

AERO 60/90/130

Release 3.0

Operator's Manual

AERO 130 AS OF 2014

Release 3.0

PAGE 1



Trusted Partner for Your Product Decorating Needs

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Aero 60/90/130

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1. Safety

1.1 Symbols and their Interpretations



WARNING Neglecting a safety instruction identified with the WARNING symbol may lead to personal injury.



CAUTION Neglecting a safety instruction identified with the CAUTION symbol may lead to property damage.



POINTER It is strongly recommended to observe instructions identified with a POINTER symbol.

1.2 Liability



- In no event will **ITW TRANS TECH** be responsible or liable for indirect or consequential damages resulting from the use of this equipment.
- The information contained in this manual is subject to change due to improvements in design.
- Though this document has been checked for inaccuracies, **ITW TRANS TECH** does not assume responsibility for any errors contained herein.
- This manual is provided as an aid when operating the Aero 60/90 pad printing machine. Prior to operation, it is strongly advised that the user be thoroughly familiar with the Aero 60/90 operating manual.
- **ITW TRANS TECH** is not responsible or liable for any disadvantage occurred for not following the operating instructions.



All operators must be sufficiently trained.

1.3 Warnings and Cautions



- Switch off main switch prior to connecting/disconnecting power.
- Disconnect power prior to opening the electrical enclosure.



Switch the MAIN DISCONNECT off and disconnect the power cord prior to working on the electrical system.

1.4 Application Restrictions



Any use other than described in this manual may cause damage to the equipment, personal injury or property damage.

2. Installation Instructions

2.1 Selecting the location



Choose a well ventilated area away from direct sunlight to install your pad printing machine. The ideal conditions for the inks used in pad printing are approximately 20° C (68° F) and 40 - 60 % humidity.

Make sure the machine is positioned away from walls and other obstructions and placed on a flat surface. The guards, operating panel and other machine openings must be accessible. Ensure adequate area for setup tooling and for storage of parts before and after printing.

2.2 Connection to power

Use the included power cord to power the machine. The female end plugs into the printer Power Cord Receptacle, the male end plugs into a standard 115V/15A grounded outlet. The Aero consumes less than 0.5amps.

Also shown is the DB25 Accessory receptacle connection and the DB15 Automation and Footpedal receptacle connections.



Accessory Connection

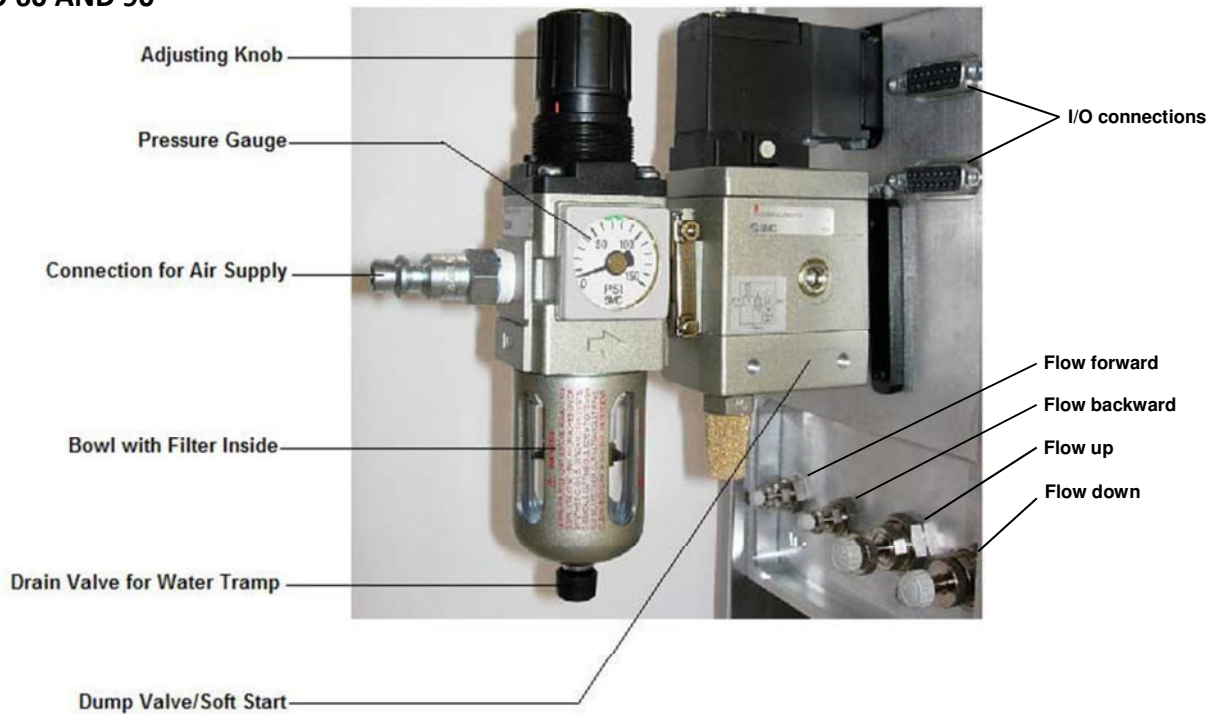
Power Plug Receptacle

On/Off Switch

Automation Connections

2.3 Connecting to Air Supply

AERO 60 AND 90



The machine requires clean, dry air.

Minimum requirement:

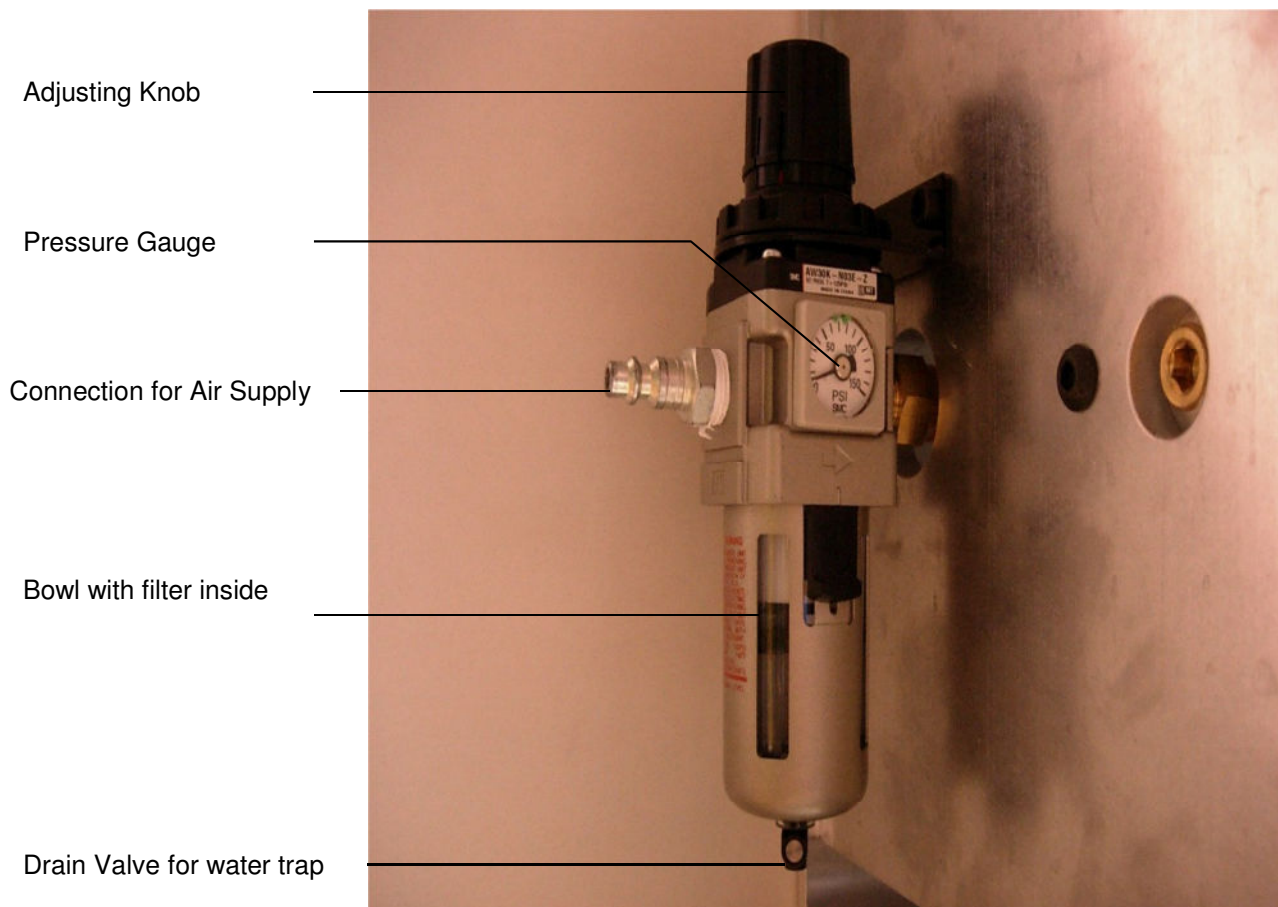
- 6 bar (85 psi)
- 3 cfm

Air connection is to quick disconnect adapter (included) or to 1/4" NPT female thread.

