

ROTARY TECHNOLOGIES



Series 3

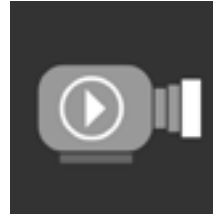


Series 3 Servo 3000 Infeed + Reregister System Installation and Operating Manual





Electrical Video Link



Warning! Before powering the Servo 3000 the following steps must be taken.

1) Switch 24 volt circuit breakers to the off position - to the left position, the breakers will show green when it is in the "off" position. *figure 2*

2) Before turning power on, using a voltage meter measure VAC across terminals L1, L2, & L3 to determine main input power.

4) After main VAC is known, wire the terminal jumpers on the 24 VDC power supply according to the wiring chart located on the 24 VDC power supply. This wiring chart is also located on page 6 of this manual. *figure 3*

4) After terminal jumpers are set in the correct terminals per the wiring chart it is safe to switch power on the Servo 3000.

5) Measure the 24 VDC output from the power supply. If correct 24VDC turn on the 24 VDC breaker. If not correct recheck terminal jumpers.

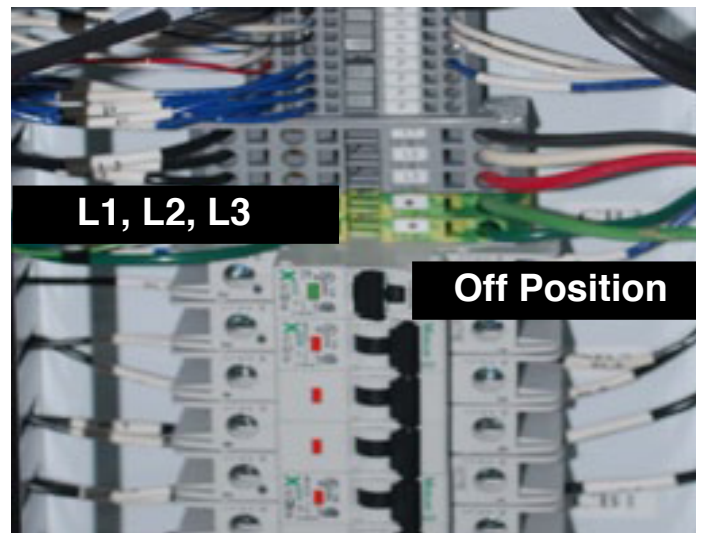


figure 2

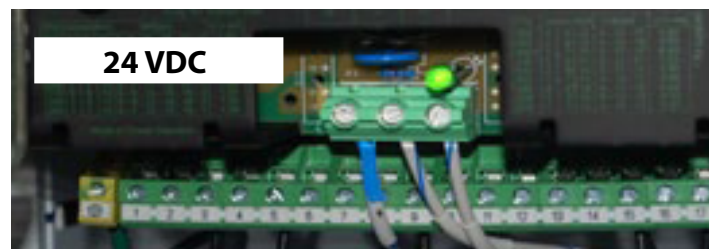


figure 3



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Servo Mounting Video Link



1. System Overviews

The Servo3000 Reregister + Infeed System is a self contained web tensioning machine. It operates in a precision feed mode that improves press registration, lowers material waste, and expands the runable substrate range.

The Servo3000 is a precision registration system for pre-printed rolls. The Servo3000 allows pre-printed rolls to be over printed for additional colors, allows digitally printed rolls to be converted on a conventional press, and allows pre-printed rolls to be laminated to other printed webs for multi layered products.

The system can operate at full press speed.

2. System Parts

Servo Unit

Encoder

Electrical Cabinet

Backside Web Reader (optional)



Pictures 1 & 2: Mounting Bracket Examples



Pictures 5: Direct couple mount

3. Mechanical Installation

3.1 Servo Unit: The Servo Unit must be mounted with rigid bracketry. Excessive vibration will degrade performance. See [page 20 for mounting hole locations](#).

The unit must be mounted downstream of the dancer and web guide, and with the web path bypassing the existing infeed cylinder as shown in *figure 1*.

[Download Link for installation photos.](#)

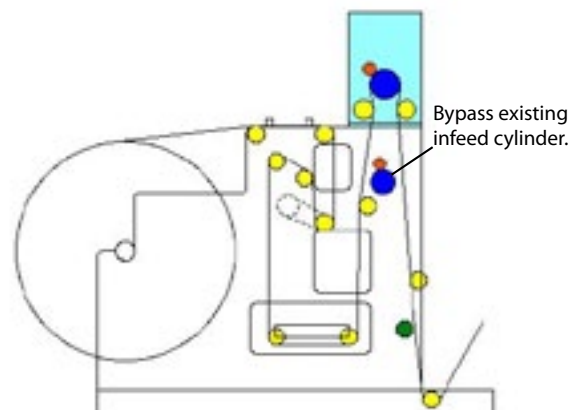
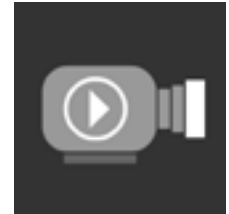


figure 1



Encoder Video Link



3.2 Encoder: There are three methods of mounting the encoder, 1) timing belt pulleys from the press line shaft, 2) direct couple to the line shaft, and 3) direct geared using a spur gear. See pictures 4, 5, and 6.

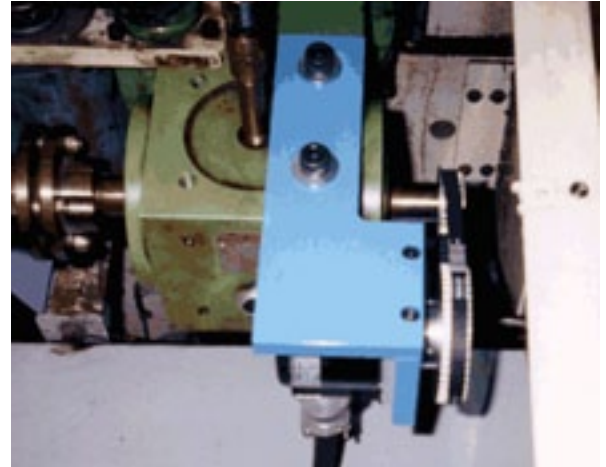
The encoder is a precision instrument and must be mounted with rigid bracketry. Excessive vibration will degrade performance. See [page 21](#) for encoder drawing.

If mounting using a spur gear adjust the mesh so there is a tight fit.

