009	12	Lockwasher, No. 10	
5	439010	1	Lockwasher, 1/4" ID	
6	606037	1	Wire, #22, Black, 6" Lg.	
7	606044	1	Wire, #22, Red, 6" Lg.	
8	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
9	609120	1	Terminal, Ring, 1/4", 16-14 AWG, Non-ins.	
10	9101669	2	Shrink Wrap, 1/16" ID, 1" Lg.	
11	9102681	1	Wire, #14, Green/Yellow, 24" Lg.	
12	9102781	1	Fan, 12VDC, Flight II 120	
13	9102783	1	Fan, Finger Guard Metal, Flight II 120	
14	9103117	1	Board, 170V Power Supply	
15	9103171A	1	Terminal Block Assembly, Atlas/Aurora	Page C-7
16	9103198	4	Screw, SHCS, 8-32 UNC x 1-3/4"	
17	9103416A	1	Subbracket Assembly, Atlas/Aurora	Page C-15
18	9103417	1	Bracket, Atlas Power Supply	
19	9103433A	1	Power Supply Assembly, 12VDC	Page C-21
20	9103434	3	Ferrule, #14, Dual Wire, Blue	
21	9103514A	1	Transformer Assembly, Jetting Voltage	Page C-22

Figure C-13: 9103417A – Power Supply Subbracket Assembly

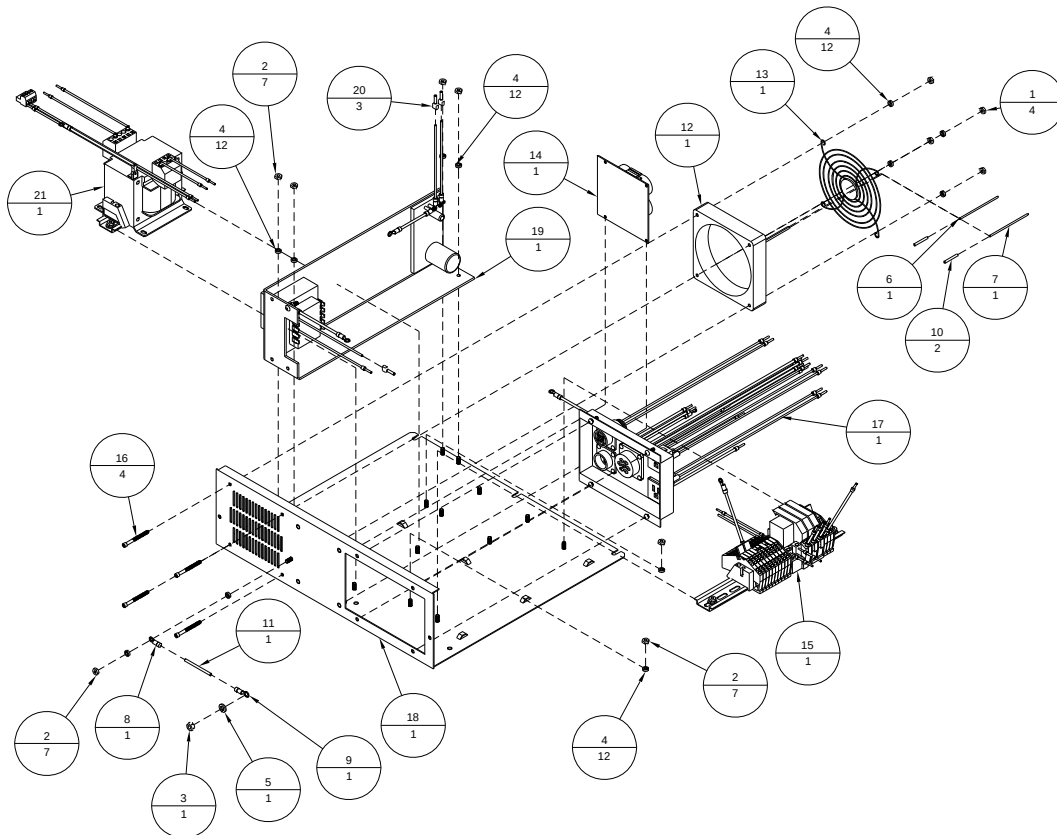


Table C-14: 9103418A – Power Supply Subbracket Assembly, Apollo, Release 1

Item	Part Number	Quantity	Description	Reference
1	420008	5	Nut, 10-32 UNF	
2	420010	1	Nut, 1/4-20 UNC	
3	439008	1	Lockwasher, No. 10, External Tooth	
4	439009	5	Lockwasher, No. 10	
5	439010	1	Lockwasher, 1/4" ID	
6	440008	2	Washer, No. 10 ID	
7	606008	1	Wire, #14, White, 18" Lg.	
8	606010	1	Wire, #14, Black, 2" Lg.	
9	609111	1	Terminal Ring, #10, 16-14 AWG, Blue	
10	609120	1	Terminal Ring, 1/4", 16-14 AWG, Non-Ins.	
11	9102681	1	Wire, #14, Green/Yellow, 24" Lg.	
12	9103173A	1	Terminal Block Assembly, Apollo	Page C-9
13	9103418	1	Bracket, Apollo Power Supply	
14	9103419A	1	Subbracket Assembly, Power Supply	Page C-19
15	9103433	4	Ferrule, #14 AWG, Blue	

Figure C-14: 9103418A – Power Supply Subbracket Assembly, Apollo

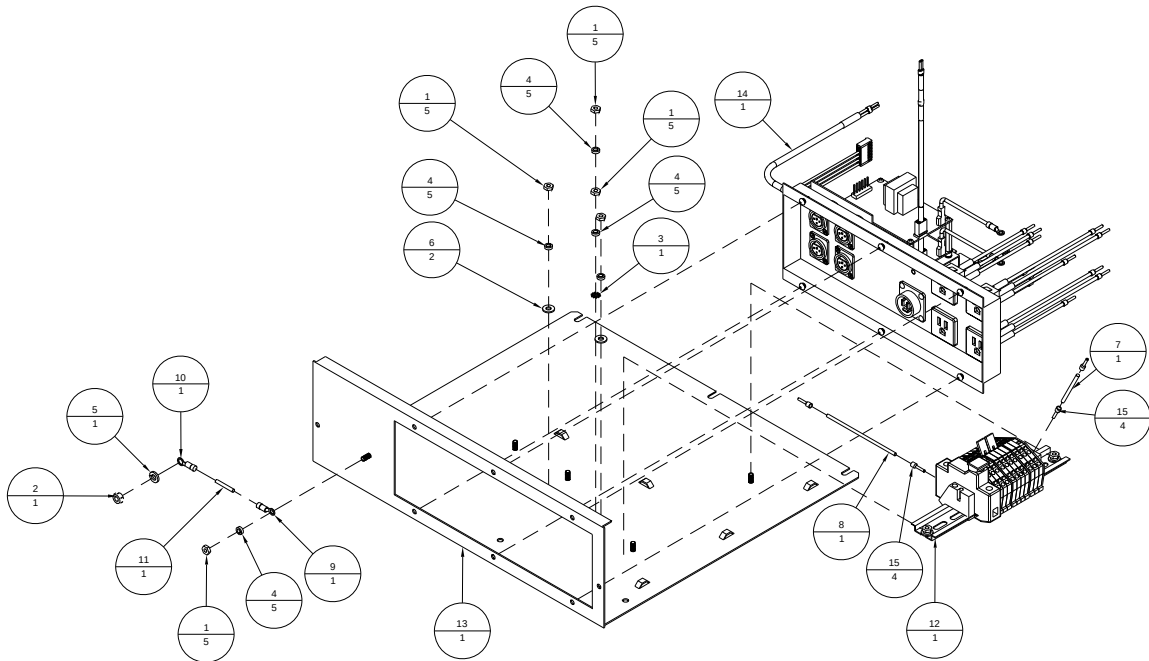


Table C-15: 9103419A – Subbracket Assembly, Apollo, Release 1

Item	Part Number	Quantity	Description	Reference
1	401010	8	Screw, FHCS, 4-40 UNC x 1/4"	
2	402310	4	Screw, PHMS, 6-32 UNC x 1/4"	
3	402320	4	Screw, PHMS, 6-32 UNC x 3/8"	
4	403520	6	Screw, BHCS, 8-32 UNC x 3/8"	
5	420008	1	Nut, 10-32 UNF	
6	439008	1	Lockwasher, No. 10, External Tooth	
7	439009	1	Lockwasher, No. 10	
8	606008	1	Wire, #14, White, 9"	
9	606008	2	Wire, #14, White, 9"	
10	606008	2	Wire, #14, White, 9"	
11	606010	1	Wire, #14, Black, 9"	
12	606010	2	Wire, #14, Black, 9"	
13	606010	2	Wire, #14, Black, 9"	
14	609000	12	Shrink Wrap, 3/16" ID, 1" Lg.	
15	609110	2	Connector, Push-on, 16-14 AWG, Blue	
16	609111	5	Terminal Ring, #10, 16-14 AWG, Blue	
17	614102	1	Receptacle, 17-3, Male	
18	614109	3	Pin, Power Contact	
19	9102362	4	Hex Spacer, 6-32 UNC x 3/4"	
20	9102418	1	Power Supply, Switching, 5.1VDC, 8A	
21	9102419	1	Power Supply, Switching, 28V/1.8A	
22	9102580A	2	Cable, 5VDC, 28VDC Power Input	
23	9102681	2	Wire, #14, Green/Yellow, 6"	
24	9102681	4	Wire, #14, Green/Yellow, 9"	
25	9102681	2	Wire, #14, Green/Yellow, 7"	
26	9103419	1	Subbracket, Apollo Power Supply	
27	9103420	1	Board, 5VDC/28VDC Power Supply	
28	9103433	14	Ferrule, #14 AWG, Blue	
29	9103567	4	Socket, Straight Blade, 15A/125VAC	
30	9103638A	1	Cable, Apollo Power Supply	

Figure C-15: 9103419A – Subbracket Assembly, Apollo, Release 1

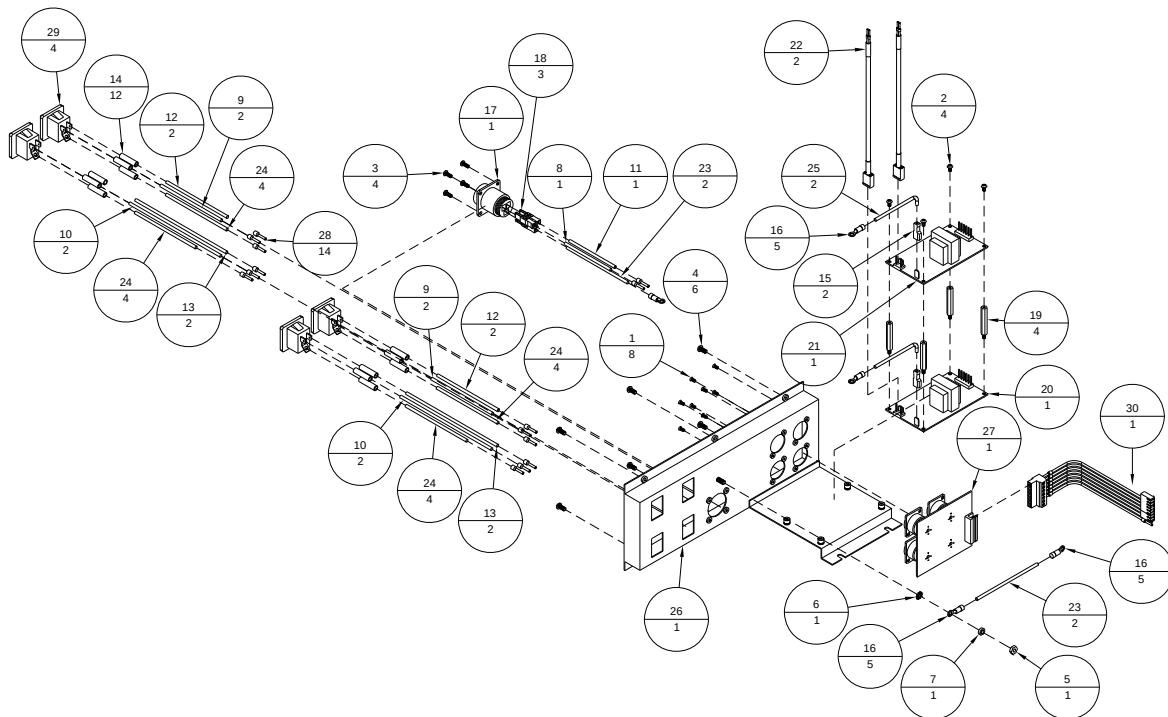


Table C-16: 9103433A – Power Supply Assembly, 12VDC, Release 1

Item	Part Number	Quantity	Description	Reference
1	404550	1	Screw, BHCS, 10-32 UNF x ¾"	
2	420008	1	Nut, 10-32 UNF	
3	439009	1	Lockwasher, No. 10	
4	606000	1	Wire, #16, Black, 14" Lg.	
5	606002	1	Wire, #16, Blue, 14" Lg.	
6	606009	1	Wire, #16, White, 14" Lg.	
7	606021	1	Wire, #16, Brown, 14" Lg.	
8	609114	6	Terminal Ring, #10, 12-10 AWG, Non-ins.	
9	9101209	1	Power Supply, 12VDC, 10.2A	
10	9102681	1	Wire, #14, Green/Yellow, 12" Lg.	
11	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
12	9103433	1	Ferrule, #14 AWG, Blue	

Figure C-16: 91003433A – Power Supply Assembly, 12VDC, Release 1

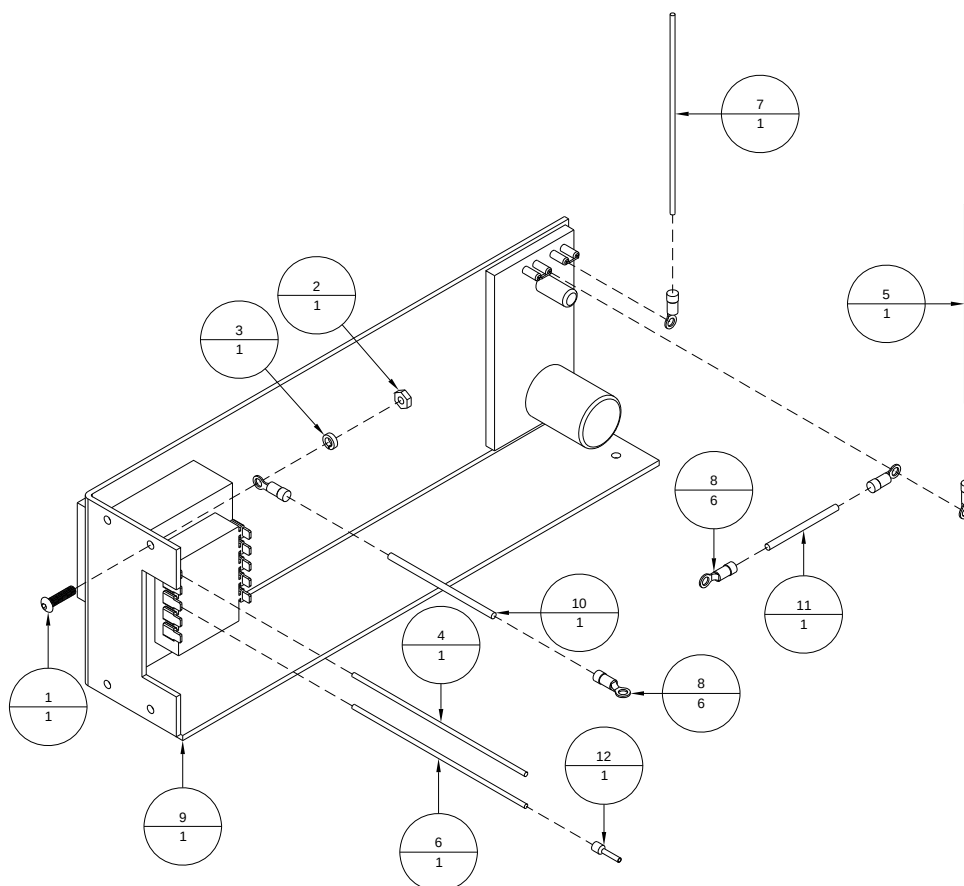


Table C-17: 9103514A – Transformer Assembly, Jetting Voltage, Release 1

Item	Part Number	Quantity	Description	Reference
1	420008	2	Nut, 10-32 UNF	
2	439009	2	Lockwasher, No. 10	
3	440008	2	Washer, #10 ID	
4	606000	1	Wire, #16, Black, 12" Lg.	
5	606001	1	Wire, #16, Red, 12" Lg.	
6	606005	1	Wire, #16, Green, 12" Lg.	
7	606009	1	Wire, #16, White, 12" Lg.	
8	606020	2	Wire, #18, Black, 6" Lg.	
9	609110	1	Connector, Push-on, 16-14 AWG, Blue	
10	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
11	615021	1	T-Rail, DIN, 5.6" Lg.	
12	615066	1	Connector, Female, 4-Pin, BLA4	
13	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
14	9103435	8	Ferrule, #16 AWG, Red	
15	9103442	2	End Bracket, EW 35	
16	9103514	1	Transformer, 120 x 90/100/110/120 VAC	
17	9103539	4	Ferrule, #18 AWG, White	

Figure C-17: 9103514A – Transformer Assembly, Jetting Voltage, Release 1

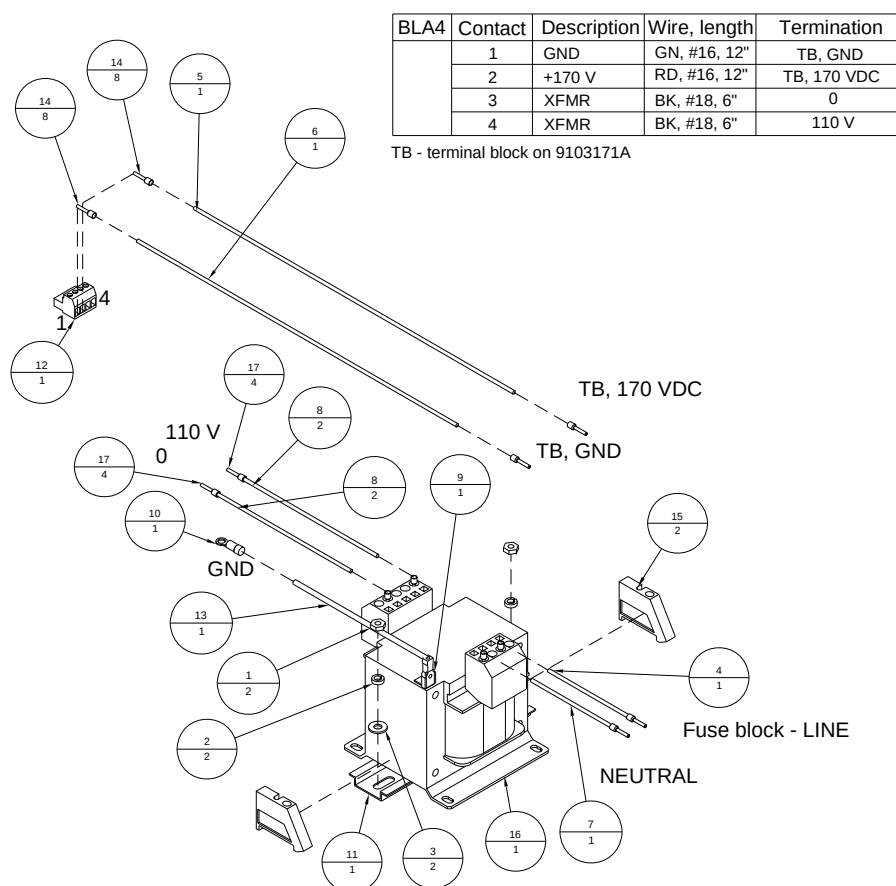


Table C-18: 9103539A – Transformer Assembly, Jetting Voltage, Release 2

Item	Part Number	Quantity	Description	Reference
1	420008	4	Nut, 10-32 UNF	
2	439009	4	Lockwasher, #10	
3	440008	4	Washer, #10 ID	
4	606000	1	Wire, #16, Black, 12" Lg.	
5	606001	1	Wire, #16, Red, 12" Lg.	
6	606005	1	Wire, #16, Green, 12" Lg.	
7	606009	1	Wire, #16, White, 12" Lg.	
8	606020	2	Wire, #18, Black, 6" Lg.	
9	609110	1	Connector, Push-on, 16-14 AWG, Blue	
10	609111	1	Terminal, Ring, #10, 16-14 AWG, Blue	
11	615066	1	Connector, Female, 4-Pin, BLA4	
12	9102681	1	Wire, #14, Green/Yellow, 6" Lg.	
13	9103435	8	Ferrule, #16 AWG, Red	
14	9103514	1	Transformer, 120 x 90/100/110/120 VAC	
15	9103539	4	Ferrule, #18 AWG, White	