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Installation Instructions

AERO 130



The machine requires clean, dry air. Minimum requirement:

- 6 bar (85 psi)

- 5 cfm

Air connection is to quick disconnect adapter (included) or to 3/8" NPT female thread.

2.3.1 Setting Pressure Regulator

Adjust system pressure to 6 bar (85 psi) by lifting the adjusting knob to unlock, then turning the knob clockwise to increase the pressure or counterclockwise to decrease the pressure. Push down on the adjusting knob to lock the regulator after making adjustments.

2.3.2 Flow Controls

The **Flow Controls** are used to adjust the speed of the pad movement.

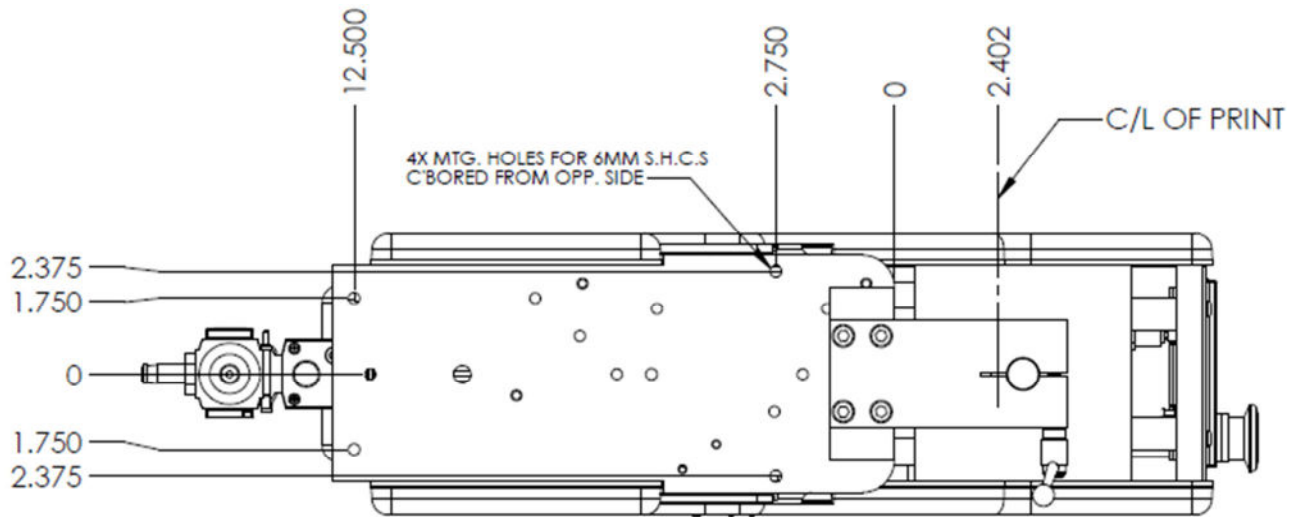
Aero 60/90/130

Installation Instructions

2.4 Mounting the Machine

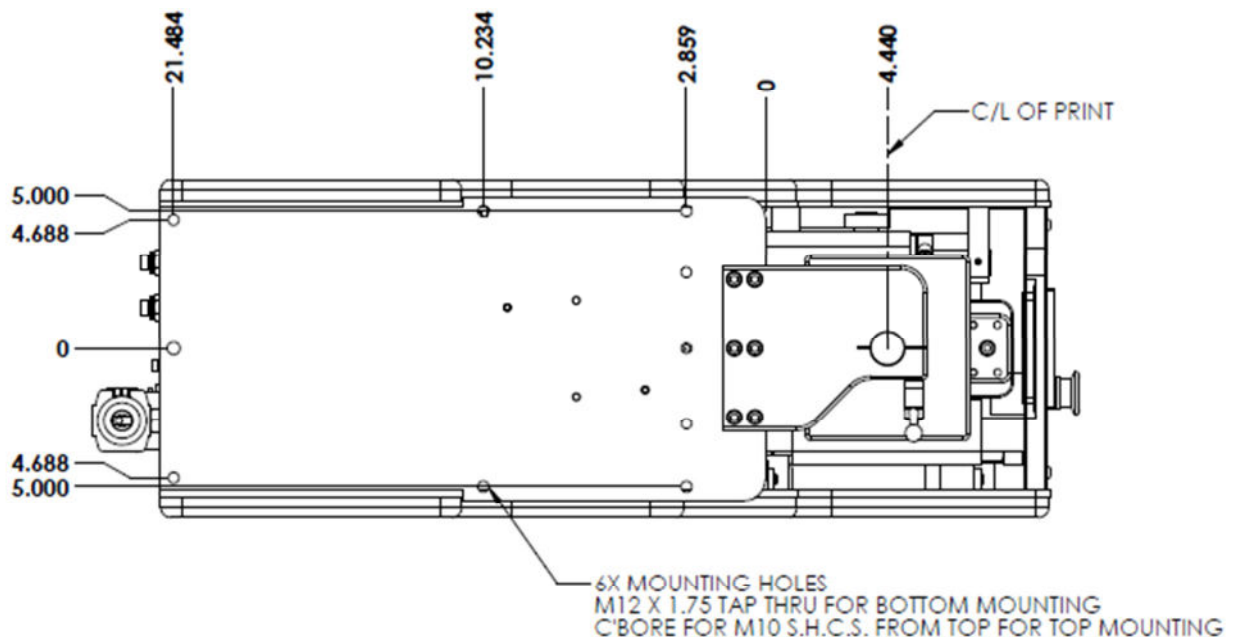
AERO 60 AND 90

Using the holes marked "A" in the following drawing, Install four (4) M6 x 20 S.H.C.S and tighten to 7 ft-lbs of torque. If preferred the machine can also be mounted from beneath using (4) M8-1.25 metric fasteners. Torque M8-1.25 fasteners to 17 ft-lbs.