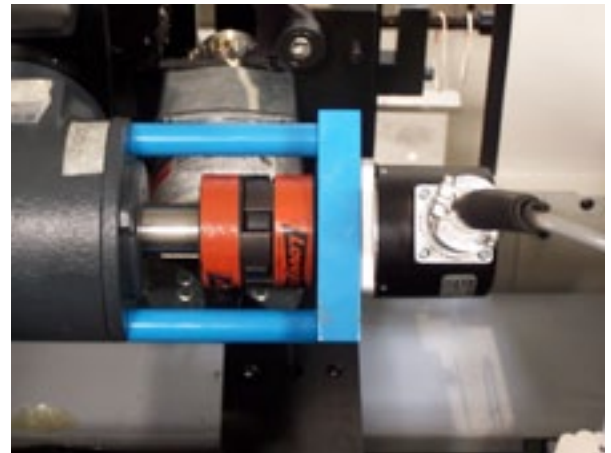
Important. The ratio between the press and encoder is extremely important. Consult Rotary when choosing to mount the encoder using timing belt pulleys or direct couple to the line shaft.

3.3 Electrical Cabinet: The electrical cabinet is delivered already mounted on casters.

3.4 Backside Web Reader: This option mounts directing to the Servo Unit with the supplied hardware (4x 3/8-16 x 2" SHCS). See figure 2 for the web path diagram.



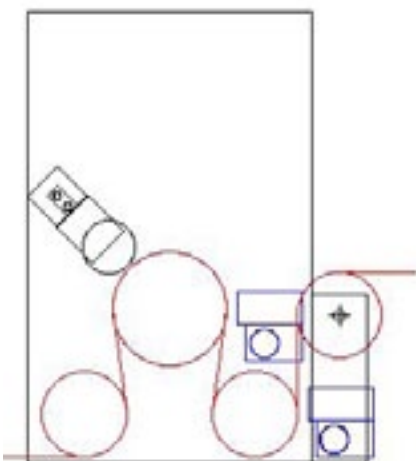
Pictures 4: Timing belt pulleys mount



Pictures 5: Direct couple mount



Pictures 6: Direct gear mount

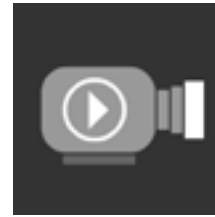


Reposition sensor to read back of web

Figure 2



Electrical Video Link



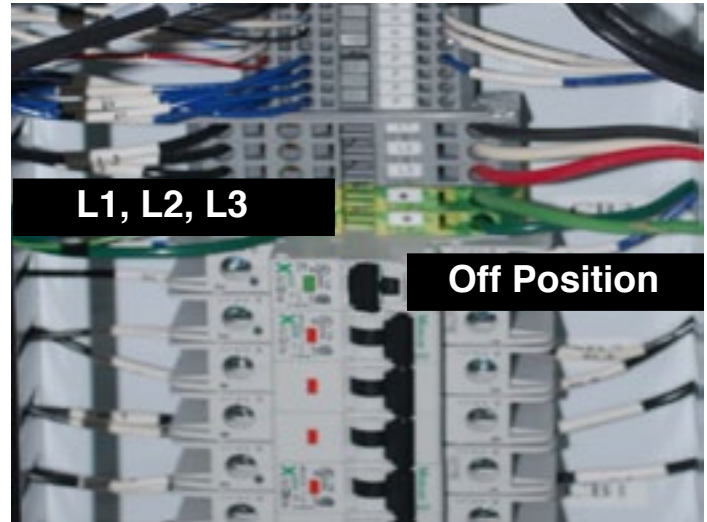
4. Electrical Installation

4.1 Mains: The Series II Systems are designed for universal three phase power.

Voltage 3x 208 - 520 VAC
 Cycle 50/60 Hz
 Service 20 Amps

The Series II Systems are portable and it is recommended that a power drop with a female receptacle be provided for ease of connection. A male plug can be wired to the supplied 12' power cord which is terminated inside the electrical cabinet. Observe local electrical requirements when choosing the plug and receptacle.

Warning: Do not turn the system on before wiring the correct inputs and bridging the correct terminals on the power supply located inside the electrical cabinet. Failure to do so may cause damage to the system and possible injury. *See figure 3.*



First measure the incoming power then wire the inputs and bridges based on the wiring chart. [Detailed instructions.](#)

4.2 Encoder: The encoder cable coming from the electrical cabinet has a military style connector. Connect this cable to the encoder before turning the system on. Make sure the encoder cable is clear of moving parts and other high voltage lines.

5. Pneumatic Installation

Located on top of the electrical cabinet is a universal air intake fitting. Connect regular shop air. Adjust the air regulator to 25 psi.













Input Voltage	L1	L2	L3	Bridges
208 VAC	3	9	15	4-9, 10-15, 16-3
220 VAC	2	8	14	4-8, 10-14, 16-2
230 VAC	1	7	13	4-7, 10-13, 16-1
242 VAC	3	9	15	5-9, 11-15, 17-3
254 VAC	2	8	14	5-8, 11-14, 17-2
266 VAC	1	7	13	5-7, 11-13, 17-1
278 VAC	3	9	15	6-9, 12-15, 18-3
289 VAC	2	8	14	6-8, 12-14, 18-2
300 VAC	1	7	13	6-7, 12-13, 18-1
360 VAC	3	9	15	4-10-16
380 VAC	2	8	14	4-10-16
400 VAC	1	7	13	4-10-16
420 VAC	3	9	15	5-11-17
440 VAC	2	8	14	5-11-17
460 VAC	1	7	13	5-11-17
480 VAC	3	9	15	6-12-18
500 VAC	2	8	14	6-12-18
520 VAC	1	7	13	6-12-18






5. Operations

5.1 Operator Keypad - Key Functions

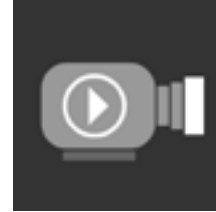
Function Keys with LED Indicators
LED Denotes On/Off Status

-  Gripper Wheels/Nip On
-  Gripper Wheels/Nip Off
-  Infeed Mode Page
-  Reregister Mode Page
-  Reregister On
-  Reregister Off
-  Advance Register
LED on when pressed
-  Retard Register
LED on when pressed
-  Motor Engage
-  Motor Disengage
-  Initial Install Page - Key Toggles Between
Current Page - LED on when pressed
-  Clear Error
LED on when pressed

System LED Indicators

-  On = Alarm - Off = No Alarm
-  On = Comm.OK - Off = Comm. Error
-  On = Unit in Operation
Off = Hardware Fault









Keypad Video Link



Operator Keypad

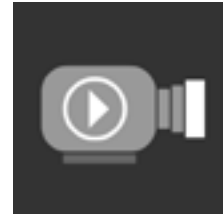


Data Function Keys

-  Program Key
-  Status Page - Key Toggles
Between Current Page
-  Begin Data Entry Key
-  Cursor Direction Keys
-  Page Up/Dwn Keys
-  Numeric Data Keys
-  Enter Key
-  Clear Key



Status Video Link



5.2 Status Lights and Emergency Stop

5.2.1 Green LED Indicator:

On = System ready to operate.