Figure C-18: 9103539A – Transformer Assembly, Jetting Voltage, Release 2

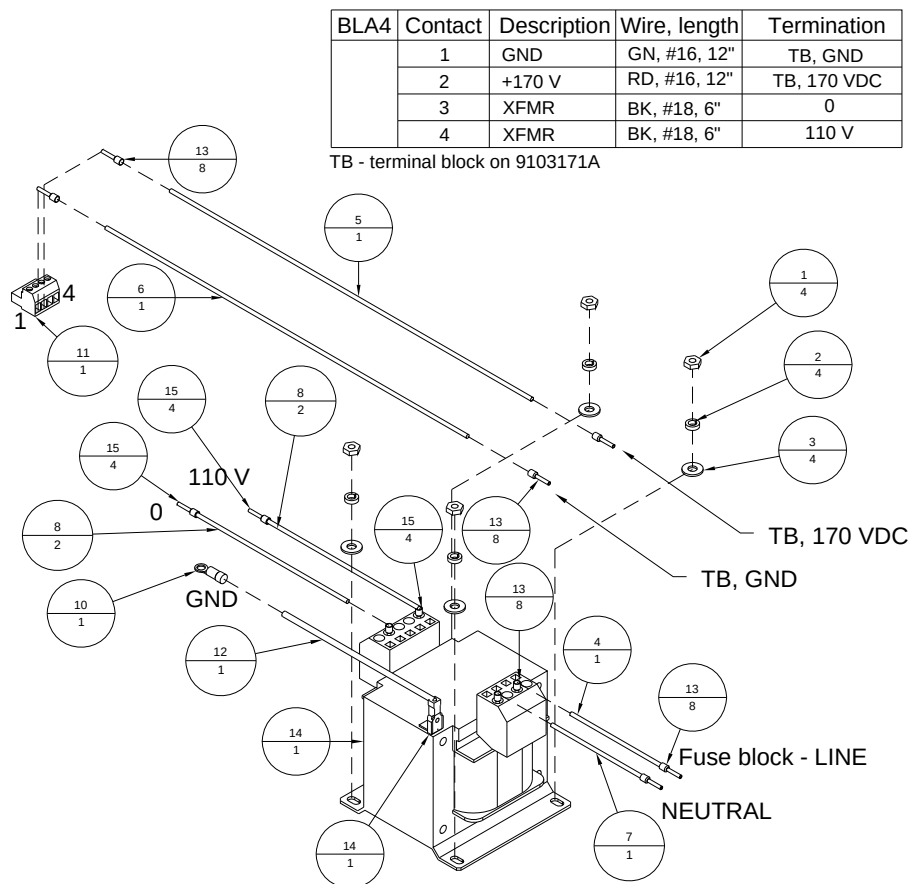


Table C-19: 9104164A – Chassis Assembly, Apollo PSM, 4-Channel, Release 2

Item	Part Number	Quantity	Description	Reference
1	401010	18	Screw, FHCS, 4-40 UNC x 1/4"	
2	402310	8	Screw, PHMS, 6-32 UNC x 1/4"	
3	404520	2	Screw, BHCS, 10-32 UNF x 3/8"	
4	420008	8	Nut, 10-32 UNF	
5	439008	1	Lockwasher, #10, External Tooth	
6	439009	7	Lockwasher, #10	
7	440530	8	Washer, #6, Nylon	
8	606008	1	Wire, #14, White, 12"	
9	606033	4	Cable, #14-3, SJOW-A, 8" Lg.	
10	606039	1	Cable, #14-2, Shielded, BK/RD, 14" Lg.	
11	606040	1	Cable, #14-2, SJOW, BK/WH, 14" Lg.	
12	609000	15	Shrink Wrap, 3/16" ID, 1" Lg.	
13	609110	4	Connector, Push-on, 16-14 AWG, Blue	
14	609111	3	Terminal Ring, #10, 16-14 AWG, Blue	
15	609113	3	Connector, Push-on, Yellow	
16	9102205	1	Switch, Breaker, 15A, 2 Pole, Green	
17	9102418	1	Power Supply, Switching, 5.1VDC, 8A	
18	9102419	1	Power Supply, Switching, 28V/1.8A	
19	9102580A	2	Cable, 5VDC, 28VDC Power Input	
20	9102681	1	Wire, #14, Green/Yellow, 7"	
21	9102681	1	Wire, #14, Green/Yellow, 11"	
22	9102681	1	Wire, #14, Green/Yellow, 20"	
23	9102681	1	Wire, #14, Green/Yellow, 8"	
24	9102862	1	Receptacle, Male, 250VAC/10A, IEC	
25	9103167	4	Receptacle, Female, 120 VAC, 15A, IEC	
26	9103174A	1	Terminal Block Assembly, Apollo PSM	Page C-10
27	9103176A	1	Cable, Power Supply Display Board	
28	9103414	1	Board, Power Supply Display, Apollo	
29	9103420	1	Board, 5VDC/28VDC Power Supply	
30	9103433	17	Ferrule, #14 AWG, Blue	
31	9103445	1	Fuse, 3A, 250V, 1/4 x 1-1/4", Time Delay	
32	9103638A	1	Cable, Apollo Power Supply	
33	9104133	1	Cover, PCM / PSM	
34	9104164	1	Chassis, Apollo Power Supply Module	
35	9104193A	1	Faceplate Assembly, Apollo PSM	Page C-27

Figure C-19: 9104164A – Chassis Assembly, Apollo PSM, 4-Channel, Release 2

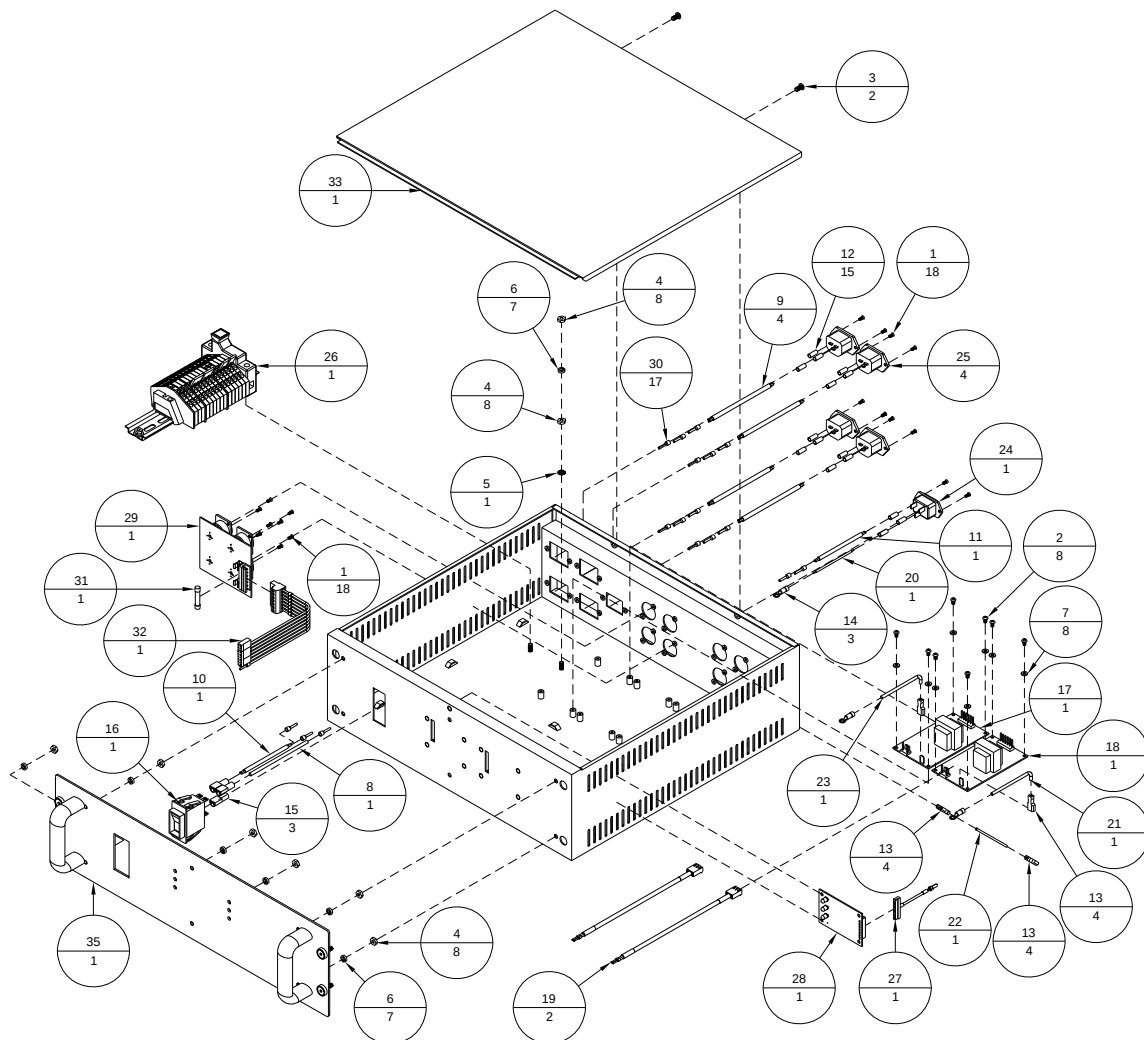


Table C-20: 9104192A – Faceplate Assembly, Atlas/Aurora PSM, Release 2

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
2	405530	4	Screw, BHCS, 1/4-20 UNC x 1/2"	
3	439010	4	Lockwasher, 1/4" ID	
4	9102846	2	Handle, Pull, 1/4-20	
5	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
6	9104192	1	Faceplate, Atlas/Aurora PSM	

Figure C-20: 9104192A – Faceplate Assembly, Atlas/Aurora PSM, Release 2

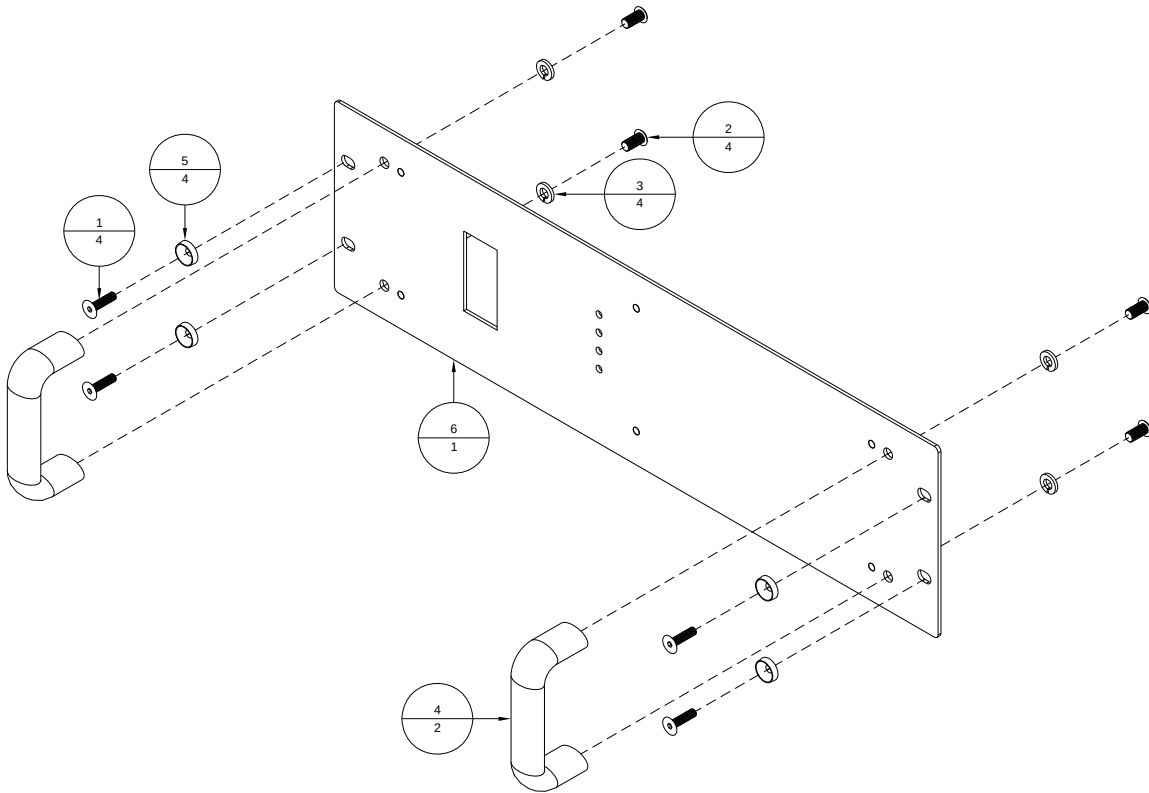
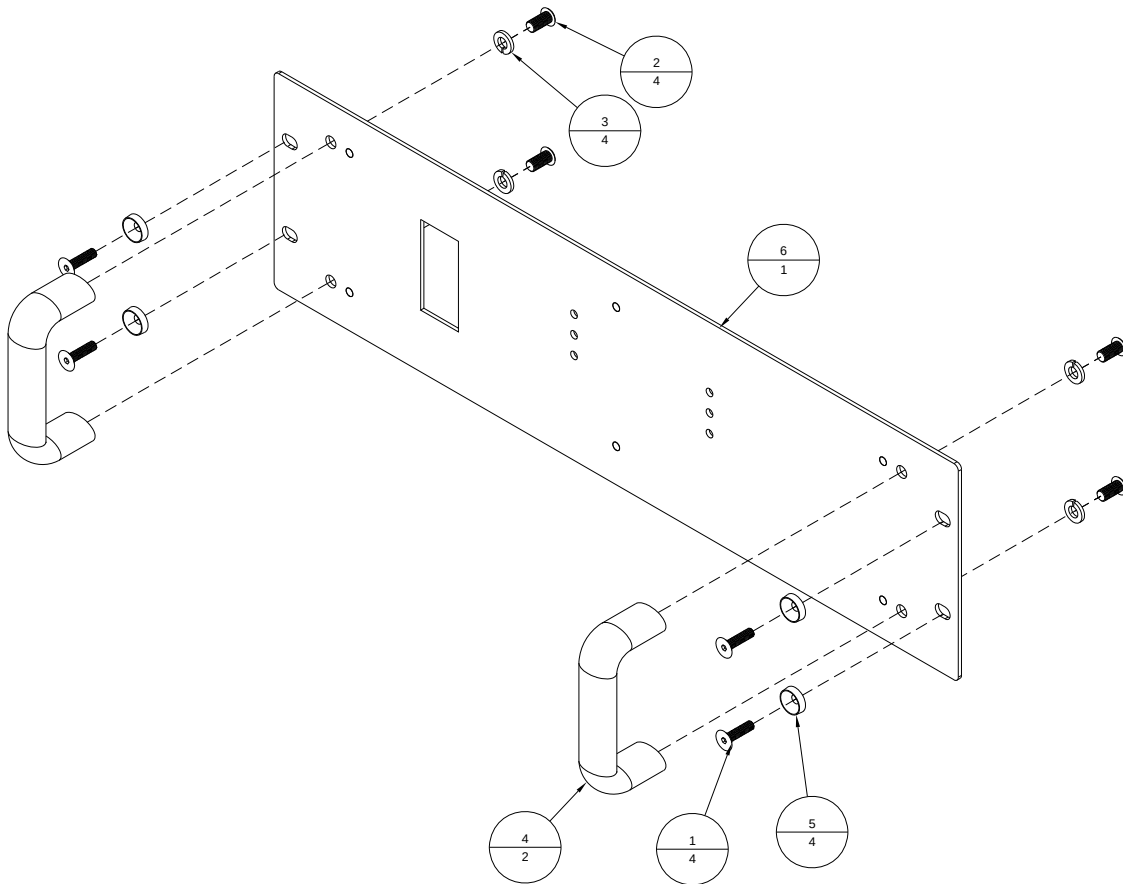


Table C-21: 9104193A – Faceplate Assembly, Apollo PSM, Release 2

Item	Part Number	Quantity	Description	Reference
1	404050	4	Screw, FHCS, 10-32 UNF x 3/4"	
2	405530	4	Screw, BHCS, 1/4-20 UNC x 1/2"	
3	439010	4	Lockwasher, 1/4" ID	
4	9102846	2	Handle, Pull, 1/4-20	
5	9103315	4	Washer, Cup, 10-32 UNF Flat Head	
6	9104193	1	Faceplate, Apollo PSM	

Figure C-21: 9104193A – Faceplate Assembly, Apollo PSM, Release 2



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Figure D-1: *BK-1700-FRM-C – Wiring Diagram, BK1700 / 1710 / 1720*