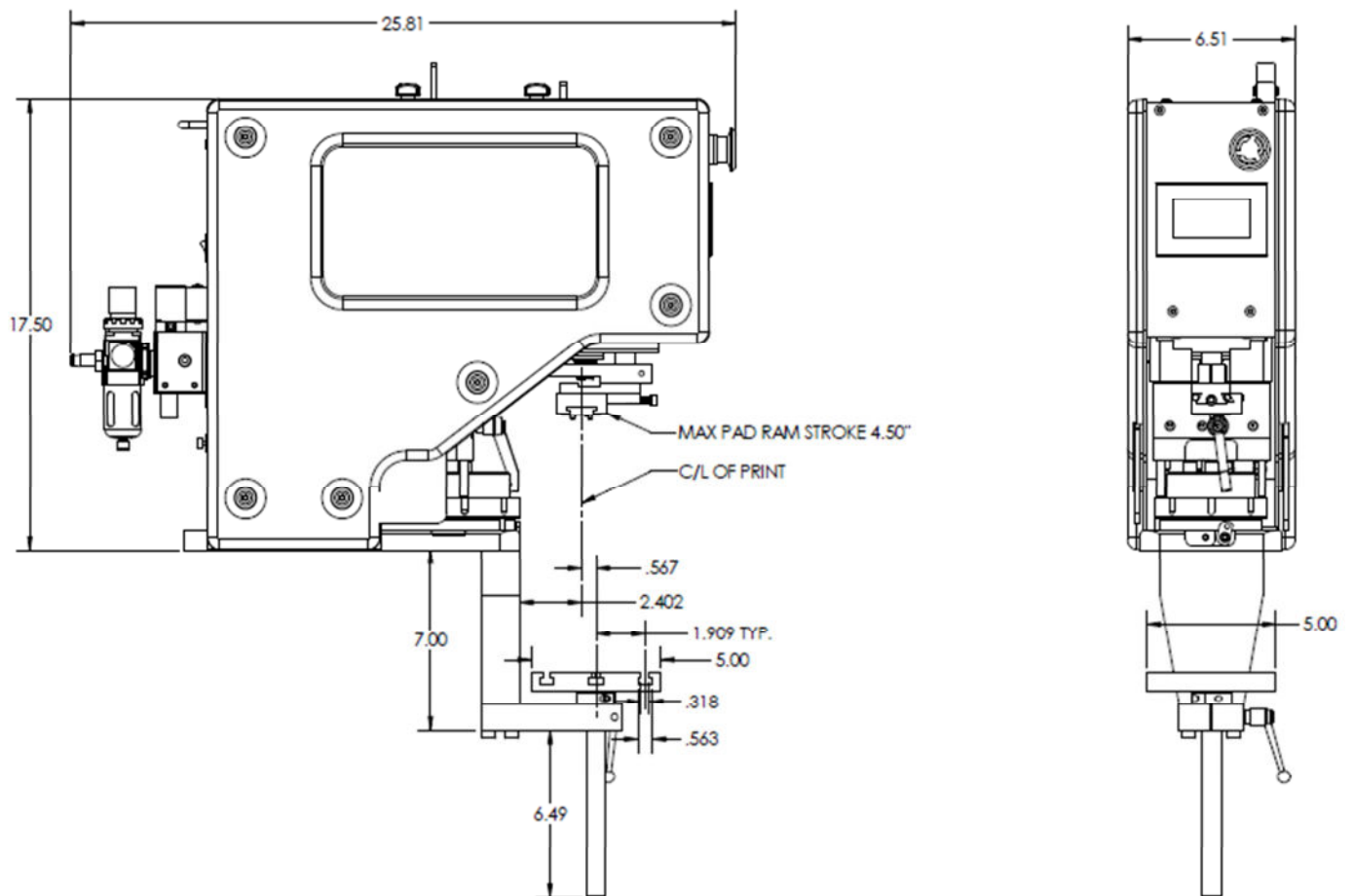
AERO 130

Using the holes marked "A" in the following drawing, Install six (6) M6 x 20 S.H.C.S and tighten to 7.1 ft- lbs of torque. If preferred the machine can also be mounted from beneath using six (6) M8-1.25 metric fasteners. Torque M8-1.25 fasteners to 17 ft-lbs.



2.5 Machine Dimensions

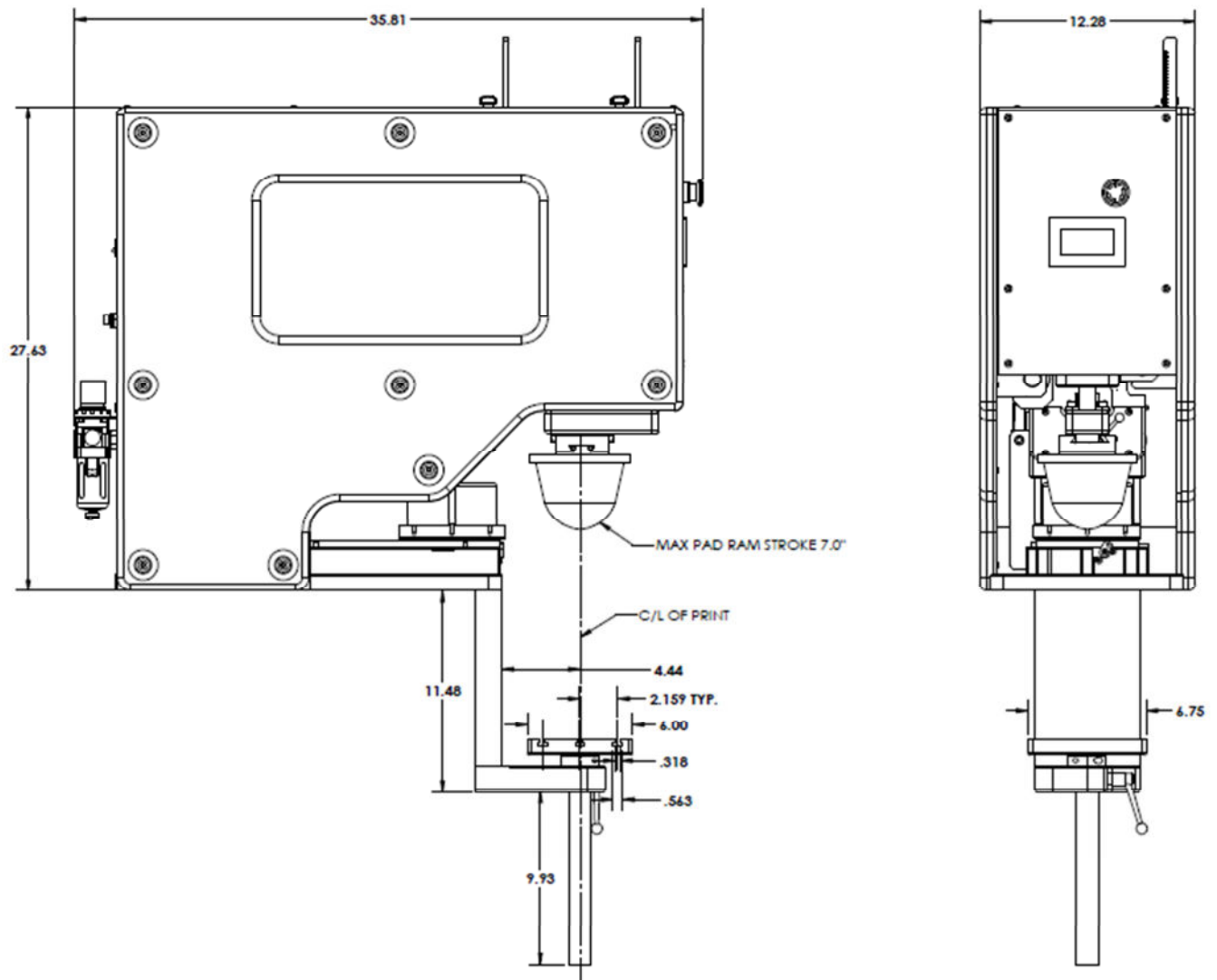
AERO 60 AND 90



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Installation Instructions

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3.1 Description of Ink Cup Tooling

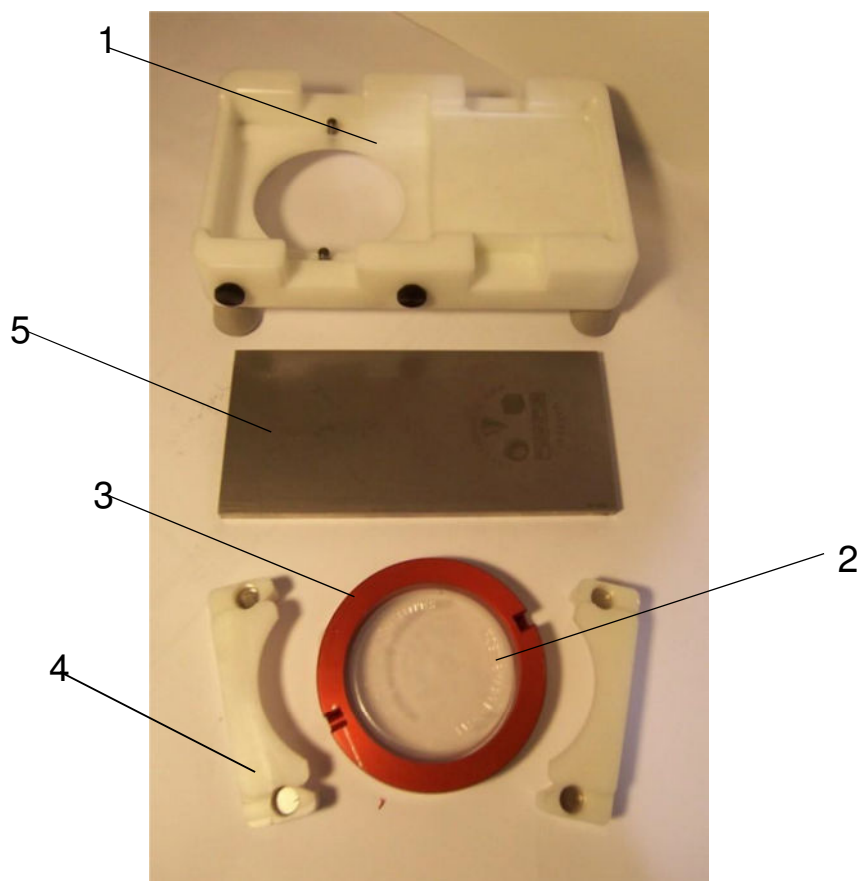


Illustration 2-1. Cliché assembly device

AERO 60 and 90

Bill of Materials for Ink Cup Assembly			
No.	Description	Part number Aero 90	Part number Aero 60
1	Setup Table	9901-30-001	9901-31-001
2	ExpressLiner	(std) (tall)	9260-10-004
3	SpaceFrame	9260-26-100	9260-16-100
4	Magnetic Cup Clamp	9901-30-002	9901-31-002
5	Cliché	Contact Trans Tech	Contact Trans Tech