Off = System error, motor disengaged or e-stop pressed.

Note: To clear a system error press the clear error key, to clear an e-stop follow the procedure in section 5.2.3 Emergency Stop.

5.2.2 Clear LED Indicator:

On = Visual acknowledgement when pressing Register Advance/Retard function keys.

Blinking = Print mark not read. See [Mark Sensor Operation Section 9](#)

5.2.3 Emergency Stop:

This stop is for the Servo 3000 only and will not stop the press.

If the press emergency stops are activated, the Servo 3000 will stop but the motor will be engaged.

Note: Pressing the e-stop creates a drive error that must be acknowledged. To clear the e-stop follow this procedure.

1. Release the e-stop.
2. Press the Clear Error key.
3. Press the Motor Disengage key.
4. Press the Motor Engage key.

Green LED



Clear LED



E-Stop



Clear Error
LED on when pressed

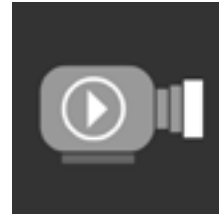


Motor Disengage



Motor Engage

5.3 Gripper Video



5.3 Gripper Wheels

Gripper wheels provide a positive nip point and prevent the web from slipping around the infeed cylinder. They can be moved side to side by loosening the locking lever and sliding the gripper assembly across the gripper bar.

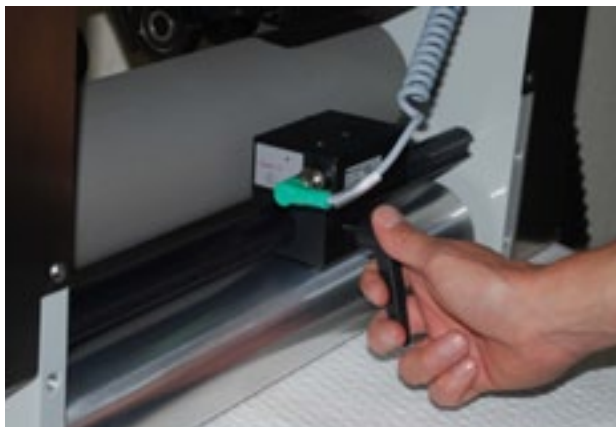
Pressing the gripper function keys will put the gripper wheels up or down. It is recommended they be down when running and that the air pressure be set at 40 psi.



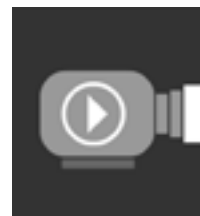
Gripper Wheels/Nip On



Gripper Wheels/Nip Off



5.4 Sensor Video Link

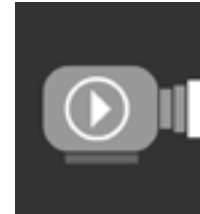


5.4 Mark Sensor

The mark sensor can be moved side to side to be positioned above the print mark by loosening the locking lever and sliding the sensor assembly across the sensor bar. [See section 9 Mark Sensor Set-up for sensor operation.](#)



5..5 Data Video Link



5.5 Data Entry

The data entry procedure is the same for each page. To enter new data press the "Begin Data Entry Key" and a cursor will highlight a field that can be changed.



Begin Data Entry Key

Use the "Cursor Direction Keys" to move the cursor to a new field.



Cursor Direction Keys

Use the "Numeric Keys" to enter data in a highlighted field.



Numeric Data Keys

Use the "Enter Key" to store new data.



Enter Key

Use the "Clear Key" to delete data.



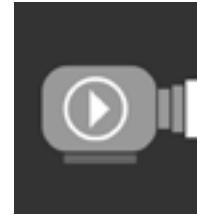
Clear Key



Press the Begin Data Entry Key and a cursor will appear.




6 Initial Set-up Video Link



6. System Set-up / Initial Set-up: The system must be initially set-up for new installations or when moving it to a another press.

Note: The procedures described in this section require “data entry”. [See section 5.5 for details.](#)

Press the “Initial Install Page” key to enter set-up page. Pressing this key again will toggle back to the previous page.

 Initial Install Page - Key Toggles Between Current Page - LED on when pressed

Note: This screen is password protected. Enter password 1234 then press the Enter Key.

 Numeric Data Keys

 Enter Key

There are seven fields for data entry on this page, only four lines of text are displayed at once. Use the page up/down keys to view complete page.

 Page Up/Dwn Keys



Initial Install / System Set-up Page

System Set-up		
Motor Polarity		X
Encoder XXXX	XX.XXX	
Gear Type		X
Anti Backing		X
Inches=□/Metric=1		X
Drive Language		X
Language		X

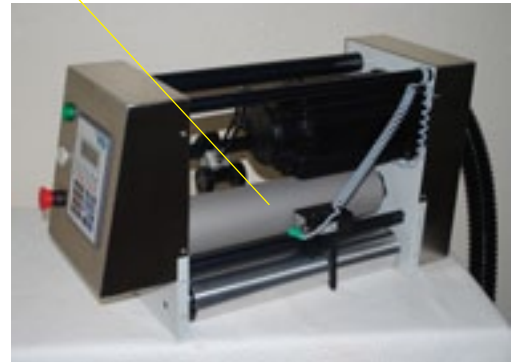
Only four lines of text are dsplay at once.



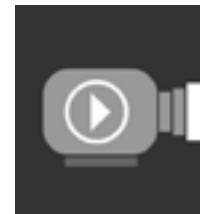
6.1 Motor Polarity: The motor polarity value determines which direction the infeed cylinder on the Servo Head Unit turns. To test jog press and see if the infeed cylinder is turning the same direction as the web direction, if yes it is correct. If the infeed cylinder turns the opposite direction change the motor polarity.