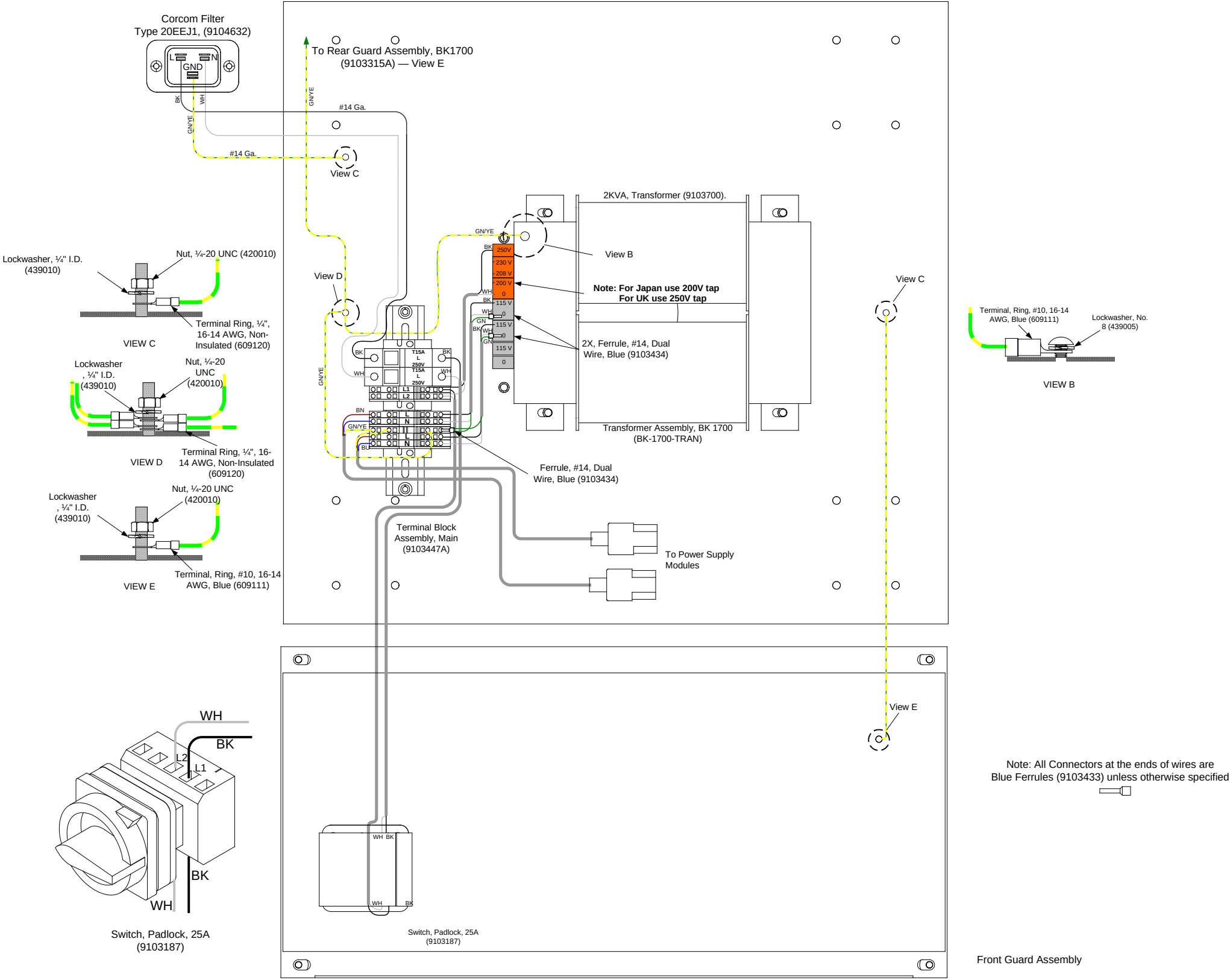


Figure D-2: BK-PSM-4A-C – Wiring, Atlas/Aurora PSM, Release 2, Page 1/2

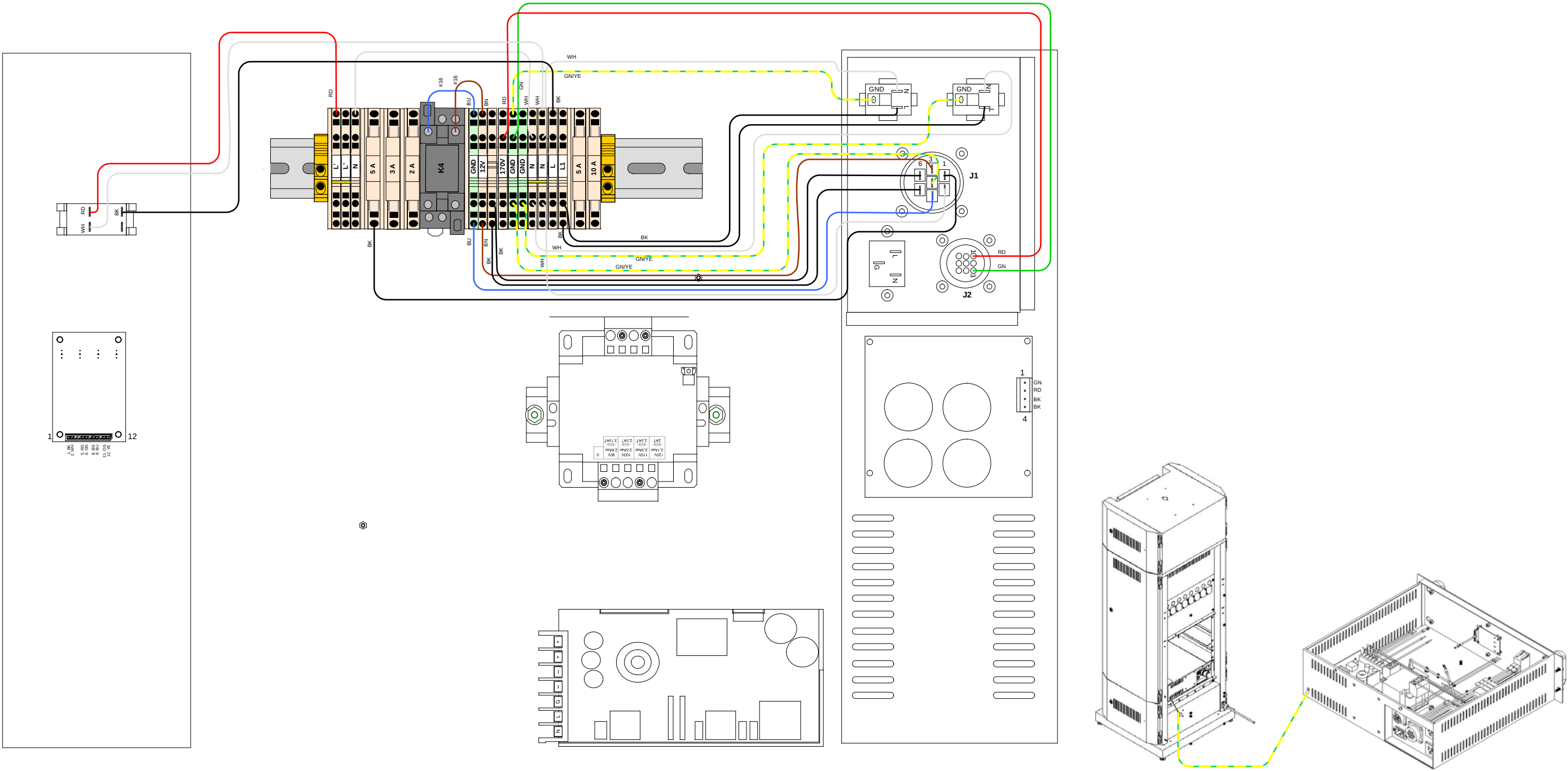


Figure D-3: BK-PSM-4A-C – Wiring, Atlas/Aurora PSM, Release 2, Page 2/2

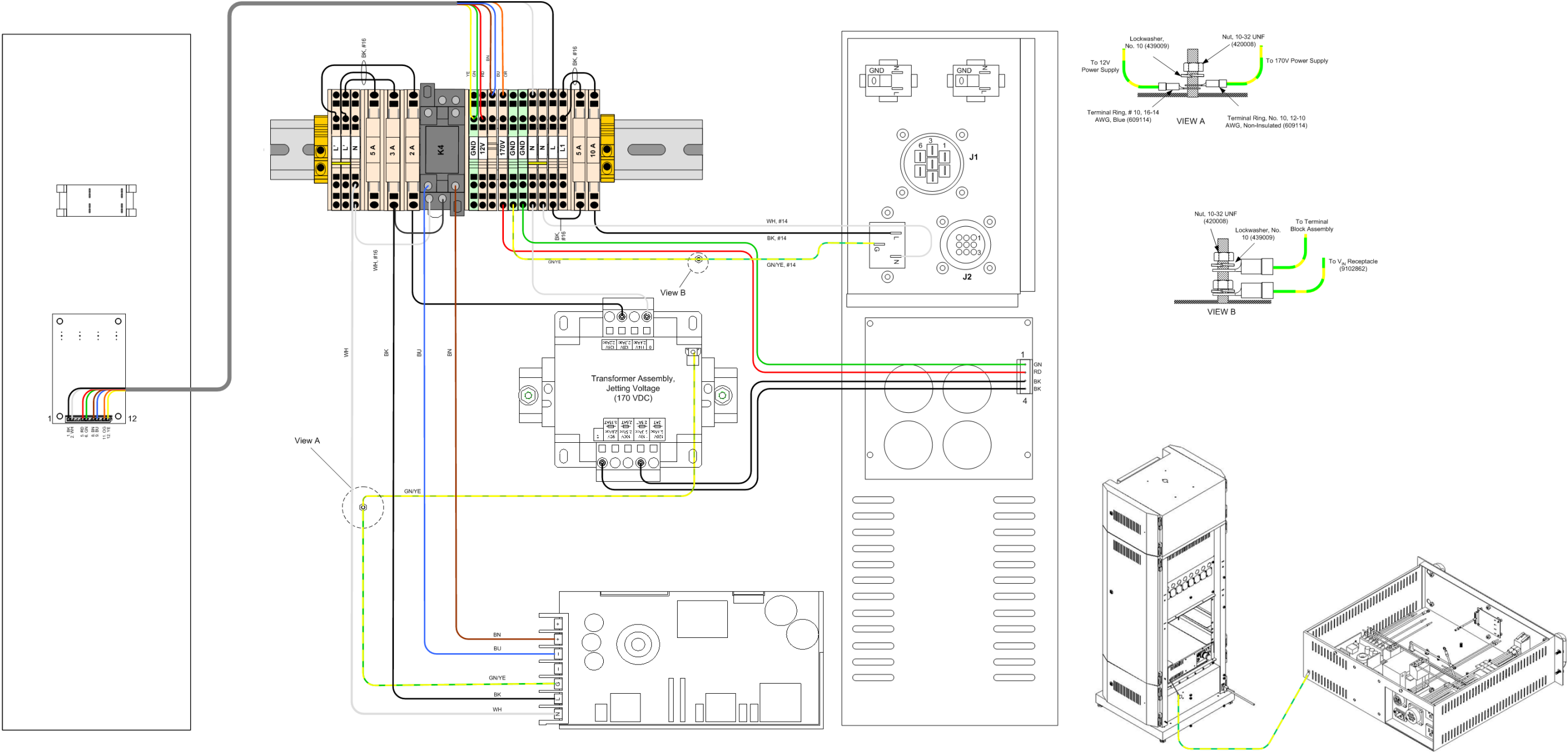


Figure D-4: BK-PSM-4A-C – Wiring, Atlas/Aurora PSM, Release 1

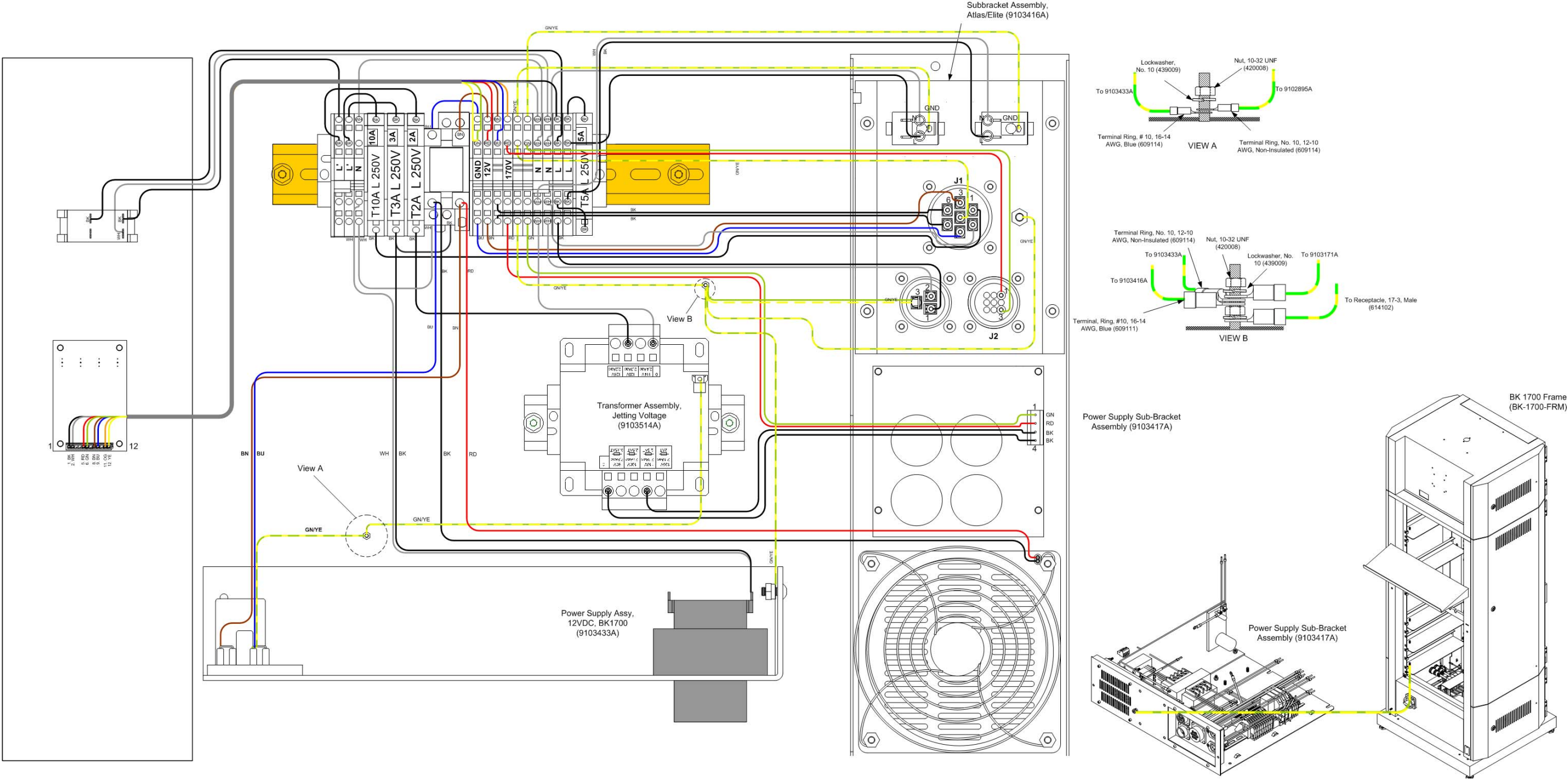


Figure D-5: *BK-PSM-4H-C – Wiring, Apollo Power Supply, Release 2, Page 1/2*

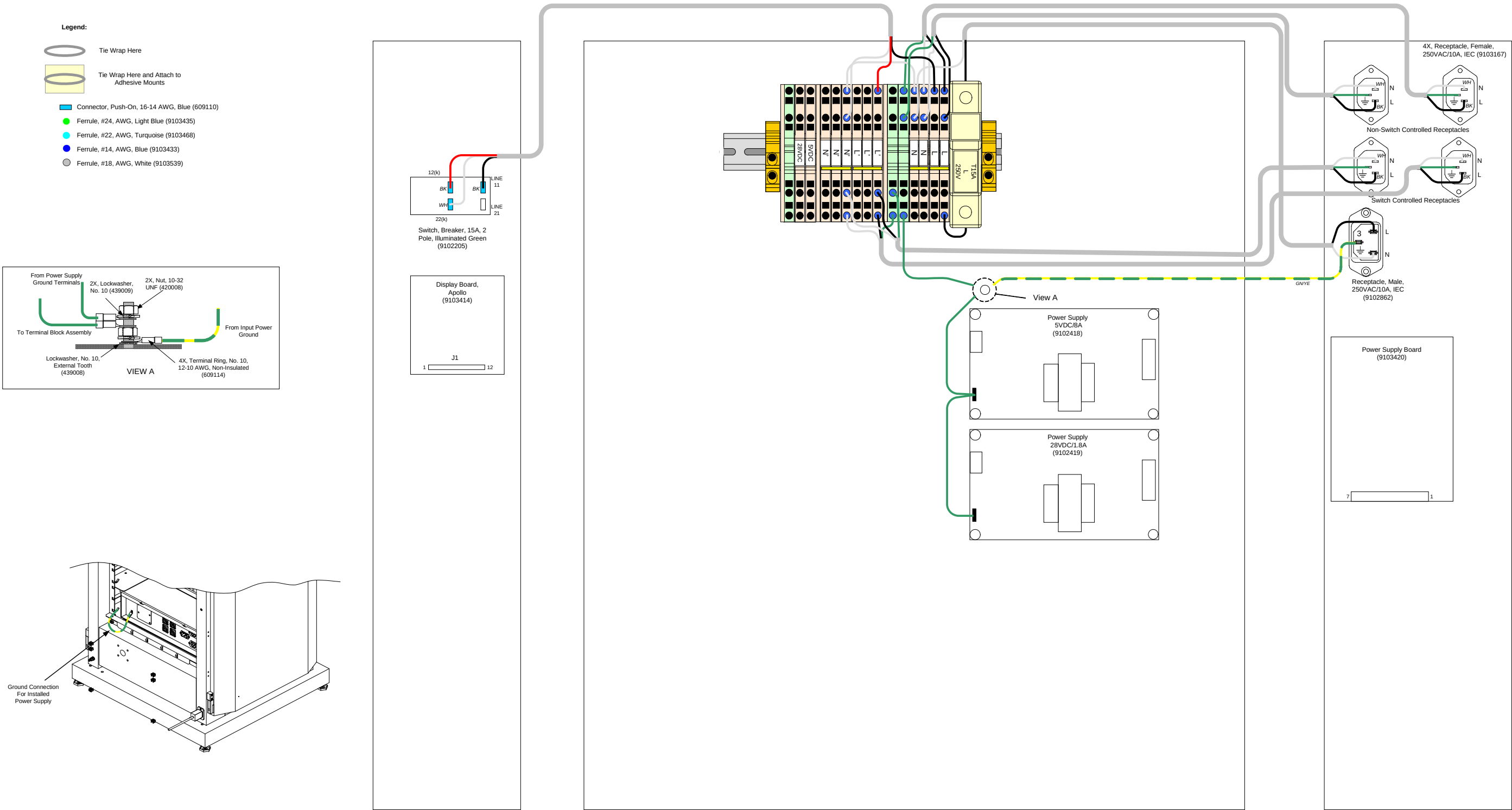


Figure D-6: BK-PSM-4H-C – Wiring, Apollo Power Supply, Release 2, Page 2/2

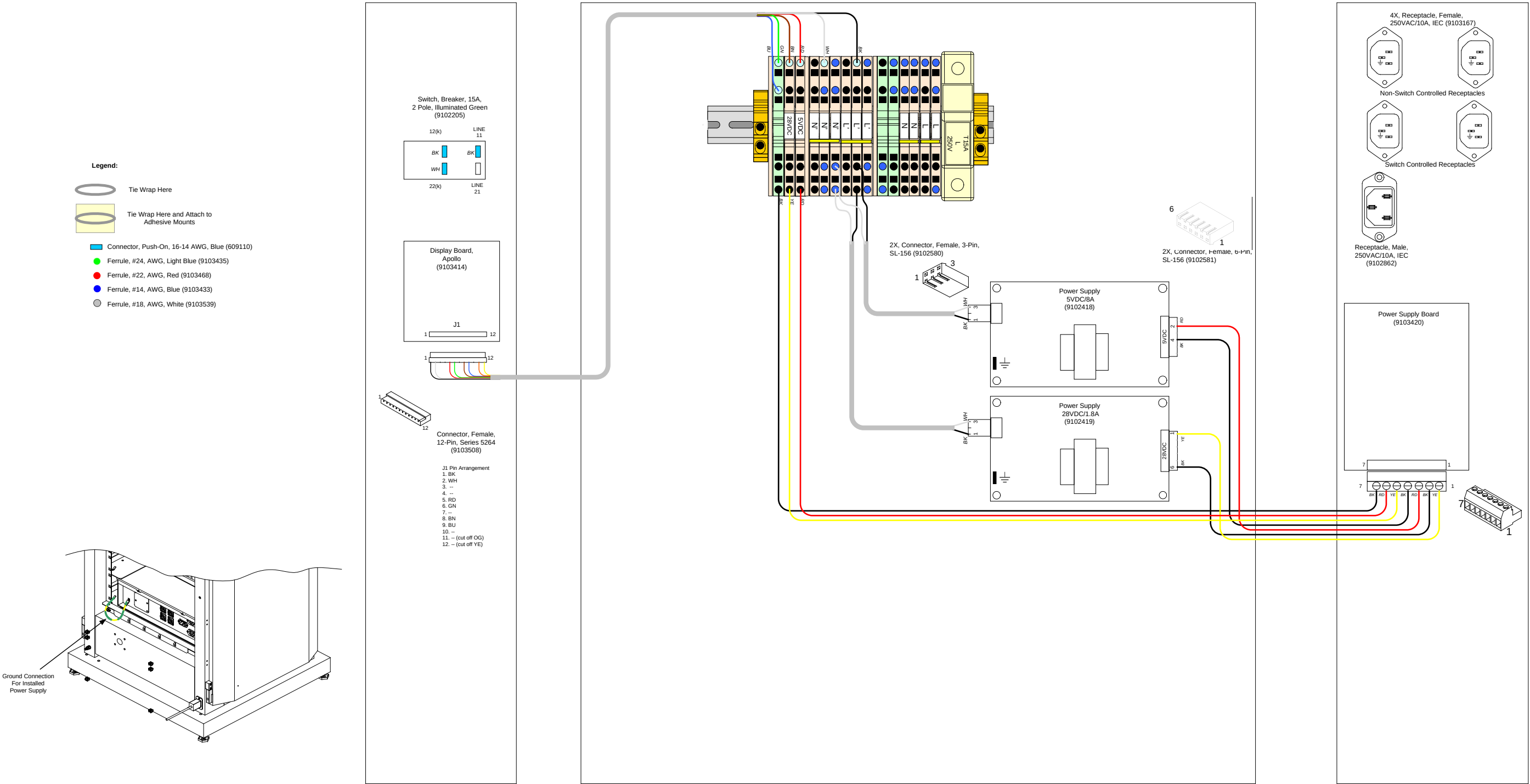


Figure D-8: *BK-PSM-8H-C – Wiring, Apollo Power Supply, Page 1/2*

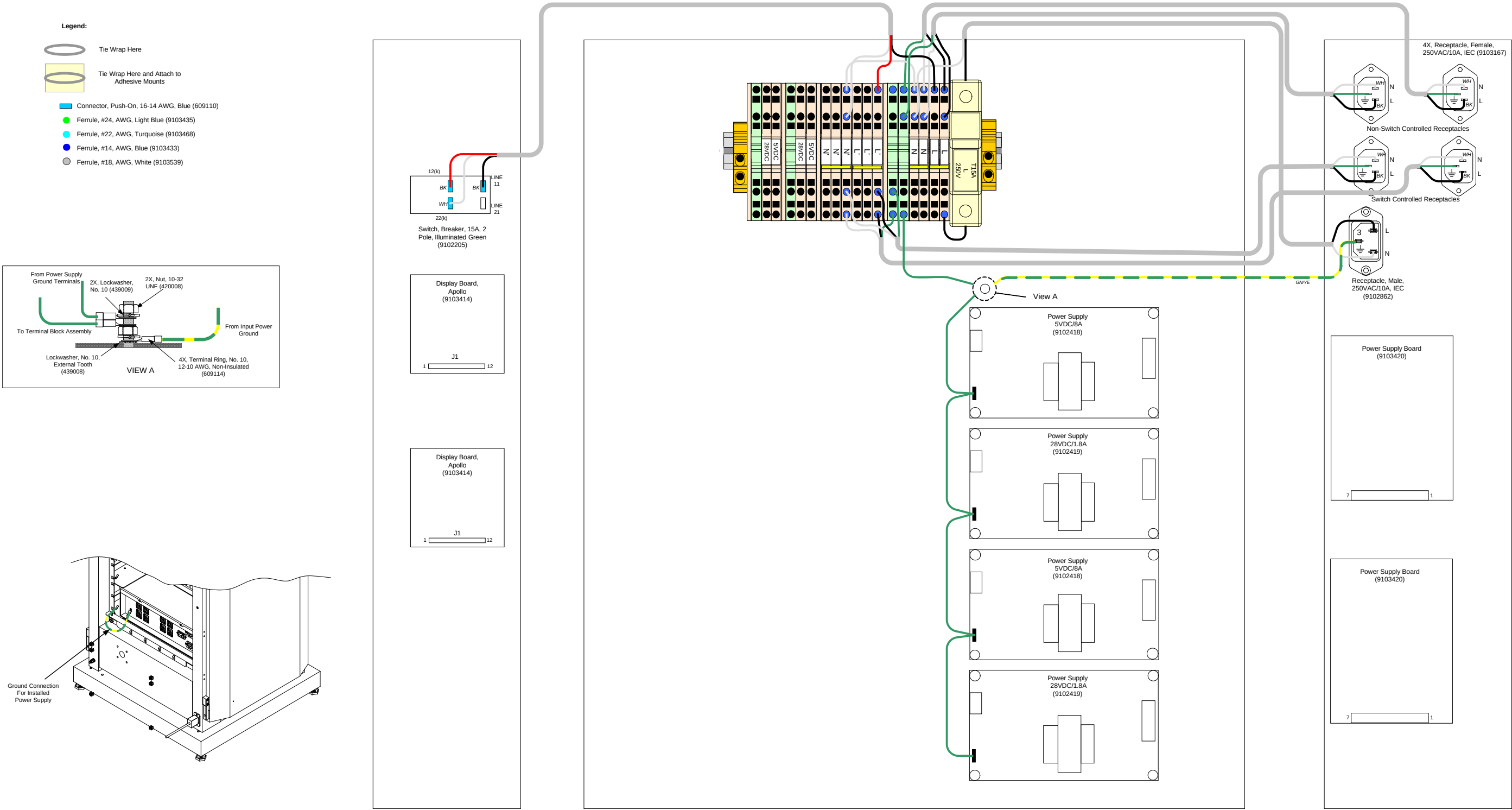
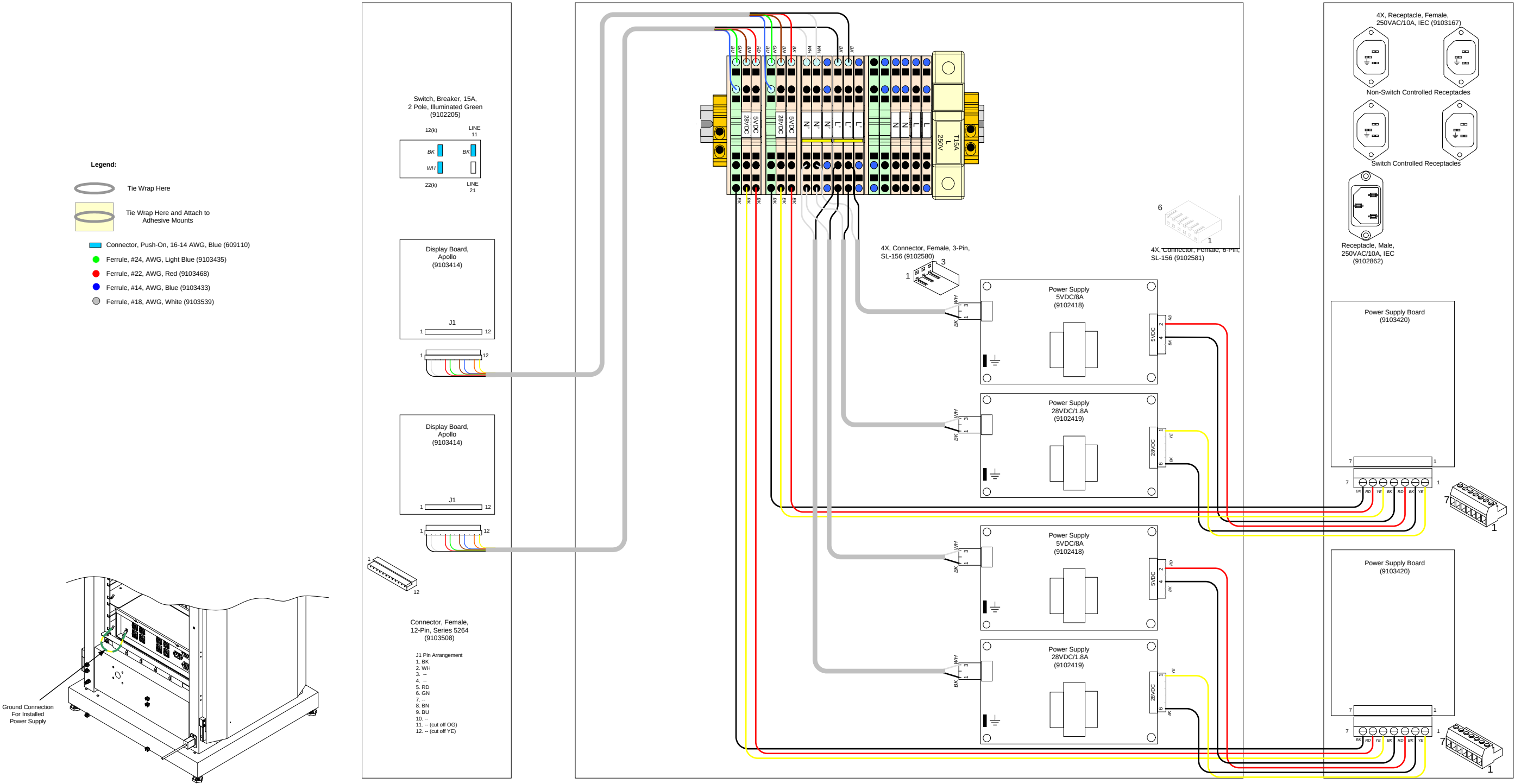


Figure D-9: BK-PSM-8H-C – Wiring, Apollo Power Supply, Page 2/2



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E.1 Introduction

The Field Connection Board (FCB) shown in Figure E-1 is used to interconnect the field inputs and outputs in the inkjet system with the Base Interface Board, the Datapath card, and an optional Programmable Logic Controller. The inkjet system architecture is illustrated in Figure E-2..

Figure E-1: *Field Connection Board*

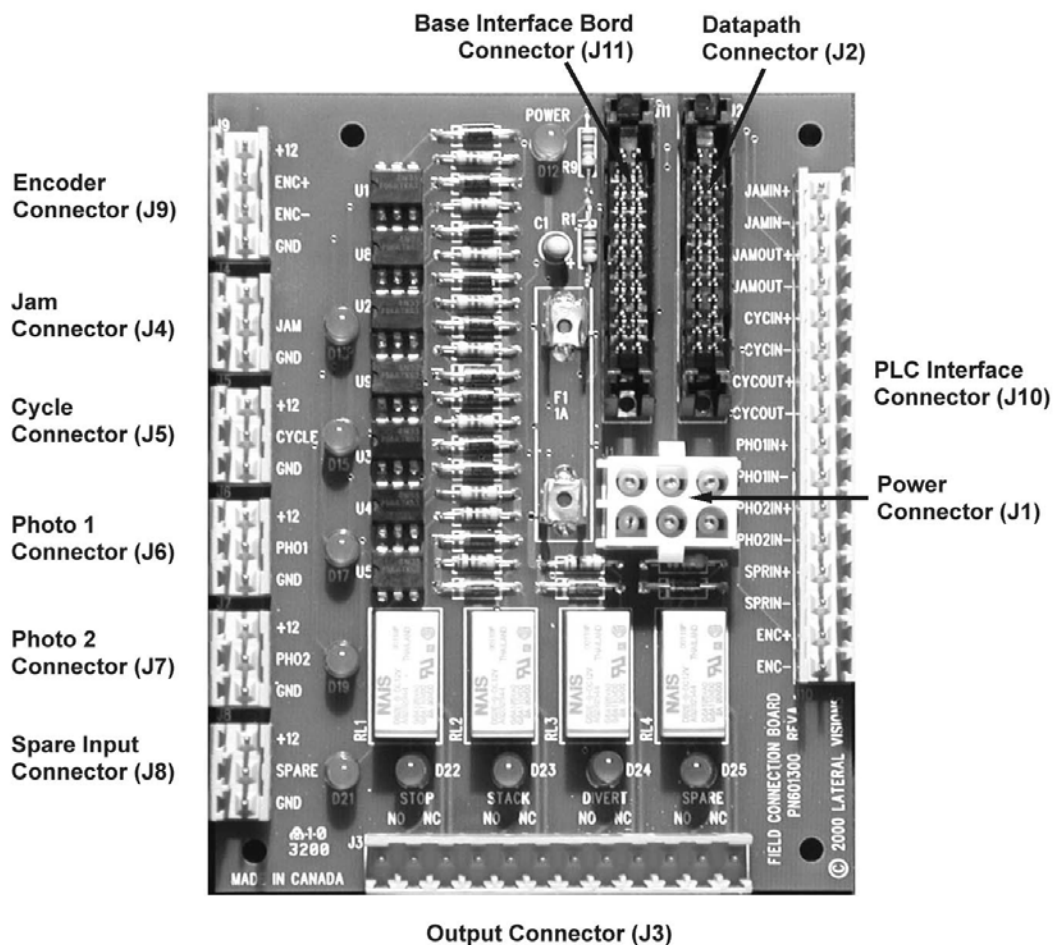
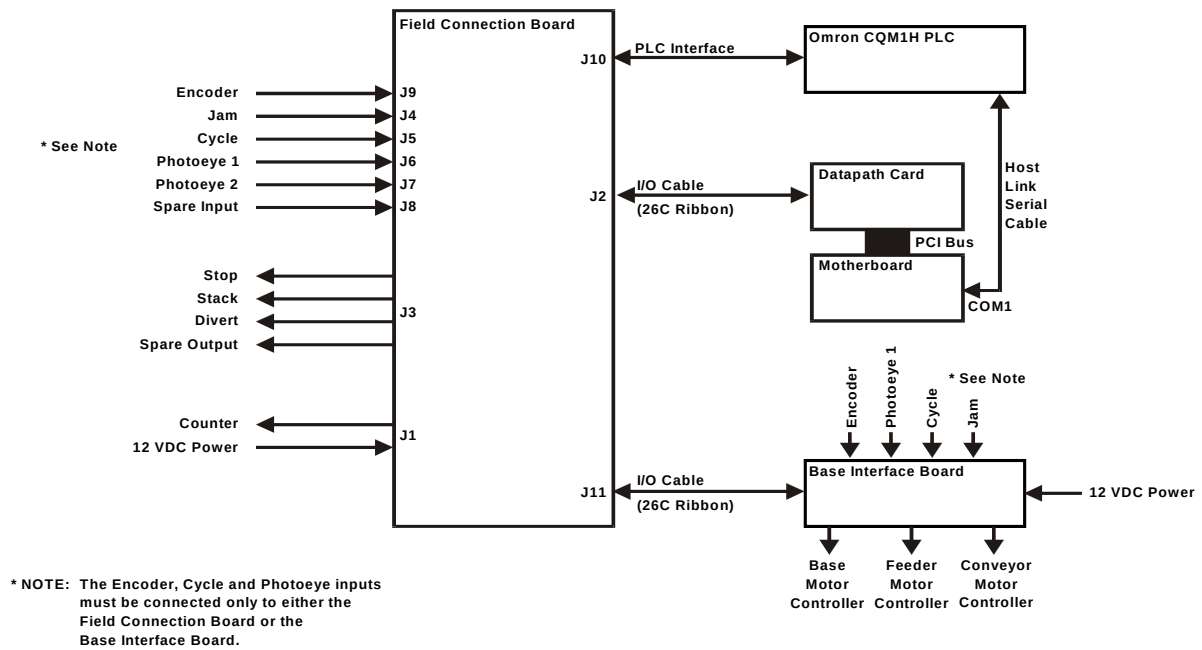


Figure E-2: Inkjet Controller Field Connections



E.2 Field Connection Board Inputs & Outputs

The FCB provides connection points to the inputs of the controller. The inputs can be used by the customer to process signals from external equipment. The inputs are as follows:

Encoder	Provides the transport position and is used to synchronize the jetting process.
Jam	Indicates a material jam condition.
Cycle	Indicates the beginning of a feed cycle.
Photocue 1	Used to detect the material and register the print location.
Photocue 2	Currently not used.
Spare Input	Currently not used.

The FCB provides connection points to the outputs of the controller. The outputs can be used by the customer to control external equipment and include the following:

Stop	Provides a momentary output (0.25 s) indicating that the transport has been commanded to stop by the controller.
Stack	Provides an output to indicate that a stack should be performed on the current cycle. A stack represents a bundle of mail to a post office defined delivery area. The stack function is configured with the inkjet software.
Divert	Provides an output to indicate that a divert should be performed on the current cycle. The divert function is used to divert the stack bundles which fall below a post office defined minimum size. The divert function is configured with the inkjet software.
Spare	Currently not used.

The FCB provides an interface to a Programmable Logic Controller (PLC). The PLC is used in applications where the control of an inserter or similar device is required. The interface provides the ability to receive the field inputs from or send the field inputs to the PLC. The signals of the PLC interface are optically isolated so that the PLC may operate on a different voltage than the Inkjet Controller. The signals provided by the PLC interface include the following:

Encoder	Encoder signal received by the FCB or Base Interface Board, and sent to the PLC. Note that the encoder signal is not optically isolated to allow for high-speed operation.
Jam In	PLC generated jam signal sent to the inkjet controller.
Jam Out	Jam signal received by the FCB or Base Interface Board, and sent to the PLC.
Cycle In	PLC generated <i>Machine Cycle</i> signal sent to the inkjet controller.
Cycle Out	<i>Machine Cycle</i> signal received by the FCB or Base Interface Board, and sent to the PLC.
Photo 1 In	PLC generated <i>Material Detected</i> signal sent to the inkjet controller.

Photo 2 In	PLC generated <i>Photoeye 2</i> signal sent to the inkjet controller. Currently not used.
Spare In	PLC generated spare input signal sent to the inkjet controller. Currently not used.

E.3 Connector Pin Assignments

This section provides the pin assignments for each of the FCB connectors. The connector locations are shown in Figure E-1.

E.3.1 J1 - Power Connector

The Power Connector is a 6-pin male Mate-N-Lock connector. The connector provides 12 Volt DC power to the board. The connector also provides the counter output signal from the board.

Table E-1: *Power Connector (J1)*

Signal	Pin	Description
+12V	1	12 Volt Supply
Count	2	Counter Output (Pulled up to 12V)
NC	3	Not connected
GND	4	Ground
GND	5	Ground
NC	6	Not connected

E.3.2 J2 – Datapath Connector

The Datapath Connector is a 26-pin male header connector. The connector is used to connect the FCB to the Datapath Card through a 26-conductor ribbon cable.