AERO 130

Bill of Materials for Setup System 9902-30-000		
No.	Description	Part number Aero 130
1	Setup Table	9902-30-001
2	ExpressLiner	9260-30-003
3	SpaceFrame	926038100
4	Magnetic Cup Clamp	9902-30-002
5	Cliché	Contact Trans Tech

3.2 Installation of the Cliché and Ink Cup

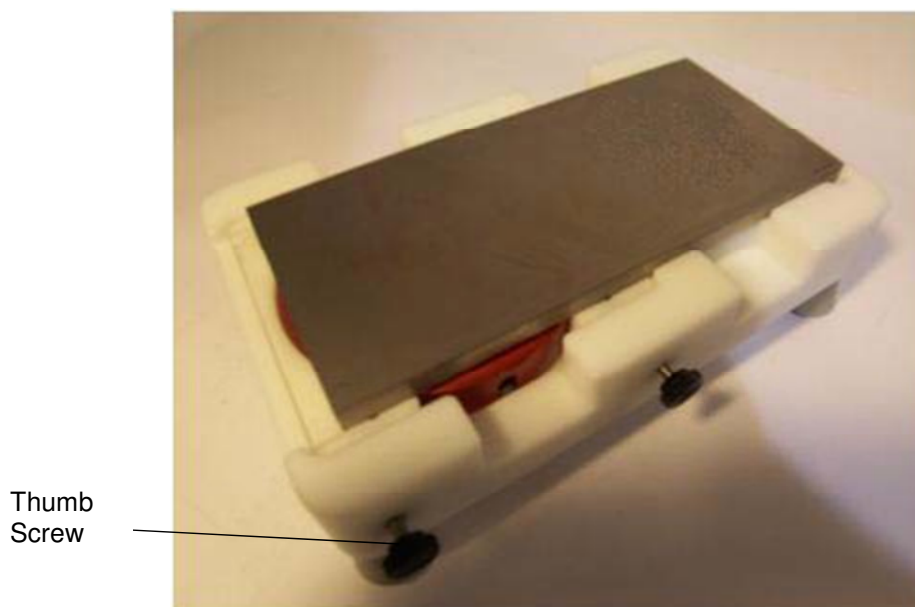


Illustration 2-2. Ink cup assembled on assembly table

When preparing the ink cup to be placed into the machine for printing, proceed as described in the following instruction:

1. Insert both 'MAGNETIC CUP CLAMPS' (4) with the top down into the 'SETUP TABLE' (1) Tighten thumb screws snugly to retain clamps.
2. Place the ExpressLiner (2) with the opening up into the SpaceFrame (3)
3. Place SpaceFrame assembly into 'MAGNETIC CUP CLAMPS' with both dowel pins engaged into the receiver pockets of the cup.
4. Fill ExpressLiner (2) with ink to desired fill level.
5. Place the 'CLICHÉ' (5) carefully with the image facing down. Slide cliché back until it is located firmly against the back and side stops on the 'SETUP TABLE' (1)
6. Loosen thumb screws and carefully lift the ink cup/cliché assembly out of the SETUP TABLE

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7. Remove the ink cup assembly from the 'SETUP TABLE' (1)
Turn the assembly over (the cliché is now on the bottom)
With side guard open, slide the assembly into the Aero Pad Printer.
8. Close the clamping lever (move counterclockwise) to clamp the ink cup
Verify that the clamping fingers are properly engaged with the hold down ring
9. Remove the MAGNETIC CUP CLAMPS
10. Mount pad onto magnetic holding base
11. Close machine guard
The machine is ready to operate

3.3 Removal of the Cliché and Ink Cup

When removing the ink cup from the machine, proceed as described in the following instruction:

1. Stop the AERO printer via the 'STOP' button in the 'HOME' position (Pad forward and up).
2. Open the machine guard and remove pad
3. Place MAGNETIC CUP CLAMPS on the front and rear of the CUP
4. Loosen the cliché clamping screws and move the cliché clamp to clear the cliché
5. Using the T handle ALLEN wrench (or black handle for Aero 130), turn the machine clamping screw clockwise to lift the clamping fingers clear of the 'HOLD DOWN RING' (3)



If the machine has been assembled for an extended period of time, accumulation of ink may inhibit the removal of the cliché'. This may cause the ink cup to pull free from the cliché' and to spill the ink. Verify that the cliché' and ink cup slide out together!

6. Draw the cup/cliché assembly out of the machine and turn it over with the ink cup facing down
7. Set assembly into the 'SETUP TABLE' (1) and tighten the thumb screws
8. Slide the cliché off the ink cup. The ink remaining on the cliché will be stripped off



If the printing machine will not be in operation for an extended time, the ink can remain in the cup without deterioration of the ink.

3.4 Handling of the Ink Cup



- Always protect the doctor ring in the ink cup from being damaged
- When not in use, place cup assembled with the cliché and clamped with the 'CLAMPING TOOL' (4) in the 'SETUP TABLE (1)' as shown in illustration 2.3
- If stored separately, place the ink cup in the protective plastic container
- Rotate the cup frequently (steel cliché 2 hrs., polymer cliché 1 hr.) while in operation



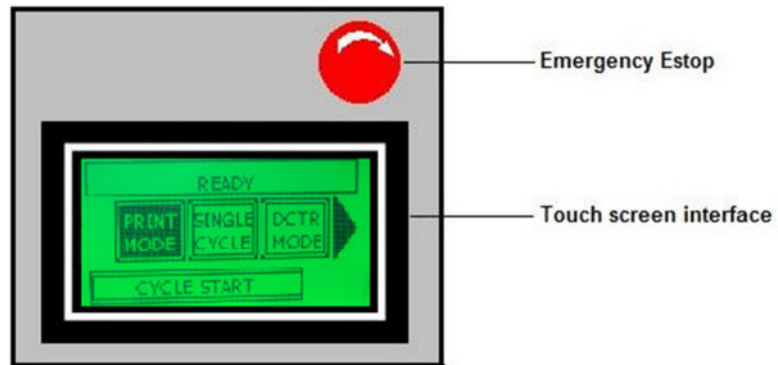
WARNING

The doctor ring has a very sharp edge that may cause personal injury if improperly handled.

PLEASE HANDLE WITH CAUTION!