Possible Values: 0 = Positive
 1 = Negative

Infeed cylinder must turn in web direction.



6.2 Encoder Video Link



6.2 Encoder: The encoder value is displayed and entered according to the "Gear Type" selected (see section 6.3). The value is the actual representation of how the encoder is installed and relates to one revolution of the encoder compared to press movement.

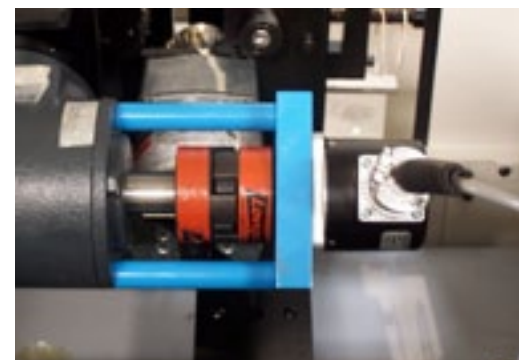
Example 1: The encoder is mounted direct geared using a 1/8" pitch spur gear with 73 teeth. Therefore one revolution of the encoder is 9.125" of press movement. The Encoder value would be 9.125 if Gear Type Inches is selected, or 73 if Gear Type 1/8 CP is selected.

Example 2: The encoder is direct coupled to the press line shaft. One revolution of the press line shaft is 8.250". The Encoder value would be 8.250 if Gear Type Inches is selected, or 66 if Gear Type 1/8 CP is selected.

Important: Entering any value other than the correct Encoder Value and the system will not work !



Spur gear mount.



Direct couple mount.



6.3 Gear Type: The selected gear type value will determine how the encoder value is entered in the system set-up page, but more importantly it is an operator preference since it determines how the "Print Repeat" is entered using the Reregister Mode.

Possible Values	Print Repeat (Reregister)
0 = Inch	Enter Print Repeat in Inches
1 = 1/8 CP	Enter Gear Teeth of Print or Die Cylinder
2 = 1/4 CP	Enter Gear Teeth of Print or Die Cylinder
3 = 32 DP	Enter Gear Teeth of Print or Die Cylinder
4 = MOD 1	Enter Gear Teeth of Print or Die Cylinder

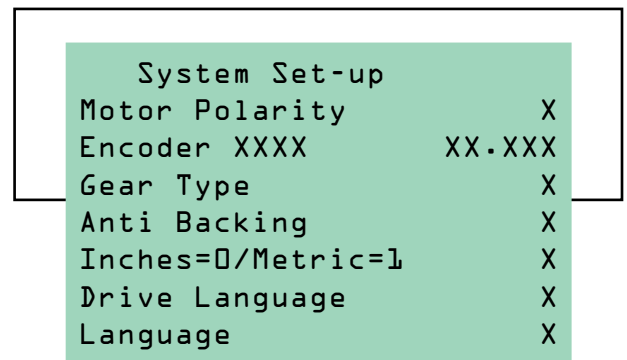
Initial Install / System Set-up Page

6.4 Anti Backing: The anti backing feature when enabled prevents backward Encoder movements to be transfered to the Servo Head Unit, causing the infeed cylinder to turn backwards when the press comes to a stop. The cause of backward encoder movements is due to web tension releasing when the press comes to a stop.

It is only recommended this feature be turned on if necessary.

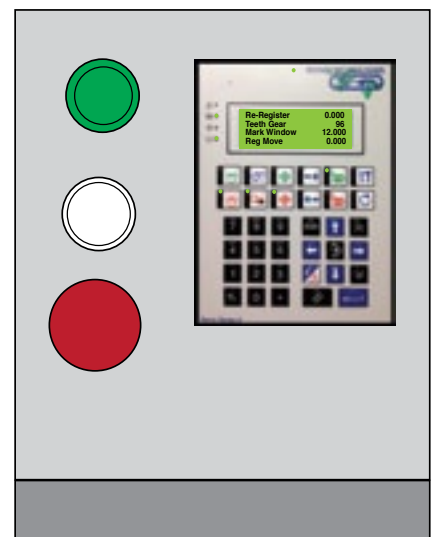
Possible Values:	0 = Off
	1 = On Positive
	2 = On Negative

Note: To test which On Value is correct for the installation, enter 1 = On Positive. Next jog the press and if the Green LED stays on it is correct. If the Green LED goes off when the press moves, enter 2 = On Negative.



Only four lines of text are display at once.

Green LED





6.5 Inch / Metric: Value determined by user preference.

Possible Value	Display (Status Screen)	Data Entry (Reregister Screen)
0 = Inches	Temperature = F° (Fahrenheit) Speed = FPM (Feet Per Minute)	Mark Window = Inches Reg. Movement = Inches Reg. Display in Inches
1 = Inches	Temperature = C° (Celsius) Speed = MPM (Meters Per Minute)	Mark Window = Millimeters Reg. Movement = Millimeters Reg. Display = Millimeters

6.6 Drive Language: Value determined by user preference. The selected value determines the language for the Error Display in the Status Screen (see section x for details of the Status Screen).

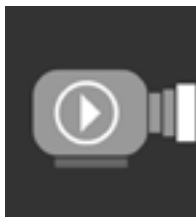
Possible Value :	0 = German
	1 = English
	2 = French
	3 = Italian
	4 = Spanish

6.7 Language: Value determined by user preference. The selected value determines the language for all Keypad displays.

Possible Value :	1 = English
	2 = Spanish
	3 = Dutch
	4 = Portuguese



7 Infeed Video Link



7. Infeed Mode

Infeed Mode is used to adjust and maintain web tension for all activities except reregister. Press the "Infeed Mode Page" key to enter Infeed Mode.

Infeed Tension is the only field for data entry. Infeed Tension is a digital scale of 250 micro step adjustments.

0.0 = Most tension.

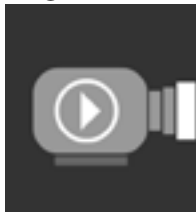
20.0 = System runs 1:1 to the press.

25.0 = Least tension (overfeed).

Note: On most installations a good tension value is between 16.0 and 18.0.