Table E-2: *Datapath Connector (J2)*

Signal	Pin	Description
GND	1	Ground
NC	2	Not connected
NC	3	Not connected
NC	4	Not connected
NC	5	Not connected
CARDON	6	Indicates Datapath Card is powered
PHOTO2	7	Photocue 2 input
STOPBUT	8	Stop button input
CYCLE	9	Machine cycle input
JAM	10	Jam input
SPDO1	11	Spare Output 1
SPDO2	12	Spare Output 2
SPDO3	13	Spare Output 3
DIVERT	14	Divert Output
STACK	15	Stack Output
COUNT	16	Counter Output
STOP	17	Stop Output
GND	18	Ground
ENC+	19	Encoder Positive Input
ENC-	20	Encoder Negative Input
GND	21	Ground
PHOTO1	22	Photocue 1 input
SPDI1	23	Spare Input 1
SPDI2	24	Spare Input 2
SPDI3	25	Spare Input 3
SPDI4	26	Spare Input 4

E.3.3 J3 - Output Connector

The Output connector is a 12-position Weidmüller header connector. The connector provides Stop, Stack, Divert, and 1 Spare output. The Output contacts are rated for 2 Amps at 30 VDC, or 0.6 Amps at 125 VAC.

Table E-3: *Output Connector (J3)*

Signal	Pin	Description
STOPNO	1	Stop (Normally Open) Output
STOPCOM	2	Stop (Common) Output
STOPNC	3	Stop (Normally Closed) Output
STACKNO	4	Stack (Normally Open) Output
STACKCOM	5	Stack (Common) Output
STACKNC	6	Stack (Normally Closed) Output
DIVERTNO	7	Divert (Normally Open) Output
DIVERTCOM	8	Divert (Common) Output
DIVERTNC	9	Divert (Normally Closed) Output
SPARENO	10	Spare (Normally Open) Output
SPARECOM	11	Spare (Common) Output
SPARENC	12	Spare (Normally Closed) Output

E.3.4 J4 - Jam Connector

The Jam connector is a 3-position Weidmüller header connector. The connector is used to connect a *Jam* switch. Grounding the *Jam* input indicates a material jam condition.

Table E-4: *Jam Connector (J4)*

Signal	Pin	Description
NC	1	Not connected
JAM	2	Jam Input (Active Low)
GND	3	Ground

E.3.5 J5 - Cycle Connector

The Cycle connector is a 3-position Weidmüller header connector. The connector is used to connect a *Cycle* switch. The negative going edge of the cycle input is used to indicate the start of a machine feed.

Table E-5: *Cycle Connector (J5)*

Signal	Pin	Description
12V	1	12 VDC
CYCLE	2	Cycle Input
GND	3	Ground

E.3.6 J6 - Photo 1 Connector

The Photo 1 connector is a 3-position Weidmüller header connector. The connector is used to connect a material registration photo detector. Grounding the Photo input indicates that the detector is **not** blocked.

Table E-6: *Photo 1 Connector (J6)*

Signal	Pin	Description
12V	1	12 VDC
PHO1	2	Photocue Input 1
GND	3	Ground

E.3.7 J7 - Photo 2 Connector

The Photo 2 connector is a 3-position Weidmüller header connector. The connector is used to connect a material registration photo detector. Grounding the Photo input indicates that the detector is **not** blocked. This input is currently not used.

Table E-7: *Photo 2 Connector (J7)*

Signal	Pin	Description
12V	1	12 VDC
PHO2	2	Photocue Input 2
GND	3	Ground

E.3.8 J8 - Spare Input Connector

The Spare Input connector is a 3-position Weidmüller header connector. The connector is provided for future use.

Table E-8: *Spare Input Connector (J8)*

Signal	Pin	Description
12V	1	12 VDC
SPARE	2	Spare Input
GND	3	Ground

E.3.9 J9 - Encoder Connector

The Encoder connector is a 4-position Weidmüller header connector. The connector is used to connect the transport shaft encoder.

Table E-9: *Encoder Connector (J9)*

Signal	Pin	Description
12V	1	12 VDC
ENC+	2	Encoder Positive Input
ENC-	3	Encoder Negative Input
GND	4	Ground

E.3.10 J10 - PLC Interface Connector

The PLC interface connector is a 16-pin male header connector. The connector is used to connect the FCB to a Programmable Logic Controller used for Inserter control. The FCB provides optical isolation for the inputs and outputs to the PLC.

Table E-10: *PLC Interface Connector (J10)*

Signal	Pin	Description	Direction
ENC-	16	Encoder Negative (Not Isolated)	To or From PLC
ENC+	15	Encoder Positive (Not Isolated)	To or From PLC
SPRIN-	14	Spare Input Negative	From PLC
SPRIN+	13	Spare Input Positive	From PLC
PHO2IN-	12	Photocue 2 Output Negative	To PLC
PHO2IN+	11	Photocue 2 Output Positive	To PLC
PHO1IN-	10	Photocue 1 Output Negative	To PLC
PHO1IN+	9	Photocue 1 Output Positive	To PLC
CYCOUT-	8	Cycle Output Negative	To PLC
CYCOUT+	7	Cycle Output Positive	To PLC
CYCIN-	6	Cycle Input Negative	From PLC
CYCIN+	5	Cycle Input Positive	From PLC
JAMOUT-	4	Jam Output Negative	To PLC
JAMOUT+	3	Jam Output Positive	To PLC
JAMIN-	2	Jam Input Negative	From PLC
JAMIN+	1	Jam Input Positive	From PLC

E.3.11 J11 - Base Interface Board Connector

The Base Interface Board connector is a 26-pin male header connector. The connector is used to connect the FCB to the Base Interface Board through a 26-conductor ribbon cable.