4. Operating Controls

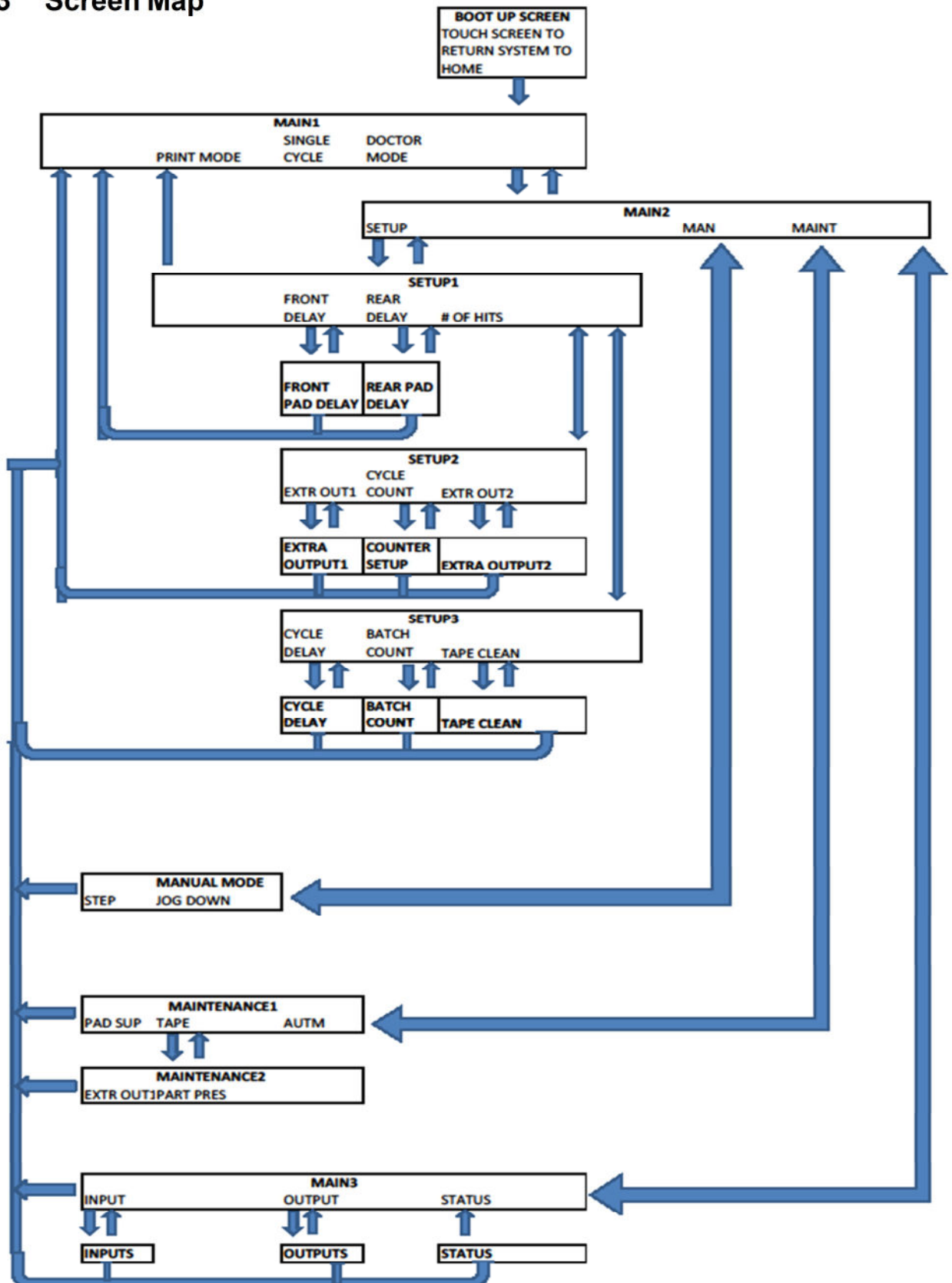
4.1 Description of the Operating Panel



4.2 The Operating Control Functions

Button	Description	Result
Touch Screen	Active when power is on	All setup, operating mode, start and stop command and manual functions are input via the touch screen.
E-Stop	Press to activate. Pull to release.	Interrupts power to inputs and outputs. Machine motion is immediately disabled. The machine may continue to move for a short distance after E-STOP is pressed.
Pad stroke down limit	Adjust the pad down stroke limit	Loosen lock screw before making adjustment. Move slide up to shorten stroke. Move slide down to lengthen stroke. Tighten lock screw after making adjustment.
Flow controls	Adjust the speed of the pad ram. Adjust the speed of the pad slide.	Loosen the lock ring. Turn knurled screw clockwise to slow down movement. Turn knurled screw counterclockwise to speed up movement. Tighten lock ring after making adjustment
Foot Switch And START button on control screen	Stop and start the printer.	When in single cycle mode, pressing the foot pedal or the START button will start the print cycle. When in continuous cycle mode, pressing the foot pedal once or pressing the START button will start the print cycle. Pressing the foot pedal again will stop the printer at the end of the active step of the print cycle. Press again to continue the print cycle.

4.3 Screen Map



4.4 Setup

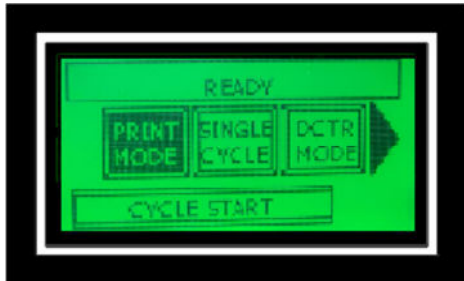
4.4.1 Boot Up Screen



Normal Boot up screen after power on

Touch screen or push Foot Pedal to jump to Main screen.

4.4.2 Main Screen



Main Screen with single mode selected



Main Screen with auto mode selected



Touch Print Mode to select Print



Single Cycle selected, Touch Single Cycle to select Auto Cycle mode



Auto Cycle selected, Touch Auto Cycle to select Single Cycle mode



Touch Doctor Mode to select Doctor mode



After cycle mode is selected press Cycle Start



Press the STOP button to initiate a cycle stop.
 *Note: The machine will not stop immediately. It will complete the active cycle and then stop in the home position.

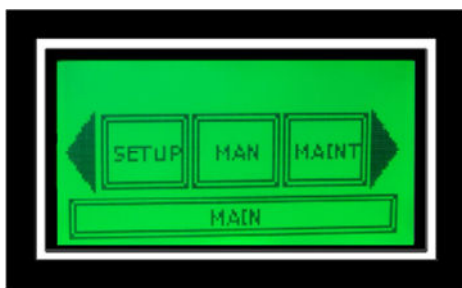


Touch arrow button to jump to the next screen



*Note: During a cycle, RATE and CYCLE CT are displayed.

4.4.3 Second Screen



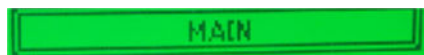
Touch SETUP button to jump to the SETUP screen.



Touch MAN button to jump to the MANUAL screen



Touch MAINT button to jump to the MAINTENANCE screen. Before the Maintenance screen is displayed a valid password must be entered. If the password entered is correct then the Maintenance screen will be displayed. (Note: Maintenance screen will allow the printer configuration to be modified. Only turn on options that are installed on the machine. The password is 9999.)



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the next screen



Touch arrow button to jump to the previous screen

4.4.4 Setup 1



Touch FRONT DELAY button to jump to the FRONT PAD DELAY screen.



Touch REAR DELAY button to jump to the REAR PAD DELAY screen



Touch to increase the number of prints per cycle in Single Cycle mode from 1 to 4. Pressing again after 4 will return to 1.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the next screen



Touch arrow button to jump to the previous screen

4.4.5 Front Pad Delay



FRONT PAD DELAY UP – causes printer to stop in the front and up position after printer has picked up ink but before it has printed the part.

FRONT PAD DELAY DOWN – causes printer to continue pushing the pad down in the front and down position while the printer is printing the part but before returning to the up position.

Note: Entering a value of zero will result in no delay

Note: Use this Down Dwell in conjunction with lowering the main air pressure in order to cause a “stall on part” condition.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.6 Rear Pad Delay



REAR PAD DELAY UP – causes printer to stop in the rear and up position before printer has picked up image.

REAR PAD DELAY DOWN – causes printer to continue pushing the pad down in the rear and down position while the printer is picking up ink from the cliché for the length of time set, before returning to the up position.

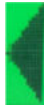
Note: Entering a value of zero will result in no delay

Note: Set this to zero if no Tape Cleaning device is installed. Use this delay to add more time to rear pad down adjustment scale for ink pick-up if a Tape Cleaning device is installed. This is the time

required to go from the Tape Cleaning Plate height to the Cliché height at the given speed.

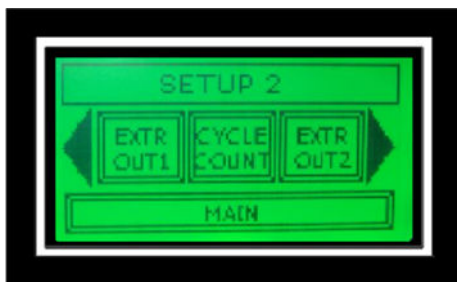


Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.7 Setup 2



Touch EXTR OUT1 button to jump to the EXTRA OUTPUT1 screen.



Touch CYCLE COUNT button to jump to the CYCLE COUNT screen



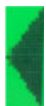
Touch EXTR OUT2 button to jump to the EXTRA OUTPUT2 screen.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the next screen



Touch arrow button to jump to the previous screen

4.4.8 Extra Output 1



Output Y0 turns on at the beginning of the 1st print and turns off at the completion of the 1st print. The pad will then go down to print the 2nd image (without picking up a new image) after the rising edge of input X2. Input X2 can be connected via diodes to auto switches in parallel to monitor slide/rotary fixture position. For example, position slide to print the 1st image on one side of the part and then print the 2nd image on the other side of the part with only one image pickup and one foot switch activation. Typically used with two small images and two printing pads.