Note: The system blocks Infeed Mode while Reregister is On. To enter Infeed Mode the Reregister

8 Reregister Video Link



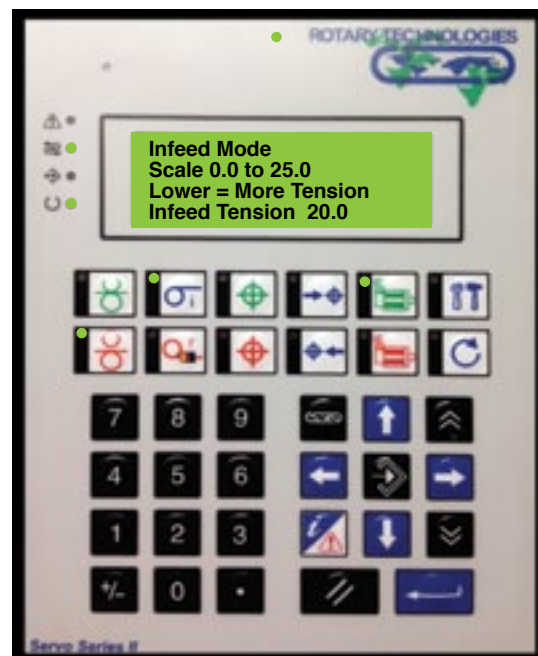
8. Reregister Mode

Reregister Mode is used to register pre-printed materials. Press the "Reregister Mode Page" key to enter Reregister Mode.

When running a reregister job the display will show the actual register position. The lower this value the better the registration is between the pre-printed material and the press.

There are three fields for data entry: Print Repeat/ Gear Teeth, Mark Window, and Reg Movement.

There are four function keys used in Reregister Mode: Reregister On, Reregister Off, Advance Register, Retard Register.



Infeed Mode Page



Reregister Mode Page



Reregister On



Reregister Off



Advance Register
LED on when pressed



Retard Register
LED on when pressed



8.1 Reregister On/Off: Pressing one of these two function keys will turn the reregister process controller on and off.



Reregister On



Reregister Off

8.2 Print Repeat/Gear Teeth: Depending on the value selected for Gear Type in the System Set-up Page ([see section 6.3](#)) the display will read Print Repeat or Gear Teeth.

When Print Repeat is displayed enter in inches the actual size of the print cylinder or die cylinder. Do not mistake this with image repeat or label repeat.

When Gear Teeth is displayed enter the number of teeth of the print cylinder or die cylinder.

8.3 Mark Window: Depending on the value selected for Inch/Metric in the System Set-up Page (see section 6.5) this value will be enter as inches or millimeters accordingly.

This value refers to where the system can look for the print mark within the print repeat. The system automatically opens the Mark Window to equal the Print Repeat when the reregister is turned on. The Mark Window is used to block out any unwanted marks or images and read only the intended registration mark.

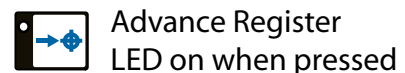
Note: The system uses only one mark per Print Repeat. If there are multiple marks the Mark Window must be used. See section xxx Reregister Set-up for more information.

8.4 Reg Movement: Depending on the value selected for Inch/Metric in the System Set-up Page (see section 6.5) this value will be enter as inches or millimeters accordingly.

This value refers to the distance the registration of the pre-printed material is to be moved. The minimum movement is .001" or 0.01 mm, and the maximum movement is .500" or 25 mm at one time.

8.5 Advance/Retard Register: Pressing one of these two function keys will move the register position of the pre-printed material the amount of the value in the Reg Movement field.

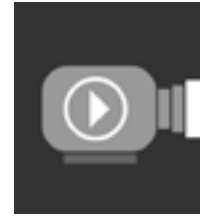
Example: Entered in the Reg Movement field is .250 and the Advance Register key is pressed, the pre-printed material will advance .250".



Advance Register
LED on when pressed



Retard Register
LED on when pressed



9. Mark Sensor Operation

To teach the sensor a print mark follow these steps.

1. Point the light spot to the print mark.
2. Press TEACH-IN key. After finishing this first step, the indicator LED flashes slowly.
3. Point light spot to the background.
4. Press TEACH-IN key once more.
5. If TEACH-IN was successful the LED will be off and only turn on when sensing the mark.
6. If TEACH-IN was unsuccessful (insufficient contrast), the LED will flash fast. Repeat the steps.

Note: With mirroring or shiny surface tilt the sensor by 10° to 15°.



Indicator LED



Teach In Key



10. Reregister Job Set-up

1. Run the pre-printed material thru the Servo Unit and adjust the Mark Sensor as described [in section 9](#).

2. Press the Reregister Mode page key and enter the Print Repeat.



Reregister Mode Page

3. If there is one mark per Print Repeat press the Reregister On key and proceed to run the press.

4. If there are multiple marks the Mark Window must be set. Measure the distance in inches between the target register mark and the next closest mark or image. This distance will be the Mark Window value. Jog the press so that the target mark is just before the light on the Mark Sensor. Press the Reregister On key. Jog the press so the target mark passes the Mark Sensor. Enter the value for the Mark Window.

5. As the press runs the display will show the register position between the pre-printed material and the press. When the display settles to a low number the system has locked a register position.

6. Make ready the press as usual.

7. Further register adjustment may be made by changing the pre-printed material position. In the Reg Movement field enter in inches a distances then press either the Advance/Retard Register keys depending on the intended direction.



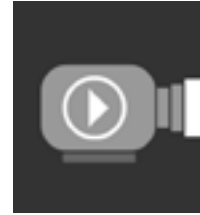
Advance Register
LED on when pressed



Retard Register
LED on when pressed



Status Page Video Link



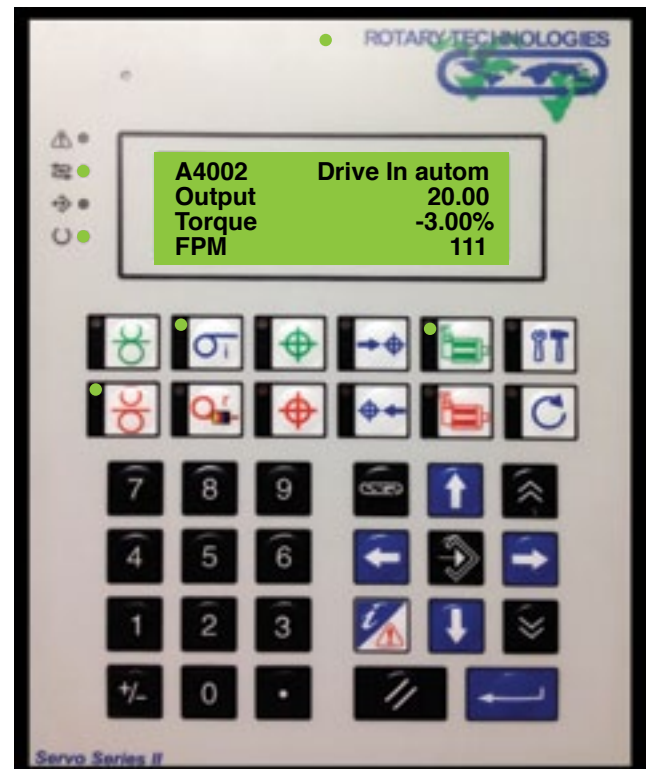
11. Status Page

11.1 System Status: The first line shows a system status code with a description. [See Appendix 2 for status code definitions.](#)