Table E-11: *Base Interface Board Connector (J11)*

Signal	Pin	Description
GND	1	Ground
NC	2	Not Connected
NC	3	Not Connected
NC	4	Not Connected
NC	5	Not Connected
CARDON	6	Indicates Datapath Card is powered
PHOTO2	7	Photocue 2 Input
STOPBUT	8	Stop Button Input
CYCLE	9	Machine Cycle Input
JAM	10	Jam Input
SPDO1	11	Spare Output 1
SPDO2	12	Spare Output 2
SPDO3	13	Spare Output 3
DIVERT	14	Divert Output
STACK	15	Stack Output
COUNT	16	Counter Output
STOP	17	Stop Output
GND	18	Ground
ENC+	19	Encoder Positive Input
ENC-	20	Encoder Negative Input
GND	21	Ground
PHOTO1	22	Photocue 1 input
SPDI1	23	Spare Input 1
SPDI2	24	Spare Input 2
SPDI3	25	Spare Input 3
SPDI4	26	Spare Input 4

E.4 Output Drive Characteristics

The FCB provides connection points to the outputs of the inkjet controller. The outputs can be used by the customer to control external equipment. The outputs include the following:

Stop	Provides a momentary output (0.25 s) indicating that the transport has been commanded to stop by the controller.
Stack	Provides an output to indicate that a <i>stack</i> should be performed on the current cycle. A stack represents a bundle of mail to a post office defined delivery area. The stack function is configured with the Inkjet software.
Divert	Provides an output to indicate that a <i>divert</i> should be performed on the current cycle. The divert function is used to divert the stack bundles which fall below a post office defined minimum size. The divert function is configured with the Inkjet software.
Spare	Currently unused.

The output contacts are rated for 2 Amps @ 30 VDC, or 0.6 Amps @ 125 VDC/VAC.

Each output provides a *normally open* and a *normally closed* contact. The following diagrams detail each type of connection:

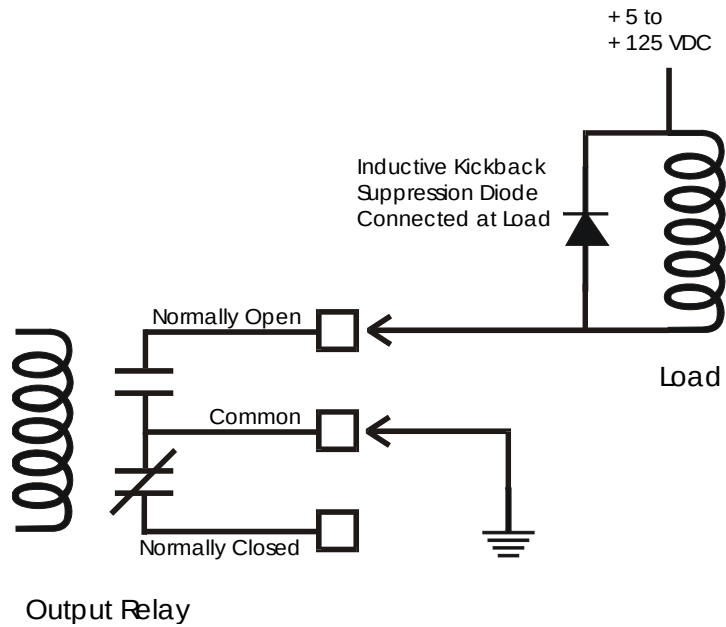
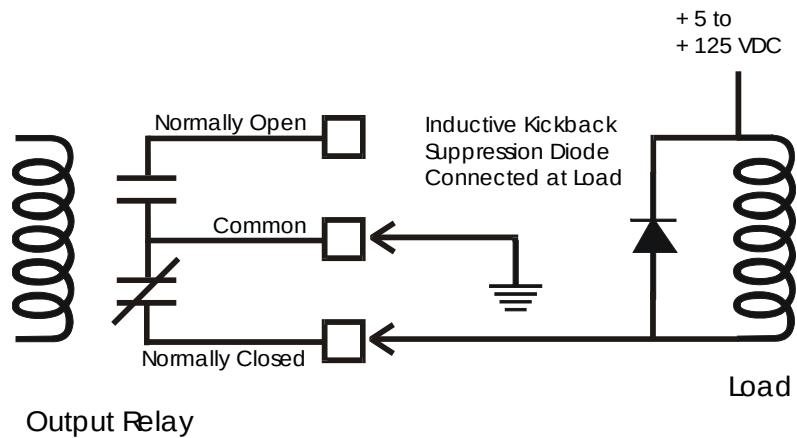
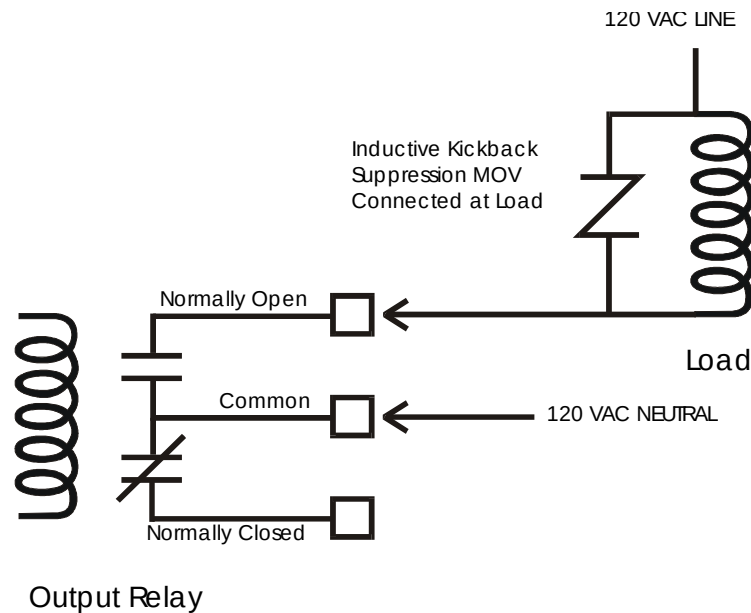
Figure E-3: *Normally Open Connection of a DC Load*Figure E-4: *Normally Closed Connection of a DC Load*

Figure E-5: *Normally Open Connection of an AC Load*

E.5 PLC Interface Characteristics

The FCB provides an interface to a Programmable Logic Controller. The PLC is used in applications where the control of an inserter or similar device is required. The interface provides the ability to receive the field inputs from, or send the field inputs to the PLC. The signals of the PLC interface are optically isolated, so that the PLC may operate on a different voltage from the inkjet controller. The signals provided by the PLC Interface include the following:

Encoder	Encoder signal received by the FCB or Base Interface Board, and sent to the PLC. Note that the encoder signal is not optically isolated to allow for high-speed operation.
Jam In	PLC generated <i>Jam</i> signal sent to the inkjet controller.
Jam Out	<i>Jam</i> signal received by the FCB or Base Interface Board, and sent to the PLC.
Cycle In	PLC generated <i>Machine Cycle</i> signal sent to the inkjet controller.
Cycle Out	<i>Machine Cycle</i> signal received by the FCB or Base Interface Board, and sent to the PLC.

Photo 1 In	Inkjet generated <i>Material Detected</i> signal sent to the PLC.
Photo 2 In	Inkjet generated <i>Photoeye 2</i> signal sent to the PLC. Currently unused.
Spare In	PLC generated <i>Spare Input</i> signal sent to the inkjet controller. Currently unused.

Note that each input signal must be provided by **only one** source (i.e. the FCB, the Base Interface Board, or the PLC). The exception is the *Jam* input, which can be generated by all sources. A material jam is indicated if any of the sources assert their *Jam* input.

The PLC Interface input connections are provided so that a PLC generated signal may be sent to the FCB. Optically isolated input connections are provided for *Jam*, *Cycle*, and one spare. The input connections are directional, with each input having a positive and a negative terminal. Examples of connections to a PLC output using a negative or positive common are shown in Figure E-6 and Figure E-7.

Figure E-6: *Input Connection for Negative Common PLC Output*

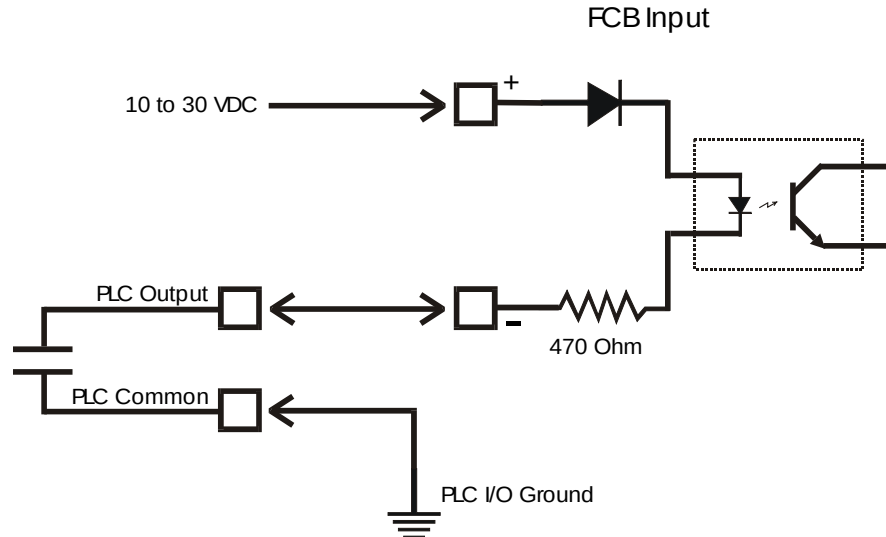
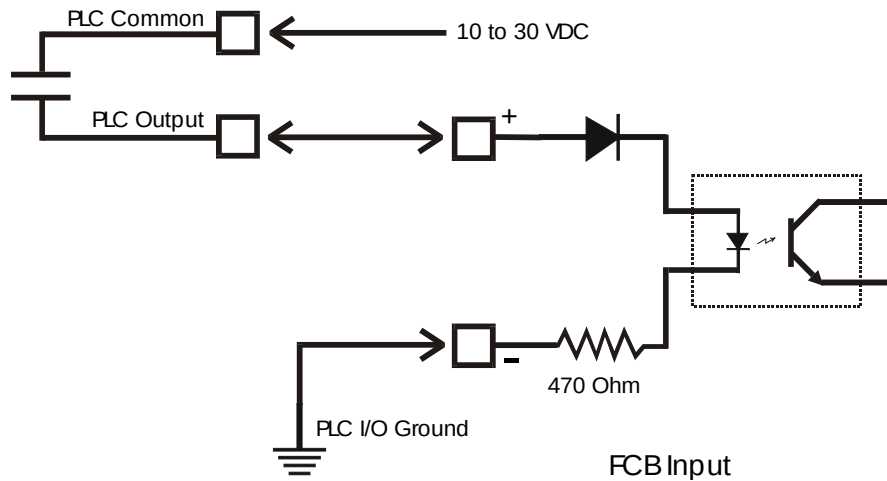
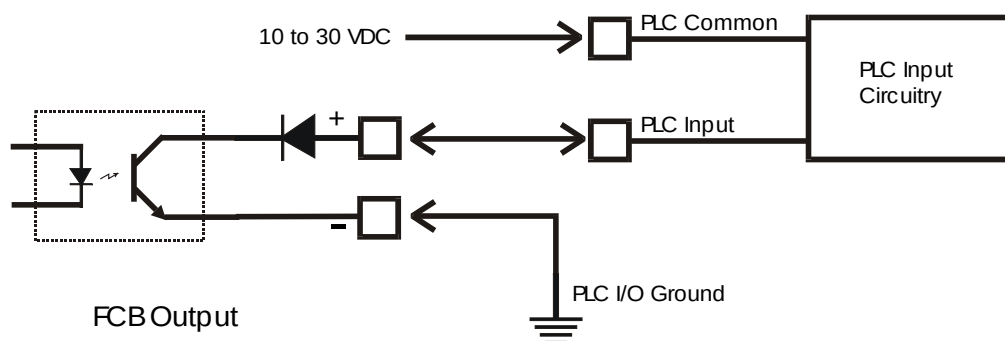


Figure E-7: *Input Connection for Positive Common PLC Output*

The PLC interface provides output connections for the *Jam* and *Cycle* signals. The output connections are provided so that a FCB or Base Interface Board generated signal may be sent to the PLC. The optically isolated output connections are directional, with each output having a positive and a negative terminal. An example of a connection to a PLC input using a positive common is provided in Figure E-8.

The FCB outputs will sink a guaranteed minimum of 20 mA (typically 60 mA), due to the transfer ratio of the output optocoupler. The PLC documentation needs to be consulted to determine if this current is sufficient to operate the inputs at a given PLC I/O voltage.

Figure E-8: *Output Connection for Positive Common PLC Input*

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F.1 Introduction

For communication with other computer equipment the Buskro controller may be equipped with a serial communication card with up to 4 serial ports. Buskro uses Control's RocketPort cards for this purpose.

F.2 Features and Specifications

The heart of the RocketPort card is Control's exclusive AIOPIC chip, a 36 Mhz ASIC (Application Specific Integrated Circuit) that enables the RocketPort to transmit and receive data at rates far higher than multiport cards based on conventional 16550 UART technology—up to 921 Kbps full duplex across all ports simultaneously. While most serial cards use shared dual-port memory which can cause conflicts with other hardware and software products, the RocketPort is I/O memory mapped to avoid shared memory conflicts. This makes installation, configuration, and port expansion easy and hassle-free.

F.2.1 Features

- Up to 32 COM ports can be added in a single slot without using any IRQs
- Dedicated 36 MHz Application Specific Integrated Circuits (ASIC) processors, one per every eight ports, for optimum performance
- ASIC integration reduces the number of components by 80%, resulting in improved reliability and the high Mean Time Between Failure times (MTBF)
- Up to 921 Kbps* transmit-and-receive across all ports simultaneously—sustains fully compressed ISDN throughput
- Both ISDN terminal adapters and modems can be connected to the same card
- I/O mapping eliminates memory conflicts and allows plug-and-play compatibility
- Supports PCI and ISA bus architectures, ensuring compatibility regardless of the host environment
- Supports serial interfaces, including RS-232, RS-422, and RS-485
- Easy installation—no shared memory to configure (and no IRQs required)
- Minimal “host” CPU utilization
- Large FIFOs, 64 times larger than a 16550 UART, maximize speed and minimize data loss while optimizing host efficiency and data integrity

* Speed dependent on hardware configuration and operating system

F.2.2 Approvals

- Canadian EMC Requirements
- FCC Part 15 Class A Certification
- Product Safety UL Recognized
- European EMC Requirements
- ESD and Surge Protection to EN 50082-1 Standard

F.2.3 Specifications

Model # 95860-4
Type Quad/DB25

Table F-1: *Serial Communications Card Specifications*

D.2.3.1 Hardware		
	# of cards/system	1
	# of ports/card	4
	Interrupts	none, 3, 4, 5, 9, 10, 11, 12, 15
	Baud rate	460K
	Data bits	7 or 8
	Parity	odd, even, none
	Stop bits	1 or 2
D.2.3.2 Interfaces		
	Bus interface	PCI
	Communications interface	RS-232
D.2.3.3 Conditions		
	Operating temperature	0 to 40°C
	MTBF (years)	23.5
	Humidity (Non-condensing)	
	System on	8% to 80%
	System off	20% to 80%
D.2.3.4 Physical Specifications		
	Dimensions	5.6" by 4.2"
	Weight (card only)	4 oz - 10 oz
D.2.3.5 Electrical Requirements		
	+ 5 VDC	410 mA
	+ 12 VDC	100 mA
	- 12 VDC	160 mA

F.3 Installation

Note: To avoid conflicts with the Data Path Card (designed to use PCI Slot 4), the RocketPort Card must be installed in PCI Slot 1 or 2.

I/O mapping makes the RocketPort series easy to install. Memory collisions that often occur with cache memory are eliminated, simplifying configuration and installation. To further expedite installation, there are no switches or jumpers to configure for the RS-232 interface box. Simply plug it in with the supplied cable. Selectable IRQs can be easily changed through the device driver configuration. The RocketPort series uses either no interrupts or one interrupt, contingent on the operating system.

For this installation Buskro provides a CD-ROM with all necessary files and detailed instructions on the hardware and software configuration required.

Pressure Regulator Drawings

Appendix G

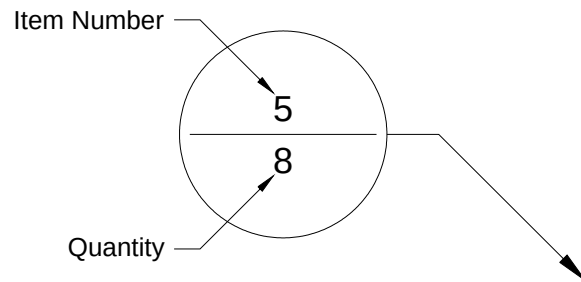
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Balloon Annotation and Parts Listing



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 G-1: *BK-PVM-4A – Module, Pressure/Vacuum, 4-Channel*

Item	Part Number	Quantity	Description	Reference
1	9102575	4	Filter, Bronze/Steel	
2	9101866A	1	Pressure Regulator Assembly, 4-Head	Page G-6

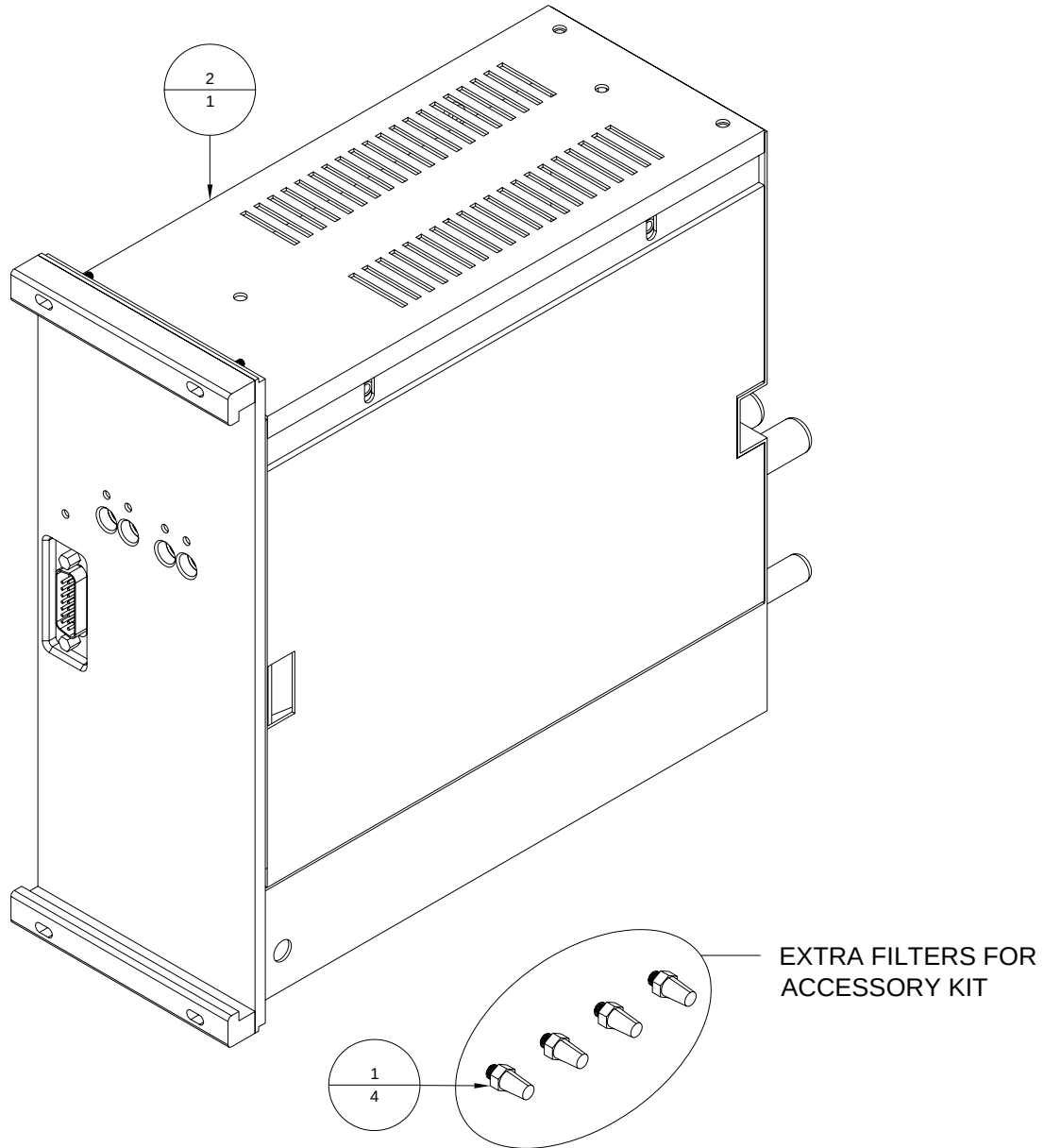
Figure G-1: *BK-PVM-4A – Module, Pressure/Vacuum, 4-Channel*

Table G-2: 9101582A – Flow Control, Purge Pressure

Item	Part Number	Quantity	Description	Reference
1	9101582	1	Fitting, 10-32 Thread to Tube 1/8" I.D.	
2	9102960	1	Valve, Flow Control, 10-32 UNF	