Output Y0 turns on at the beginning of the 1st print and turns off at the start of the 2nd print. The printer will initiate its own 2nd print. Input X2 can be connected via diodes to auto switches in parallel to monitor slide/rotary fixture position. For example, position slide to print the image on one section of the part and then pick up and print the same image of a 2nd section of the part with one foot switch activation. Typically used with one large image and one printing pad



Output Y0 turns on at the beginning of the cycle every other cycle for the entire print cycle. Input X2 must be on to allow the printer to finish the cycle. For example, Pneumatic rotary dial table that goes changes directions with a 2 position single valve. Input X2 can be connected via diodes to auto switches in parallel to monitor table position.



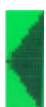
Output Y0 turns on at the beginning of the cycle and then turns off at the rising edge of input X2. For example, electric rotary indexing dial.



Select this to turn on or off the Y0 output mode. When selected to on, the Y0 will operate to the mode selection. When selected to off the Y0 output will not operate and the printer will run without the mode selection.

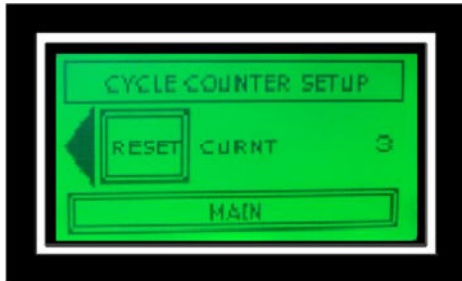


Touch Main Button to jump back to the MAIN screen

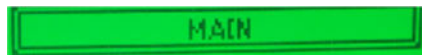


Touch arrow button to jump to the previous screen

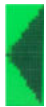
4.4.9 Cycle Counter



Touch to RESET current cycle count value to 0.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.10

Extra Output 2 Setup



Output Y1 turns on at the start of the print cycle for the duration print cycle



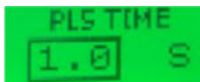
Output Y1 turns on at the start of the 1st print cycle for the duration selected in the Pulse Length.



Output Y1 turns on at the completion of the print cycle for the duration selected in the Pulse Length.



Output Y1 turns off at the start of the print cycle for the duration print cycle and then remains on until the next print cycle is started. Y1 initially turns on after the main air is on.



Touch here to enter the length of time for output Y1 to pulse on



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.11

Setup 3



Touch CYCLE DELAY button to jump to the CYCLE DELAY SETUP screen.



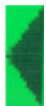
Touch BATCH COUNT button to jump to the BATCH COUNT SETUP screen



Touch TAPE CLEAN button to jump to the TAPE CLEAN SETUP screen.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.12

Cycle Delay



CYCLE DELAY will delay the printer at the end of its print cycle after the preset time delay has occurred in Auto mode.



Touch to enter the value of the delay between cycles.



Touch Main Button to jump back to the MAIN screen

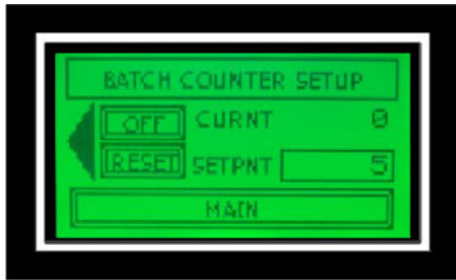


Touch arrow button to jump to the previous screen

Note: Entering a value of zero will result in no delay

4.4.13

Batch Count



Displays Batch Counter functions; Batch Counter will stop the printer at the end of its print cycle once the preset number of BATCH COUNT print cycles has occurred. The printer will stop cycling and a message will be displayed to indicate BATCH count achieved. To reset and start the printer, the BATCH COUNTER will need to be reset.



Press the ON/OFF button to disable/enable BATCH COUNTER



Press the RESET button to rest the BATCH COUNTER



Displays the current count of the batch cycle.



Touch the cell to display a numeric keypad. Enter a preset value which will stop the machine when the preset count is achieved.



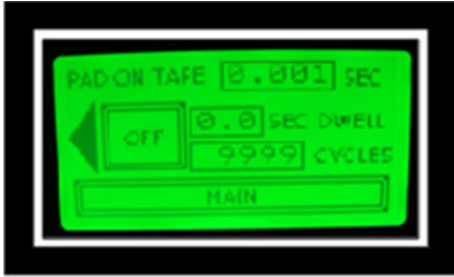
Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.14

Tape Clean



Note: The printer is pre-programmed with the tape cleaner option. (TAPE CLEANER IS PURCHASED SEPARATELY)

The Tape Cleaner is an optional device that uses a moving “tape plate” to clean the residual ink of a printing pad. The pad/ink reservoir moves back to allow the tape plate to move over the etched image of the cliché. The pad comes down on the tape plate (via the rear stroke adjustment scale) and retracts to the up position. The tape plate retracts to a clear position and then the pad/ink reservoir returns to the front position to re-wet the ink in the etched image. The tape take-up spool is activated when the tape plate retracts. The amount of tape take-up can be controlled by adjusting the take-up spool rotary cylinder end stop adjusters. (See tape cleaner manual for further details)



Press the cell to display a numeric keypad. Enter a preset value which will be the length of time added to the “Pad Down on Tape Tongue” sensor before the pad returns to the “up” position during a tape clean cycle. This allows the amount of pad compression on the tape tongue to be adjusted. Use the mechanical scale slider to adjust the down distance for printing and this adjustment for cleaning.



Press the ON/OFF button to disable/enable TAPE CLEANER



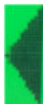
Touch the cell to display a numeric keypad. Enter a preset value which will be the length of time between a tape clean cycle completed and a new print cycle starting. This allows the ink in the exposed image to be rewet after the SpaceFrame has returned to the front of the cliché.



Touch the cell to display a numeric keypad. Enter a preset value which will be the number of cycles before a tape clean is activated.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.15 Manual Screen



Default display for Manual screen.

*Note:

1. The production count will not increment in JOG mode.
2. The PAD DELAY is not active in JOG mode.



The printer completes **one** step of the printer cycle **each** time the Step button is pressed.



The pad ram will complete **one** down/up cycle **each** time the JOG DOWN button is pressed.



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.16

Maintenance 1 Screen



Touch to select this option if Pad Support is installed (The button will display dark). If Pad support is not installed this option should not be selected (the button should display light). Pad Support activates an NPN output Y6 (sinking) on pin 8 when a part is being printed (Support Up), and then toggles to pin 21 (output Y7) when the part is not being printed (Support Down). The system monitors these inputs when activated as NPN inputs X6 (Support Up, pin 4), and X7 (Support Down, pin 17).



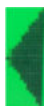
Touch to select this option if Tape Cleaner is installed (The button will display dark). If Tape Cleaner is not installed this option should not be selected (the button should display light). Tape Cleaner activates an NPN output Y4 (sinking) on pin 7 when the tape cleaner goes into the machine (clean position) (Tape Clean In), and then toggles to pin 19 (output Y3) when the pad is not being cleaned (Tape Clean Out). The system monitors these inputs when activated as NPN inputs X4 (Tape Clean In, pin 3), and X3 (Tape Clean Out, pin 15).



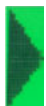
Touch to select this option if Automation is installed (The button will display dark). If Automation is not installed this option should not be selected (the button should display light).



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

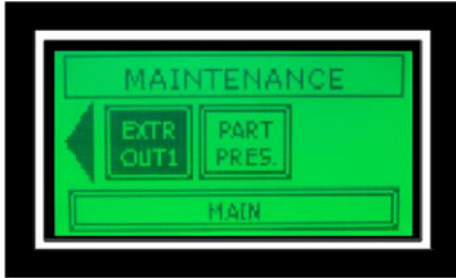


Touch arrow button to jump to the next screen

Note: A fault/message will occur if the accessory electrical autoswitches are not present/correct once a device has been selected as "Installed"!

4.4.17

Maintenance 2 Screen



Touch to select this option if Part Present is installed (The button will display dark). If Part Present is not installed this option should not be selected (the button should display light). Part Present looks at the state of an NPN input X5 (sinking) on pin 16 when a cycle is being started. The cycle will only be started if a part is sensed and while the foot switch or Start softkey are being pushed. A alarm message will appear if no part is sensed during the start activation. A “P” inside of a frame will appear on the Main Screen whenever a part is sensed.