11.2 Output: This value is the "Infeed Tension" value. When running reregister this value adjusts automatically to keep the pre-printed material in register.

11.3 Torque: This value is the current motor torque.

11.4 FPM: This value is the press speed in feet per minute.

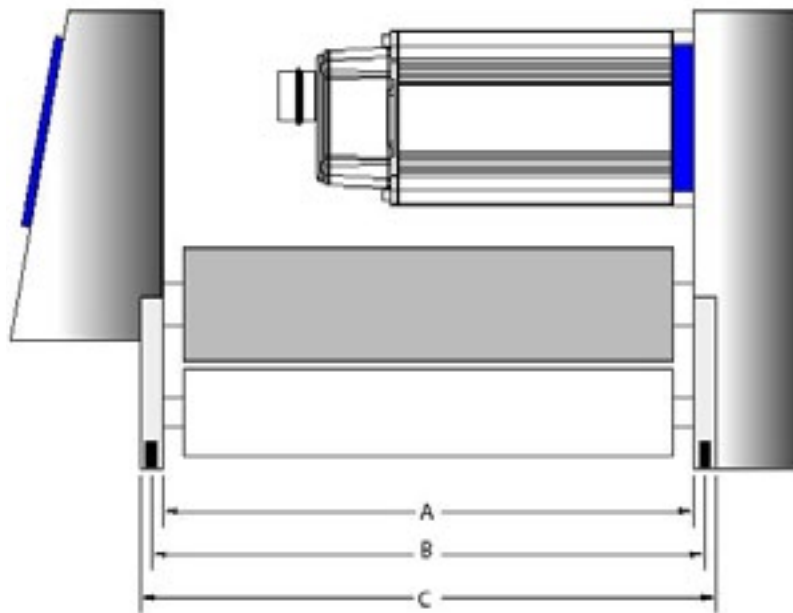


Status Page - Key Toggles
Between Current Page



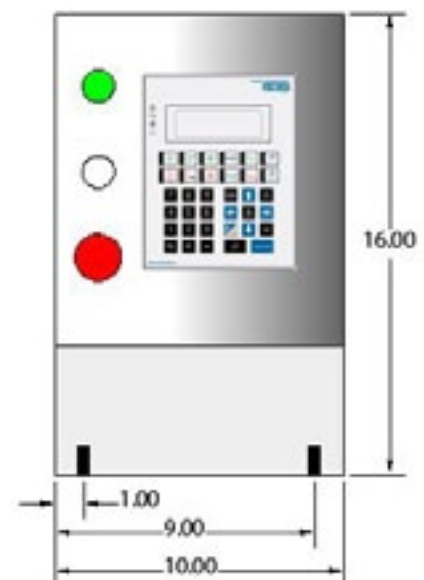
12. Mechanical Drawings

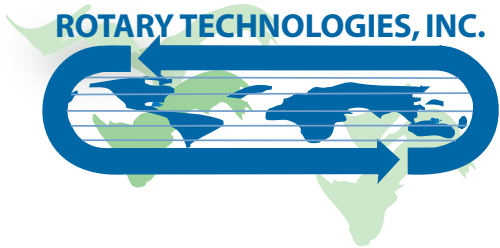
12.1 Servo Unit



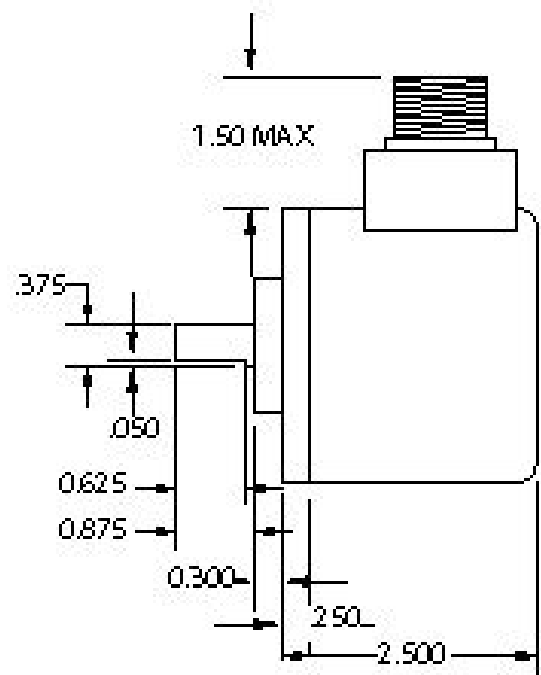
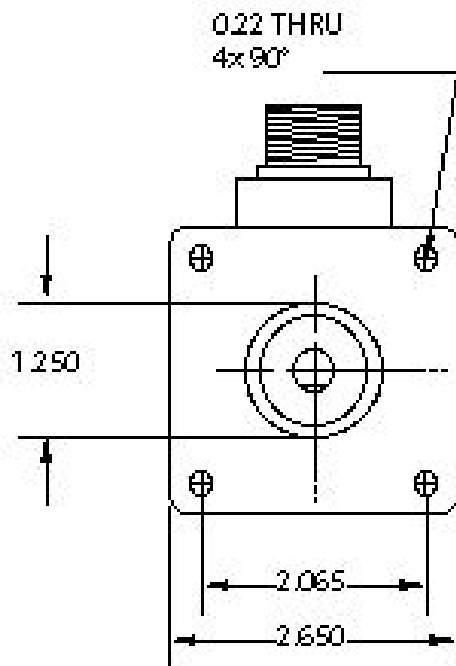
■ = 4x 3/8-16 x 1" Deep Mounting Holes