Figure G-2: 9101582A – Flow Control, Purge Pressure

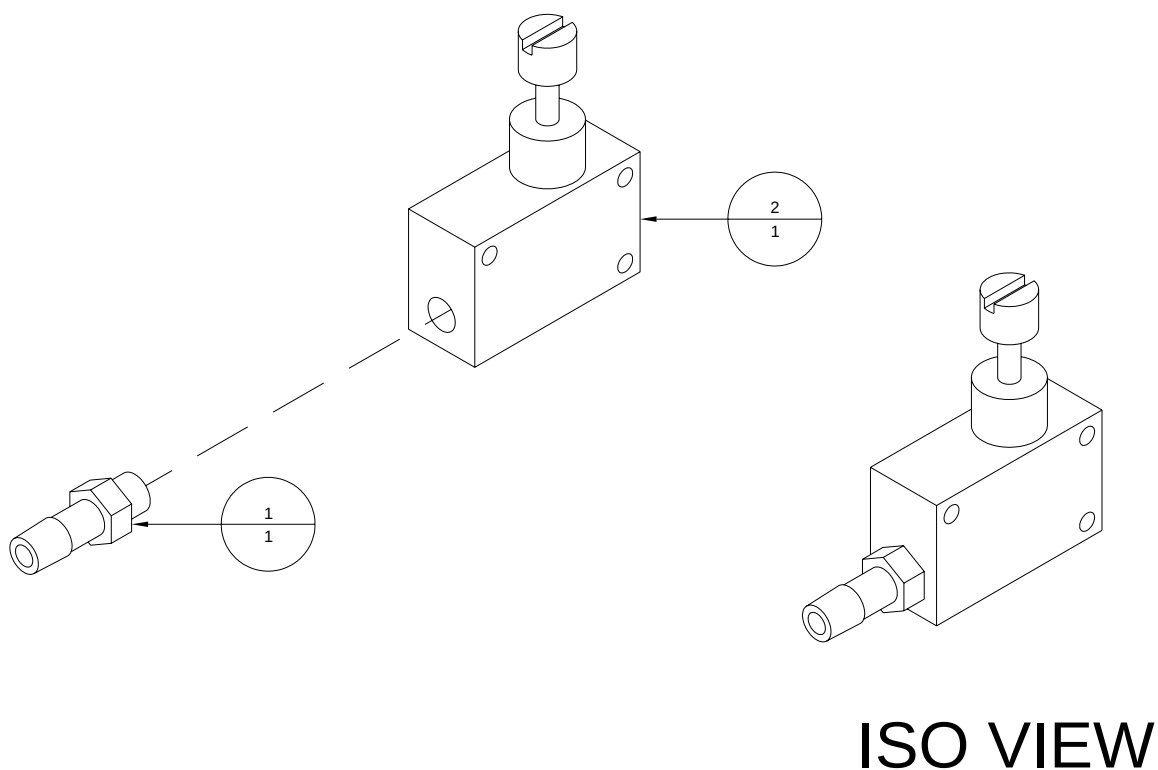


Table G-3: 9101862A – Pressure Regulator Main Chamber Assembly

Item	Part Number	Quantity	Description	Reference
1	401330	2	Screw, PHMS, 4-40 UNC x ½"	
2	402510	8	Screw, BHCS, 6-32 UNC x ¼"	
3	420004	2	Nut, 4-40 UNC	
4	439004	2	Lockwasher, No. 4	
5	9103046	1	Bracket, Main, Pressure Regulator	
6	9103047A	1	Manifold Block Assembly, Meniscus Vacuum	Page G-10
7	9103048A	1	Manifold Block Assembly, Lung Vacuum	Page G-11
8	9103456A	1	Cable, Through-Panel, Alarm	

Figure G-3: 9101862A – Pressure Regulator Main Chamber Assembly

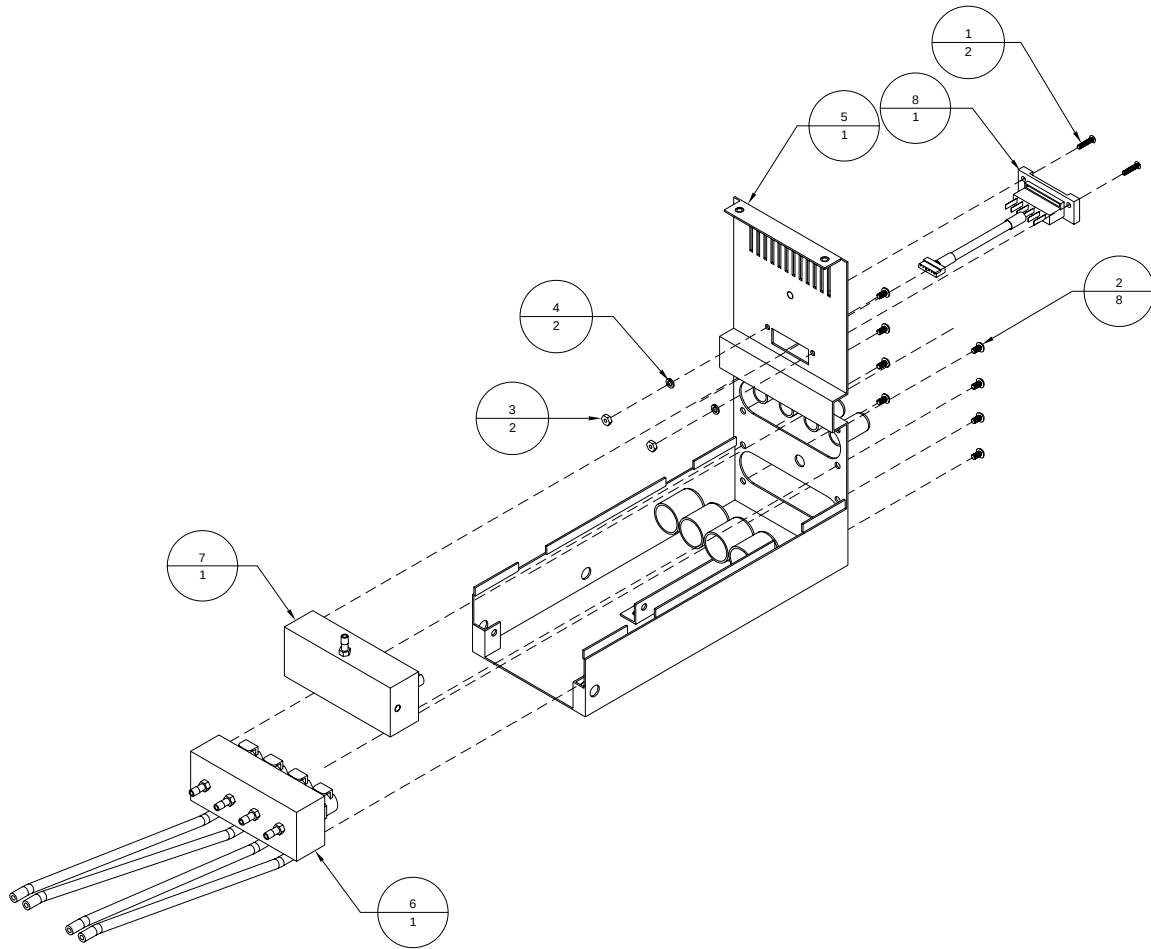


Table G-4: 9101863A – Pressure Regulator Bottom Assembly

Item	Part Number	Quantity	Description	Reference
1	403310	2	Screw, PHMS, 8-32 UNC x ¼"	
2	439009	2	Lockwasher, No. 10	
3	9101862A	1	Pressure Regulator Main Chamber Assembly	Page G-3
4	9103069A	1	Front Plate Assembly, Pressure Regulator	Page G-16
5	9103081A	1	Cable, Pressure Regulator, Solenoids	
6	9103192A	1	Cable, Pressure Regulator, Pumps	

Figure G-4: 9101863A – Pressure Regulator Bottom Assembly

NOTE: THE SILICONE TUBING CONNECTS TO THE LOWER FITTINGS ON THE FRONT PLATE ASSEMBLY SENSORS

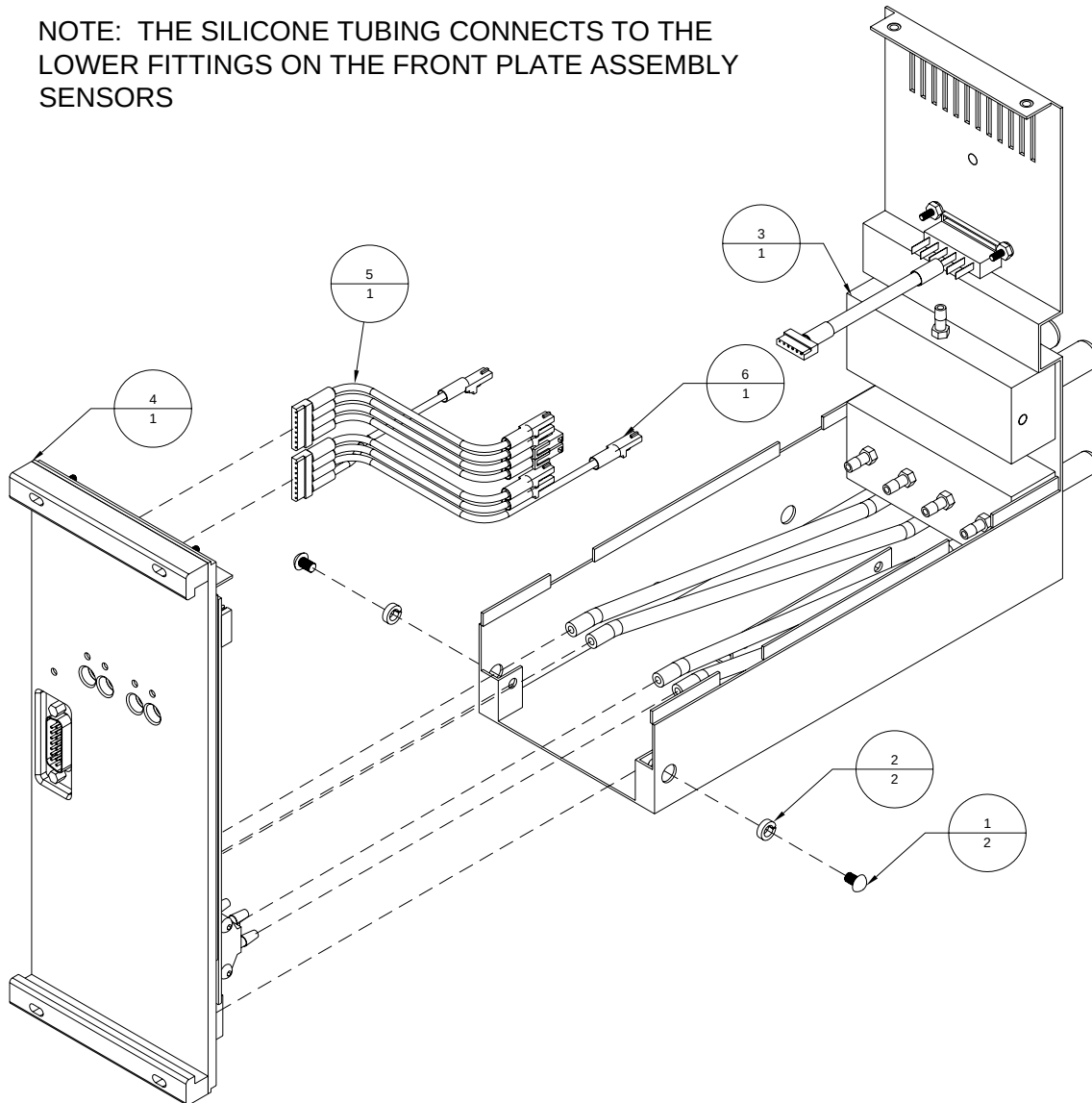


Table G-5: 9101865A – Pressure Regulator Top Assembly

Item	Part Number	Quantity	Description	Reference
1	403510	2	Screw, BHCS, 8-32 UNC x ¼"	
2	439009	2	Lockwasher, No. 10	
3	9103049	1	Bracket, Controller Module, Top	
4	9103050A	1	Pressure Regulator Pump Support Assembly	Page G-12
5	9103053A	1	Pressure Regulator Add-On Bracket Assembly	Page G-15
6	9103109	2	Screw, Truss, 8-32 UNC x ¼"	

Figure G-5: 9101865A – Pressure Regulator Top Assembly

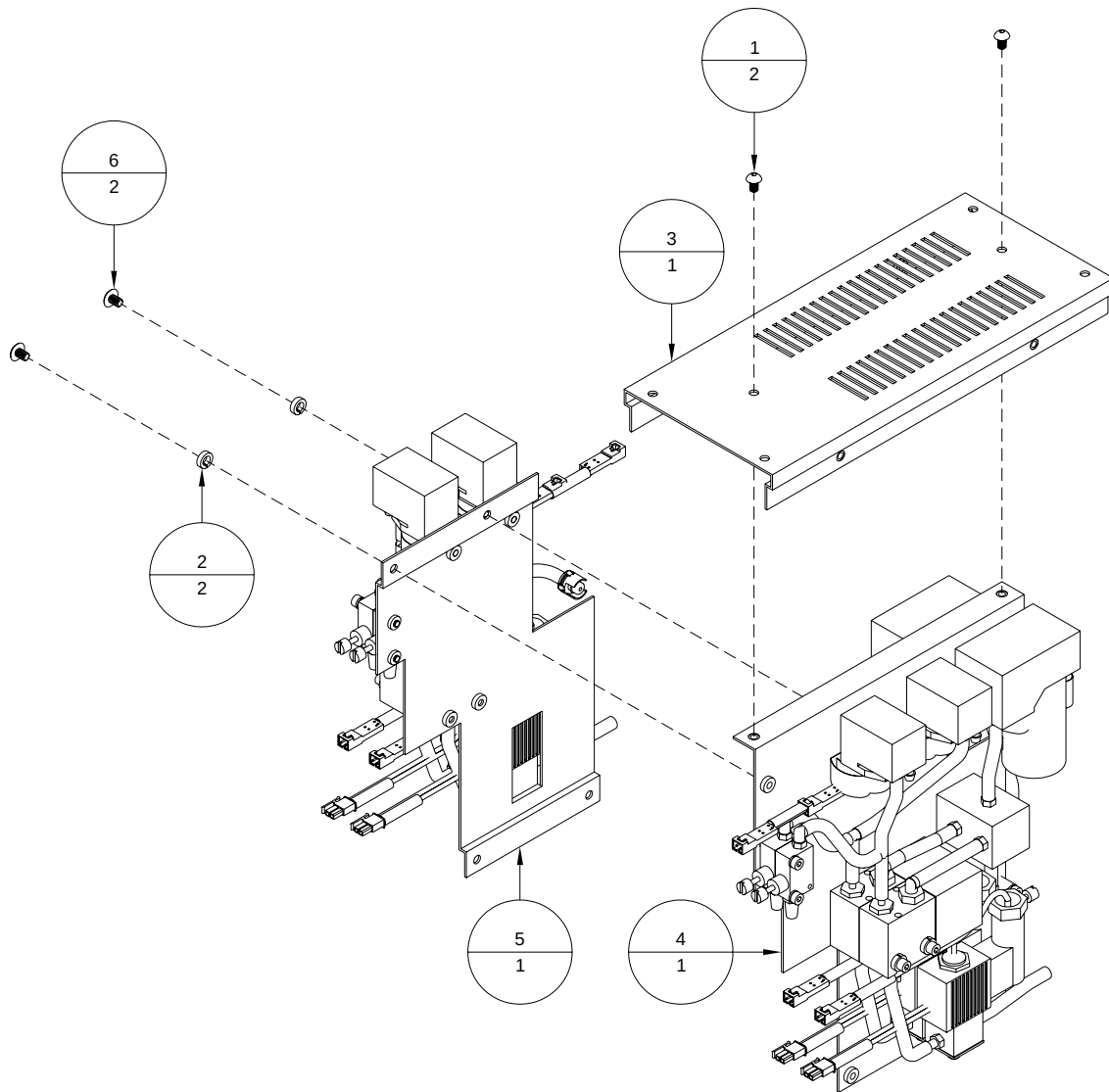


Table G-6: 9101866A – Pressure Regulator Assembly, 4-Head

Item	Part Number	Quantity	Description	Reference
1	403510	4	Screw, BHCS, 8-32 UNC x ¼":	
2	439009	2	Lockwasher, No. 10	
3	9101863A	1	Pressure Regulator Bottom Assembly	Page G-4
4	9101865A	1	Pressure Regulator Top Assembly	Page G-5
5	9103054	2	Cover, Controller Module, Side	
6	9103081A	1	Cable, Pressure Regulator, Solenoids	
7	9103109	6	Screw, Truss, 8-32 UNC x ¼"	
8	9103190A	1	Cable, Pressure Regulator Pumps, 4-Head	

Figure G-6: 9101866A – Pressure Regulator Assembly, 4-Head

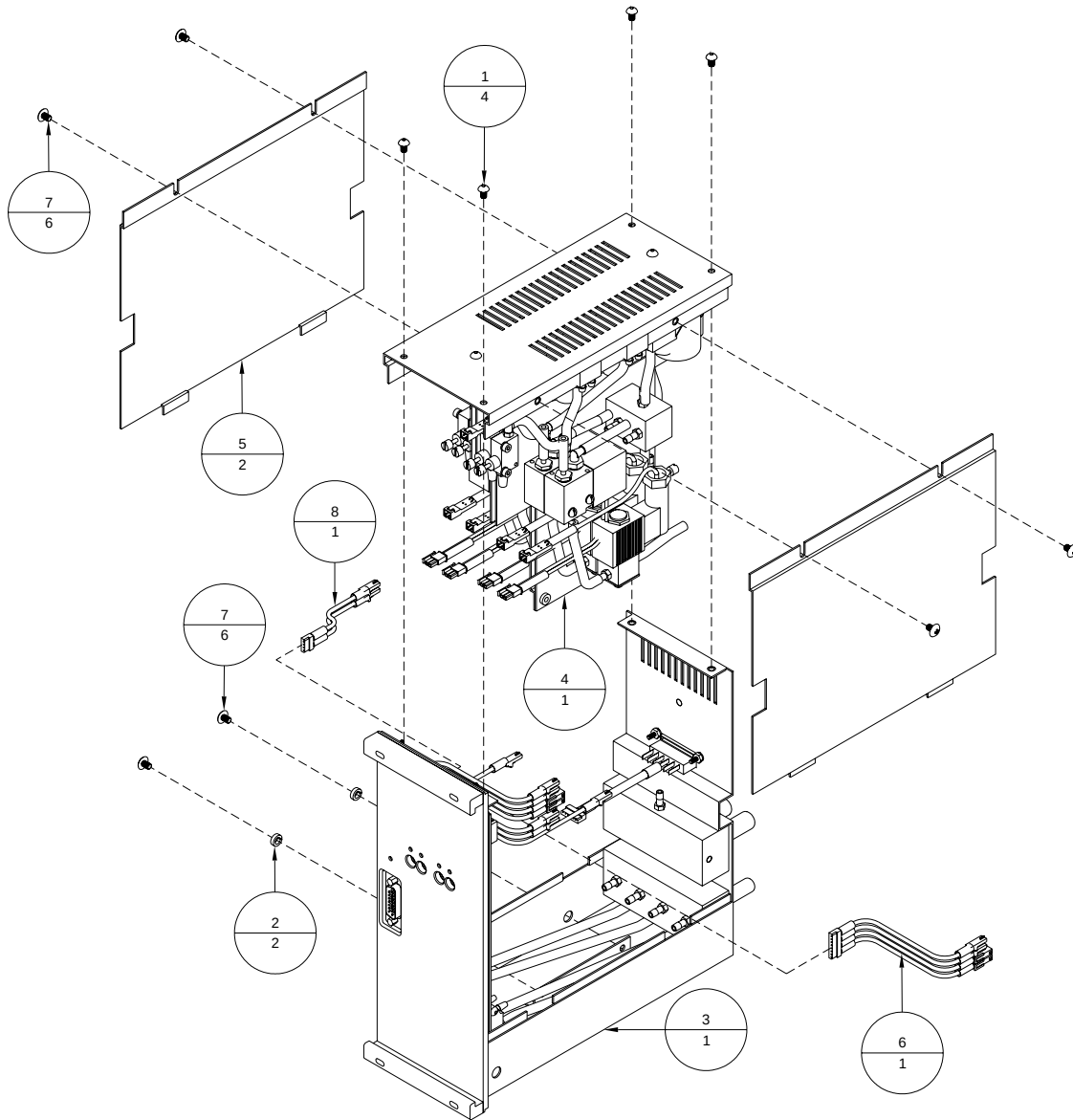


Table G-7: 9102715A – Solenoid Valve Assembly, Meniscus/Purge

Item	Part Number	Quantity	Description	Reference
1	609000	1	Shrink Wrap, 3/16" I.D. x 1"	
2	9100149	2	Connector, 1/8" NPT, 1/8" I.D.	
3	9100247	2	Contact, Female, 24-20 AWG, Micro-Fit 3.0	
4	9102085	1	Connector "L", 1/8-27 NPT, 1/8" I.D.	
5	9102714	1	Solenoid Valve, 12VDC	
6	9102718	1	Connector, male, 2-Pin, Micro-Fit 3.0	