Touch to select this option if Extra Output 2 is installed (The button will display dark). If Extra Output 1 is not installed this option should not be selected (the button should display light). Extra Output 1 activates an NPN output Y0 (sinking) on pin 5 when required. The system monitors NPN input X2 (Extra Output in Position, pin 2) when required.



Touch Main Button to jump back to the MAIN screen

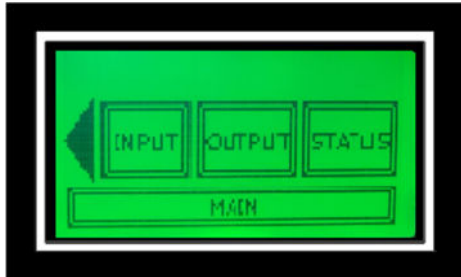


Touch arrow button to jump to the previous screen

Note: A fault/message will occur if the accessory electrical autoswitches are not present/correct once a device has been selected as “Installed”!

4.4.18

Third Screen



Touch INPUT button to jump to the INPUTS screen.



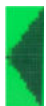
Touch OUTPUT button to jump to the OUTPUTS screen



Touch STATUS button to jump to the STATUS screen



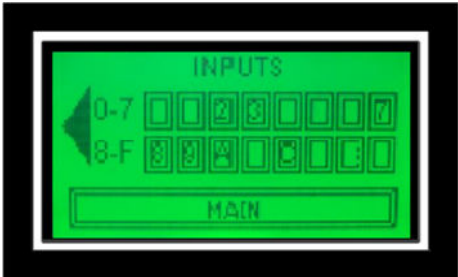
Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.19

Inputs



Displays the current status of the PLC inputs

Note: When input is active the input number is displayed on screen



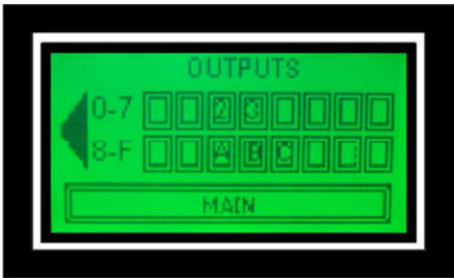
Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.20

Outputs



Displays the current status of the PLC outputs

Note: When input is active the output number is displayed on screen



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.21

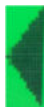
Status



Displays the current status of the PLC program



Touch Main Button to jump back to the MAIN screen



Touch arrow button to jump to the previous screen

4.4.22

Alarms



Note: Correct the fault causing condition and then press reset fault button.



Press the Reset button to clear displayed alarms. Once the alarms are clear the screen will return to green.

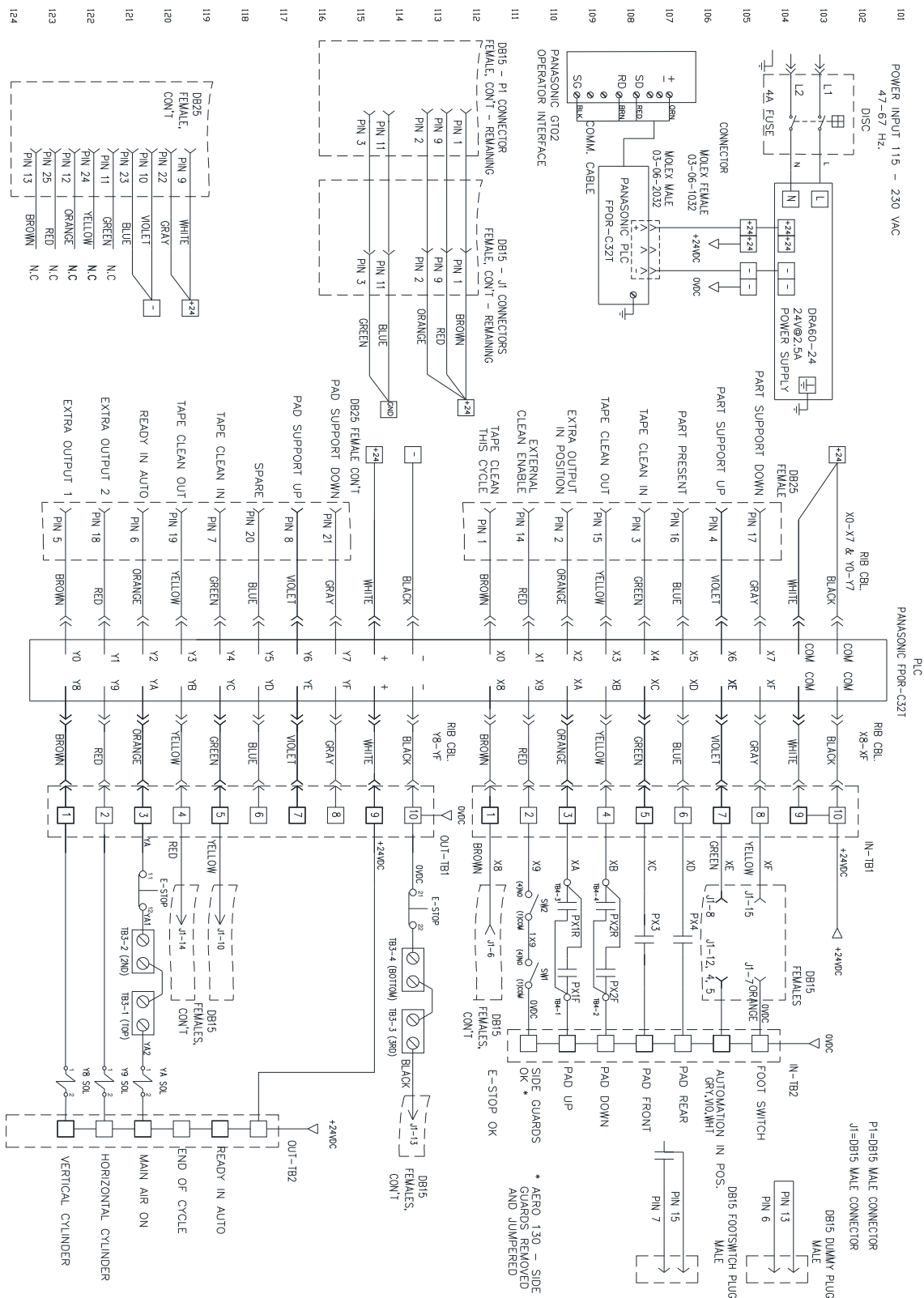


Touch arrow button to jump to the next screen

4.5 Standard Errors

Error	Action
PAD RAM DOWN TIMEOUT	Check bottom proximity switch on vertical cylinder Check up/down valve
PAD RAM REAR TIMEOUT	Check rear proximity switch on horizontal cylinder Check pad forward/back valve
E-STOP	Pull E-Stop to release
NO AIR	Check air connection Check up proximity switch Check front proximity switch Check up/down valve Check pad forward/back valve
TAPE CLEANER POS TIMEOUT	Check tape cleaner proximity switches on cylinder Check tape cleaner in/out valve
PAD RAM UP TIMEOUT	Check top proximity switch on vertical cylinder Check up/down valve
BATCH CT. FINISH	Press reset to clear batch count, then press back to go to previous screen
PAD RAM FRONT TIMEOUT	Check front proximity switch on horizontal cylinder Check pad forward/back valve
AUTOMATION IN POSITION TIMEOUT	Check XE INPUT

PAD SUPPORT NOT IN UP POSITION	Check X6 proximity switch on cylinder. Check pad support up/down valve
PAD SUPPORT NOT IN DOWN POSITION	Check X7 proximity switch on cylinder. Check pad support up/down valve
PAD AT FRONT PROX STUCK ON	Check XC proximity switch stuck in the on state. Check prox on cylinder.
PAD AT REAR PROX STUCK ON	Check XD proximity switch stuck in the on state Check prox on cylinder.
PAD AT UP PROX STUCK ON	Check XA proximity switch stuck in the on state. Check prox on cylinder.
PAD AT DOWN PROX STUCK ON	Check XB proximity switch stuck in the on state Check prox on cylinder.
DIAL MOTION NOT COMPLETED	Check X2 proximity switch. Dial is selected and installed for the Extra Output1. A complete dial index consists of Prox X2 starting “on”, then going “off”, and then back to “on”.