Model	A	B	C
10"	12.50"	13.25"	14.00"
16"	18.50"	19.25"	20.00"
20.5"	23.00"	23.75"	24.50"

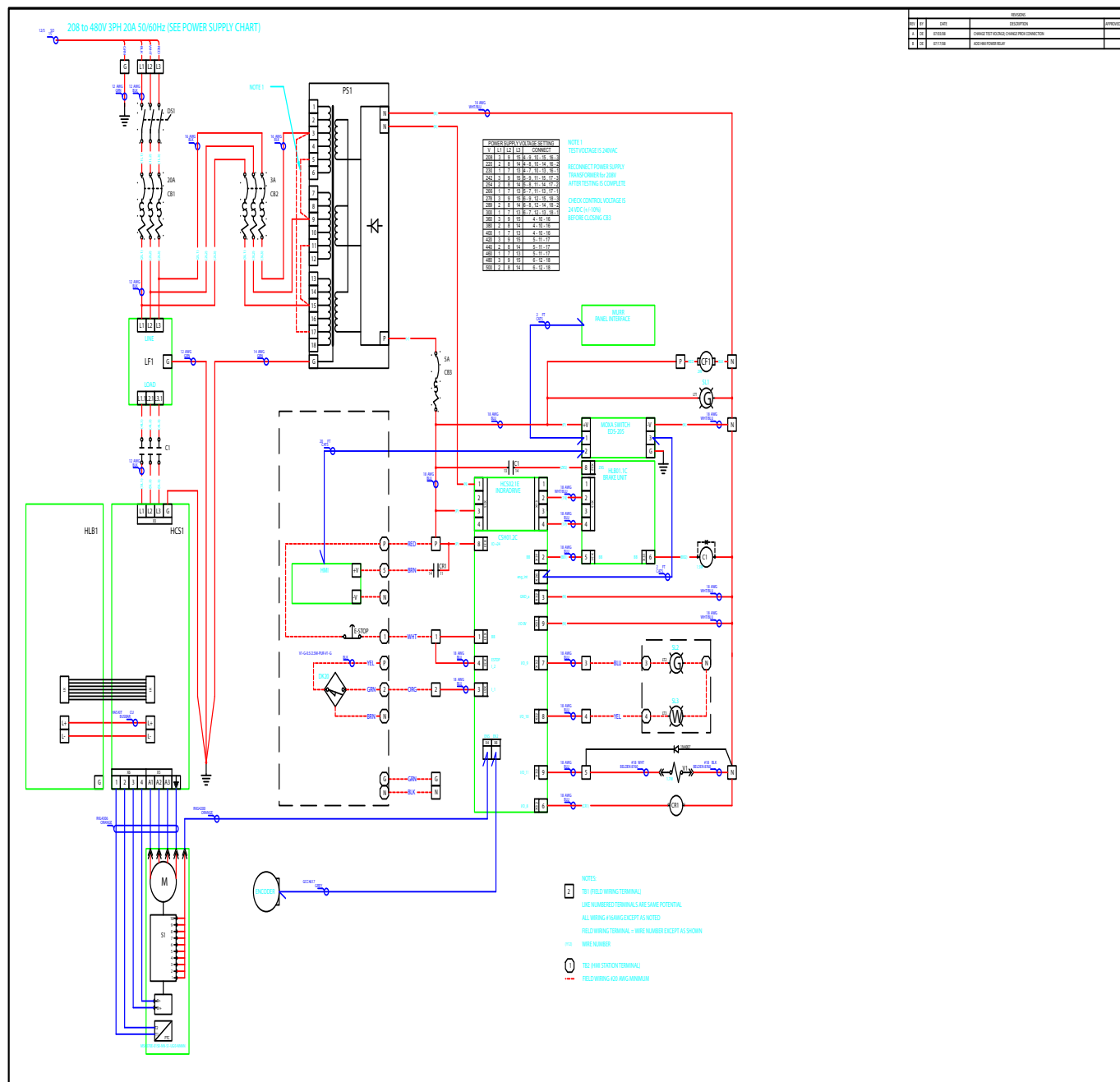




12.2 Encoder

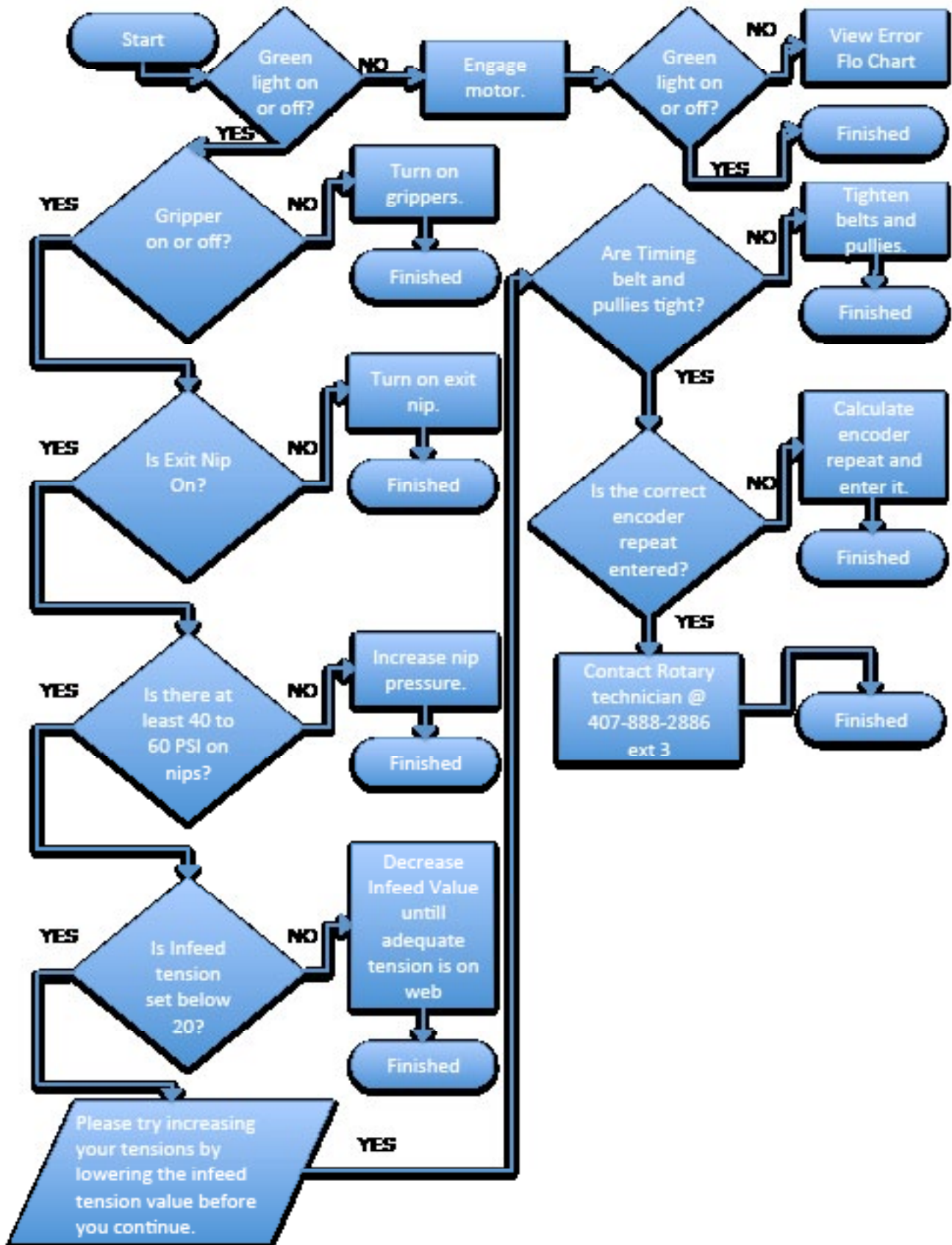


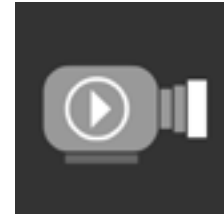
9. Electrical Drawing





Infeed tension not working.





Remote Communication for the Servo 3000

1. In order for remote communication to work, Port Forwarding **MUST** be set up.
2. The Servo 3000 uses two Static IP address.
192.168.1.61
192.168.1.31
3. The default IP Scheme is as follows:
IP **192.168.1.*****
Subnet 255.255.255.0
Gateway 192.168.1.254
4. There are three ports that must be forwarded.
TCP Port 1200 to IP Address 192.168.1.61
TCP Port 5002 to IP Address 192.168.1.61
UDP Port 6918 to IP Address 192.168.1.31

Example (Note: Our Router calls Port Forwarding Pinholes)

Pinhole Entry	
Pinhole Name	Servo 3000
Protocol	TCP
External Port Start	1200
External Port End	1200
Internal IP Address	192.168.1.61
Internal Port	1200
<input type="button" value="Submit"/>	

Pinhole Entry	
Pinhole Name	Servo 3000 2
Protocol	TCP
External Port Start	5002
External Port End	5002
Internal IP Address	192.168.1.61
Internal Port	5002
<input type="button" value="Submit"/>	

Pinhole Entry	
Pinhole Name	Servo 3000 3
Protocol	UDP
External Port Start	6918
External Port End	6918
Internal IP Address	192.168.1.31
Internal Port	6918
<input type="button" value="Submit"/>	



Setting up IP Addresses on the Servo 3000

Drive: (The drive is located in control cabinet)

The Indradrive IP address is set in parameter P0-1531, the subnet is set in P0-1532 and the gateway is set in P0-1533. It is important that the first three elements in the IP Address and Gateway address match.

These parameters can be set manually with the user interface on the front of the drive. The control power must be cycled before the changes will take effect.

In the case of the user interface, use the following procedure.

1. Hold down the ESC and Enter buttons for 10 seconds: "1.Er.Anz" will be displayed.
2. Press the up arrow once: "2.Comand" is displayed.
3. Press Enter: "Adr. 1" and "2.1 Adr." will alternate.
4. Press the up arrow twice: "Ethernet" and "2.3 Kom." will alternate.
5. Press Enter: "2.3.1" and "P -0-1531" will alternate.
6. Press Enter to edit the IP Address (P-0-1531)(192.168.0.61) or the up arrow to edit the subnet (P-0-1532)(255.255.255.0) or the gateway address (P0-1533)(192.168.0.1).