Figure G-7: 9102715A – Solenoid Valve Assembly, Meniscus/Purge

USE TEFLON TAPE AS THREAD
SEALANT

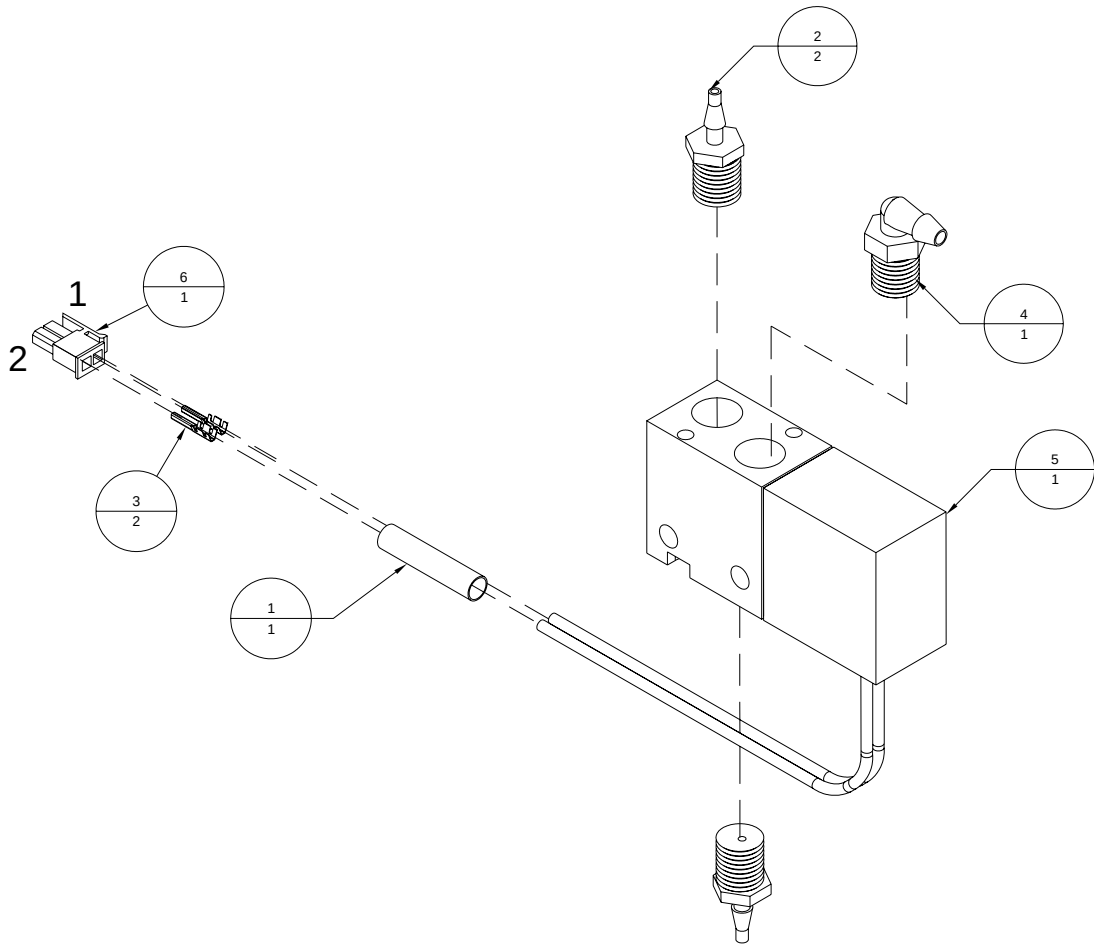


Table G-8: 9102941A – Pressure Regulator 2-Way Valve Assembly

Item	Part Number	Quantity	Description	Reference
1	606531	1	Cable, #22-2, Shielded, 5"	
2	609000	1	Shrink Wrap, 3/16" I.D. x 1"	
3	9101208	1	Solenoid Wrap, Air, 12 VDC, N.C.	
4	9101582	2	Fitting, 10-32 Thread to Tube, 1/8" I.D.	
5	9102426	2	Terminal, Male Crimp	
6	9103312	1	Connector, Male, 2-Pin, SL	

Figure G-8: 9102941A – Pressure Regulator 2-Way Valve Assembly

USE TEFLON TAPE FOR THREAD SEALANT

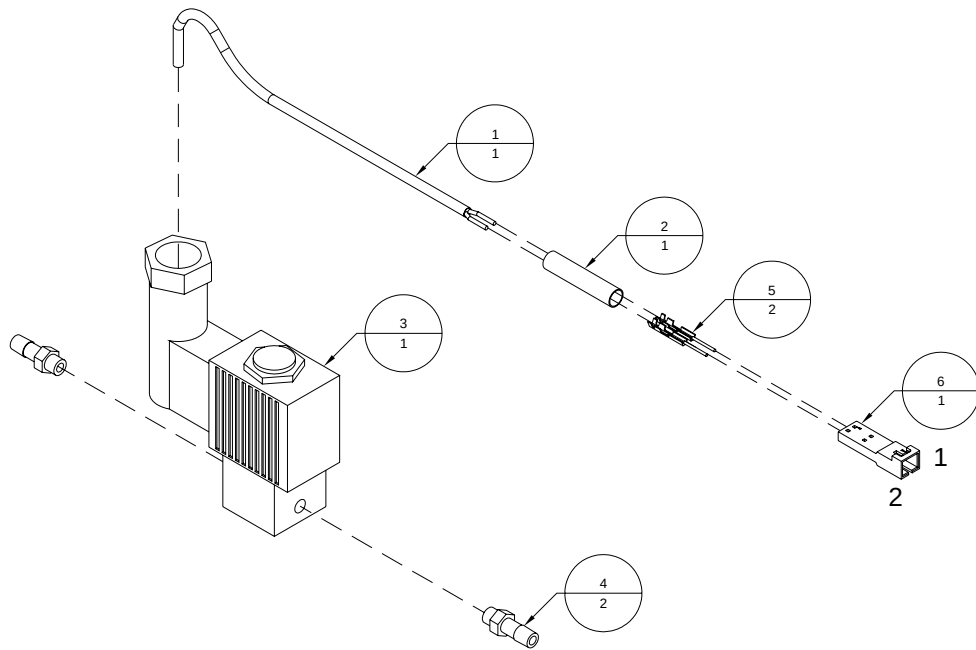


Table G-9: 9102960A – Flow Control, Meniscus Vacuum

Item	Part Number	Quantity	Description	Reference
1	9102575	1	Filter, Bronze/Steel	
2	9102960	1	Valve, Flow Control, 10-32 UNF	
3	9103020	1	Fitting, 10-32 UNF, Elbow, 1/8" I.D.	

Figure G-9: 9102960A – Flow Control, Meniscus Vacuum

USE TEFLON TAPE AS THREAD SEALANT

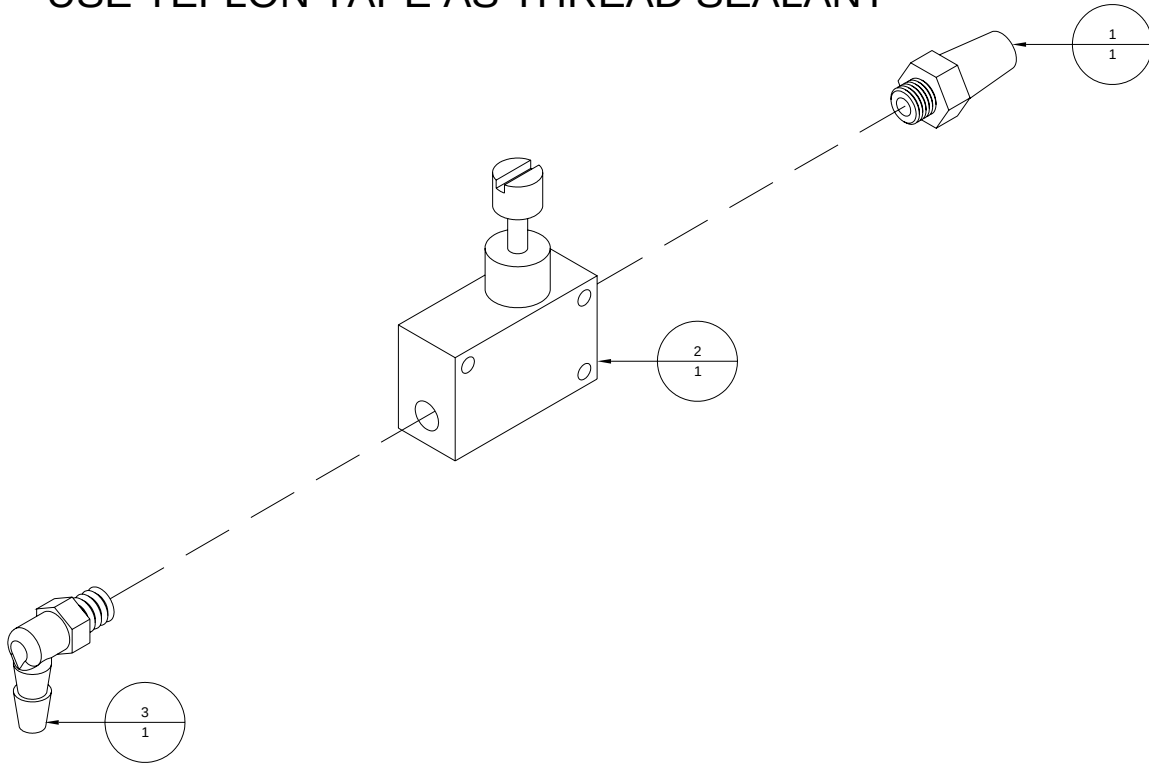


Table G-10: 9103047A – Manifold Block Assembly, Meniscus Vacuum

Item	Part Number	Quantity	Description	Reference
1	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D., 8"	
2	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D., 8"	
3	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D., 8"	
4	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D., 8"	
5	9101582	4	Fitting, 10-32 Thread to Tube 1/8" I.D.	
6	9103020	4	Fitting, 10-32 UNF, Elbow, 1/8" I.D.	
7	9103047	1	Manifold Block, Meniscus Vacuum	
8	9103289	4	Caplug, VC Series, 0.281" Dia., Black	
9	9103913	4	Coupling Insert, 1/8" NPT, 1/16" Tubing	

Figure G-10: 9103047A – Manifold Block Assembly, Meniscus Vacuum

USE TEFLON TAPE FOR TREAD SEALANT
 USE SILICONE FOR EACH TUBE/FITTING SEALANT
 USE TIE WRAPS AROUND EACH TUBE/FITTING

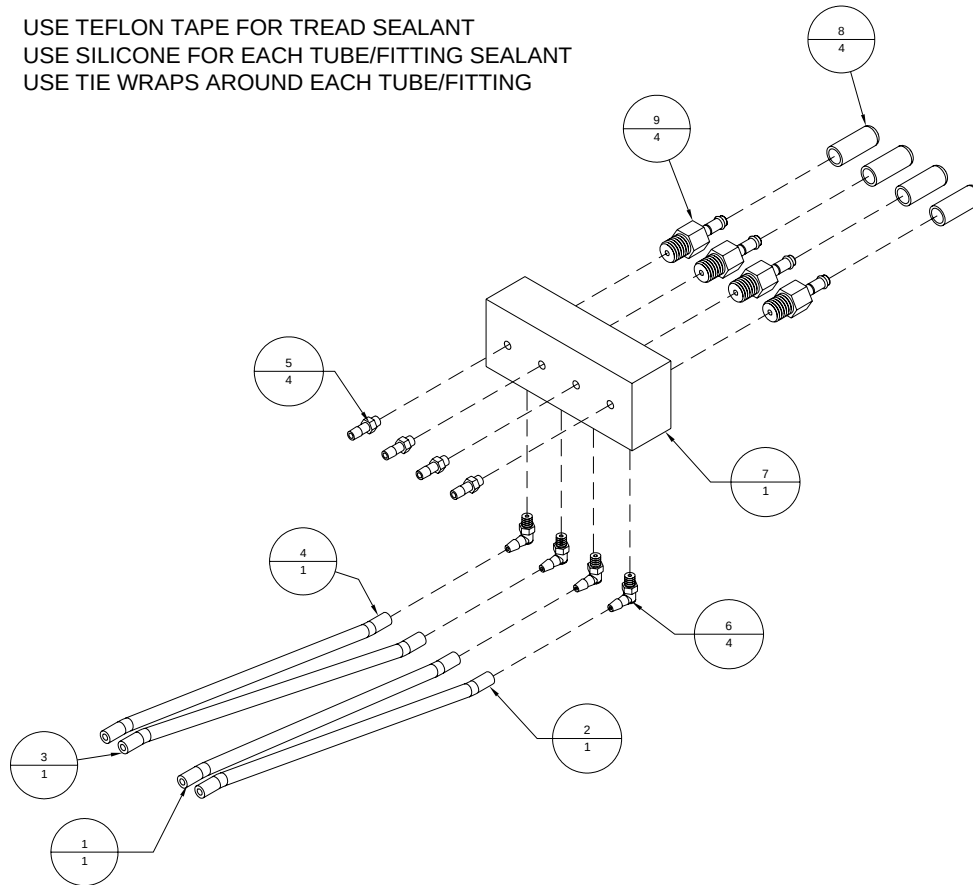


Table G-11: 9103048A – Manifold Block Assembly, Lung Vacuum

Item	Part Number	Quantity	Description	Reference
1	404810	1	Screw, SHSS, 10-32 UNF x 1/4"	
2	9101582	1	Fitting, 10-32 Thread to Tube 1/8"	
3	9102990	4	Coupling, 1/8" NPT, SMC, Shutoff	
4	9103048	1	Manifold Block, Lung Vacuum	
5	9103291	4	Caplug, VC Series, 0.406" dia, Black	

Figure G-11: 9103048A – Manifold Block Assembly, Lung Vacuum

USE TEFLON TAPE AS THREAD SEALANT
USE SILICONE FOR TUBE/FITTING SEALANT

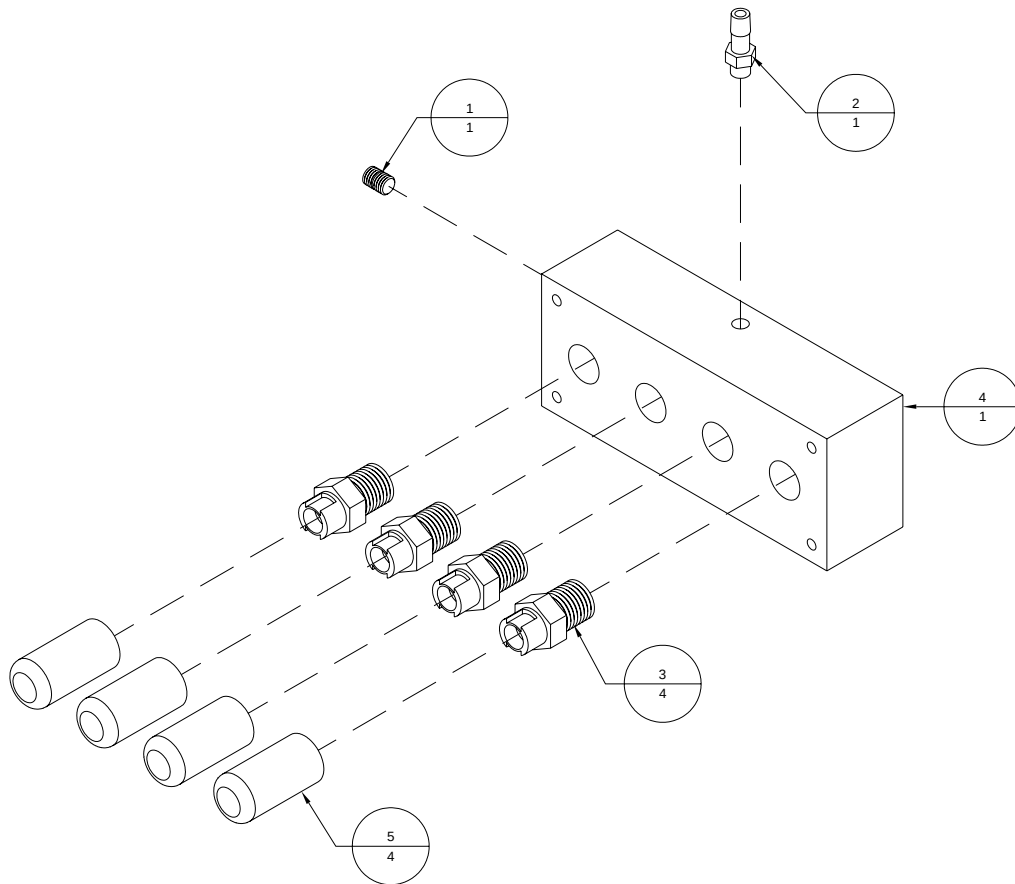


Table G-12: 9103050A – Pressure Regulator Pump Support Assembly

Item	Part Number	Quantity	Description	Reference
1	402230	2	Screw, SHCS 6-32 UNC x 1/2"	
2	402270	2	Screw, SHCS 6-32 UNC x 1"	
3	403310	4	Screw, PHMS, 8-32 UNC x 1/4"	
4	404210	2	Screw, SHCS, 10-32 UNF x 1/4"	
5	413506	4	Screw, BHCS, M3 x 6mm	
6	439006	6	Lockwasher, No.6	
7	439009	6	Lockwasher, No. 10	
8	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
9	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
10	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 3"	
11	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
12	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 4"	
13	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
14	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
15	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 1.5"	
16	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 1.5"	
17	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2"	
18	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2"	
19	9100472	2	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 1"	
20	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2.5"	
21	9100472	1	Tubing, Silicone, 1/4" I.D. x 1/8" O.D. x 2"	
22	9100921	2	Lung Vacuum Pump	
23	9100971	2	Gripper Clip	
24	9101290	2	Fitting, Tee, 1/8" I.D.	
25	9101582A	1	Flow Control, Purge Pressure	Page G-2
26	9102715	2	Gripper Clip, 3/8" - 5/8"	
27	9102715A	2	Solenoid Valve Assembly, Meniscus/Purge	Page G-7
28	9102941A	2	Pressure Regulator 2-Way Valve Assembly	Page G-8
29	9102960A	2	Flow Control, Meniscus Vacuum	Page G-9
30	9103050	1	Mount, Pump Support	
31	9103052A	1	Manifold Block Assembly, Purging Pressure	Page G-14
32	9103473A	2	Meniscus Pump Assembly, Heavy duty	Page G-18
33	9104663	2	Screw, SDMS, 6-32 UNC x 1.75", Round	