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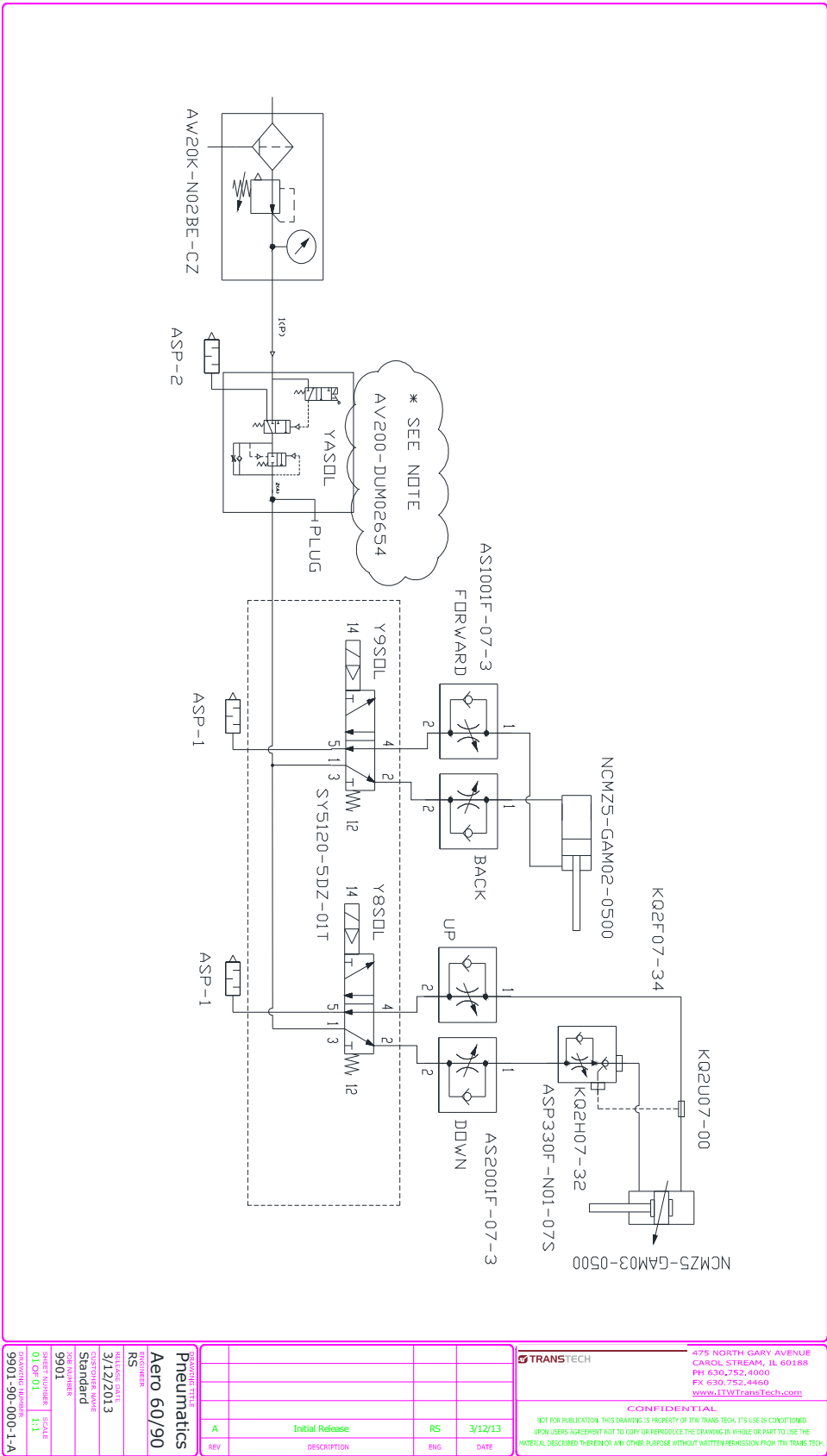
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B	X8 6-13 changed	RS	2014
A	Initial Release	RS	2013
REV	DESCRIPTION	ENG	DATE

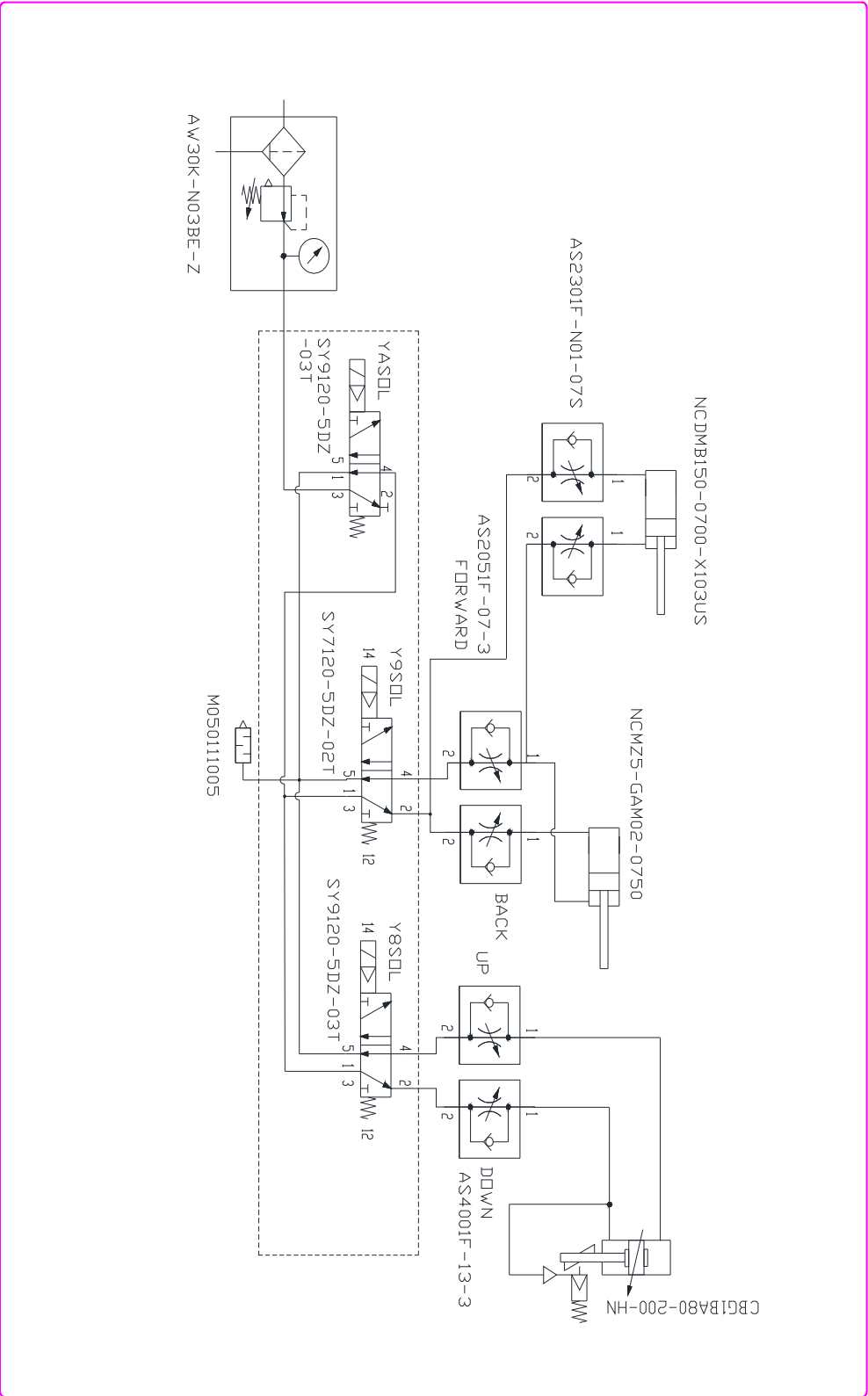
DRAWING TITLE	
Electrical Schematic	
ENGINEER	
Rich Schulz	
RELEASE DATE	
2014	
CUSTOMER NAME	
AERO 60 90 130	
JOB NUMBER	
9901	
SHEET NUMBER	SCALE
02 OF 02	1:1
DRAWING NUMBER	
9901-80-000-2-A	

6. Pneumatics Schematics

6.1 Version AERO 60/90



6.2 Version AERO 130



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REV	DESCRIPTION	ENG	DATE
A	Initial Release	RS	3/12/13