7. Use the up and down arrows to edit each element. Use the enter button to tab between elements.

Press Enter to accept when done and Esc multiple times to exit all menus.

HMI: (Screen)

Setting the IP address on the screen has the same principle as the drive. You must set the IP Address, the Subnet mask and the Gateway.

1. Press and hold the enter button. A menu will popup, Select the menu PSW (PSW stands for password).
2. The Password is 7101. Enter the password and press enter. Screen will go back to the beginning.
3. Press and hold the enter button again. Select CFG (CFG stands for configuration). Press enter
4. Once in configuration mode, Press the up arrow and down arrow key at the same time. This will bring you into the IP Configuration mode.
5. Enter the new IP address for the screen. ex. 192.168.0.31)
6. The next line down will be your subnet mask. Enter your subnet (ex. 255.255.255.0)
7. The Third line down will be you Gateway. Enter your Gateway (ex. 192.168.0.1)
8. Accept the settings by pressing enter.
9. It will ask you if you're sure. Press enter for yes.
10. Screen will reboot with new setting in effect.

(Default IP Settings)

Drive IP Settings	Screen IP Settings
IP 192.168.0 .61	IP 192.168.0.31
Subnet 255.255.255.0	Subnet 255.255.255 .0
Gateway 192.168.0.1	Gateway 192.168.0 .1



Appendix 4 - Maintenance Schedule

1) Air Filter.

Every month clean the air filters located in the electric cabinet. Remove the filter and blow off dust using shop air.

Warning: Turn off power on the Servo 3000 when removing or installing the air filters.

2) Timing Belt

Every 6 months inspect the timing belt for any signs of wear. If necessary replace the belt.

Warning: Do not inspect the timing belt while the Servo 3000 is running.

3) Gripper Wheels

Every 3 months inspect the gripper wheels for any signs of wear. While the gripper wheels are engaged against the infeed cylinder check to see if they are actually touching the cylinder by trying to spin the wheels. It is recommended that the gripper wheels be set at 40 psi. If necessary replace the gripper wheels.

Warning: Do not inspect the gripper wheels while the Servo 3000 is running.



Service email link.



Technical support hours are from 8:30 AM to 4:30 PM Eastern standard time. When contacting technical support please have your machine serial number ready.

Telephone : + 407 888 2886 Extension 3

Sales office email links.



Headquarters Orlando Fl