Figure G-12: 9103050A – Pressure Regulator Pump Support Assembly

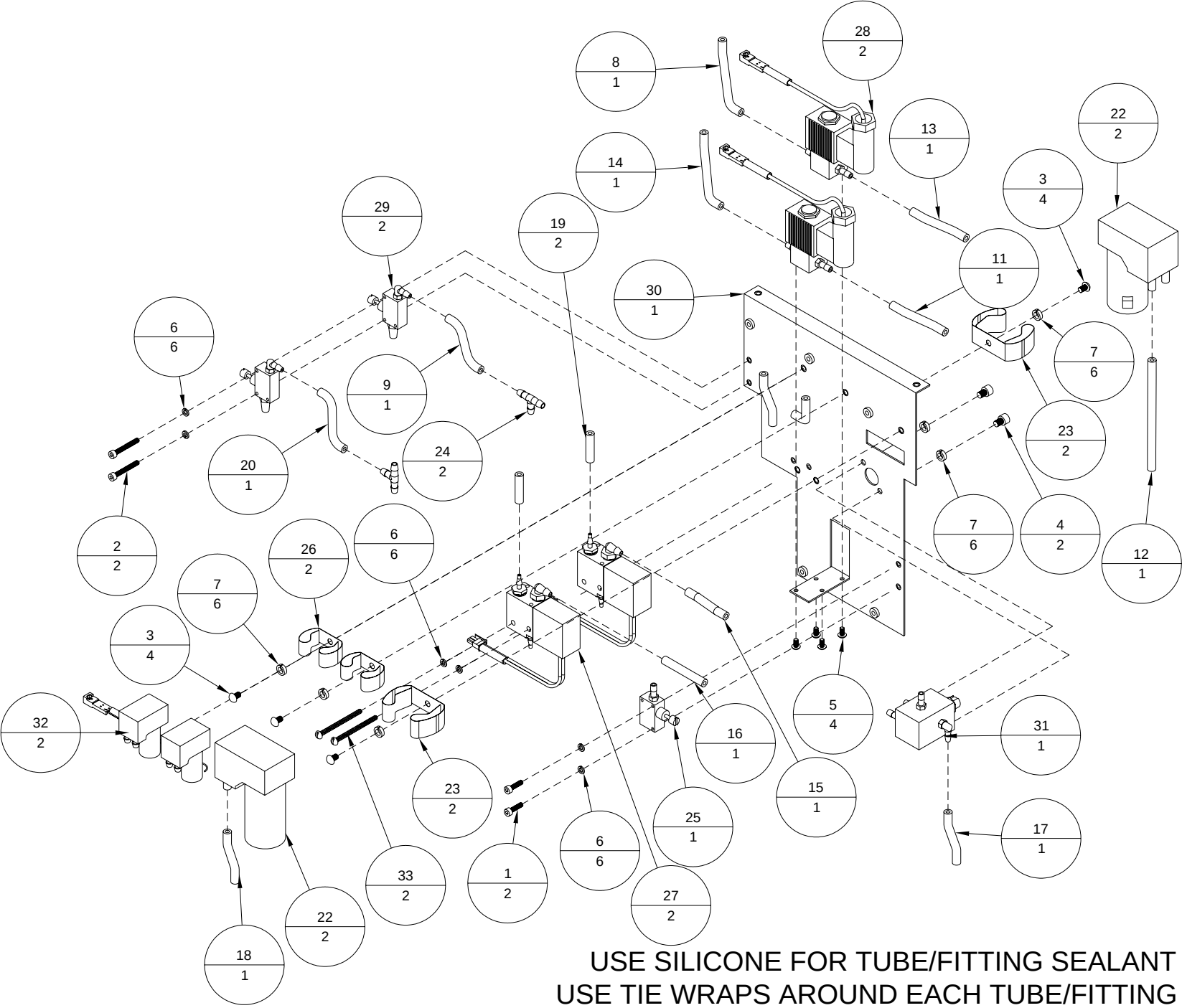


Table G-13: 9103052A – Manifold Block Assembly, Purging Pressure

Item	Part Number	Quantity	Description	Reference
1	9101582	3	Fitting, 10-32 Thread to Tube 1/8" I.D.	
2	9102990	1	Coupling, 1/8" NPT, SMC, Shutoff	
3	9103020	1	Fitting, 10-32 UNF, Elbow, 1/8"	
4	9103052	1	Manifold Block, Purging Pressure	

Figure G-13: 9103052A – Manifold Block Assembly, Purging Pressure

USE TEFLON TAPE AS THREAD SEALANT

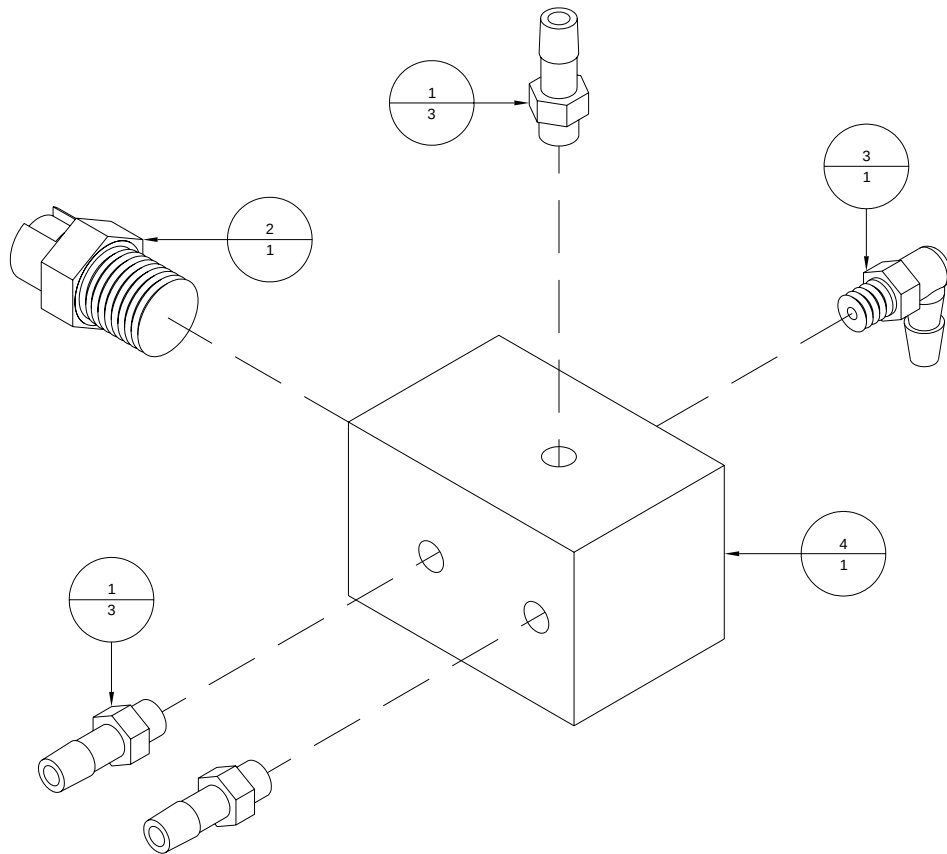


Table G-14: 9103053A – Pressure Regulator Add-On Bracket Assembly

Item	Part Number	Quantity	Description	Reference
1	402270	2	Screw, SHCS, 6-32 UNC x 1"	
2	413506	4	Screw, BHCS, M3 x 6mm	
3	439006	4	Lockwasher, No.6	
4	439009	2	Lockwasher, No. 10	
5	9100472	2	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 1"	
6	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 1.5"	
7	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 2"	
8	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 3.5"	
9	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 3"	
10	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 1.5"	
11	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 1.5"	
12	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 2.5"	
13	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 2.5"	
14	9101290	2	Fitting, Tee, 1/8" I.D.	
15	9102715	2	Gripper Clip, 3/8" - 5/8"	
16	9102715A	2	Solenoid Valve Assembly, Meniscus/Purge	Page G-7
17	9102941A	2	Pressure Regulator 2-Way Valve Assembly	Page G-8
18	9102960A	2	Flow Control, Meniscus Vacuum	Page G-9
19	9103053	1	Bracket, Add-on, Pressure Regulator	
20	9103109	2	Screw, Truss, 8-32 UNC x 1/4"	
21	9103284A	1	Purge Pressure Connector, Add-on Unit	Page G-17
22	9103473A	2	Meniscus Pump Assembly, Heavy duty	Page G-18
23	9104663	2	Screw, SDMS, 6-32 UNC x 1.75", Round	

Figure G-14: 9103053A – Pressure Regulator Add-On Bracket Assembly

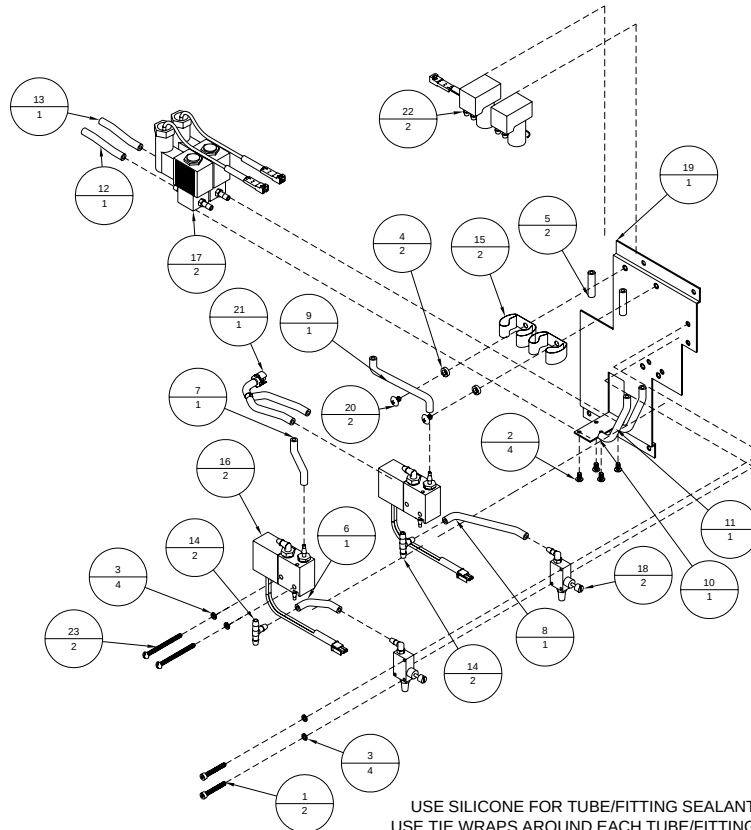


Table G-15: 9103069A – Front Plate Assembly, Pressure Regulator

Item	Part Number	Quantity	Description	Reference
1	401309	4	Screw, PHMS, M2.5 x 6 mm	
2	401510	4	Screw, BHCS, 4-40 UNC x 1/4"	
3	402210	4	Screw, SHCS, 6-32 UNC x 1/4"	
4	420006	6	Nut, 6-32 UNC	
5	439006	6	Lockwasher, No.6	
6	615322	2	Female Screwlock, 4-40 UNC	
7	9102941	2	Handle, Module	
8	9103069	1	Plate, Front, Pressure Regulator	
9	9103072	1	Bracket, Electrical Board	
10	9103339	6	Nut, 6-32 UNC, Nylon	
11	9103477	1	Spacer, Pressure Regulator Block	
12	9105071	1	Board, Pressure Regulator	

Figure G-15: 9103069A – Front Plate Assembly, Pressure Regulator

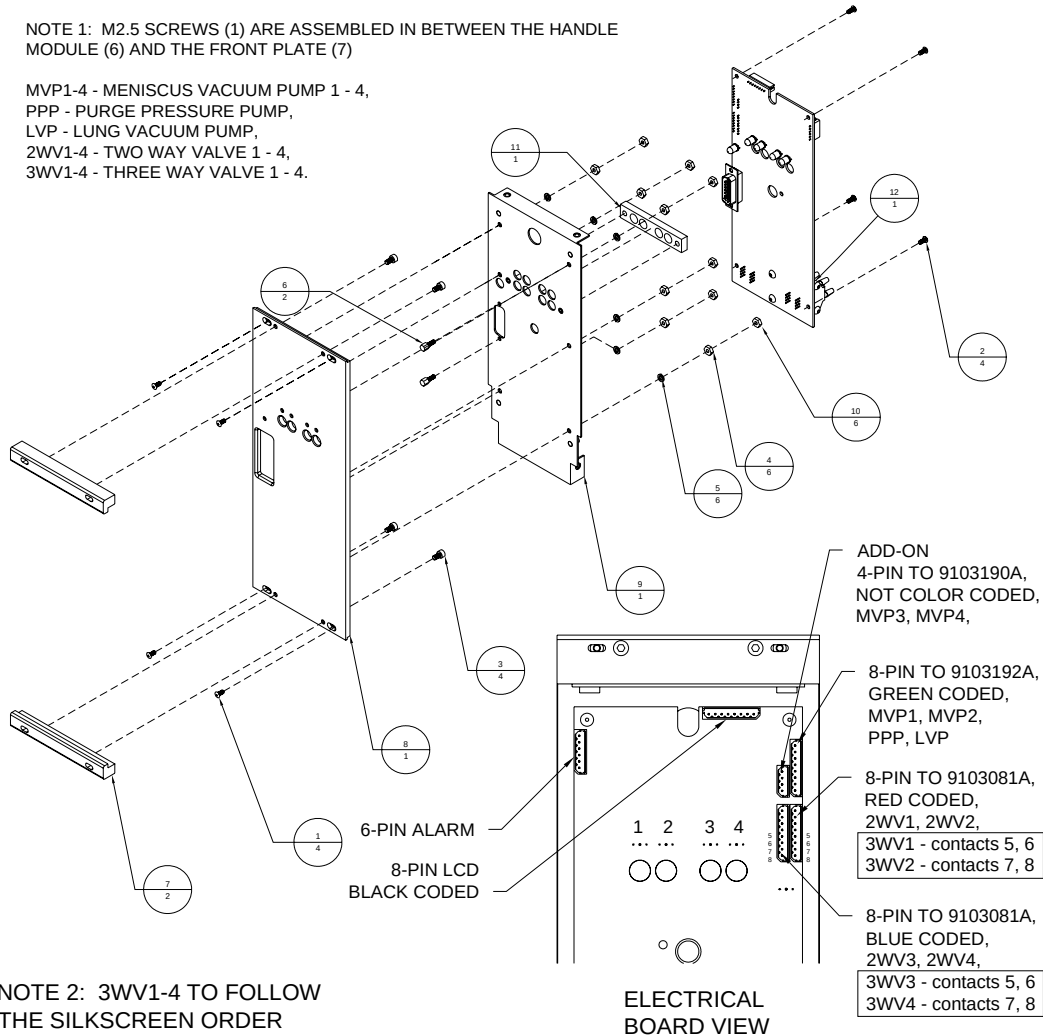
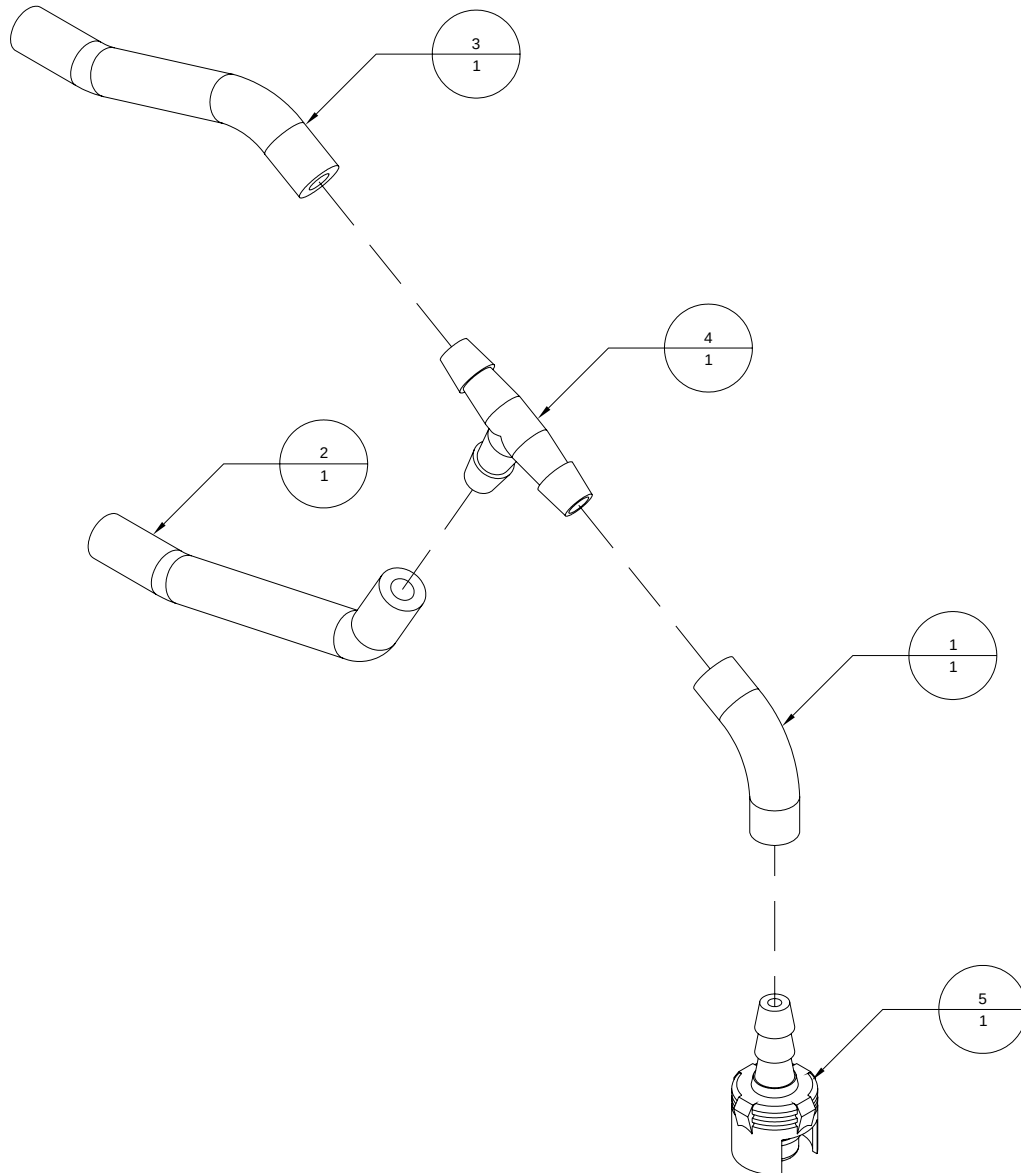


Table G-16: 9103284A – Purge Pressure Connector, Add-On Unit

Item	Part Number	Quantity	Description	Reference
1	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 1"	
2	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 2.5"	
3	9100472	1	Tubing, Silicone, 1/4" O.D. x 1/8" I.D. x 2.5"	
4	9101290	1	Fitting, Tee, 1/8" I.D.	
5	9103284	1	Coupling, Insert-In-Line, 1/8" I.D.	

Figure G-16: 9103284A – Purge Pressure Connector, Add-On Unit

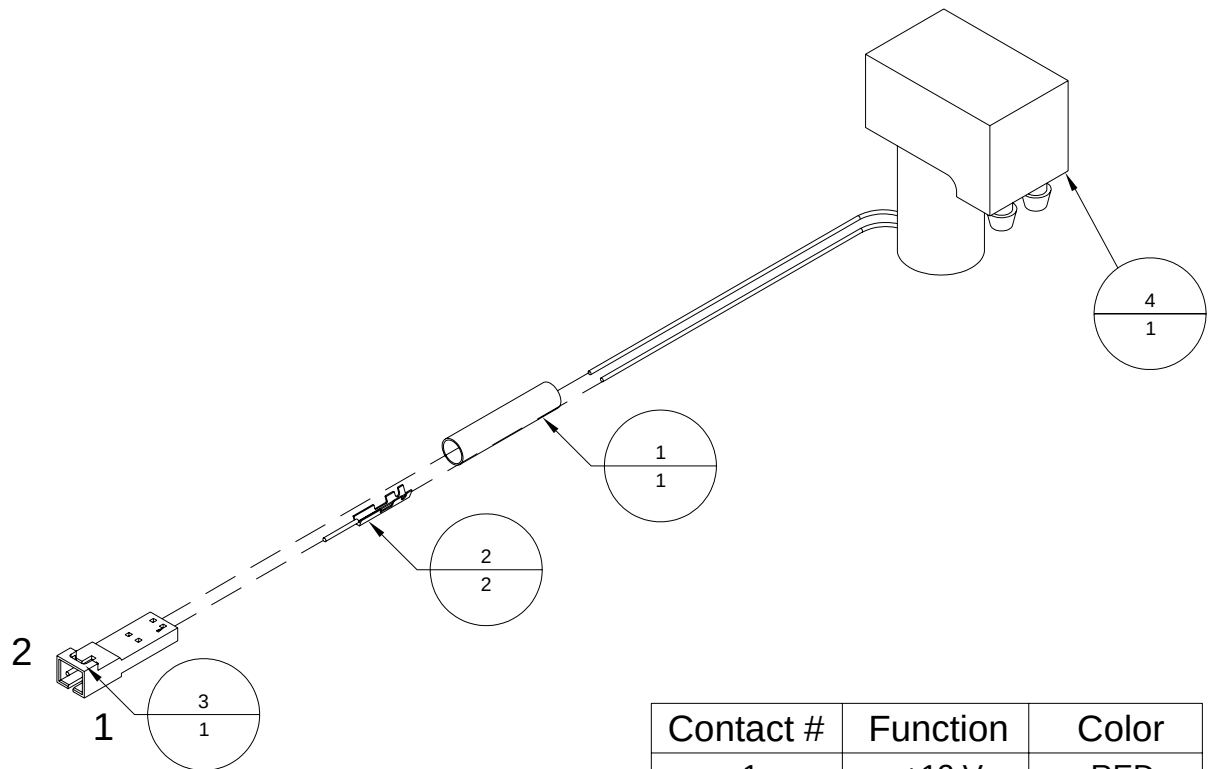


USE SILICONE FOR EACH FITTING/TUBE SEALANT
USE TIE WRAPS AROUND EACH TUBE/FITTING

Table G-17: 9103473A – Meniscus Pump Assembly, Heavy Duty

Item	Part Number	Quantity	Description	Reference
1	609000	1	Shrink Wrap, 3/16" I.D. x 1"	
2	9102426	2	Terminal, Male Crimp	
3	9103312	1	Connector, Male, 2-Pin, SL	
4	9103473	1	Pump, 12 VDC, diaphragm, brushless	

Figure G-17: 9103473A – Meniscus Pump Assembly, Heavy Duty



Contact #	Function	Color
1	+12 V	RED
2	GND	BLK

NOTE: Cut pump wire to 6"